

Bloodborne Pathogens (BBP)

2017 Annual CE



1



Objectives

2

Upon successful completion of this module, the EMS provider will be able to:

1. Define the mission of OSHA and its Standard.
2. Examine contents of your department's written Exposure Control Plan
3. Define bloodborne pathogen (BBP).
4. Provide examples of potential bloodborne pathogens.
5. Define the term standard precautions.
6. List personal protective equipment (PPE) available for use.

Objectives cont'd

3

7. Describe the proper procedure to don/doff gloves
8. Explain the steps in proper hand washing
9. List examples of engineering controls.
10. List examples of work practice controls.
11. Recognize signs or labels that indicate the presence of bloodborne pathogen hazard.
12. Discuss factors affecting disease transmission
13. Distinguish modes of transmission of bloodborne pathogens

Objectives cont'd

4

14. Discuss definition, incubation period, transmission route, signs and symptoms, and PPE to use for a variety of infectious diseases.
15. Describe components of housekeeping and when they are performed
16. Describe necessary recordkeeping related to bloodborne pathogens.
17. Define an exposure incident.

Objectives cont'd

5

18. Review the EMS System Operating Guideline (SOG) policy for infection control and exposure.
19. Describe the “Notification of Significant Exposure” form, and how to complete and forward the form.
20. Successfully complete the post quiz with a score of 80% or better.

Why Take A BBP Program?

6

- Increase your awareness of hazards
- Increase your knowledge base
- Understand steps to take for prevention of contracting or spreading illness
- Understand your role in the healthcare environment
- Know how to make your environment as safe as possible for all

Federal Agencies - OSHA

- Occupational Safety and Health Administration
- Protects the health of workers by ensuring a safe and healthy workplace for everyone
- Sets and enforces standards
 - Bloodborne Pathogen (BBP) Standards protects employees at risk of exposure to blood or other potentially infectious material (OPIM)
- Requires employers to develop written documents regarding implementation and training of the Standard

Provides training, outreach, education and assistance

Federal Agency Involvement

➤ CDC

- Monitors national disease data
- Disseminates information to all health care providers

➤ NIOSH works with OSHA

- Sets standards & guidelines for workplace and worker controls to prevent infectious diseases in workplace

Employer Responsibilities – Written Exposure Control Plan

- ▶ Plan must be in writing and accessible 24/7
 - ▶ Employees need to be knowledgeable on location of written plan
 - ▶ Where is your plan kept and how do you get access?
- ▶ Department plan is to be updated annually
- ▶ Department plan to be written including all elements required by OSHA BBP Standard 29 CFR 1910.1030
- ▶ Department plan needs to be tailored to your individual requirements

Exposure Control Plan cont'd



Content included in the plan

- ✓ Identification of hazards in the workplace
- ✓ Identification of which tasks could expose employees
- ✓ Identification of which employees could have potential exposure based on tasks expected
- ✓ Information on modes of transmission of bloodborne pathogens
- ✓ Identification and provision of appropriate PPE
- ✓ Training of employee in use & care of PPE's
- ✓ Maintenance of PPE's and replacement of worn or damaged PPE's

Exposure Control Plan cont'd

- ✓ Implementation of various methods of exposure control
 - Standard precautions
 - Engineering and work practice controls
 - Housekeeping
- ✓ Access to receiving the Hepatitis B vaccination
- ✓ Process of post-exposure evaluation and follow-up
- ✓ Evaluation of circumstances surrounding an exposure
- ✓ Maintenance of recordkeeping



Definition of Pathogen (BBP)

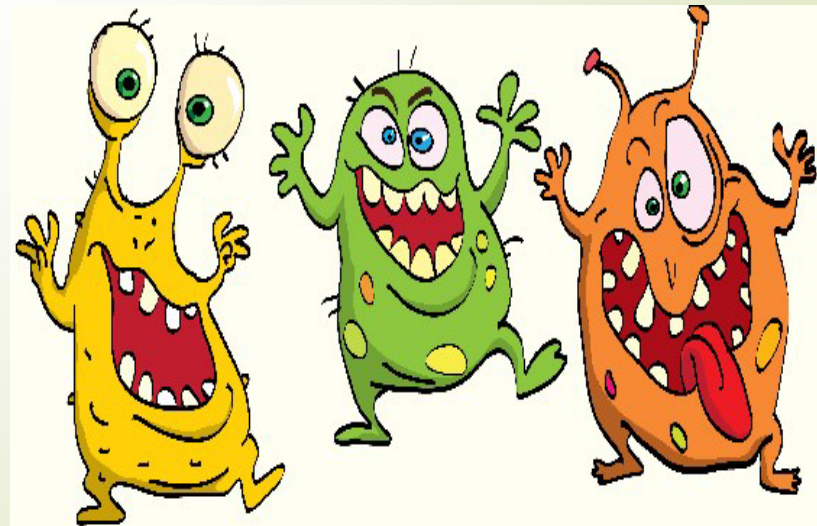


- ▶ Pathogenic microorganisms present in blood or certain body fluids that can cause disease in humans

Risk of exposure increases in presence of open wounds, active bleeding, or increased secretions

Examples of BBP

- HIV/AIDS
- Hepatitis B (HBV)
- Hepatitis C (HCV)
- Hepatitis D (HDV)
- Syphilis
- Malaria



Other Potentially Infectious Material/Agents (OPIM)

- ✓ Cerebrospinal fluid
- ✓ Synovial fluid
- ✓ Pleural fluid
- ✓ Amniotic fluid
- ✓ Pericardial fluid
- ✓ Peritoneal fluid
- ✓ Semen
- ✓ Vaginal secretions
- ✓ Any body fluid contaminated with blood or saliva in dental procedures
- ✓ Body fluids in emergency situations that cannot be recognized – blood, saliva, vomit, urine



Exposure Potential

- Contact with another person's blood or bodily fluid that may contain blood
- Contact through mucous membranes –
 - Eyes, nose, mouth
- Non-intact skin
- Contamination via sharps or needles



Safe Practice

*Everyone's got something that
you don't want!!!*

*Take precautions with every
potential exposure – seen
and unseen!!!*

Standard Precautions

- Term includes universal precautions and body substance isolation (BSI)
- Includes a group of infection prevention practices applied to all patients in the delivery of healthcare
 - Based on principle that everyone may have something you don't want
 - You can't always "tell" what infectious process someone may have
- Application of Standard Precautions dictated by task being performed related to potential for exposure

Standard Precautions cont'd

- Implies routine use of appropriate PPE and other practices in order to prevent exposure to any contact of blood or other body fluids
 - Protecting skin and mucous membranes
 - Performing frequent hand washing
 - Hand sanitizer acceptable in absence of soap & water especially in absence of gross material
 - Wearing gloves DOES NOT modify hand washing skills
 - Taking precautions to avoid needle sticks

Personal Protective Equipment - PPE

- ▶ The type of protective equipment appropriate for your job or research varies with the task and the degree of exposure you anticipate



PPE

- ▶ Eye and face protection
- ▶ Hand protection (i.e.: gloves)
- ▶ Protective clothing (i.e.: gowns)
- ▶ Employee needs to be informed:
 - ▶ When and what PPE to use
 - ▶ How to put PPE on (don), adjust it, wear it, and take it off (doff)
 - ▶ Limitations of PPE
 - ▶ Maintenance, care, useful life, and disposal of PPE



Just asking...

21

- ▶ Why do you think hand washing is promoted so much?
 - ▶ Most pathogens are transferred via contaminated hands.
- ▶ When wearing gloves, are you aware of when they come into contact with potential pathogens?
- ▶ Are you aware of what you do with your gloved hands and how many times you touch and potentially cross contaminate ?
- ▶ Removal should be monitored by partner watching for potential contamination

PPE available

22

- Gloves – for contact
- Utility gloves – broken glass & sharps
- Gowns – impervious to fluids
- Tyvek suit – gross contamination anticipated
- Face shield – invasive procedures
- Goggles – shield to front, sides, top of eyes
- Surgical mask – worn with eye protection
- Booties – to cover shoes/boots
- Head covering - splashing

PPE's

23

- ▶ Can only be useful if worn
- ▶ Know how to use your PPE's
 - ▶ If not sized and used appropriately, it's like not using any at all



- ▶ Note: The loose fit of mask over bridge of nose and gap at bottom of chin makes this mask ineffective

Removing Single Layer Gloves

- ▶ Outside of glove is contaminated!
- ▶ Grasp outside of glove with opposite gloved hand
- ▶ Slowly peel glove off turning it inside out as it is removed
- ▶ Place removed glove into palm of gloved hand
- ▶ Slowly peel remaining glove off turning it inside out as you remove it and capturing 1st glove inside glove being peeled off
- ▶ Dispose of properly
- ▶ Wash hands including wrist area

Removing Double Gloves

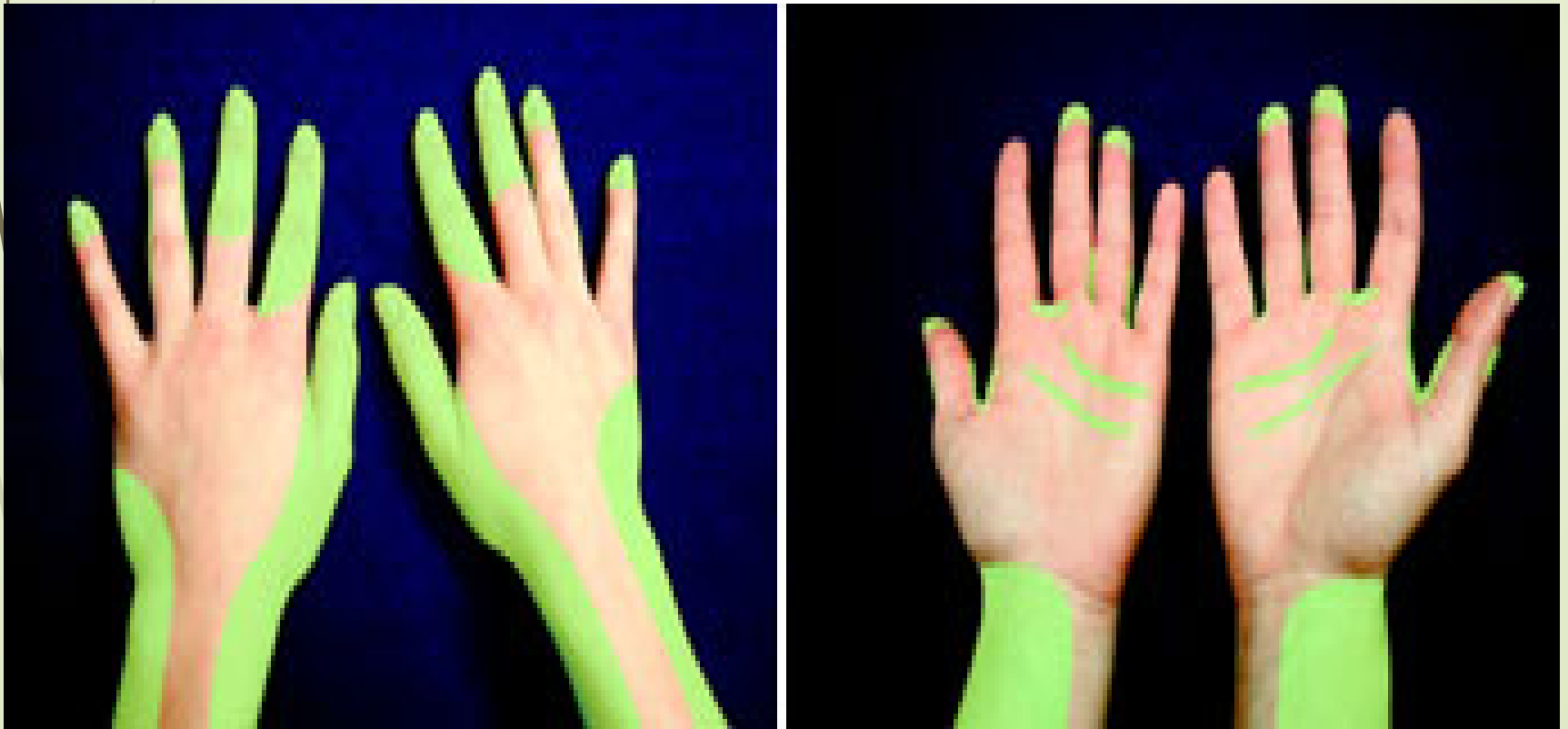
- Remove outer, more contaminated layer of gloves before removing other PPE's
- Disinfect (bleach or Cavicide) inner glove after removal of each piece of PPE
- Prepare to remove inner glove last
- Grasp outside of glove with opposite gloved hand and peel off
- Hold removed glove in palm of gloved hand
- Slide fingers of ungloved inside glove at wrist area
- Remove 2nd glove by slowly rolling it down hand and fold into first glove
- Discard the removed gloves
- Perform hand hygiene (i.e.: wash hands)

Handwashing

- ▶ Single, most effective means of work practice control that is highly effective
 - ▶ Performed before and after every patient exposure
 - ▶ Performed after removal of gloves
 - ▶ Performed prior to eating
 - ▶ Performed after toileting
 - ▶ Wash hands including all surfaces of hands and up to wrists
- ▶ **Wet, lather, scrub vigorously (15-20 seconds), rinse, dry**

How Good Are You?

- Frequently missed areas when hand washing performed



Antiseptic Hand Sanitizer



- Antiseptic hand sanitizers may be used as an appropriate hand washing practice *IF*:
 - ✓ Your gloves remained intact
 - ✓ You have had no occupational exposure to blood or other potentially infectious materials
 - ✓ Material can be left to air dry on your skin
- Choose a product with **at least 60%** alcohol base

Engineering Controls

- Devices that isolate or remove bloodborne pathogen hazards from the workplace to minimize exposure
 - ✓ Sharps disposal containers
 - ✓ Needleless systems
 - ✓ Self-sheathing needles
- Devices only good if & when they are used



Work Practices

30

- ➔ Practices that reduce the likelihood of exposure by altering how a task is performed
 - ✓ Handwashing (*preferably frequently!!!*)
 - ✓ Recapping a needle with the one-handed technique, if at all
 - ✓ Not eating or drinking in ambulance
 - ✓ Disinfecting equipment and vehicle
 - ✓ Changing from soiled clothing
 - ✓ Keeping work area clean and decontaminated

Handling Sharps

31

- ▶ Avoid recapping needles
 - ▶ If necessary, recap with the one handed technique
- ▶ Never break or shear needles
- ▶ Use mechanical devices to move or pick up used needles (i.e.: forceps, pliers)
- ▶ Dispose of needles in labeled sharps container
 - ▶ Do not overfill sharps container
- ▶ To transport sharps container, close to prevent spilling

Hazardous Material Labels

- ▶ Warning label of fluorescent orange or orange red with contrasting letter and symbols (universal symbol)
- ▶ Must be used to identify presence of blood or other potentially infectious material
- ▶ Use of red bags substitutes for use of labels



- ▶ What are the modes of transmission?
- ▶ What is the infectious process?
- ▶ What are the risk factors?

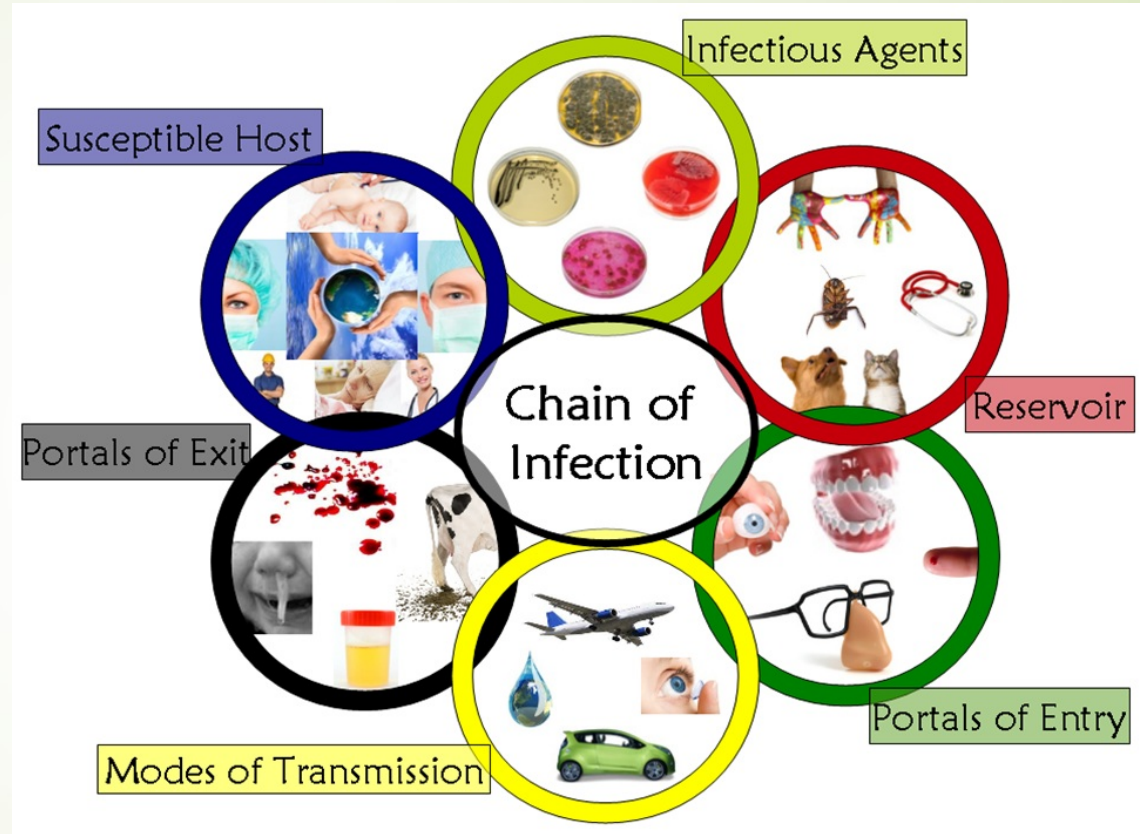
Factors Affecting Transmission

- Mode of entry acceptable for that particular pathogen
- Virulence – strength or ability to infect or overcome body's defenses
- Number of organisms – minimal dose necessary to cause infection
- Resistance of host – ability to fight off pathogen

Modes of Transmission

35

- ✓ Bloodborne
- ✓ Airborne
- ✓ Droplet
- ✓ Fecal-oral
- ✓ Indirect
- ✓ Opportunistic*
- ✓ Sexual*



*Sexual route and opportunistic not of concern to on-the-job EMS provider

Bloodborne Exposure

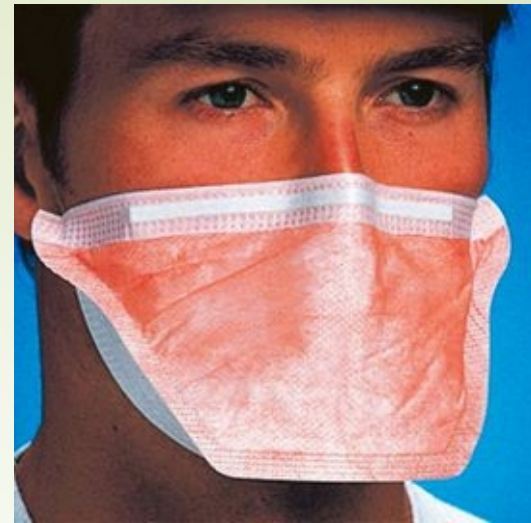
- Direct or indirect contact with blood or infected body fluids
 - ✓ Needle stick
 - ✓ Splash on broken skin
 - ✓ Splash on mucous membranes
 - Eyes, nose, mouth



Airborne Exposure

37

- Particles remain suspended in air a long time and float over a distance
- Most risk at less than 6 feet from source
- Transmitted via sneezing, coughing, talking, shedding of skin
- Patient to wear a surgical mask to minimize spread of disease
 - TB, polio, pneumonia, influenza, chicken pox
- Healthcare worker to wear N95 to prevent exposure to particles



Droplet Exposure

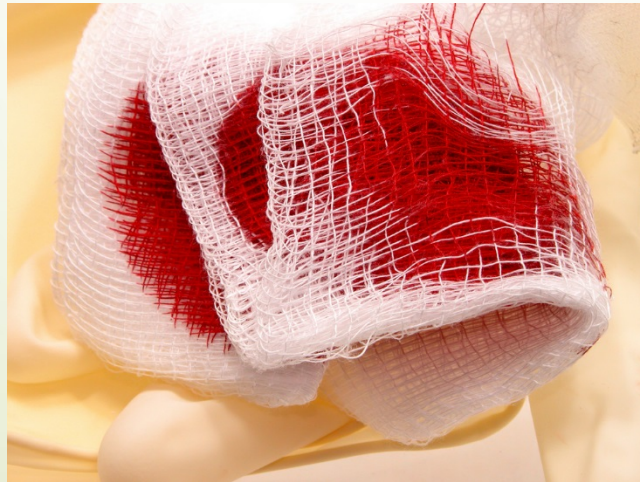
38

- Droplet of moisture expelled from source's upper respiratory tract and then inhaled into respiratory system or contact with mucous membranes
- Droplets too heavy to remain airborne for long
- Transmitted via sneezing, coughing, talking
- Most at risk within 3 feet of source
- Patient to wear surgical mask; provider wears N95
- Diseases: common cold, influenza, meningitis, rubeola (measles), whooping cough



Indirect Exposure

- ▶ Contact with a contaminated object or surface and then material is transferred to your mouth, eyes, nose or open skin
 - ▶ HBV can survive about 7 days dried on a surface
 - ▶ HIV does not live long outside the host site (body)



Fecal-Oral Exposure

- Often results from poor or non-existent hand washing efforts
- Contaminated hands transfer microorganisms to all surfaces and objects touched
- Recipient touches contaminated surface and then brings contaminated hands to face or ingests contaminated food or liquid
 - HAV, food poisoning



Infectious Disease Discussion

- The following slides discuss a few select diseases that may be problematic for the healthcare worker or at least something to be aware of
- Reminder:
 - Assume all persons have something contagious that you don't want!
 - Frequent hand washing single most important step to take to keep self healthy

Review of Selected Infectious Diseases

Definition

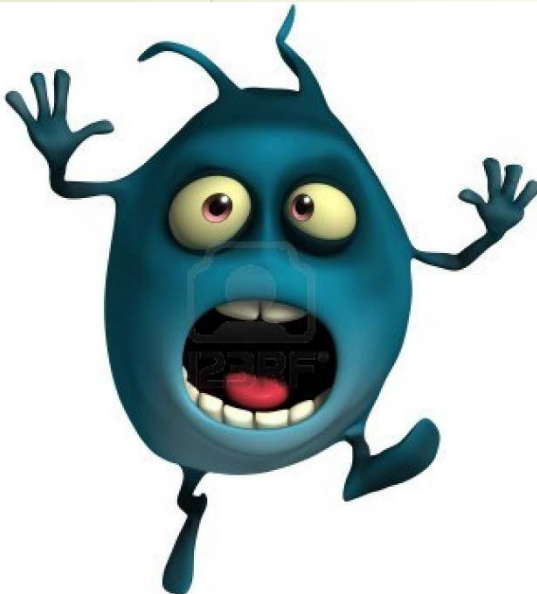
Incubation Period

Transmission Mode

Signs & Symptoms

Recommended PPE

Special Considerations



HIV

- A fragile virus that attacks the immune system
- Eventually leads to AIDS which is a collection of signs and symptoms
- Incubation is variable and can be in years
- Transmission
 - ✓ Sexual contact
 - ✓ Contact with contaminated blood
 - ✓ Mother to newborn



HIV cont'd

44

- ▶ Signs & symptoms
 - ▶ Fatigue, fever, sore throat, lymphadenopathy, splenomegaly, rash, diarrhea, secondary infections, weight loss, dementia, psychosis
- ▶ No vaccine available
- ▶ PPE – gloves, goggles, mask, gown as needed to avoid blood contamination
- ▶ Antibodies develop in approximately 6 - 12 weeks post exposure
 - ▶ Post exposure, provider needs to keep scheduled appointments for serial lab draws

Hepatitis B (HBV)

45

- Viral infection; can develop into chronic state; affects the liver
- Incubation 4 - 25 weeks
- Transmitted by direct contact with blood or body fluids
- Complaints start as flu-like symptoms
 - Dark urine, light colored stools, fatigue, fever, jaundice, abdominal pain, loss of appetite, nausea/vomiting
 - Symptoms can begin 1-9 months after exposure



Hepatitis B Virility



- ▶ The CDC states that Hepatitis B Virus can survive for at least one week in dried blood on environmental surfaces or on contaminated instruments
- ▶ NOT spread via contaminated food or water, via breast feeding, coughing/sneezing/kissing, or sharing eating utensils
- ▶ PPE's – gloves, goggles, mask, avoidance of needlesticks



Hepatitis B Vaccine

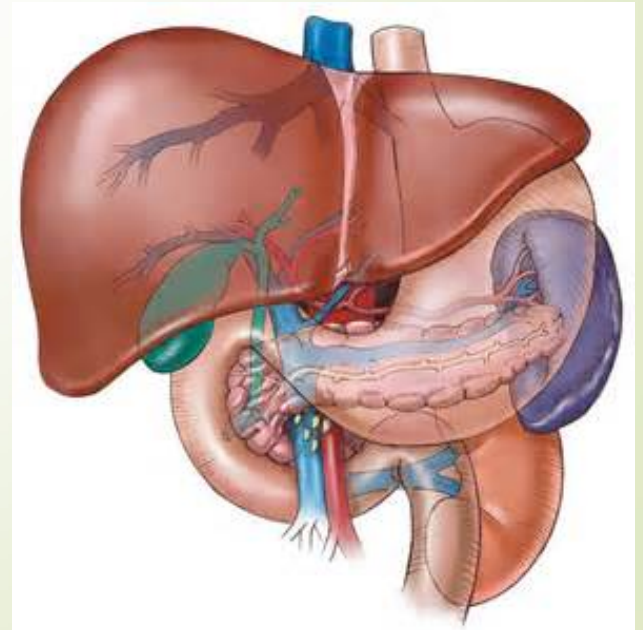
47

- ✓ Available since 1982
- ✓ Highly effective means of protection from the virus
 - ✓ Decline in number of cases most likely due to vaccine
- ✓ Must be offered within 10 days of assignment to task involving an exposure risk and must be free
- ✓ If employee declines, must sign declination form
 - ✓ Kept on file
- ✓ Employee may, at any time, request the hepatitis B vaccine after initial declination
 - ✓ 3 injection series
 - ✓ Given IM in deltoid
 - ✓ Once started, 2nd dose is in 1 month; 3rd dose 6 months from 1st dose

Hepatitis C (HCV)

48

- ▶ Viral infection causing inflammation of liver
 - ▶ Currently, most common chronic bloodborne infection in the USA
- ▶ Leading reason for need of liver transplant in the USA
- ▶ Can lead to cirrhosis and cancer
 - ▶ 75 – 85% of infected people develop chronic infection
- ▶ Incubation 2-25 weeks



HCV cont'd

49

- ✓ Transmission – contact with contaminated blood
 - ✓ Most common exposure is sharing needles and equipment for illicit drug injection
- ✓ Contagious throughout course of infection
- ✓ Symptom onset slow (up to 20 years for chronic infection)
 - ✓ Loss of appetite
 - ✓ Vague abdominal discomfort
 - ✓ Nausea and/or vomiting
 - ✓ Jaundice less common than with HBV
- ✓ *Currently work is ongoing to develop a vaccine*
- ✓ PPE's – gloves, mask, goggles, avoidance of needle sticks

Tuberculosis (TB)

50

- Bacterial infection most commonly affecting the lungs
- TB infection
 - Person has the bacteria but is not ill; cannot spread disease
- TB disease
 - Person ill, can spread TB
- Incubation 4 -12 weeks
- Transmission via airborne droplet
 - Prolonged exposure increases risk

TB cont'd

➤ Signs and symptoms

- Fever
- Chills
- Weakness. fatigue
- Night sweats
- Weight loss
- Dyspnea
- Productive cough
- Chronic cough



TB cont'd

- ▶ PPE's
 - ▶ Respiratory isolation
 - ▶ N95 mask for providers
 - ▶ Tight fitting surgical mask on patient
- ▶ Obtain periodic skin testing
 - ▶ If positive, need chest x-ray
- ▶ Provide adequate ventilation while caring for and transporting the patient with suspected or positive diagnosis

**N95 for
healthcare
worker**



**Surgical mask
for patient**



Chickenpox (Varicella)

- Viral infection
- Transmitted via direct and indirect contact and airborne droplets
- Incubation 10 - 21 days
- Signs and symptoms
 - Sudden onset low-grade fever
 - Mild feeling of not being well (malaise)
 - Rash



Chickenpox cont'd

- Contagious about 2 days prior to rash and until all vesicles have scabbed over
- Virus dies quickly outside the body
- Skin eruptions continue over 3 – 4 days
- PPE's – gloves; surgical mask on patient, mask on healthcare provider
- Vaccination added to childhood immunization schedule

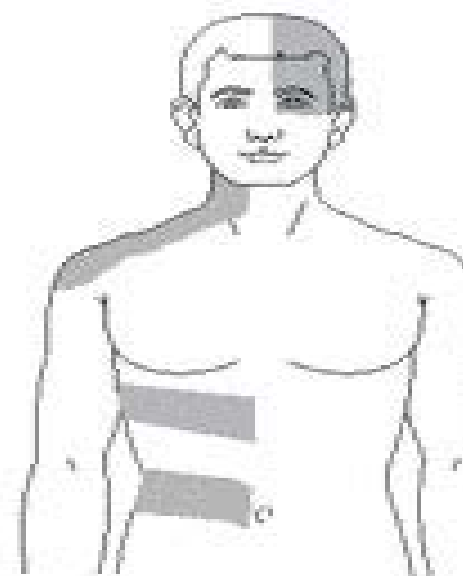
Shingles



- ▶ Caused by the varicella-zoster virus
 - ▶ (same virus as chicken pox)
- ▶ After chickenpox, varicella-zoster virus lies dormant in the body
 - ▶ May reactivate as shingles
- ▶ Transmission
 - ▶ Direct contact with fluid in the blisters
 - ▶ Risk low if rash kept covered (i.e.: clothing)
 - ▶ Contagious until rash scabbed over (about 7-10 days)
 - ▶ Risk is to anyone not immune to chicken pox
 - ▶ If exposed, you could develop chickenpox, not shingles

Shingles cont'd

- ▶ Most often appears as a unilateral stripe of blisters most often on the trunk that lasts 2-6 wks
 - ▶ Can appear around 1 eye or 1 side of the face/neck
- ▶ Treatment
 - ▶ Symptomatic
 - ▶ May be prescribed an antiviral medication to severity of symptoms
 - ▶ Vaccination available for those over 50 – not necessarily to prevent disease but to lessen severity of symptoms
- ▶ Not life threatening but can be very painful



Bacterial Meningitis

- Bacterial infection causing inflammation of the covering the brain and spinal cord
- Transmitted via contact with respiratory droplets
- Incubation: 2 – 10 days
- Sudden onset high fever, headache, stiff neck, nausea with vomiting, irritability
 - Infants – poor feeding, irritability

Bacterial Meningitis cont'd

- PPE's – gloves, mask (patient and provider)
- Vaccination now provided in childhood immunization schedule
- Antibiotic prophylaxis provided to all persons exposed and in contact with patient (post-exposure prophylaxis)
- Note: viral meningitis most common, less dangerous, and most improve on their own (no treatment)

Influenza – The Flu



- ▶ Upper respiratory viral disease
- ▶ Transmitted via respiratory droplet or airborne in crowded, enclosed spaces
- ▶ Incubation usually 1 – 5 days
- ▶ Adults contagious 3 – 5 days after symptom onset
 - ▶ Up to 7 days in children
- ▶ Rapid onset high fever, headache, muscle aches, sore throat, dry cough

Importance of Vaccinations

- ▶ Vaccines allow development of passive immunity to disease
 - ▶ Vaccines contain weakened or killed germs
 - ▶ You develop antibodies that stay in your body to protect you if exposed to that disease
 - ▶ Immunity may last a life time or may weaken requiring periodic revaccination
 - ▶ Active immunity develops when you have the disease
- ▶ Vaccinations protect from illness and serious complications from vaccine-preventable disease
- ▶ Vaccination has led to decline in number of serious cases of disease
- ▶ Vaccines undergo extensive testing for safety and efficacy

General Advice to Avoid Flu

- ▶ Get vaccinated
- ▶ Cover mouth and nose when coughing or sneezing
 - ▶ Use elbow not hand
 - ▶ Throw tissue away after one use
- ▶ Wash hands often
- ▶ Avoid touching eyes, nose, mouth with hands
- ▶ Practice good personal health
 - ▶ Get plenty of rest
 - ▶ Eat healthfully
 - ▶ Manage stress
 - ▶ Stay physically active

Pertussis – Whooping Cough

- ▶ Highly contagious bacterial disease
- ▶ Incubation 7 – 10 days
 - ▶ Range total 4 – 21 days
- ▶ Transmitted most commonly respiratory droplet and airborne
- ▶ Most at risk
 - ▶ Infants prior to vaccination
 - ▶ Aging population with lost immunity
 - ▶ Those never vaccinated

Whooping Cough cont'd

- Signs and symptoms in phases
 - 1st phase – sneezing, watery eyes, loss of appetite, listless, noticeable night cough
 - 2nd phase – in 10 -14 days paroxysms of coughing, thick mucous coughed up
 - 3rd phase – in 4 weeks coughing decreases in frequency; can last for months
- Vaccination – DTaP
- Vaccine immunity not life long; need repeated periodic revaccinations

Whooping Cough cont'd

- PPE – gloves, surgical mask patient and provider, goggles, possible gown
- Complications often from the spasmodic forceful coughing
 - ✓ Pneumothorax
 - ✓ Rib fractures
 - ✓ Hypoxia during coughing spells



Staph Infections

- ▶ *Staphylococcus aureus*, often referred to simply as "staph," are bacteria commonly carried on the skin or in the nose of healthy people
- ▶ Approximately 25% to 30% of the population is colonized (bacteria are present, but not causing an infection) in the nose with staph bacteria
- ▶ One of the most common causes of skin infections in the United States
- ▶ Most of these skin infections are minor (such as pimples and boils) and can be treated without antibiotics
- ▶ Staph bacteria can also cause serious infections

MRSA – Methicillin-Resistant Staphylococcus Aureus

- Type of bacteria (staph aureus) that is resistant to common antibiotics such as methicillin, oxacillin, penicillin and amoxicillin.
- Consequently, MRSA infections can be far more difficult to treat quickly than traditional staph infections.
- Occurs most frequently among persons in hospitals and healthcare facilities who have weakened immune systems.

Community Associated MRSA

- ▶ MRSA infections usually acquired by persons who have been recently hospitalized or had a medical procedure (such as dialysis, surgery, catheters) are known as CA-MRSA (Community Associated MRSA) infections.
- ▶ CA-MRSA infections can be transmitted in settings such as workout facilities or locker rooms
- ▶ Are usually manifested as skin infections such as pimples and boils

Results Of Contracting MRSA

- ✓ Skin infections, pimples, boils
- ✓ Pneumonia
- ✓ Bloodstream infections
- ✓ Potentially death (sepsis)



Transmission of MRSA

- ➔ Spread of MRSA skin infections is direct and indirect
 - ✓ Close skin-to-skin contact
 - ✓ Cuts or abrasions
 - ✓ Poor hygiene
- ➔ Methods of Contraction
 - ✓ Crowded living conditions
 - ✓ Contaminated items or surfaces
 - ✓ Weakened immune system



MRSA

- PPE
 - Gloves
 - Transport patient with a clean sheet
 - Do not use the sheet from the bed the patient was lying in, if possible
 - Avoid placing laundry in contact with uniform; wear gown if contact made with uniform
 - *Hand hygiene!!!*

Vancomycin-resistant Enterococcus - VRE

- ▶ Bacteria normally found in intestines
- ▶ Produces disease when bacteria invade other areas
 - ▶ Urinary tract, wounds, blood
- ▶ Healthy individuals rarely at risk
 - ▶ Healthy individuals can transmit VRE via indirect methods
- ▶ Those at most risk – weakened immune systems and other health issues

VRE

- Spread via contact
 - ✓ Feces
 - ✓ Contaminated equipment
 - ✓ Healthcare worker's hands
- PPE
 - Gloves
 - Gown if clothing contact anticipated
 - **Hand washing – single most important process to control spread of VRE**
 - Disinfect equipment after calls
 - Prevents indirect spread of VRE



Clostridium Difficile – C-Diff

- A spore-forming bacteria normally found in the human gut that is not usually a problem
 - Overgrowth causes problems
 - Mild diarrhea to colitis to death
- A common cause of antibiotic-associated diarrhea
 - Antibiotic use increases risk 7-10 fold while patient taking medication and up to 2 months after discontinuation
- Incubation is generally 2-3 days

C-Diff cont'd

- ▶ C diff shed in feces (fecal-oral route)
 - ▶ Transmission is usually via healthcare worker hands
 - ▶ Contaminated material, surfaces, devices contaminated with feces and not properly cleaned
- ▶ Patients at highest risk
 - ▶ Antibiotic exposure
 - ▶ Long length of stay in healthcare setting
 - ▶ Immunocompromised condition
 - ▶ Advanced age

C-Diff cont'd

76

- Clinical symptoms
 - Watery diarrhea
 - Fever
 - Loss of appetite
 - Nausea
 - Abdominal pain/tenderness
- Colonization = positive test but no symptoms
- Infection = positive test & clinical symptoms

C-Diff cont'd



- ▶ PPE's
 - ▶ Gloves during patient care
 - ▶ Hand washing after removing gloves
 - ▶ Soap & water over alcohol based hand gels
 - ▶ Alcohol does not kill C diff spores
 - ▶ Gowns recommended for patient care
 - ▶ Prevents contamination to clothing

C-Diff cont'd

- Special considerations
 - Adequate cleaning and disinfection of environmental surfaces after care of any patient with diarrhea
 - Use EPA registered disinfectant with sporicidal claim for environmental surface disinfecting after cleaning surface of gross material
 - **1:10 bleach solution is effective**
 - **Cavicide is effective**
 - *Super Sani-cloth NOT effective*
- Important: hand washing, barrier precautions, meticulous environmental cleaning of fecally contaminated surfaces

Norovirus



- Highly contagious virus that is the most common reason for acute gastroenteritis in the USA
- Outbreaks usually occur November to April
- Transmitted via fecal-oral route
 - Exposure to infected person, contaminated food or water, or touching contaminated surface and then introducing the virus into your mouth
- Symptoms develop 12-48 hours after exposure



Norovirus cont'd

- Symptoms due to inflammation in stomach and intestines
 - ✓ Abdominal pain
 - ✓ Nausea and vomiting
 - ✓ Diarrhea
 - ✓ Can also include fever, headache, body aches
- Improvement in 1-3 days
 - Virus can stay active in stool up to 2 weeks
- Complications mostly linked to dehydration
- Best intervention is prevention
 - **GOOD HAND WASHING TECHNIQUE!!!**
- Disinfect using chlorine bleach – 5-25 T per gallon water

Ebola

- Rare, deadly viral disease
- First discovered in 1976
- Unknown natural host site
 - Most likely animal borne – bats most likely the reservoir
- 2-21 day incubation period (average 8-10 days) after contact with Ebola patient



Ebola Transmission

- Direct contact with non-intact skin or via mucous membranes (eyes, nose, mouth)
- Contact with contaminated objects
- Contact with infected animals
- NOT spread via casual contact
- 1:10 bleach solution and Cavicide wipes to be used to clean equipment after patient exposure

Ebola Signs and Symptoms

- Fever $>38.6^{\circ}\text{C}$ or 101.5°F
- Severe headache
- Muscle/joint pain
- Weakness/fatigue
- Diarrhea
- Vomiting
- Abdominal pain
- Hemorrhage – bleeding or bruising
- Lack of appetite

Caring for Ebola Patient

- Inquire/screen patient for travel
 - West Africa (Guinea, Liberia, Sierra Leone, Senegal, Nigeria)
 - Within past 21 days/3 weeks of symptom onset
- Treatment
 - No specific treatment available
 - Treat symptoms
 - Fluid replacement required

Isolation For Suspected Ebola

- Standard precautions every patient contact
 - Handwashing extremely important
- Contact isolation
 - Face mask/shield, double gloves, impermeable gown, shoe covers
- Droplet precautions
 - N95 mask for healthcare worker
 - Surgical mask for patient
- Try to maintain distance of 6 feet

Zika Virus



- ▶ About Zika!
 - ▶ Zika outbreaks are currently happening in many countries.
- ▶ How Zika Spreads:
 - ▶ Primarily through the bite of infected mosquitos
 - ▶ During sex with a person who has Zika to his/her partners
 - ▶ From pregnant women to her fetus during pregnancy or around the time of birth.
- ▶ Zika Symptoms
 - ▶ Most people infected wont have symptoms or will only have mild symptoms.
 - ▶ Commonly: fever, rash, joint pain, red eyes, muscle pain, headache.

Zika Virus- Cont'd...

► Why Is Zika Risky?

- During pregnancy can cause a birth defect of the brain (microcephaly), eye defects, hearing deficits, impaired growth.
- Increased reports of Guillain-Barre syndrome (uncommon nervous system syndrome) in areas affected by Zika.

► How To Prevent Zika:

- No vaccine exists
- Protect yourself and family from mosquito bites.
- Prevent sexual transmission by using condoms or abstaining.

► What To Do If You Have Zika:

- Treated symptomatically: get lots of rest, drink fluids, fever reducers, avoid NSAIDS* (aspirin, ibuprofen, naproxen).
*until Dengue Fever ruled out to prevent risk of bleeding.
- To help prevent others from getting sick, strictly follow steps to prevent mosquito bites during the first week of illness.

General Housekeeping

- Pay attention to what you are doing
- Disinfect equipment between every patient contact
- Decontaminate infected equipment as soon as possible
- Wear appropriate protective equipment when performing the above tasks
- Know limitations of product based on suspected disease process
 - Ex: bleach or cavicide for Ebola and C-diff

Housekeeping cont'd

- To begin decontamination, clean surface of gross material
 - Can use soap and water initially
 - Soap is an emulsifying agent
 - One liquid disperses into another liquid to allow the product to be removed
 - Metrizyme disintegrates blood & protein
- After surface cleaning, then apply disinfectant according to product directions
 - Disinfectant must remain in contact with surface for prescribed time period to be effective

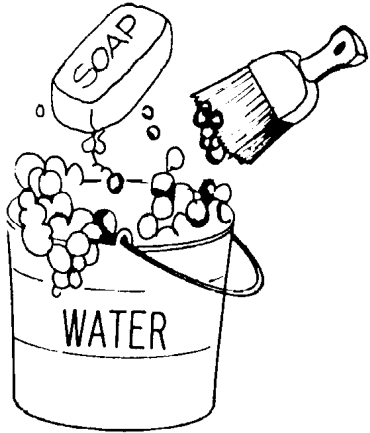
Housekeeping and Waste Disposal

- Keeping the worksite clean and sanitary is a necessary part of controlling worker exposure to blood borne pathogens.
- Cleaning schedules and decontamination methods depend on:
 - Type of surface to be cleaned
 - Determine minimal vs. frequent opportunity for hand contact to surface
 - Type of soil that is present
 - Particular tasks or procedures that are being performed

Cleaning and Decontamination Duties

- Review product labeling for any special directions/precautions
- Wear appropriate PPE for task being performed
- Remove all blood and debris from surface to be cleaned
 - Products can't clean the surface if they can't be in contact with the surface
- Allow disinfectant to air dry
 - Read label directions to determine length of time to leave surface wet based on need for disinfection

Example Products



1:10 dilution

Ethyl or Isopropyl Alcohol Products

- Short contact time due to rapid evaporation
- Used for small surfaces (i.e.: vial tops)
- Alcohol may discolor, harden, crack rubber & certain plastics if extended exposure over time
- Not practical for large surface disinfecting
- *Not effective against C-diff or Ebola*

Tuberculocidal Products

- ▶ Does not interrupt or prevent transmission of TB (TB not acquired from environmental surfaces)
- ▶ Claim used to indicate germicidal potency of product
- ▶ Indicates intermediate level disinfectant
- ▶ Capable of inactivating broad-spectrum pathogens including BBP (i.e.: HBV, HCV, HIV)

Bleach Products

- *Effective for C-diff (and Ebola)*
 - Caution - won't have diagnosis at time of transport
 - *Assume C-diff for any patient with diarrhea until proven otherwise*
 - Can shed bacterium in stool if asymptomatic
- Replace cleaning solution frequently
 - Contamination of solution and cleaning tools occurs quickly and can cross contaminate

Clean Up Involving Blood or Body Fluids

- ▶ Wear appropriate Personal Protective Equipment (PPE).
- ▶ Carefully cover the spill with absorbent material, such as paper towels, to prevent splashing.
- ▶ Decontaminate the area of the spill using an appropriate disinfectant, such as a solution of one part bleach to ten parts water. When pouring disinfectant over the area always pour gently and work from the edge of the spill towards the center to prevent the contamination from spreading out.

Clean Up of Spills cont'd

- ▶ Wait 10 minutes to ensure adequate decontamination, and then carefully wipe up the spilled material.
- ▶ Be very alert for broken glass or sharps in or around the spill.
- ▶ Disinfect all mops and cleaning tools after the job is done.
- ▶ Dispose of all contaminated materials appropriately.
- ▶ Wash your hands thoroughly with soap and water immediately after the clean up is complete.

Recordkeeping

- ▶ Medical records must be kept for each employee with occupational exposure for the **duration of employment plus 30 years**, must be confidential and must include name and social security number; hepatitis B vaccination status (including dates); results of any examinations, medical testing and follow-up procedures; a copy of the healthcare professional's written opinion; and a copy of information provided to the healthcare professional.

Recordkeeping

- Hepatitis B vaccination
 - Maintain employee status
- Training
 - To be delivered annually
 - Requires access to resource who can answer questions
 - In person or minimally via phone for instant access
 - Records to include date of training, contents, signature of trainer and attendees

Exposure Incident

- ▶ Considered occupational exposure if there is infiltration of mucous membranes or via open, non-intact skin
 - ▶ If in doubt, check it out
- ▶ Report all accidental exposures involving blood or body fluids
 - ▶ ED physician of receiving facility
 - ▶ It is recommended that you seek care at the same facility that the source patient is transported to.
 - ▶ Your immediate supervisor
- ▶ Immediately wash site thoroughly with soap & water
- ▶ Flush/irrigate mucous membranes as necessary

EMS System Policy

- Notification of significant exposure is to be reported immediately to the receiving hospital
- Complete “Notification of Significant Exposure” form
 - Leave in sealed envelope for EMS coordinator
- The ED MD on duty will advise the appropriate medical follow-up or need for consultation with private physician
- Follow-up fees are the responsibility of the provider
- If ED care is rendered to the provider, they must sign-in as a patient in the ED
 - Guarantees proper documentation of the incident and of care rendered

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102

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103

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