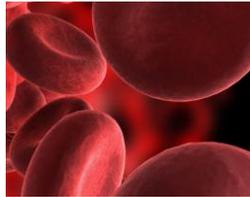


What are Bloodborne Pathogens (BBP)?

- Bloodborne pathogens are pathogenic microorganisms that are present in human blood and can cause disease in humans
- Examples:
 - Human Immunodeficiency Virus (HIV)
 - Hepatitis B Virus (HBV)
 - Hepatitis C Virus (HCV)

Potentially Infectious Bodily Fluids

- Skin, tissue
- Blood
- Saliva
- Vomit
- Urine
- Semen
- Vaginal secretions



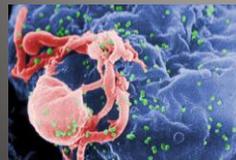
Entry

- The infected blood or body fluid comes in contact with broken skin
 - Punctures to the skin, needle sticks, sharps
 - Rashes, cuts, abrasions
- The infected blood or body fluid comes in contact with mucous membranes such as your eyes, nose or mouth
 - Splashes, touching your mouth or nose with a contaminated glove

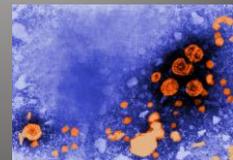
OSHA Bloodborne Pathogens Standard

- Details what employers must do to protect workers whose jobs put them at a reasonable risk of coming in contact with blood and other potentially infectious materials
- Passed in 1991
- CDC estimated that 90% of needle sticks could be avoided by improved handling and disposal of sharps

HIV, HBV, HCV



HIV



Hepatitis Virus

Human Immunodeficiency Virus

- Acute infection causes flu-like symptoms within 1-4 weeks of exposure
- Asymptomatic infection causes no symptoms; develop antibodies 4-12 weeks after exposure
- HIV causes Acquired Immunodeficiency Syndrome (AIDS)
- Transmission of HIV through:
 - sexual contact, transfusions, sharing needles, health care exposures, mother to child
- An estimated 1.1 million persons in the United States are living with HIV/AIDS, 18% unaware of their HIV infection

Exposure Risk for HIV

- It is estimated that the risk of infection with HIV from a needle-stick is less than 1%
- CDC does not recommend testing discarded needles for HIV
- If you are stuck by a needle, you should contact a healthcare professional as soon as possible
- There is no cure or vaccine for HIV/AIDS

How long does HIV survive outside the body?

- HIV does not survive well outside the body, making the possibility of environmental transmission remote
- HIV is found in varying concentrations or amounts in blood, semen, vaginal fluid, breast milk, saliva, and tears

HIV is NOT transmitted by...

- Closed-mouth kissing
- A human bite when the skin remains unbroken or intact
- Hugging
- Shaking hands
- Being spit on
- Drinking from the same the glass

Healthcare Personnel with Documented and Possible Occupationally Acquired HIV Infection, by Occupation, 1981-2010

Occupation	Documented	Possible
Nurse	24	36
Laboratory worker, clinical	16	17
Physician, nonsurgical	6	13
Laboratory technician, nonclinical	3	-
Housekeeper/maintenance worker	2	14
Technician, surgical	2	2
Embalmer/morgue technician	1	2
Health aide/attendant	1	15
Respiratory therapist	1	2
Technician, dialysis	1	3
Dental worker, including dentist	-	6
Emergency medical technician/paramedic	-	12
Physician, surgical	-	6
Other technician/therapist	-	9
Other healthcare occupation	-	6
Total	57	143

<http://www.cdc.gov/HAI/organisms/hiv/Surveillance-Occupationally-Acquired-HIV-AIDS.html>

Hepatitis Viruses

- Hepatitis A and E are not bloodborne pathogens
 - Cause infection via contaminated food or water
 - Cause acute illness; most recover but immunocompromised individuals are more ill
- Hepatitis B, C, D are bloodborne pathogens
 - Cause infection via punctures, mucosal contact
 - Needle stick, IDU
 - Hepatitis B and C virus can cause cirrhosis, liver cancer, liver failure

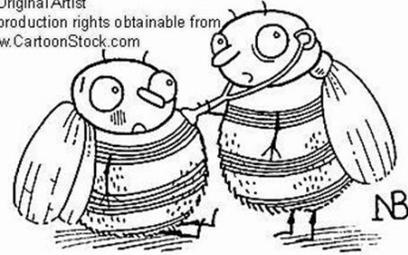
<http://www.cdc.gov/hepatitis/>

Symptoms of Viral Hepatitis

- Jaundice
- Fever
- Fatigue
- Loss of appetite
- Nausea
- Vomiting
- Abdominal pain
- Gray-colored bowel movements
- Joint pain

Hepatitis B Virus

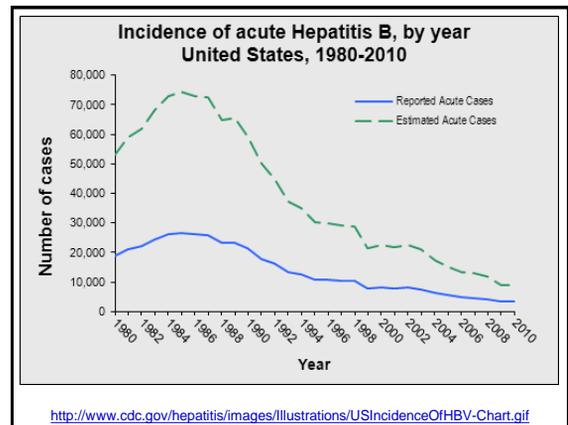
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"You've got Hepatitis Bee."

Hepatitis B Virus

- Incubation period is ~90 days (6wk-6mo)
- Symptoms last for several weeks
- Chronic HBV results in 2,000-4,000 deaths each year
- ~90% of infants will remain chronically infected; 95% of adults recover completely and do not become chronically infected
- Supportive treatment for acute HBV infection; some take antiviral drugs for chronic infections



Hepatitis B Virus

- High Risk Groups:
 - Asian Pacific Islanders
 - Men who have sex with men
 - IDUs
 - Individuals with HIV/AIDS

Exposure Risk for HBV

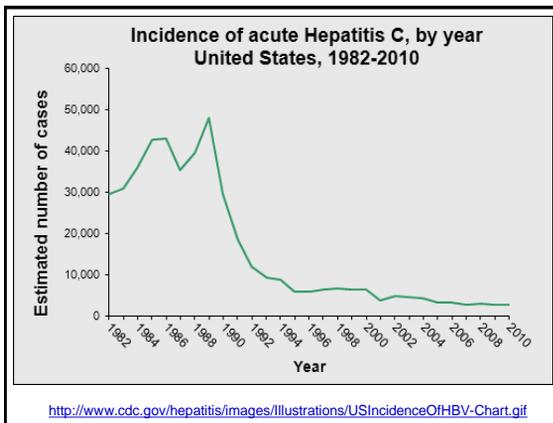
- 800,000 – 1.4 million Americans are chronically infected with HBV
- Incidence of transmission from a contaminated needle stick is higher than HIV, about 6-30%.
- HBV can survive for at least 1 week in dried blood on environmental surfaces or contaminated equipment

Hepatitis B Vaccination

- A vaccine is available!!!!
- The number of occupational cases has decreased 95% since the Hepatitis B vaccine became available in 1982
 - From 10,000 in 1983 to less than 400 in 2001
- Vaccine is 97% effective
 - Get a titer to make sure you developed an adequate immune response after you get the vaccine

Hepatitis C Virus

- Some individuals (15-25%) infected with HCV clear the infection without treatment
- HCV becomes chronic in 75-85% of cases
- 60-70% will develop chronic liver disease
- ~12,000 deaths per year from liver disease
- High risk groups:
 - IDU
 - Recipients of blood transfusions prior to 1992
 - Persons with HIV infection
 - Chronic hemodialysis patients



Exposure Risk for HCV

- Estimated 3.2 million chronically infected persons in U.S
- Estimated 17,000 new infections each year
- 75% of the people infected do not know they are infected
- Incidence of transmission from contaminated needles is about 2-10%
- Leading cause of liver transplants and liver cancer
- No vaccine

<http://www.cdc.gov/knowmorehepatitis/index.htm>

**BORN FROM
1945 to
1965?**

**BABY BOOMERS HAVE
THE HIGHEST RATES OF
HEPATITIS C.**

Talk to your doctor about getting tested.
Early detection can save lives.

www.cdc.gov/bornfromhepatitis

- 5x more likely to be infected with Hepatitis C
- 3 out of every 4 people with Hepatitis C were born between these years
- CDC encourages testing of anyone born from 1945 to 1965

Prevention is the key...

Accidental contact with contaminated blood or body fluids can infect a person that is providing first aid or who is cleaning up contaminated fluids.

Universal Precautions

- Universal precautions is an approach to infection control to treat all human blood and certain human body fluids as if they were known to be infectious
- Use personal protective equipment

Personal Protective Equipment (PPE)

- Disposable gloves
- Safety glasses
- Face shield
- Apron and shoe covers



Disposable Gloves

- Gloves should be worn:
 - For touching blood and body fluids, mucous membranes, or non-intact skin
 - For handling items or surfaces soiled with blood or body fluids
 - Gloves should be changed after contact with body fluids
 - Hands and other skin surfaces should be washed immediately or as soon as patient safety permits if contaminated with blood or body fluids requiring universal precautions
 - Hands should be washed immediately after gloves are removed

Proper Glove Removal



Masks, Gowns, Shoe Covers, Eyewear

- Masks and protective eyewear or face shields should be worn to prevent exposure of mucous membranes of the mouth, nose, and eyes during procedures that are likely to generate droplets of blood or body fluids
- Gowns or aprons and shoe covers should be worn during procedures that are likely to generate splashes of body fluids or create spills on the floor

For really messy situations...



- Protection from debris and non-hazardous liquid splashes
- Keeps bugs from entering your clothes

Maybe we should just dress like this everyday?



Sharps

- Take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments



Clean-up and Sanitation

- Wear personal protective equipment
- Use a solution of ¼ cup of bleach per gallon of water, an EPA registered disinfectant or a bodily fluid spill kit
- Clean the surfaces that were in contact with the contaminated fluid
- Properly dispose of contaminated PPE, paper towels, etc.

Emergency Exposure Info

- If you experience a sharps injury or were exposed to blood, **immediately**:
 - Wash needlesticks and cuts with soap and water
 - Flush splashes to the nose, mouth or skin with water
 - Irrigate eyes with clean water or saline
 - Report the incident to your supervisor
 - Immediately seek medical treatment
- There is a 24 hour Clinicians' Post Exposure Prophylaxis Hotline: 1-888-448-4911

<http://www.cdc.gov/niosh/topics/bbp/emergnedl.html>

Hand Hygiene

- When in doubt, wash your hands....a lot...
- Soap and water is best but if unavailable, use hand sanitizer with at least 60% alcohol

Wash Your Hands

After a disaster, staying clean can be hard to do. You may not have running water. But staying clean helps you stay healthy.

Things you can do to stay clean and healthy

- Wash your hands with soap and clean water. If you don't have soap and water, you can use hand cleaners with alcohol in them.
- Wash your hands many times each day.



Times to wash your hands are

BEFORE

- making food
- eating
- touching a sick person
- touching a cut, sore, or wound.

AFTER

- using the bathroom
- blowing your nose, coughing, or sneezing
- touching things that may carry germs, like
 - diapers or a child who has used the toilet
 - food that is not cooked (raw food)
 - animals or animal waste
 - trash
 - things touched by flood water
 - a sick person
 - cuts, sores, and wounds.



CDC poster on hand hygiene after a disaster

<http://emergency.cdc.gov/disasters/pdf/flyer-wash-your-hands.pdf>

Recap

- Unprotected contact with blood can transmit disease through contact with broken skin or mucous membranes
- Remember to wear PPE!
- Always treat body fluids as if it were known to be contaminated with a BBP
- Clean and sanitize any spill area

Environmental Hazards

What is the appropriate PPE for this environment?



Contact With Animals

What is the first piece of vital information you should obtain if scratched or bitten by an animal?



And Smaller Things...

What are typical precautions to take to avoid infestation or exposure?



Meth Labs and Grow Houses

What are the potential hazards and what is the appropriate PPE?



Safety First!

Septics, Sewage and Fecal Waste

What are we worried about when coming into contact with fecal waste?



Tetanus

- Infection caused by the bacteria *Clostridium tetani* which is found in the soil, dust and manure
- Enters the body through breaks in the skin
- Causes painful muscle contractions
- About 29 cases each year in the US in unvaccinated individuals or those that don't stay up to date on their booster shots
- Get your booster shots every 10 years and get the Tdap vaccine if you haven't already, includes vaccination against pertussis

<http://www.cdc.gov/tetanus/index.html>

Resources

- CDC BBP Website
 - www.cdc.gov/niosh/topics/bbp
- CDC Viral Hepatitis Website
 - www.cdc.gov/hepatitis

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