

Fall Quarterly Safety Meeting

Infection Control Practices Blood-Borne Pathogens

Instructional Objectives:

1. The employee will demonstrate, by answering the review questions, complete knowledge of:

- * Epidemiology and symptoms of blood borne diseases.
- * The written hospital exposure control plan and compliance with OSHA regulations.
- * Activities that may involve blood and other potentially infectious materials.
- * Preventative measures: Hepatitis B vaccine, Standard Precautions.
- * Methods to prevent exposure:
 - Engineering controls: shields, hoods, sharps containers, hemaguard caps, etc.
 - Work practices: hand washing technique and frequency, safe pipetting techniques, opening tubes, eating and drinking practices, cosmetics and lip balm use, and applying contact lenses.
 - Personal Protective Equipment: Clothing, gloves (use, and changing procedure), eyewear and face protection.
 - Housekeeping: waste disposal, handling laundry, decontamination of benches and equipment (techniques and disinfectants).
 - Biohazard communication: Labeling, signs, biohazard zones--clean zones, dirty sink--clean sink.
 - Record keeping: medical and training records.

2. The employee will demonstrate skills necessary to utilize a sharps container (including needle removal where applicable).

3. The employee will demonstrate proper glove removal skills.

4. The employee will cite the unique hazards of hepatitis C virus and transmissible spongiform encephalopathies.

Topics and Activities:

1. Background

Begin the discussion with the presentation of the written Blood Borne Pathogens (BBP) Exposure Control Plan which is in the safety manual. Make sure that everybody knows what it is and that it fulfills the requirements of the OSHA BBP regulations. Show the group your copy of the OSHA regulations and tell them that the copy is kept in the departmental safety manual.

2. Epidemiology

Review the Blood Borne Pathogens by presenting the life cycle of the pathogens. The viruses enter the body by exposure to an infected-person's body fluids (by sexual contact, sharing I.V. needles, transfusion with infected blood or by accident in the hospital environment). The virus enters the host cell and produces new viral particles which can circulate in the bloodstream and be passed to new individuals. The viruses eventually kill the host cell--causing liver damage in Hepatitis and destroying immune cells in HIV infection.

The symptoms of infection:

Hepatitis:	may be asymptomatic	loss of appetite	dark urine
	general fatigue	right-side pain	light stool
	jaundice	aching joints/muscles	nausea
	diarrhea	loss of taste for tobacco	weight loss

HIV:	flu-like symptoms	swollen lymph nodes	diarrhea
	fever	loss of appetite	fatigue
	weight loss	forgetfulness / confusion	
	night sweats	persistant cough	

3. Laboratory Risk Activities:

Review the laboratory activities that could result in infection:

1. The number-one method is from needlestick or sharps injury, which includes injury from capillary tubes.
2. The next major route of entry is by exposure to open skin-- be it by abrasion, cuts or dermatitis.
3. The third most dangerous activity is from eye, nose or mouth splash (face splash).

4. Preventative Measures:

a. Hepatitis B. Vaccine: Review the advantages of the Hepatitis B vaccine. Antibodies to the virus will destroy the virus before it can infect the host cell and prevent the employee from getting hepatitis. The Hepatitis B vaccine is offered free-of-charge to all laboratory personnel who pose a potential blood-borne pathogen exposure -- Monday through Friday, 7:30a.m. to 3:30 p.m.-- contact Employee Health Clinic at the Charity Campus at 903-1043. If people choose not to get the heptavax they must sign a waiver in the IC department. It would certainly be to your advantage to receive the Hepatitis B vaccine, for

not only would you prevent getting Hepatitis B but there has been a strong correlation between Hepatitis B and liver cancer. Therefore, you could be preventing liver cancer as well.

b. Standard Precautions:

The advantage of Standard Precautions is that in considering and handling every specimen as if it were infectious, employees use good work practices and protective equipment at all times. Thus, employees protect themselves from infection from untested people and from other real (or potential) Blood Borne Pathogens (HTLV I, Hep. C , etc.).

5. Methods and Equipment:

a. Engineering controls:

These are devices and equipment which are designed to prevent exposure.

Laboratory controls include:

- ***Sharps containers:** Show the container and review the use of the container. Stress the fact that the container must be replaced when it is three-fourths full. Introduce the slogan ***Three-fourths full is full enough*** . Also, remind folks that non-sharps do not belong in the sharps containers. For all personnel who perform phlebotomy, demonstrate how to use the container and reinforce the dangers inherent in recapping and how recapping is forbidden in our department. Demonstrate all of the types of devices that the employee will use.
- ***Shields and hoods:** Reinforce your policy on shields and hoods-- when, where and how they must be used.
- ***Hemaguard Caps:** Point out that this is an engineering control to prevent splash and how if a conventional tube is used, folks need to use the *gauze method* or use a shield to open the tubes. Demonstrate the *gauze method*.

b. Personal Protective Equipment:

These are barriers for your personal use:

***Gloves:** Review the need to wear gloves at all workstations in the Biohazard zones (everything in the biohazard zone is considered contaminated). Review the need to change gloves frequently and according to the following guidelines:

- 1.) Employ the use of properly fitting gloves.
- 2.) Replace gloves immediately when torn or contaminated.
- 3.) Always avoid washing or disinfecting gloves for reuse.

Whenever soiled, discard gloves and wash hands between gloves (at the *Clean Sinks*). Review how to peel the glove--inside out-- on removal to prevent contamination of hands. Review the requirement that gloves and protective clothing be removed when leaving the Biohazard zones. (Note: Specimen Carriers are given exemption from this requirement with the justification that they only handle closed specimens. Therefore, you will see carriers on the elevators wearing gloves and wraps.)

***GOWNS:** We now have 2 types of personal protective garments that are in use and must be worn when working in one of the following workstations. 1.) a workstation where there is significant risk of spilling and splashing. (The appropriate garment to be worn here is impervious to liquids.) 2.) a workstation in which splashes are unlikely. (The appropriate garment here is liquid-resistant but not totally leak-proof.) Due to the use of engineering controls, the need for barrier clothing is minimal..

c. Housekeeping:

Review the waste disposal methods-- stress that all sharps must go into the sharps containers. Show employees where to put the sharps containers for disposal and how to sort other biohazard wastes. Stress the need to keep the clean trash out of the biohazard waste stream.

Review the written bench disinfection policies and other clean-up/ disinfection routines which are unique to your area.

Review the need for disinfection of equipment before servicing by you, Biomed or by outside vendors.

d. Biohazard communications:

Review the need to observe the concepts of Biohazard Zones, Clean Zones, Dirty Sink/Clean Sink. Show the signs and labels and discuss the rationale behind these concepts.

e. Record keeping:

Discuss the importance of keeping good records of exposures via the incident report mechanism. Show folks the incident report and discuss the importance of the surveillance job that Infection Control performs after each exposure. Explain that good reporting and record keeping is in the best interest of all employees in that dangerous devices and work-practices are identified, studied and replaced.

Tell the employees that, in Pathology and housewide, the number and severity of incidents have been reduced by trending incidents and taking corrective action based on past incidents.

Verbal Review Questions:

1. What are the routes of infection for the Blood Borne Pathogens?

Blood and body fluids contact via the sexual route, tainted transfusions, I.V. needles.

2. Name the three most common ways for laboratory workers to be exposed to the Blood Borne pathogens?

Needlesticks (or sharps injuries), BBP exposure to cuts or abrasions and face-splash (eye, nose or mouth-splash).

3. What is Standard Precautions?

That **all** specimens and blood products are to be treated as if they were infectious.

4. Demonstrate the proper technique for removing gloves. **Gloves can't be re-used or washed.**

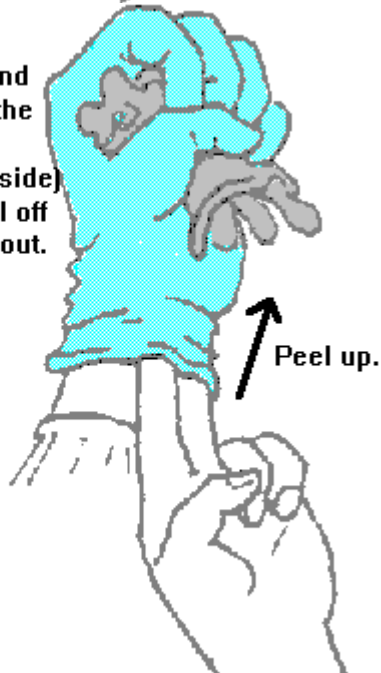
First Step:

Grab the outer edge of the cuff to peel the first glove off. Peel up and turn the glove inside-out as you go. Hold the glove in the palm of your gloved hand.



Second Step:

With bare hand reach under the glove's cuff (to the clean side) and then peel off – clean side out.

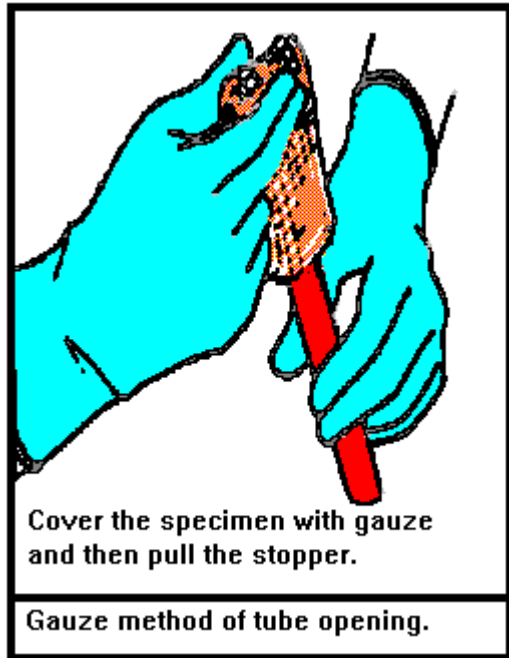


Final Step:

When the process is finished, the gloves are clean-side-out. Dispose of them in a biohazard bag.



5. Demonstrate the proper technique for opening tubes when no shield is available (gauze technique).



Hepatitis C Update

Health care workers are involved in 600,000-1,000,000 injuries annually from needles and sharps. Many of these cases involve exposure to such viruses as HIV and hepatitis B and C. Of these viruses hepatitis C (HCV) is the most disturbing because once dried it can exist in a viable state on surfaces for weeks. It also cannot be prevented by immunization like A and B because it mutates so rapidly.

The Centers for Disease Control and Prevention (CDC) predicts in the next 10 years that deaths caused by Hepatitis C virus (HCV) will triple from the current 10,000 to 30,000 annually— even though there is a decrease in needle sharing, increase in HIV awareness, and extensive blood donor screening. The increase in deaths will result from individuals who have chronic hepatitis C and were infected decades ago. HCV related-hepatic failure is now the leading cause for liver transplantation in the US.

The onset of HCV infection is often unrecognized and asymptomatic. Chronic HCV develops in 80-90% of infected individuals.

Symptoms of chronic hepatitis include:

- Mild to severe tiredness
- Nausea and vomiting
- Soreness in upper right part of abdomen
- Fever
- Loss of appetite
- Pain in joints

About 60% of the patients with chronic HCV are asymptomatic and 80-90% have no physical findings attributable to chronic liver disease. Of the patients that have chronic HCV, 20-30% progress to cirrhosis of the liver and 1% to 2% to hepatocellular carcinoma 20 to 30 years after initial exposure to HCV.

What does this mean to me???

After exposure to an HCV positive patient the average incidence of anti-HCV seroconversion for health care workers is 1.8%. If that seems low consider these two facts: **1. At MCL we have documented several post-exposure HCV seroconversions. 2. Up to one thousand new occupational HCV infections are estimated to occur worldwide each year. Those are not small numbers especially when that person is you! Avoid this risk by:**

- **earing and changing gloves**
- **Handling contaminated needles carefully**
- **Properly disposing of sharps in sharps container**
- **Remembering to fill sharps container only 3/4 full**
- **Disinfecting work surfaces daily**
- **Using universal precautions**
- **Wearing proper PPE for the task**
- **Reporting ALL injuries**

REFERENCES:

1. Bocklhold, KM. Who's afraid of hepatitis C? *American Journal of Nursing*; May 2000: 100(5) 26-31.
2. Clark, CH. Hepatitis C: Role of the advanced practice nurse. *AACN Clinical Issues*; 1999: 10(4) 455-463.

Mad Cow Disease & Creutzfeldt-Jakob Disease (CJD)

Mad Cow disease which is properly called *Bovine Spongiform Encephalopathy* (BSE) is recently quite famous in the press. First described in 1986 in Great Britain, Mad Cow disease is thought to be related to a centuries-old disease of sheep called *scrapie*. In 1996, new cases of Creutzfeldt-Jakob Disease, which is similar human disease, were described in Great Britain. These represented a new variant form and these are the cases that caught the world's attention. Mad Cow disease is suspected to have crossed into the human species after the consumption of meat from infected animals.

Creutzfeldt-Jakob disease was first described in 1920, it is also called *Transmissible Spongiform Encephalopathies*, (TSE). CJD is a rapidly progressive fatal disease of the central nervous system characterized by progressive decreased mental status and chronic muscle spasms. The incubation period lasts several years and it is always fatal. The agent which causes CJD is thought to be a particle even smaller than a virus called a *prion* (which is an infectious protein still incompletely characterized). There is no known way to conventionally see or culture it, although it can be seen by electron microscopy. No one knows exactly how humans get this disease and a brain biopsy is necessary to tell if someone is infected. Laboratory animals can be given CJD if injected with brain tissue or cerebral spinal fluid from an infected person. Patients may be infected in hospitals (iatrogenic infection) with the use of contaminated instruments or the transplantation of brain tissue. Person-to-person transmission via skin contact or via environmental contamination has not been shown.

CJD has been identified in all developed countries and is thought to occur worldwide. The incidence of CJD is estimated at about 1 case per million persons per year. Most cases (85%) of CJD are sporadic, and less than 10% of CJD cases may be related to a genetic predisposition the rest are doctor-induced (iatrogenic). Less than one percent of the cases have been acquired. There is no effective treatment known to slow the progression of the disease and 90% of the cases die within one year of onset.

There are no documented cases of CJD transmission to lab personnel. Even though the incidence of CJD is extremely low, the possibility of laboratory exposure to CJD is still a high level of concern when one considers the devastating outcome associated with the disease. The following steps will occur in the event of a known or suspected CJD is received in the Pathology department.

Notification of all Laboratory Personnel:

- Notify Department Safety Personnel (Chair, Coordinator, Safety Committee member, Lab Supervisor)

This person

- Will track specimens back to source
- Alert all personnel receiving specimens of potential hazards
- Alert Hospital Infection Control
- Remind lab personnel of Universal Precautions and special disposal instructions

Specimen Handling:

- In addition to observing Universal Precautions:
 - Observe section specific procedures
 - Handling blood and other body fluids (excluding CSF and most tissues) requires no special precautions
 - It is recommended that automated equipment not be used when assaying CJD known CSF; all materials coming in contact with CSF must be incinerated or decontaminated. (See safety manual for decontamination procedures)
 - Disposable clothing is preferred (aprons, gloves, mask)
 - Disposable supplies must be clearly identified and incinerated

The information in this handout along with the special section on CJD in the safety manual will prepare us in case we encounter specimens of this highly infectious manner.

REFERENCES:

1. Rank,JP. Creutzfeldt-Jakob disease. *Lab Med* 1999; 30:305-306.
2. Haywood,AM. Mechanisms of disease:Transmissible Spongiform Encephalopathies. *N ENG J Med.* 1997;337:1821-1828.
3. WHO/CDS/CSR/APH/2000.3 Report of a WHO consultation:WHO Infection Control Guidelines for Transmissible Spongiform Encephalopathies, Geneva, Switzerland, March 23-26,1999.
4. Creutzfeldt -Jakob Disease: Epidemiology, Risk Factors, and Decontamination;CDC preliminary document, October2, 2000.

Name: _____ Date: _____ LAB/CAMPUS: _____

Infection Control -----Blood Borne Pathogen Test

- _____ 1. Blood-borne pathogens enter a person's body by all of the following routes except
- sexual contact
 - drinking after an infected person
 - sharing I.V. needles
 - receiving infected blood transfusions
- _____ 2. Symptoms associated with Hepatitis and HIV
- Are very specific and almost diagnostic
 - Are varied and non-specific
 - Include dry mouth
 - Occur immediately after exposure
- _____ 3. The written Blood-Borne Pathogen Exposure Control Plan is located
- in the administrative office
 - in the Infection Control office
 - with the MSDS binder
 - in the departmental safety manual
- _____ 4. The top three entry routes for BBP exposure— in order of risk— are through
- #1. faulty lab coats, #2. needlestick & #3. splash to eye
 - #1. needlestick, #2. cuts in skin & #3. splash to eye
 - #1. cuts in skin, #2. splash to eye & #3. needlestick
 - #1 needlestick, #2breathing infected air & #3 cuts in the skin
- _____ 5. Sharps containers must be replaced when they are
- completely full
 - 3/4 full
 - 1/2 full
 - 1/4 full
- _____ 6. In short, Standard Precautions means
- That we treat every specimen as if it were infectious
 - That we treat all specimens from HIV clinic as infectious
 - That we wear double gloves when we see a jaundiced specimen
 - You are so careful that you never have to say you're sorry.
- _____ 7. Visibly contaminated gloves
- Should be placed in a sharps container
 - Can be washed in bleach and used again
 - Can be worn all day long— everything in the lab is contaminated
 - None of the above.

- _____ 8. Keeping good records of exposures is important for organizational improvement
- a. so every exposure and near miss requires an incident report
 - b. so only severe injuries require incident reports
 - c. but incidents are not even trended so why fill out a report.
 - d. but incident reports are only for patient care issues- just tell your supervisor.
- _____ 9. Hepatitis B vaccine
- a. is expensive, and the employees are billed for it
 - b. is offered free of charge but employees are discouraged from asking
 - c. is offered free of charge and employees are encouraged to request it.
 - d. doesn't work anyway
- _____ 10. Hepatitis C: _____
- a. remains viable on surfaces for weeks
 - b. severely limits your viability because it causes liver cancer
 - c. there is no vaccine available because the virus mutates so frequently
 - d. all of the above.
- _____ 11. If a suspected/known CJD specimen is received in the lab one must:
- a. Notify the Lab supervisor, Safety committee member or Safety Coordinator
 - b. Use disposable supplies
 - c. Use special decontaminating procedures
 - d. Avoid assaying on automated equipment
 - e. All of the above