



Morehouse School of Medicine

INFECTION CONTROL HANDBOOK

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KNOWLEDGE WISDOM EXCELLENCE SERVICE

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FOREWARD

Infection Control and Prevention is an integral component of overall education and practice protocols for students, residents, faculty and staff at the Morehouse School of Medicine (MSM). The handbook is designed to concisely provide important infection control standards and compliance guidelines as they relate to healthcare worker and patient safety. In addition, this module embraces mandatory federal, state, and local regulatory laws as well as MSM policy and procedures. Therefore, it is a pleasure to present the Infection Control Handbook to the Morehouse School of Medicine.

The handbook should be viewed as a supplement to the MSM Infection Control Policy Manual and Bloodborne Pathogen Policy (coding: 01050-35-00) as well all Infection Control and Occupational Health departments affiliated with the Morehouse School of Medicine Student Affairs and Graduate Medical Education departments.

I would like to thank Janice P. Winston Ph.D., MSc., RN, Infection Control Officer, for the research and culmination of the Infection Control Handbook – a job well done. In addition, thanks to the members of the Infection Control Committee for its annual review and updates. A special recognition to President John E. Maupin, Jr., D.D.S., M.B.A., and Dr. Sandra Harris-Hooker (Interim Dean) for their rigorous enthusiasm and engaging manner regarding the efforts and vision of the Office of Infection Control and Committee. In addition, a special thanks to the Associate Dean for Administrative Affairs at MSM, Sandra Watson, M.B.A., for her tenure and constant guidance of the Office of Infection Control and Committee.

At a time when the focus of healthcare is shifting toward PREVENTION, the goal of the Office of Infection Control and Committee is to enhance development of innovative education and clinical programs in Infection Control. We acknowledge the CDC, OSHA, NIOSH, APIC along with other valuable resources for the scientific material included in the handbook.

Mesfin Fransua, M.D.
Morehouse School of Medicine
Chair, Infection Control Committee
March, 2010

TERMS USED IN THE MANUAL

- ACIP** - **Advisory Committee on Immunization Practice**
- APIC** - **Association of Professionals in Infection Control and Epidemiology, Inc.**
- CDC** - **Centers for Disease Control and Prevention**
- ICC** - **Infection Control Committee**
- ICP** - **Infection Control Practitioner**
- ICO** - **Infection Control Officer**
- ISO** - **Institutional Safety Officer**
- LPN** - **Licensed Practical Nurse**
- MSM** - **Morehouse School of Medicine**
- NIOSH** - **National Institute of Occupational Safety and Health**
- NP** - **Nurse Practitioner**
- OSHA** - **Occupational Safety and Health Administration**
- PI** - **Principle Investigator**
- RN** - **Registered Nurse**

IMPORTANT NUMBERS TO REMEMBER IN CASE OF BLOODBORNE PATHOGEN EXPOSURE

- Atlanta Medical Center Outpatient Center - **404-265-3958**
- Children's Healthcare of Atlanta at Hughes Spalding - **404-616-4373**
- Columbus Medical Center - Occupational Health Office, **706-571-1880**
- Egleston-Scottish Rite Children's Hospital, Occupational Health Office -
404-325-6662
- Georgia Regional Hospital, Occupational Health Office - **404-243-2293**
- Grady Healthcare System, Occupational Health Department - **404-616-4600**
- **Morehouse School of Medicine, Infection Control Office - 404-756-5282**
- **Morehouse Medical Associates - 404-756-5036**
- South Fulton Hospital Occupational Health - **404-305-1103**
- VA Hospital Tuskegee Occupation - **334-727-0550, ext. 3898**

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II. INFECTION CONTROL: GENERAL PRINCIPLES AND GUIDELINES

A. “What is Infection Control?”

Preventing the spread of germs and infections (occupational exposures) in the healthcare arena. Infections acquired in the healthcare arena are called **nosocomial infections**.

B. Why is Infection Control important?

- Infections can:
 - lengthen patient stay in the hospital
 - increase health-care costs
 - cause inconvenience, pain, death
- One might be exposed to germs that cause sickness and absence from work
- One could spread illness to family and friends

YOU are a major key in the prevention of infections among patients, families, visitors and healthcare workers (including yourself)!

C. How are Infections spread?

The chain of infection has six links. All six links in the infection chain must be present for an infection to develop:

1. A micro-organism (germ) that can cause disease
2. A person such as a patient, health-care worker, or student who carries the microorganism
3. A mode from the carrier, such as sneezing, coughing, shedding skin, etc.
4. A method of traveling, such as via the air, direct physical contact and/or contaminated hands, linens, towels, instruments, bandages, etc.
5. A mode of entry to another person such as breathing, swallowing or skin puncture or break in skin
6. A susceptible person who is unable to fight germs; weakened immune system

Infection Control policies and procedures are aimed at breaking the infection chain by removing one of these links.

How do we prevent the spread of germs? “An ounce of PREVENTION is better than a touch of cure.”

D. **HAND WASHING** is the single most important practice used in the prevention and spread of infections.

Studies have shown that the hands of *health-care workers* are the most common transmitters of disease in healthcare facilities.

One might have open cuts, nicks or abrasions on the skin such as dermatitis or acne. Healthcare workers transfer germs to patients and colleagues. Microorganisms on the skin that might be harmless to one individual might cause serious infections in patients and others.

Handwashing keeps one from transferring germs to other areas of the body and environment or patients. If infectious material gets on the hands, the sooner they are washed, the less chance one has of becoming infected or passing along germs to others.

Effective Handwashing criteria include:

1. Lather hands with soap and water.
2. Vigorously rub together all surfaces of lathered hands for 20 seconds.
3. Rinse hands thoroughly under a stream of water.
4. Dry hands completely with clean, dry paper towel.
5. Avoid splashing or touching sink.
6. Use dry paper towel to turn off faucet.

In general, one should wash hands:

- After eating, smoking, coughing, sneezing or using toilet
- Before and after performing invasive procedures or touching a patient's face or mouth
- After contact with wounds, body secretions, mucous membranes, blood or other body fluids
- Before caring for high-risk patients and between direct contacts with different patients
- When one touches, blood, body fluids or secretions while providing care for a patient, wash hands before proceeding to another care activity on the same patient
- Before eating, drinking, smoking, applying make-up or handling contact lenses
- Some areas have special hand washing procedures and/or special hand washing agents.

Remember: Help Prevent the Spread of Germs and Infections!

1. Understand what causes infections and how they are spread
2. Use Infection Control standards of practice each day – Universal Precautions. Prevent and control infections!
3. Hand washing: Use proper washing technique AND comply with current CDC hand - hygiene protocols: “Alcohol-Based Gels; Guidelines for Hand Hygiene in Health-care Settings.”
[MMWR 2002; vol. 51.no.RR-16.](#)
4. Do not wear artificial fingernails or extenders during direct contact with patients in high- risk patient care areas. Keep natural nail tips less than ¼ inch long.
5. Know special infection issues and criteria of special work areas

E. SHARPS DISPOSAL

OSHA recommended needleless systems in high-risk areas in 1999 per the Bloodborne Pathogen Plan #75. However, immediate and proper disposal of sharps into puncture resistant containers is imperative when these systems are not available. In addition, to prevent needlesticks, do not bend, remove or recap sharps. Carefully put contaminated items in the correct containers for disposal and sterilization; **Universal Precautions - Bloodborne Pathogen Standard 29 CFR 1910.1030(d)(2)(vii)(A)**.

F. GERM BARRIERS

- Wear gloves when likely to touch body substance fluids, mucous membranes, or items potentially contaminated with blood and/or body secretions.
- Wear protective eyewear and masks if procedure releases droplets in the air.
- Wear gown and apron as needed when splashing may soil clothing or uniform.
- Change gloves between different procedures on the same source patient.

G. WASTE DISPOSAL

Properly handle, bag and label infectious material before transport. Infectious waste includes but is not limited to microbiological lab waste, pathology waste, sharps devices, and body and blood fluids.

H. SANITATION

Decontamination methods include cleaning, disinfecting and sterilizing. Clean up infectious spill immediately. Wear gloves. Report spill as per policy. Disinfect all work surfaces when work is finished. Use proper cleaning procedures. Keep patient areas clean.

I. LAUNDRY/LINEN

Use special care with laundry. Do not shake soiled linen. Roll edges toward center, place in appropriate bags at the bedside. Transport carefully.

J. PATIENTS/VISITORS

Remind patients and visitors about the importance of hand-washing and good infection control procedures.

K. PATIENT CARE PROVIDERS

If your work involves direct patient care: **Be Alert!!!**

- Be aware of infection precautions and early signs of infection.
- Avoid unnecessary contacts: For example, do not breathe into the face of the patient or touch his or her nose, mouth or incision area without proper barriers.

- Use clean or sterile technique (where appropriate).
- Observe strict precautions when working with dressings, catheters, and other devices.

L. RESEARCH LABORATORY AND ENVIRONMENTAL SAFETY

Research Laboratories and Production Facilities shall meet the following criteria:

- All waste shall be incinerated or decontaminated before disposal i.e., AUTOCLAVE.
- Laboratory doors should be kept closed while performing duties involving HIV and/or HBV.
- Contaminated waste must be placed in durable, leak-proof, labeled and/or color coded containers before transfer to off site locations for decontamination.
- **Only** authorized persons should enter Biohazard work areas and animal facilities (See Biohazard Safety Manual).
- A Universal Biohazard Symbol must be posted on all access doors.
- All activities involving potentially infectious materials must be conducted in biological safety cabinets (physical-containment device) within the working laboratory or module. No opened benches.
- Appropriate personal protective clothing shall be used in work areas, i.e., laboratory coats, gowns, smock, uniforms). Decontaminate and/ or discard before exiting work area.
- Use gloves when handling infectious materials and/or infected animals.
- All spills shall be addressed immediately according to the Bio-Safety Manual for protocol and procedure.
- Vacuum lines shall be protected with liquid disinfectant trap and high efficiency particulate air filters (HEPA). These filters shall be checked routinely for maintenance and/or replacement.
- Hypodermic needles and syringes shall be used for injection and aspiration of fluids (See Sharps Disposal).
- Certified biological safety cabinets (Class I, 11, 111), Personal Protective Equipment (PPE), and other personal protection devices shall be used for activities where potential infectious disease exposure might occur.
- Each laboratory shall have hand washing facilities, (Hand washing, 11-D).

- Eye wash shall be maintained in all work areas.
- All exposures shall be reported to supervisor.
- Exposures determined potentially infectious shall be reported to the Office of Infection Control and Human Resources according to federal regulations (Bloodborne Pathogen Standard) and MSM policy and procedure.
- HIV/HBV research laboratories and production facilities are **required** to participate in annual Institutional Safety **AND** Infection Control training in accordance with federal regulations (Expanded Bloodborne Pathogen Standard) and the MSM Bloodborne Pathogen Policy.

M. PERSONAL TIPS TO HELP PREVENT INFECTIONS

- Get immunizations that are required or recommended.
- Have periodic testing as required or recommended for tuberculosis, Hepatitis B and other infections. Remember your annual required student/employee screening.
- Maintain good health with a balanced diet, plenty of sleep, and regular exercise.
- Report any infectious illness, such as a cold, flu, or infected cut to your supervisor.
- Do not report to work if you are sick.
- Practice good personal hygiene!
 - Bathe or shower every day
 - Keep your hair clean
 - Keep nails trimmed and clean
 - Wear a clean uniform every day

III. WHEN SHOULD YOU REPORT TO THE OFFICE OF INFECTION CONTROL?

- A. Any concerns regarding placement of or removal of patients from **ISOLATION**.
- B. Any concerns regarding the appropriateness of ISOLATION Precaution ordered or not ordered.
- C. Any confirmed exposure to a **COMMUNICABLE DISEASE** that could be spread to fellow healthcare workers or **PATIENTS**, including TB, SARS, Meningitis, MRSA, etc.
- D. Anytime a student/healthcare worker presents with fever, diarrhea, or any signs and symptoms of a potentially Infection Disease.
- E. Any other concerns regarding **INFECTION CONTROL AND PREVENTION**.

IV. ISOLATION PROTOCOLS:

Isolation procedures are used to define steps to prevent the spread of Infectious Disease agents from an infected or colonized person to another. Isolation precautions are designed to:

- Control or eliminate the agent (germ)
- Control or eliminate the reservoir
- Interrupt transmission
- Protect large numbers of susceptible persons in specified areas

The Centers for Disease Control and Prevention (CDC) recommends that hospitals and other medical arenas use specific isolation precautions. Isolation manuals are available in all Morehouse School of Medicine (MSM) clinical and research areas. In addition, each MSM clinical affiliate site provides like guidelines and protocols. Isolation systems use color coded cards displayed near patient areas to alert personnel and visitors that special precautions are necessary.

Isolation precautions and/or protocols are the main focus relative to prevention of Infectious Diseases. Private rooms, surgical and/or N-95 masks, gowns, and gloves are indicated to interrupt transmission of disease. Furthermore, isolation precautions are recommended to prevent the transmission of infectious agents and diseases which are likely to be found in United States hospitals, laboratories and other academic-medical and clinical arenas. Education is KEY.

V. **UNIVERSAL PRECAUTIONS, STANDARD PRECAUTIONS and the “EXPANDED” BLOODBORNE PATHOGEN STANDARD:**

The **CDC** issued the **UNIVERSAL PRECAUTIONS (UP)** Statements/Guidelines in 1987 with modifications in **1988, 1995-1996 and 2007**. The Occupational Safety and Health Administration (OSHA) issued the first Bloodborne Pathogen Standard in December, 1991.

- A. STATEMENT OF PURPOSE:** To endorse the application of blood and body fluid precautions for **all** patients including those with an isolation precaution status and medical diagnosis.

Purpose for applying Universal and the Expanded Standard Precautions include:

- a. Minimize contact with blood and body fluids and the healthcare worker
- b. Minimize likelihood of transmission of specific organisms such as Hepatitis B and Human Immunodeficiency Virus (HIV).
- c. Consistent application of **INFECTION CONTROL** Standards of Practice.

B. TEXT: STANDARDS INCLUDE THE FOLLOWING CONCEPTS AND PROCEDURES:

- a. **Hands** should be washed before and after contact with all patients. Hands should be washed after the use of gloves. Wash hands thoroughly with soap and water after contact with blood or body fluids. Use hand-gels when indicated.
- b. **Gloves** should be worn when contact with blood, body fluids, or surfaces contaminated with blood or body fluids is anticipated.
- c. **Gowns** or other appropriate coverings are indicated if splattering might occur.
- d. **Mask and protective eyewear, or face shields** should be worn if aerosolization or splattering might to occur.
- e. To minimize the need for emergency and mouth-to-mouth resuscitation, mouth pieces, resuscitation bags and other ventilation devices are strategically located and available for use.
- f. **Sharp** objects should be handled safely. Do not bend, break, or re- insert sharps.
- g. **Sharps** should be discarded immediately after use into needle (sharps) box.
- h. All **needle stick accidents, mucosal splashes, contamination** of open wounds (non-intact skin) with blood or body fluids, or other significant **blood exposures** should be promptly reported to the Office of Infection Control and Occupational (Employee) Health Service at respective practice site or facility.
- i. All **specimens** are considered biohazardous.

C. BLOOD AND BODY FLUIDS SPILLS CLEAN-UP PROCEDURE:

- Clean up promptly.
- Wear gloves and remove visible material, blood or body fluids.
- Wear other Personal Protective Equipment (PPE) if indicated.
- Decontaminate area with germicidal disinfectant used by Environmental Services – i.e., Clorox or Lysol.

VI. PURPOSE AND INTENT OF THE OSHA BLOODBORNE PATHOGEN STANDARD IN DECEMBER, 1991:

As with all OSHA regulations, the Bloodborne Pathogen Standard is intended to protect employees from potential workplace hazards. In this case, it is to reduce occupational exposure to Hepatitis B virus (HBV), Human Immunodeficiency Virus (HIV) and other Bloodborne Pathogens.

Complete details of this regulation are described in the Morehouse School of Medicine Bloodborne Pathogen policy.

A. EXPOSURE DETERMINATION

A key to implementing a successful Exposure Control Plan is to identify exposures staff may encounter. To facilitate the plan, the following job classes are denoted:

- Job classification in which all staff have occupational exposure to bloodborne pathogens.
- Job classifications in which some staff have occupational exposure to bloodborne pathogens.
- Tasks and procedures relegated to staff by job classification that pose potential risk of occupational exposure are noted in the MSM Bloodborne Pathogen policy.

B. WHAT ARE BLOODBORNE PATHOGENS?

They are viruses, bacteria, and other microorganisms which are carried in the blood stream and cause disease. Persons coming in contact with blood infected with a bloodborne pathogen or bacteria may become infected as well.

Other body fluids may spread bloodborne pathogens. These include: semen, vaginal secretions, cerebral, spinal, pericardial, synovial, pleural, peritoneal and other body secretions contaminated with blood.

Some bloodborne pathogens are deadly.

C. The OSHA Bloodborne Pathogen Standard known as Universal Precautions. Specifically, it is known as Universal Precautions with Expanded Standard Precautions (ESPs) that determines isolation guidelines.

Healthcare workers must follow these precautions according to OSHA rules and regulations.

D. THREE BLOODBORNE PATHOGENS OF MOST CONCERN TO THE HEALTHCARE WORKER:

1. Hepatitis B Virus (HBV) attacks the liver. **HBV can cause:**
 - Active hepatitis B: a flu-like illness that can last for months
 - A chronic carrier state: persons may have no symptom, but pass HBV to others
 - Cirrhosis, liver cancer, and death
 - Specific vaccines are available to prevent HBV infection.
2. Human Immunodeficiency Virus (HIV) causes AIDS. HIV attacks the immune system, making the body less able to fight off infections. In most cases, these infections eventually prove fatal. To date, there is no HIV vaccine. **HBV** and **HIV** can be spread when infected fluids enter the body through:
 - **Needlestick** injuries
 - Cuts, scrapes and other breaks in the skin
 - Splashes into the mouth, nose or eyes
 - Oral, vaginal, or anal sex
 - Sharing infected drug needles
 - Pregnant women who are infected and passing the infection to their babies
3. Hepatitis C: No vaccine available. Attacks the liver.
4. There are other diseases caused by bloodborne pathogens, such as syphilis, and malaria. However, the **greatest risks** are HBV, HCV and HIV.

Protect yourself from potential bloodborne pathogen exposures by following Universal Precautions and the Bloodborne Pathogen Standard.

- Use engineering controls
- Use required equipment and labels
- Follow required work place practices and policies
- Use required personal protective equipment (PPE)
- Eliminate environmental hazards with proper housekeeping
- **Be alert**

Reminder: Certain communicable diseases require immediate reporting to local health departments and a work clearance following the disease such as: Viral Conjunctivitis, Rubella, Rubeola, Varicella, Hepatitis, etc.

FOLLOW UNIVERSAL AND STANDARD PRECAUTIONS

- Take steps to prevent contact with blood and other body fluids.
- Refer to your Isolation Manual for additional details at your respective practice site.
- If you have any questions, ask your supervisor.

BIOHAZARD LABELS are Red - Orange



VII. Universal Precautions and the “Expanded” Standard Precaution - BLOODBORNE FACTS. The expansion involves isolation precautions and environmental compliance guidelines.

- **PROTECT YOURSELF WHEN HANDLING SHARPS**
- **PROMPT DISPOSAL**

The best way to prevent cuts and sticks is to minimize contact with sharps. This means disposing of them immediately after use. Puncture-resistant containers must be available nearby to hold contaminated sharps. When reprocessing contaminated reusable sharps, employees must not reach by hand into the holding container. Contaminated sharps must never be sheared or broken.

Recapping, bending or removing needles is permissible only if there is no feasible alternative or if required for a specific medical procedure such as blood gas analysis. If recapping, bending, or removal is necessary, workers must use either a mechanical device or a one-handed technique. Staff might recap with a one-handed “scoop” technique, using the needle itself to pick up the cap, pushing cap and sharp together against a hard surface to ensure a tight fit. Or they might hold the cap with tongs or forceps to place it on the needle.

SHARPS CONTAINERS

Containers for used sharps must be puncture resistant. The sides and the bottom must be leak proof. They must be labeled or color coded red to ensure that everyone knows the contents are hazardous. Containers for disposable sharps must have a lid, and they must be maintained upright to keep liquids and the sharps inside.

Staff must never reach by hand into containers of contaminated sharps. Containers for reusable sharps could be equipped with wire basket liners for easy removal during reprocessing, or employees could use tongs or forceps to withdraw the contents. Reusable sharps disposal containers may not be opened, emptied, or cleaned manually.

Containers need to be located as near to as feasible the area of use. The containers must be replaced routinely and not be overfilled, which can increase the risk of needlesticks or cuts.

HANDLING CONTAINERS

When you are ready to discard containers, you should first close the lids.

Careful handling of sharps can prevent injury and reduce the risk of infection. By following these work practices, staff can decrease their chances of contracting bloodborne illness.

BLOODBORNE FACTS

HEPATITIS B: VACCINATION - PROTECTION FOR YOU

WHAT IS HBV?

Hepatitis B **virus (HBV)** is potentially life-threatening bloodborne pathogen. The Centers for Disease Control estimates there are approximately 280,000 HBV infectious each year in the U.S.

Approximately 8,7000 health-care workers each year contract hepatitis B, and about 200 will die as a result. In addition, some who contract HBV will become carriers, passing the disease on to others. Carriers also face a significantly higher risk for other liver ailments which can be fatal, including cirrhosis of the liver and primary liver cancer.

HBV infection is transmitted through exposure to blood and other infectious body fluids and tissues. Anyone with occupational exposure to blood is at risk of contracting the infection.

Employers must provide engineering controls; workers must use work practices and protective clothing and equipment to prevent exposure to potentially infectious materials. However, the best defense against hepatitis B is vaccination.

WHO NEEDS VACCINATION?

The 1991 OSHA standard covering bloodborne pathogens requires employers to offer the three injection vaccination series free to all staff who may be exposed to blood or other potentially infectious materials as part of their job duties. This includes health care workers, emergency responders, morticians, first-aid personnel, law enforcement officers, correctional facilities staff, launderers, as well as others.

WHAT DOES VACCINATION INVOLVE?

The hepatitis B vaccination is a non-infectious, yeast-

based vaccine given in three injections in the arm. Yeast preps. There is no risk of contamination from other bloodborne or is there any chance of developing HBV from the vaccine is there any chance of developing HBV from the vaccine since it is prepared from recombinant yeast cultures.

The second injection should be given one month after the first, and the third injection six months after the initial dose. More than 90 percent of those vaccinated will develop immunity to the hepatitis B virus. To ensure immunity, it is important for individuals to receive all three injections. At this point it is unclear how long the immunity lasts, so booster shots may be required at some point in the future.

The vaccine causes no harm to those who are already immune or those who may be HBV carriers. Although personnel may opt to have their blood tested for antibodies to determine need for the vaccine, employers may not make such screening a condition of receiving vaccination nor are employers required to provide pre-screening.

Personnel should receive counseling from a health care professional when vaccination is offered. This discussion will help an employee determine whether inoculation is necessary.

WHAT IF I DECLINE VACCINATION?

Personnel who decide to decline vaccination must complete a declination form. Employers must keep these forms on file so that they know the vaccination status of everyone who is exposed to blood. At any time after a worker initially declines to receive the vaccine, he or she may opt to take it.

BLOODBORNE FACTS REPORTING EXPOSURE INCIDENTS

The OSHA bloodborne pathogen standard includes provisions for medical follow-up after a potential exposure incident. The most common exposure is via needlestick. However, exposure to the eye, mouth, non-intact skin and other mucous membranes, or contact with blood and/or potentially infectious materials are considered exposure incidents and should be reported to the employer.

Exposure incidents can lead to infection from hepatitis B virus (HBV) or human immunodeficiency virus (HIV) which causes AIDS. Few cases of AIDS are directly related to workplace exposure. Nevertheless, approximately 8,700 health care workers contract hepatitis B from occupational exposures each year. Approximately 200 die from bloodborne infections. Some become carriers, passing infections to others.

WHY REPORT?

Reporting an exposure incident right away permits immediate medical follow-up. Early action is crucial. Immediate intervention can prevent the potential development of hepatitis and/or HIV infection. Prompt reporting helps to prevent spread of infection to others. In addition, further evaluation of each incident aids in prevention of reoccurrence.

Additional follow-up includes blood testing for Hepatitis B and C as well as HIV infection or disease of the source individual. The exposed employee must be informed of test results.

Exposure protocols are provided to each employee. See Exposure Control Card.

MEDICAL EVALUATION AND FOLLOW-UP

Employers must provide free medical evaluation and treatment to personnel who experience an exposure incident. See specific clinical facility manual for appropriate exposure protocol and detail. Immediate intervention should be given by healthcare worker practice site. In all cases, report exposure incidents to the Office of Infection Control Office at Morehouse School of Medicine.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Wearing gloves, gowns, masks, and eye protection significantly reduce health care worker risk for exposure to blood and other potentially infectious materials. The OSHA standard covering bloodborne disease requires employers to provide appropriate personal protective equipment and clothing free of charge to employees.

Workers who have direct exposure to blood and other potentially infectious materials at the work place risk contracting bloodborne infections from hepatitis, human immunodeficiency virus and other pathogens. Approximately 8,700 health care workers are infected with Hepatitis, and 200 die from the infection each year. Although the risk of contracting AIDS through occupational exposure is much lower, wearing proper personal protective equipment can greatly reduce potential exposure to bloodborne infections.

SELECTING PPE

The level of protection must fit the potential exposure. For example, gloves would be sufficient for a laboratory technician while drawing blood, whereas a pathologist conducting an autopsy would need considerably more protective clothing.

PPE may include gloves, gowns, laboratory coats, face shields or masks, eye protection, N-95 masks, and other protective gear. The gear must be readily accessible to employees and available in appropriate sizes.

When contact with blood or other potentially infectious materials or contaminated surfaces might occur, wear gloves. Single use gloves cannot be washed or decontaminated for reuse. Utility gloves may be decontaminated if not compromised. They should be replaced if signs of cracking, peeling, tearing, puncturing, or deteriorating occurs. Hypoallergenic gloves or similar alternatives are provided to personnel with known allergy to standard gloves.

Health care workers should wear eye and mouth protection such as goggles and masks, glasses with solid side shields, and masks or chin-length face shields when splashes, sprays, splatters, or droplets of potentially infectious materials might occur. More extensive coverings such as gowns, aprons, surgical caps and hoods, and shoe covers or boots are needed when extensive contamination is expected i.e., during orthopedic surgery or autopsy.

AVOIDING CONTAMINATION

Important: Use of PPE and Handwashing is important. Avoid direct contact with potentially infectious bloodborne pathogens and contaminants.

DECONTAMINATING AND DISPOSAL OF PPE

Remove personal protective clothing and equipment prior to leaving the work area and/or when PPE becomes contaminated. When a garment is penetrated with potentially infectious material, remove it immediately. Used protective clothing and equipment should be placed in designated containers for storage, decontamination, or disposal.

OTHER PROTECTIVE PRACTICES

Remember to wash with soap and-water and flush eyes with water immediately. Wash hands after the removal of personnel protective equipment.

Health care workers must refrain from eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses in areas where they may be exposed to blood or other potentially infectious materials.

HOLDING THE LINE ON CONTAMINATION

The healthcare worker risk of exposure to bloodborne pathogens is reduced if work areas are kept clean and sanitary.

DECONTAMINATION

The method of decontamination is different depending on the area. It is determined by the type of surface as well as the tasks or procedures that occur in the area.

Health care workers should decontaminate work surfaces and equipment with an appropriate disinfectant after completing procedures involving exposure to blood.

Health care workers should clean (1) when surfaces become contaminated; (2) after blood spills or other potentially infectious materials; and (3) at the end of work shift where contamination might occur.

Use mechanical devices such a brush, dustpan, tongs and/or forceps to pick up the broken glass. Never use hands, even when wearing gloves.

All equipment should be decontaminated before being serviced or shipped for cleaning or repair.

REGULATED WASTE

In addition to effective decontamination of work areas, proper handling of regulated waste is essential to prevent unnecessary exposure to blood and other potentially infectious materials. Regulated waste must be handled with great care - - i.e., liquid or semi-liquid blood and other potentially infectious materials, items caked with potentially infected materials, items that might release blood or other potentially infected materials when compressed as well as pathological or microbiological wastes containing them and contaminated sharps.

Containers used to store regulated waste must be closable and suitable to contain its contents and prevent leakage of fluids. Containers designed for sharps must be puncture resistant. Each container must be labeled or color-coded to ensure employees are aware of potential hazards.

Regulated waste must be disposed of in accordance with applicable state and local laws.

LAUNDRY

Laundry workers must wear gloves and handle contaminated laundry as little as possible, with a minimum of agitation. Contaminated laundry should be bagged or placed in containers at the location where it is used. It should not be sorted or rinsed.

All dirty linen is considered contaminated. Laundry must be labeled and/or color-coded before transporting. Consistent use of labeling and color-coding increases health care worker awareness and compliance.

Wet laundry might require bags that prevent leakage. It can be placed in dirty linen bag if it can contain fluids. Remember, PPE and Biohazard safety precautions as needed.

VIII. OSHA, Mycobacterium Tuberculosis (TB) Facts for Health Care Workers

TB EPIDEMIOLOGY and FACTS:

Worldwide, tuberculosis (TB) is by far the second leading cause of death due to infectious disease. It is estimated that 1.7 billion people, or 1/3 of the global population, are infected with mycobacterium tuberculosis (MTB). MTB is the causative organism of tuberculosis in infection and disease, and this disease causes more than any other infectious diseases according to other experts. Georgia is known to have one of the highest prevalence rates in the United States of America.

TRANSMISSION AND PATHOGENESIS:

TB is a serious disease that is spread from person to person through the air by a germ called MYCOBACTERIUM TUBERCULOSIS. Tuberculosis (TB) usually affects the lungs, but it can affect other parts of the body. The germs are transmitted into the air by persons with TB coughing, sneezing, laughing and singing. TB is easily transmitted in close air space; therefore, it is not uncommon to find several people within the same household with TB. TB transmission can be controlled in healthcare settings.

Are healthcare workers at risk for **AIRBORNE infection?**

INFECTION AND/OR DISEASE:

There is a significant difference between TB INFECTION and TB DISEASE. Those with TB DISEASE are sick from germs that are active in the body. They usually have one or more symptom of TB. These people are often capable of giving the infection to others. Medications which can treat TB are prescribed for these persons.

Those with TB infection (WITHOUT DISEASE) carry the TB germ. Infection is shown via PPD skin testing positivity. Most people do not look or feel sick and they cannot spread the germ to others. However, development of TB Disease known as Latent TB can occur in the future, especially among high risk populations such as:

- Low income
- Homeless
- Non-US-Borne
- Nursing home residents
- Prisoners

- Alcoholics and intravenous drug users
- People with medical conditions such as diabetes, certain types of cancer and being underweight
- Especially people with HIV INFECTION (the virus that causes AIDS)

SIGNS AND SYMPTOMS OF ACTIVE TB

- Fatigue
- Fever
- Weight loss
- Anorexia Loss
- Night sweats
- Cough
- Hemoptysis
- Chest pain
- Other symptoms depending on affected body part

RISKS OF DEVELOPING TB

When one has a negative skin test that converts to a positive skin test, there is a 5% chance of development of TB disease in the first or second year after the conversion. An additional 5% of infected people will develop disease in their lifetime. It varies with age and immunologic status. Medications are prescribed for those who experience skin test conversions to prevent in their skin test to prevent TB disease.

TOOLS FOR DIAGNOSING TB

- PPD skin test: Most common method utilized to determine an INFECTION. A small amount of testing solution is placed intra-cutaneously on the forearm. Reading is done within 48 to 72 hours.
- Baseline PPD skin testing of all Health Care Workers including Bacillus of Calmette and Gurerin (BCG) vaccination recipients will identify those who previously infected with TB. Baseline testing, a two-step procedure is used to minimize the likelihood of confusing reactivity with infection or conversion
- Quantiferon testing (QFT), whole blood testing
- Chest x-ray
- AFB smear
- Cultures

PREVENTIVE THERAPY AND TREATMENT

There is preventive therapy medication for patients with skin tests conversions. TB medications are available for people with active TB. TB is easily prevented and cured with medication(s) when medication(s) is taken as instructed.

CONNECTION BETWEEN TB AND AIDS

There is a connection between TB and AIDS patients. The risk of developing TB for HIV infected people may be 8% per year compared to 5% to 10% per lifetime for non-infected persons who are provided appropriate therapy. In general, longer durations of medication therapy is needed for HIV positive patients.

MULTI-RESISTANT TB

Some antibiotic resistant strains of TB have developed due to non compliance with drug therapy. The TB GERM is not killed, these germs can change in such a way to allow germ to survive standard TB drugs. That's why every TB germ in the body must be wiped out.

MEDICATION COMPLIANCE IS EXTREMELY IMPORTANT.

INFECTION CONTROL IN THE HEALTHCARE SETTING: TB EXPOSURE CONTROL PLAN

The US Department of Labor, Occupational Safety and Health Administration (OSHA) provided uniform procedures and guidelines to compliance officers for conduction inspections and issuing citations for possible violation of infection control procedures. OSHA may visit a Healthcare Facility at any time.

IMPORTANT ISSUES IN THE PREVENTION TRANSMISSION OF TB TO OTHER PATIENTS AND HEALTHCARE WORKERS

1. Early identification of active pulmonary TB is extremely important.
2. Isolate patients in closed negative pressure room with door to room close.
3. Prompt treatment is essential.
4. The National Institute for Occupational Safety (NIOSH) requires a face device that must be fitted and worn by healthcare workers entering the Airborne Isolation room. Annual TB fit testing is provided by the Office of Infection Control at MSM.
5. Appropriate care while transporting patients to another area in a facility - patient must wear a properly fitted (**surgical mask**).
6. **Patient teaching:** cover the nose and mouth when he or she coughs or sneezes to contain the bacteria.
7. Family education: Teach family about the disease, transmission and care of their family member. Families may receive follow up at nearby county health departments.
8. Employee Health: **ALL** personnel are required to have an semi-annual EH screening.
9. Any HIV infected patient (or at high risk for HIV of serological status is unknown) or pulmonary treatment with an abnormal chest x-ray must be placed on airborne precautions upon admission to rule out tuberculosis.
10. Keep room door closed at all times.

IX. EXPOSURES RELATED TO INFECTION CONTROL

A. WHAT IS AN EXPOSURE? Contact with potentially infectious agents.

B. WHAT ARE KNOWN INFECTIOUS DISEASES WHICH WOULD CAUSE CONCERN TO HEALTH CARE WORKERS? HOW IS ONE EXPOSED?

HIV/AIDS

Contact through body fluids: blood, products, semen, vaginal secretions, fluid in uterus of pregnant woman, fluid surrounding brain, spine, heart, joints, fluid in chest, abdomen, and fluid with visible blood.

HEPATITIS A

Contact with feces, blood, and urine

HEPATITIS B

Contact with blood, saliva, semen and urine

HEPATITIS C

Contact with body fluids, blood

HERPES ZOSTER

Contact with lesions by individual who is susceptible to infection

CHICKEN POX

Contact with airborne droplets and lesions of infected person. If health care workers are vaccinated with (varivex), he/she should wear a surgical mask when caring for patients with chicken pox.

MUMPS

Contact with oral secretions

RUBELLA

Contact with airborne and droplet secretions

MYCOBACTERIUM T.B. (PULMONARY)

Prolonged contact with chronic coughers who do not practice good secretions precautions; prolonged airborne contact/sharing air space with person with active pulmonary TB.

CMV

Contact with secretions

SCABIES & LICE

Close contact with infected person, sharing of combs, brushes or clothes and linen

SALMONELLA

Contact with contaminated milk, water, certain turtles, eggs, ice cream, and meringue pies

C. THE HEALTH CARE WORKER IS EXPOSED TO AN INFECTIOUS DISEASE, WHAT SHOULD BE DONE?

1. Bloodborne exposure

- Wash the area first.
- Report incident per healthcare arena protocol to immediate supervisor
- Complete and sign the Employee Occurrence Report.
- Report to Emergency Department or Occupational Health.
- Immediate blood testing for HIV and Hepatitis B & C should follow (baseline). Signed consent for HIV is required.
- Six week and 6 months post exposure testing, sometimes one year.
- On site Anti viral drug therapy for 3-5 days if desired, then up to 30 days.

Note: See Infection Control Manual of respective clinical practice site for more details.

2. Pulmonary TB: When TB exposure has occurred, follow facilities protocol per Infection Control Manual.
3. Neisseria meningitis (meningococcal): Rifampin or cipro per CDC protocol.

X. ADULT IMMUNIZATION INFORMATION

Adults, specifically those who work in the healthcare arena (medical students, residents, faculty and staff) need protection against certain infectious diseases which are vaccine preventable. The immunized employee promotes a safer environment for co-workers as well as patients. Below is a list of adult immunizations recommended by the Advisory Committee on Immunization Practice (ACIP) and the Office of Infection Control Office at MSM. Also consult with your Personal Health Care Provider for specific immunization needs.

1. **MMR (Measles, Mumps and Rubella) vaccine:** For those persons born after 1957, a second MMR is needed. A blood test is available to determine a person's immunity to these viruses. Also females should verify non-pregnancy before getting MMR.
2. **Tdap (Diphtheria-Tetanus Toxoid-Pertussis):** The Tdap component needs to be updated every 10 years.
3. **Seasonal Influenza vaccine (the FLU shot):** Each year, the drug manufacturer specifically makes the vaccine for the "flu" bug(s) expected to be the most common for that flu season. This shot is usually given in October and early November.
4. **Hepatitis B vaccine:** This vaccine is highly recommended for all health care workers. After receiving the series of three shots, most people will be protected against HEPATITIS B (not any other viral type of hepatitis, only B). A blood test is performed to confirm immunity.

5. **Varivax:** One of the newest vaccines, this vaccine is >95% effective in providing protection against varicella (chicken pox) for those who haven't had the infection. For adults, a series of 2 shots, 4 weeks apart, is recommended.
6. **PLEASE NOTE:** The PPD SKIN TEST is **NOT** a vaccine or an immunization. It is a screening tool used to test for Tuberculosis infection and potential disease. A TB skin test is required of all healthcare workers including non-US-born individuals who received BCG in early childhood. **For pre-clinical students, initial two-step testing is a required annual screening (see MSM Student Handbook).**

As required by the 1986 National Childhood Vaccine Injury Act (Public Law 99-660), each employee receiving a vaccine shall be given written vaccine information. This information includes the following:

1. Frequency, severity and potential long term effects of disease to prevented by the vaccine
2. Symptoms or possible reactions, adverse reactions
3. What to do if reaction occurs
4. Contraindications to receiving the vaccine
5. An identification of the groups, categories, or characteristics of potential recipients of the vaccine who may be at significantly higher risk of major reactions to the vaccine than the general population.

Each Morehouse School of Medicine student, staff, or faculty who chooses to receive a vaccine is required to sign an authorization form prior to receiving the vaccine. This form will be witnessed by Infection Control or designee. The employee will receive a copy of the authorization. An immunization Certificate will be provided to each participant upon completion.

Each participant receiving a vaccine will be required to remain in the Office of Infection Control or designated area for observation for 20 minutes following each injection. Vaccines are provided FREE of charge to students of Morehouse School of Medicine.

For more information or to schedule an appointment, please call the Office of Infection Control at 404-756-5282 or 5036.

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REFERENCES

- American College Health Association (1994). *Program development Guidelines for Nurse-Directed Health Services*. American College Health Association. Baltimore, MD.
- Bloch, A. B. (1995). Screening for tuberculosis and tuberculosis infection in high-risk populations. *Morbidity and Mortality Weekly Report*, 44(RR-11): 18-34.
- Centers for Disease Control and Prevention (1996). *NIOSH Guide to the selection and use of particulate respirators certification under 42 CFR 84*. DHHS (NIOSH), Publ. No. 96-101. Cincinnati, OH, National Institute for Occupational Safety and Health, HHS, CDC.
- Centers for Disease Control and Prevention (2002). *Guidelines for Hand Hygiene in Health-care Settings*. *Morbidity and Mortality Weekly Report*, 51(RR)-16.
- Fredlund, D. J. (1967). The route of effective school nursing. *Nursing Outlook*, 15(8): 24-28.
- Gerberding, J. L. (1993). Occupational infectious diseases or infectious occupational diseases? Bridging the views on tuberculosis control. *Infection Control & Hospital Epidemiology*, 14(12): 686-688.
- Killip, D., S. Lovick, L. Goldman, and D. Allenworth (1987). Integrated school and community programs. *Journal of School Health*, 57(10): 437-444.
- McGinnis, J. M. and C. DeGraw (1991). Healthy schools 2000: creating partnerships for the decade. *Journal of School Health*, 61(7): 292-297.
- National Occupational Research Agenda (1994). *Disease and Injury, Work Environment and Work Force*. Washington, DC.
- Riley, R. L. and F. O'Grady (1961). *Airborne Infection*. Macmillan, 26-57. New York.
- Sepkowitz, K. A. (1996). Occupationally acquired infections in healthcare workers, Part 1. *Annals of Internal Medicine*, 125: 826-834.
- Snider, D. E., and G. M. Cauthen (1984). Tuberculin skin testing of hospital employees: Infection, boosting, and two-step testing. *American Journal of Infection Control*, 12(6): 305-311.
- Ten Dam, H. G. (1990). *BCG vaccine and vaccination policy*, Pub. No. EPI/GAG/90/WP.8. Cairo, World Health Organization.
- US Code of Federal Regulations (1981). 29 CFR 1910. 1030(d)(vii)(A). *Bloodborne Pathogen Standard*.
- US Code of Federal Regulations (1981). Title 21, Part 650, Subpart B. *Tuberculin*.
- US Department of Health and Human Services (1990). Public Health Service. *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*. DHHS Publication No. (PHS) 91-50212. US Government Printing Office. Washington, DC.
- US Department of Labor, O. S. H. A. (1996). *Enforcement Procedures and scheduling for occupational exposure to tuberculosis*. Occupational Safety and Health Administration. Washington, DC.
- Villarino, M. E., R. E. Huebner, A. H. Lanner and L. J. Geiter (1996). The role of BCG vaccine in the prevention and control of tuberculosis in the United States. *Morbidity and Mortality Weekly Report*, 45 (RR-4): 1-18.