

# The OSHA Regulations on BLOODBORNE Pathogens

**A Training Manual**

## INTRODUCTION

The new standards issued by the Occupational Safety and Health Administration (OSHA) are designed to protect the more than 5 million health care workers in the United States at risk of occupational exposure to BLOODBORNE pathogens such as human immunodeficiency virus and hepatitis B virus.

Though the chances of contracting a disease transmitted by blood are relatively low, they are real. Each year more than 300 workers die of hepatitis B virus (HBV) infection, and a small, but significant, number of health care workers are found to have human immunodeficiency virus (HIV) infection attributable to occupational exposure. Transmission of these infections is preventable. Working together, employers and employees can help halt the spread of these diseases in the workplace. Employees, in all segments of industry where occupational exposure is possible, are covered by these regulations. **Occupational exposure** means reasonably anticipated skin, eye, mucous membrane or parenteral (i.e. needlestick) contact with blood or other potentially infectious materials that results from the performance of an employee's duties. In addition to health care workers, this includes police, firefighters, janitorial workers, and laboratory technicians. These regulations are the first to set forth enforceable standards for employee protection.

This training manual, with the accompanying videotape, explains the rules that will affect you directly. It discusses the responsibilities of employee and employer, as both must become familiar with the new OSHA regulations. Compliance with these regulations is mandatory.

This manual is designed for use by most health care workers. However, it does not discuss the special regulations for HIV and HBV research laboratories and production facilities. The Administrators Guide gives more detailed information about employer's duties. It also includes a copy of the OSHA Standards. If you are interested in seeing a copy of the standards, ask your employer. Your employer is required to provide a copy for your review upon request.

## **MAJOR BLOODBORNE PATHOGENS: HIV AND HBV**

The OSHA Standards are intended to protect workers from all known and as yet unknown diseases transmitted by blood. The viruses of greatest concern at present, however, are hepatitis B and HIV.

### **HIV**

The human immunodeficiency virus (HIV) is the virus that causes AIDS. The signs of HIV infection are extremely variable. Persons infected with HIV are initially asymptomatic for an average of 10 years. The manifestations of AIDS that may eventually develop include a decreased cellular immune response and a variety of opportunistic infections. HIV is transmitted in the blood and other body fluids such as semen and cervical secretions. Exposure to tears or saliva and other casual forms of contact have not been found to transmit the virus.

### **HEPATITIS B**

Hepatitis B is far more common than HIV and is present in very high concentrations in the blood of infected patients. The high blood concentrations give HBV a greater likelihood of infecting exposed persons.

In contrast to HIV, which causes infection in only about 1 in 250 exposure incidents, HBV may cause infection in up to 1 of 3 exposures. Of those who become infected, only about one-third become symptomatic. Flue-like symptoms and jaundice are clinical clues to hepatitis B infection. A few asymptomatic infected individuals can be chronic carriers of the virus, unwittingly infecting others.

### **TRANSMISSION OF HIV AND HBV**

Typical routes of transmission of HIV and HBV in the health care setting are:

- Needlestick injuries;
- Blood contact with a preexisting portal of entry (such as a scratch or cut); and
- Blood contact with a mucous membrane (mouth, nose, or eye).

Similar contact with other potentially infectious materials or regulated waste can also result in transmission of HIV or HBV.

## **OSHA DEFINITION OF POTENTIALLY INFECTIOUS MATERIALS**

OSHA has defined three types of potentially infectious materials other than blood.

The first is human body fluids:

- Semen;
- Vaginal secretions;
- Cerebrospinal, synovial, pleural, pericardial, peritoneal, and amniotic fluids;
- Saliva in dental procedures;
- Any body fluid visibly contaminated with blood; and
- Any undetermined body fluid.

The second category includes any unfixed human tissue or organ.

The third includes blood, organs, or tissues from infected experimental animals as well as cultures or solutions containing HIV or HBV.

Regulated waste includes blood and other potentially infectious materials as well as items contaminated with and capable of releasing them. Contaminated sharps and items caked with dried blood are examples of regulated waste.

## **UNIVERSAL PRECAUTIONS**

The concept of Universal Precautions, which recommends that all blood and potentially infectious materials other than blood must be handled as if infected, is a basic tenet of the OSHA regulations.

It is virtually impossible for a health care worker to determine whether a particular patient or blood sample is infected. With HIV, in particular, there is a period between infection and development of antibody during which the virus cannot be detected by current methods. Thus, even a newly tested patient with a negative result may actually carry the virus.

Chronic carriers of HBV are also difficult to identify. About 90% of chronic HBV carriers admitted to hospitals are not identified.

Observing Universal Precautions to prevent contact with blood or other potentially infectious materials is an important first step in complying with these standards.

## **COMMUNICATION OF HAZARDS TO EMPLOYEES**

Labels and signs must be used to identify items that can pose a hazard. Labels and color codes must be used to ensure that anyone who may come in contact with a contaminated object knows they must handle it with care.

OSHA has chosen the fluorescent biohazard sign as the appropriate label marking with red as the color code. Labels can be attached by string, wire, adhesive, or some other method that will not allow them to fall off accidentally. They can also be a part of the container itself; for example, red bags or red containers can be substituted for labels.

Containers of regulated waste, refrigerators or freezers that hold potentially infectious materials, and other containers used to transport or store these materials must be labeled or color-coded.

Individual containers that are placed inside another labeled container for storage or transport do not need to be labeled separately. Containers of blood and blood products with a contents label that have been released for clinical use do not need additional labeling or color coding. Regulated waste that has been decontaminated also does not need any labeling or color-coding.

Special biohazard signs will also be required for HIV and HBV research laboratories and production facilities to mark the entrances to hazardous work areas.

Your employer is additionally responsible for seeing that the health care professional evaluating an exposed worker receives all pertinent information about the incident. This includes a description of the exposed employee's duties, documentation of the exposure incident, results of testing on the source individual, and all relevant medical records maintained by the employer.

The health care professional will, in turn, provide a written opinion stating that the employee has been informed of the results of the evaluation and about any exposure-related medical conditions that will need further evaluation or treatment. All other findings will remain confidential. **The employee must receive a copy of the opinion within 15 days of evaluation.**

#### **POSTEXPOSURE AND EVALUATION MEDICAL RECORDS**

Employers are required to keep confidential medical records for all employees with occupational exposure. These records include:

- \* Employee's name and social security number;
- \* Hepatitis B vaccination status;
- \* Results of follow-up procedures to exposure incidents;
- \* All information given to the evaluating health care professional; and
- \* A copy of the evaluating health care professional's written opinion.

Access to the records may only be granted with written permission from the employee.

#### **CONTAMINATION INCIDENTS**

In the event of an emergency involving blood or other infectious material (for example, a specimen container falls and breaks), the following procedures are recommended.

1. Notify co-workers and patients in the vicinity about the hazard;
2. Notify appropriate staff about the spill for clean-up;
3. Assign someone to monitor the site until cleanup is complete; and
4. Notify the designated contact person for exposure incidents to begin documenting what happened.

Universal Precautions must be observed as part of the spill cleanup.

#### **THE HEPATITIS B VACCINE**

A safe and effective vaccine is available to protect health care workers from hepatitis B. While the vaccine has been available for some time, **employers are now required to offer it free of charge to personnel at risk.** You are not required to receive the vaccine. Any at-risk employee who wishes not to receive the vaccine must sign a copy of OSHA's hepatitis B vaccine declination. If you later decide to receive the vaccine, the employer must still offer it to you free of charge.

The vaccine is generally well tolerated and has not been associated with any serious side effect. (The most common complaint after administration is soreness at the injection site.) The vaccination is given intramuscularly in a series of three injections. The vaccine must be offered **after** you have received training in the new standards for blood borne pathogens and no later than **July 6, 1992.** New employees must be offered the vaccination **within 10 working days** of beginning the job. It must be made available to the staff at a reasonable time and place, and be given or supervised by a licensed health care professional.

In the future, booster doses of vaccine may be recommended by the U.S. Public Health Service, and these must also be made available to employees at no cost and at a reasonable time and place.

Some employees may be exempt from this rule. They include:

- People who have previously received the complete vaccination series;
- People who have been shown to be immune to HBV; and
- People for whom the vaccine is medically contraindicated

A screening program may not be used as a prerequisite to HBV vaccination.

If a worker is exposed to hepatitis B virus, post-exposure preventive treatment must also be made available. This consists of hepatitis B immune globulin given as an intramuscular injection. The immune globulin provides passive immunity to HBV after exposure.

## EXPOSURE CONTROL PLAN

Your employer is required to develop a written Exposure Control Plan. The plan's goal is to eliminate or minimize exposures to infectious materials.

The Exposure Control Plan must include a list of job classifications in which employees risk occupational exposure. OSHA refers to this list as the Exposure Determination List. Any worker who may have contact with blood or other potentially infectious materials should be included. The determination must also list the procedures in which occupational exposure can occur. This list of jobs and procedures must be based on risks incurred without use of personal protective equipment.

The plan must also contain a schedule for implementing the requirements of the OSHA standard. It must specify how employees will be protected and how they will be trained. Your employer will give you the name of the person in your facility that you can contact if any exposure incident occurs.

In addition, your employer must develop a written procedure to evaluate any exposure incidents to be included in the Exposure Control Plan.

## ENGINEERING CONTROLS

Engineering controls, with work practice controls and personal protective equipment, function together to eliminate or minimize exposure incidents. The use of all three controls is mandated by OSHA.

Engineering controls are items designed to isolate or keep infectious materials away from patients and staff. All engineering controls must be well maintained. Inspections must be regularly scheduled. Equipment must be repaired or replaced when necessary. These controls include the following:

**Hand washing facilities** must be readily accessible to staff wherever occupational exposure may occur. Alternatives to hand washing facilities must be made available. Use of antiseptic hand cleanser and clean towels or towelettes is an acceptable short-term solution. Workers must wash their hands with soap and running water as soon as possible after exposure.

## FOLLOW-UP OF EXPOSURE AND CONTAMINATION INCIDENTS

### **Exposure Incidents**

When an exposure incident occurs, the following three steps are recommended for immediate action:

1. Cleanse the area of exposure to minimize the chance of infection.
2. Notify the designated contact person for exposure incidents to begin documenting what happened.
3. Seek medical treatment and evaluation.

If an exposure incident occurs, your employer is required to offer confidential medical evaluation and follow-up at no charge. The evaluation and follow-up must be offered at a reasonable time and place, and they must be performed or supervised by a licensed health care professional. All laboratory tests must be done by an accredited laboratory at no cost to the worker. The evaluation must include:

- \* A written report on the route of exposure and circumstances surrounding the incident.
- \* Identification of source individual where possible and not prohibited by state or local law. Your employer should check with your local and/or state medical society for information on applicable regulations in your area.
- \* HIV and HBV blood test of source individual, unless source is known to be infected with HIV or HBV. Employees have the right to know the results of testing, but they must also be informed of applicable laws governing disclosure of this information.
- \* Written documentation of evaluation and medical follow-up, including results of employee serological testing for HIV and HBV.
- \* The exposed employee has the right to refuse blood collection and/or testing. If the exposed employee gives consent for blood collection but not for HIV testing, the blood must be kept for 90 days, during which time the employee can choose to have the sample tested.
- \* Appropriate post-exposure prophylaxis (preventive treatment) must be offered, according to the recommendation of the U.S. Public Health Service. This includes immune globulin for hepatitis B. Treatment for AIDS should be in accordance with the latest Center for Disease Control guidelines.
- \* Counseling and evaluation of any reported illnesses must be provided by the employer at no cost to the exposed employee.

**Routine cleaning.** Housekeeping procedures are also covered by the new standards. Employers are responsible for seeing that work sites are kept clean and sanitary. A written schedule for cleaning and decontaminating is required. However, when equipment or surfaces come in overt contact with potentially infectious material (such as after a spill), they must be cleaned and decontaminated with an appropriate disinfectant as soon as possible. The same is true for reusable receptacles of all types. For example, if a surface has become contaminated since the last cleaning, it must be cleaned again at the end of the work shift. Similarly, workers must replace protective coverings for surfaces or equipment after contamination or at the end of a work shift if they have become contaminated during the shift.

**Broken glass.** Never pick up by hand any broken glassware that may be contaminated. Sharp edges could easily break the skin, allowing pathogens to enter. Recommended mechanical means of cleanup include use of a brush and dustpan, tongs, or forceps. If the glass container held any infectious material, then the brush, dustpan, or forceps that was used to clean up the glass must be handled as though it were also contaminated and must be thoroughly cleaned and decontaminated before reuse.

**Laundry.** Handle contaminated laundry, which includes laundry that has been soiled with blood or other potentially infectious materials, or which may contain sharps as little as possible. Bag or place contaminated laundry in a container at the place where it was used. It must be sorted or rinsed elsewhere. Containers for storing or transporting laundry must be labeled or color-coded as indicated in the following section. If universal precautions are used in handling all laundry, alternative labeling is allowed as long as all employees are familiar with the labeling. If, however, the laundry is shipped to a place that does not follow universal precautions, it must be placed in containers with standard labeling or color-coding. If the laundry is wet or may soak through its container, it must be placed in a leak-proof bag or container.

**Final Notes: *Engineering Controls, Personal Protective Equipment, and Work Practice Controls are designed to work together to protect health care workers. With your employer, you will need to actively think about which controls to use under what circumstances. Your participation helps ensure that patients and workers alike have the lowest possible risk of infection at all times.***

**Containers for used sharps** are also required as engineering controls. The containers must meet the following requirements:

- They must be puncture-resistant and leak-proof on the sides and bottom.
- They must be labeled or color-coded so that they can be readily identified by staff.
- They must be located as close as possible to the places where sharps are used and be easily accessible.
- Reusable containers must be designed so that they can be emptied without risk to the person emptying them.

**Containers for specimens.** Specimens of blood or other potentially infectious materials must be kept in a container that prevents leakage during the collection, handling, and storage of the samples. If a sample is capable of puncturing the container, a second puncture-proof one must be used. The container must always be kept closed for storage or shipment.

For storage or if the specimen is to be shipped, the container must be properly labeled or color-coded. For example, an overnight mail package containing blood samples must be labeled as hazardous on the outside of the package. When Universal Precautions are followed with the facility where the samples were collected, labeling is not necessary if the container is easily recognizable as containing specimens.

**Containers for other regulated waste.** Other regulated waste, such as used disposable gloves, must be kept in closed containers that can hold all contents without leakage during handling, storage, and transport. The waste must be color coded or labeled.

**Mechanical pipettes** are required. Pipetting by mouth is specifically prohibited by OSHA.

**Laboratory equipment.** Specific containment equipment is required by OSHA for all HIV and HBV research laboratories and production facilities. Biological safety cabinets, safety equipment for centrifuges, and other requirements for these types of facilities are specified in the regulations.

**Final Notes: *Just as you teach yourself to drive defensively, you must train yourself to think defensively about handling potentially infectious materials. As in defensive driving, you will be better prepared for mishaps by thinking ahead and recognizing risky situations.***

## PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment is designed to protect employees from direct contact with blood or other potentially infectious materials. These include:

- Gloves;
- Gowns and laboratory coats;
- Face shields or masks;
- Eye protection; and
- Mouthpieces, resuscitation bags, pocket masks, and other ventilation devices

Other items can be considered protective equipment if they do not permit blood or other potentially infectious materials to pass through them under normal conditions of use. Personal protective equipment must be provided free of charge by the employer. They must also be readily available in appropriate sizes. Cleaning and disposing of these items as well as repair and replacement must also be provided free of charge by the employer. All at-risk staff, including janitorial and laundry workers, are to be given access to personal protective equipment as needed.

**Determining when protective equipment is required.** Use of these items will depend on the situation for which protection is needed. With your employer, discuss the appropriate level of protection for each task you perform. For example, when you can reasonably assume that you may have hand contact with blood, gloves will be necessary. Face protection must be used if splashing is likely. If you think about the types of exposure that you experience, you can plan which personal protective equipment you must use for each task.

When a garment becomes penetrated by blood or some other potentially infectious material, take it off as soon as possible. Before leaving a work area, you must always remove personal protective equipment and place them in the designated area or container for storage, washing, decontamination, or disposal.

Employers must ensure that their employees use this equipment consistently. The employee may, however, under extraordinary circumstances, choose to decline the use of personal protective equipment if its use would prevent the delivery of health care services or pose an increased hazard. Whenever a worker makes this judgment, the circumstances must be documented so that potential changes in policy can be studied.

## WORK PRACTICE CONTROLS

Work Practice Controls are rules that ensure employees perform procedures in the safest way possible. Many are necessarily related to engineering controls, specifying how they can best be used by staff. Others are simply procedural guides.

**Hand washing.** This is a very basic and necessary procedure. The new OSHA regulations require hand washing as soon as possible after removal of gloves or other personal protective equipment. Never assume that wearing gloves, for example, is foolproof protection. Even if the integrity of a glove is not compromised, the act of taking it off can lead to exposure. After any skin or mucous membrane contact with blood or other potentially infectious materials, wash the affected area with soap and water. When running water is not immediately available, use an antiseptic hand cleanser. You are still required to wash with running water as soon as possible thereafter.

**Handling of materials.** Handle blood and other materials carefully to minimize splashing and spraying. The rules specifically prohibit pipetting or suctioning these materials by mouth. Use of mechanical pipettes is required.

**Eating, drinking, and hygiene.** Do not eat or drink in work areas where there is any risk of occupational exposure. The rule extends also to smoking, applying cosmetics, and handling contact lenses. In addition, food and drink must not be stored in places where other potentially infectious materials are kept. Refrigerators, freezers, shelves, cabinets, countertops, and bench tops are all covered under this regulation.

**Equipment.** Equipment that can become contaminated is also regulated by OSHA. Before any equipment that might be contaminated is repaired or shipped, it must be inspected for blood or other potentially infectious material. If infectious material is present and the equipment can be decontaminated, it must be decontaminated before it is serviced or shipped. If the contaminated equipment cannot be decontaminated, a label must be placed on it that clearly indicates the site(s) of contamination. Your employer must ensure that anyone who might handle the equipment is aware of the contamination so they can take the necessary precautions.