

BLOODBORNE PATHOGEN CEU TRAINING COURSE

**PROFESSIONAL DEVELOPMENT
CONTINUING EDUCATION COURSE**



 **Technical
Learning
College**

Fun Facts from the Infection Control Center

During an hour's swimming at a municipal pool you will ingest 1/12 liter of urine.

In an average day your hands will have come into indirect contact with 15 penises (touching door handles, etc.)

An average person's yearly fast food intake will contain 12 pubic hairs.

In a year you will have swallowed 14 insects while you slept!

Annually you will shake hands with 11 women who have recently masturbated and failed to wash their hands.

Annually you will shake hands with 36 men who have recently masturbated and failed to wash their hands.

In a lifetime 22 workmen will have examined the contents of your dirty lingerie basket.

At an average wedding reception you have a 1/100 chance of getting a cold sore from one of the guests.

Daily you will breath in 1 liter of other peoples' anal gases.

**HAVE A GREAT DAY...
and
*wash your hands!***

Copyright Notice

©2006 Technical Learning College (TLC) No part of this work may be reproduced or distributed in any form or by any means without TLC's prior written approval. Permission has been sought for all images and text where we believe copyright exists and where the copyright holder is traceable and contactable. All material that is not credited or acknowledged is the copyright of Technical Learning College. This information is intended for educational purposes only. Most unaccredited photographs have been taken by TLC instructors or TLC students. We will be pleased to hear from any copyright holder and will make good on your work if any unintentional copyright infringements were made as soon as these issues are brought to the editor's attention.

Every possible effort is made to ensure that all information provided in this course is accurate. All written, graphic, photographic or other material is provided for information only. Therefore, Technical Learning College accepts no responsibility or liability whatsoever for the application or misuse of any information included herein. Requests for permission to make copies should be made to the following address:

TLC

P.O. Box 420

Payson, AZ 85547-0420

Information in this document is subject to change without notice. TLC is not liable for errors or omissions appearing in this document.

What can I do to minimize the chances of accidental exposure?

(Elementary School Example)

- ✓ Always wear gloves when giving first aid for wounds.
- ✓ Allow students to cleanse their own bloody wounds when possible.
- ✓ Wash hands as soon as possible after removal of gloves or other personal protective clothing or equipment.
- ✓ Immediately wash hands after accidental contact with blood or body fluids.
- ✓ Wear protective equipment if splattering of body fluids is anticipated.
- ✓ Call the custodian to clean up body fluids.
- ✓ Wear gloves when emptying waste receptacles.
- ✓ Double bag all body fluid waste material.

1. If the waste contains dried blood or body fluids use leak proof plastic bags and place in the regular garbage.
2. If bloody waste is liquid or semi-liquid, it must be disposed of in a red plastic bag and then placed in a Bio-Medical box for special disposal. Contact your custodian for special disposal.

- Clean contaminated surfaces by first removing visible blood, then disinfect with a solution of 1 part household bleach to 10 parts cool water for at least 10 minutes. This solution must be less than 24 hours old.
- Do not pick up broken glass directly with the hands.
- Dispose of sharps (hypodermics, needles, lancets, scalpel blades, etc.) in color-coded, leak proof and puncture resistant containers. When these boxes are full, they must be disposed of in a special bio-medical box. Call your school nurse if you need assistance.
- Don't eat, drink, smoke, apply cosmetics or lip balm or handle contact lenses in locations where there is a likelihood that an occupational exposure could occur; for example, the health-room.
- Never share razors or toothbrushes.



Bloodborne Pathogen Exposure

Bloodborne pathogen exposure may occur in many ways, but needlestick injuries are the most common cause. Exposure may also occur through contact of contaminants with the nose, mouth, eyes, or skin.

The standard covers all employees who could be “**reasonably anticipated**” to face contact with blood and other potentially infectious materials as a result of performing their job duties.

To reduce or eliminate the hazards of occupational exposure, an employer must implement an exposure control plan for the worksite with details on protection measures. Engineering controls are the primary means of eliminating or minimizing employee exposure and include the use of safer medical devices.

Work practice controls such as hand washing are stressed by the standard. Appropriate personal protective equipment must be used when necessary. The standard requires that the Hepatitis B vaccination be made available to all employees who have occupational exposure to blood. The standard specifies procedures to be made available to all employees who have had an exposure incident.



PPE is essential to working with bodily fluids.



You are required to provide PPE for your patients and/or customers.

Course Description

Bloodborne Pathogen Training CEU Course

This short CEU course is a review of bloodborne pathogen prevention and elimination training information. This course will cover basic bloodborne pathogens, related diseases and the Federal OSHA BBP Rule. This course is general in nature and not state specific. You will not need any other materials for this course. This is not a comprehensive blood or bloodborne pathogen manual.

CEU Course Learning Goals

I. Bloodborne Pathogen Familiarization

- A. Definitions
- B. Physical Description
- C. Protective Personnel Equipment
- D. Rule

II. Types of Control and Applications

- A. Administrative Controls
- B. Engineering Controls

II. OSHA Agency

- A. Definitions
- B. Rules and Regulations
- C. BBP Standard

III. Program Review

- A. References
- B. Glossary

IV. Advanced BBP application and competency



Small Sharps Container

Audiences – Required Safety Training for most personnel

Water Distribution, Well Drillers, Pump Installers, Water Treatment Operators, Wastewater Treatment and Collection Operators--the target audience for this course is the person interested in working in a water treatment/wastewater treatment or distribution facility and/or wishing to maintain CEUs for certification license or to learn how to do the job safely and effectively, and/or to meet education needs for promotion.

Medical Audience

Family Practitioners, General Practitioners, Physician Assistants, Dentists, Nurse Practitioners, Nurses, Psychiatric Technicians, Social Workers, Marriage Counselors, Massage Therapist and Pharmacists involved in frontline treatment and care are invited to participate.

Continuing Education Information

If you are in the medical, nursing, social science, or health education field, you can receive continuing education units with the successful completion of this course. Courses offered by TLC are eligible for continuing medical education units (CME) through several State agencies. Our courses meet the qualifications for continuing education credit for most state agencies. Contact your State Agency for further information on CEU approval.

CEU Course Learning Objectives

Identify the different ways exposure to bloodborne pathogens commonly occurs.

120 Minutes

- Needlesticks.
- Cuts from other contaminated sharps such as scalpels or broken glass.
- Contact of the eye, nose, mouth or cut/abraded skin with contaminated blood.

Describe and analyze several key aspects of a Bloodborne Pathogen Exposure Control Plan. 300 Minutes

- Must be a written plan.
- Identifies jobs and tasks where occupational exposure to blood or other potentially infectious material occurs.
- Describes how the employer will use engineering and work controls.
- Describes how the employee will ensure use of personal protective equipment (PPE).
- The plan must be accessible to employees.
- Must be reviewed at least annually to reflect changes in technology that will help eliminate or reduce employee exposure.

Explain how properly used PPE and appropriate housekeeping methods protect against exposure to bloodborne pathogens. 240 Minutes

- Gowns, gloves, face shields, eye protection, mouthpieces and resuscitation devices provide a barrier between potential contaminants and susceptible parts of the body.
- Cleaning and decontamination of work surfaces reduce the chances of exposure to a bloodborne pathogen.

List important steps to take if exposed to a bloodborne pathogen. 60 Minutes

- Wash exposed area with soap and water.
- Flush splashes to nose, mouth or skin with water.
- Irrigate eyes with water or saline.
- Report the exposure.
- Seek the assistance of a health care professional to determine what follow-up actions or treatment may be needed.

Final Course Objectives

By the end of the training session, employees should understand

- The purpose and application of process safety management, including training and employee participation required by OSHA's regulation.
- The importance of paying greater attention to the risks of the highly hazardous materials covered by the regulation.
- The importance of being involved in manager programs to reduce the chance of occupational exposure of hazardous substances.
- Identify and explain, in writing, different bloodborne pathogen terms such as complex figures of speech.
- Interpret and explain, in writing, denotative and connotative meanings in written selections of the different types of diseases.

This course will provide 10 hours of continuing education knowledge base in systems pathology for the continuing education of bloodborne pathogen prevention and related clinical competencies. Material in this course will contribute to a student's ability to perform or understand:

1. Physical Examination and Application of bloodborne pathogen prevention and related diseases.
2. Diagnostic Studies of bloodborne pathogen prevention and related diseases.
3. Diagnosis of Clinical Impression of bloodborne pathogen prevention and related diseases.

Specific Course Goals and Timed Outcomes (Beta Testing)

Eleven students were successfully tested and the average time necessary to complete each task was recorded as stated in the above objectives and timed outcome section. In the above timed outcome section area, the tasks were measured using times spent on each specific objective goal and final assignment grading of 70% and higher. Sixteen students were given a task assignment survey in which to track their times on the above learning objectives (course content) and utilized a multiple choice/True/False style answer sheet to complete their final assignment. All students were given 30 days to complete this assignment and survey. Rusty Randall, Proctor, September 2002

Beta Testing Group Statistics

Sixteen students were selected for this assignment. None of the test group received credit for their assignment. Five students failed the final examination. All of the students completed the reading assignment. The average times were based upon the outcome of eleven students.

Prerequisites: None

Course Procedures for Registration and Support

All of Technical Learning College's correspondence courses have complete registration and support services offered. Delivery of services will include, e-mail, web site, telephone, fax and mail support. TLC will attempt immediate and prompt service.

When a student registers for a distance or correspondence course, he/she is assigned a start date and an end date. It is the student's responsibility to note dates for assignments and keep up with the course work. If a student falls behind, he/she must contact TLC and request an end date extension in order to complete the course. It is the prerogative of TLC to decide whether to grant the request.

All students will be tracked by their social security number or a unique number will be assigned to the student.

Instructions for Written Assignments

The Bloodborne Pathogen CEU Training distance learning course uses a fill-in-the-blank and a True/False style answer key.

You can write your answers in this manual or type out your own answer key. TLC would prefer that you type out and e-mail each of the chapter examinations to TLC, but it is not required.

Feedback Mechanism (examination procedures)

Each student will receive a feedback form as part of his or her study packet. You will be able to find this form in the rear of the course or lesson.

Security and Integrity

All students are required to do their own work. All lesson sheets and final exams are not returned to the student to discourage sharing of answers. Any fraud or deceit and the student will forfeit all fees and the appropriate agency will be notified.

Grading Criteria

TLC will offer the student either pass/fail or a standard letter grading assignment. If TLC is not notified, you will only receive a pass/fail notice.

Required Texts

The course will not require any other materials. This course comes complete. No other materials are needed.

Environmental Terms, Abbreviations, and Acronyms

TLC provides a glossary that defines, in non-technical language, commonly used environmental terms appearing in publications and materials. It also explains abbreviations and acronyms used throughout OSHA and other agencies. You can find the glossary in the rear of the manual.

Recordkeeping and Reporting Practices

TLC will keep all student records for a minimum of seven years. It is the student's responsibility to give the completion certificate to the appropriate agencies.

ADA Compliance

TLC will make reasonable accommodations for persons with documented disabilities. Students should notify TLC and their instructors of any special needs. Course content may vary from this outline to meet the needs of this particular group.

Continuing Education Units

You will have 90 days from receipt of this manual to complete it in order to receive your Continuing Education Units (**CEUs**) or Professional Development Hours (**PDHs**). A score of 70% or better is necessary to pass this course.

If you should need any assistance, please email all concerns and the final test to info@tlch2o.com.

There are 100 total points possible for the course: This course will be graded on a "P" (**credit**) or "Z" (**no credit**) basis. If you desire a letter grade for this course, you must inform the instructor prior to submitting any of the assignments.

Note to students: Final course grades are based on the total number of possible points. The grading scale is administered equally to all students in the course. Do not expect to receive a grade higher than that merited by your total points. No point adjustments will be made for class participation or other subjective factors.

Credit/no credit option (P/Z) - None Available

Note to students: Keep a copy of everything that you submit. If your work is lost you can submit your copy for grading. If you do not receive your graded assignment or quiz results within two or three weeks after submitting it, please contact your instructor.

We expect every student to produce his/her original, independent work. Any student whose work indicates a violation of the Academic Misconduct Policy (cheating, plagiarism) can expect penalties as specified in the Student Handbook, which is available through Student Services; contact them at (928) 468-0665.

A student who registers for a Distance Learning course is assigned a "**start date**" and an "**end date**." It is the student's responsibility to note due dates for assignments and to keep up with the course work.

If a student falls behind, she/he must contact the instructor and request an extension of her/his **end date** in order to complete the course.

It is the prerogative of the instructor to decide whether to grant the request.

You will have 90 days from receipt of this manual to complete it in order to receive your Continuing Education Units (**CEUs**) or Professional Development Hours (**PDHs**). A score of 70% or better is necessary to pass this course.

If you should need any assistance, please email all concerns and the final test to info@tlch2o.com.

Course Objective: To provide an awareness in effective and Bloodborne pathogens handling and disposal applications

Educational Mission

The educational mission of TLC is:

To provide TLC students with comprehensive and ongoing training in the theory and skills needed for the environmental education field,

To provide TLC students with opportunities to apply and understand the theory and skills needed for a successful career,

To provide opportunities for TLC students to learn and practice environmental educational skills with members of the community for the purpose of sharing diverse perspectives and experience,

To provide a forum in which students can exchange experiences and ideas related to environmental education,

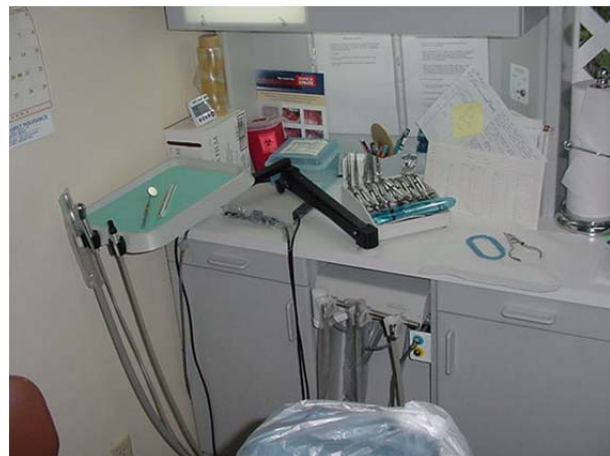
To provide a forum for the collection and dissemination of current information related to environmental education, and to maintain an environment that nurtures academic and personal growth.



Hepatitis Injection and proper BBP Procedures

Table of Contents

Disclaimer	15
BBP Introduction	17
Blood Types	19
Skin Information	21
BBP Definitions	23
Exposure Control Plan	25
Universal Precautions	27
Engineering and Work Practice Controls	29
Contaminated Needles	31
Personal Protective Equipment Chart	33
BBP Control Example	35
Housekeeping	37
Hepatitis Glossary	39
Hepatitis	41
AIDS	47
HIV Infection	49
Prevention	53
Co-infection	55
Exposure	59
Biohazard Warning Labels	63
Medical Waste Treatment & Disposal Example	65
BBP Training	67
BBP Training Example	69
Sample Lesson Plan	71
Recordkeeping Requirement	73
Sharps Injury Log	75
West Nile Virus	77
Infection Control Procedure	81
Infection Exposure Form	91
Glossary	93
BBP OSHA Rule	99
Recordkeeping Rule	111
References	113





Blood is made up of different "parts" or components: red blood cells, plasma, platelets and several types of white blood cells. Each component has its own job to do. We can separate blood into components so patients can be transfused only with what they need.

Purpose

An infection control plan must be prepared for all persons that handle, store, use, process, or dispose of infectious medical wastes. This infection control plan complies with OSHA requirement, 29 CFR 1910.1030, Bloodborne Pathogens.

The plan includes requirements for personal protective equipment, housekeeping, training, and a procedure for reporting exposures.

The complete OSHA Rule is in the rear of this manual.

Important Information about this Manual

This manual has been prepared to educate students in general awareness of dealing with the often complex and various bloodborne pathogen policies, diseases, medical treatment devices, methods, and applications. This course deals with the OSHA mandated bloodborne pathogen program.

It should be noted, however, that the bloodborne pathogen program and disease treatment is an ongoing process and subject to change over time. For this reason, a list of resources is provided to assist in obtaining the most up-to-date information on various subjects.

This manual is not a guidance document for anyone in the medical field.

This course manual will provide general anatomy principles and should not be used as a basis for medical guidance. This document is not a detailed safety manual or a source or remedy for medical treatment.

Technical Learning College or Technical Learning Consultants, Inc. make no warranty, guarantee or representation as to the absolute correctness or appropriateness of the information in this manual and assumes no responsibility in connection with the implementation of this information.

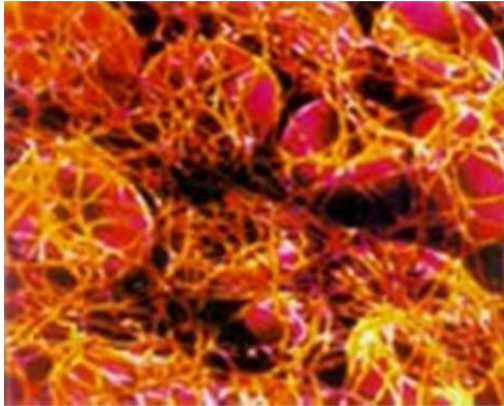
It cannot be assumed that this manual contains all measures and concepts required for specific conditions or circumstances. This document should be used for educational purposes only and is not considered a legal document.

Individuals who are responsible for bloodborne pathogen programs, safety, medical treatment or training should obtain and comply with the most recent federal, state, and local regulations relevant to these sites and are urged to consult with OSHA, the EPA and other appropriate federal, state and local agencies.



Clinical Laboratory means a workplace where diagnostic or other screening procedures are performed on blood or other potentially infectious materials.

Blood Clotting



Platelets

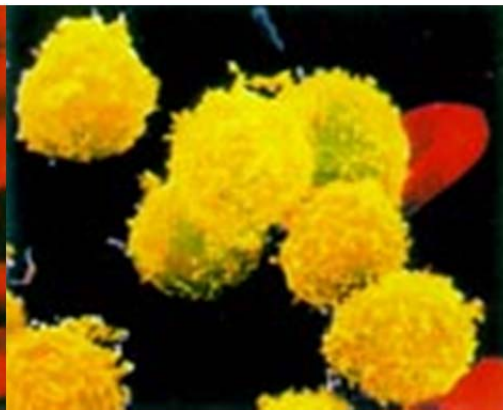


Blood Clotting Filaments of fibrin enmesh red blood cells as part of the process of blood clotting. **Platelets** Tiny cells that are activated whenever blood clotting or repair to vessels is necessary.

Red Blood Cells



White Blood Cells



Red Blood Cells These Cells are biconcave in shape to maximize their oxygen carrying capacity.

White Blood Cells Lymphocytes are the smallest white blood cells; they form antibodies against disease.



Bloodborne Pathogen Prevention Program Introduction

Introduction

- Approximately 5.6 million workers in health care and other facilities are at risk of exposure to bloodborne pathogens such as human immunodeficiency virus (**HIV** – the virus that causes AIDS), the hepatitis B virus (**HBV**), and the hepatitis C virus (**HCV**)
- OSHA's Bloodborne Pathogens standard prescribes safeguards to protect workers against the health hazards from exposure to blood and other potentially infectious materials, and to reduce their risk from this exposure

29 CFR 1910.1030(OSHA Rule)

"Bloodborne pathogens" means pathogenic microorganisms that are present in human blood and can cause disease in humans.

These pathogens include among others hepatitis B virus (**HBV**), which causes hepatitis B; human immunodeficiency virus (**HIV**), which causes AIDS; hepatitis C virus and other pathogens, such as those that cause malaria.

"Other potentially infectious materials" means:

1. The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between bodily fluids;
2. Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and
3. HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Purpose

An infection control plan must be prepared for all persons that handle, store, use, process, or dispose of infectious medical wastes. This infection control plan complies with OSHA requirement, 29 CFR 1910.1030, Blood Borne Pathogens. The plan includes requirements for personal protective equipment, housekeeping, training, and a procedure for reporting exposures.

This includes:

- All employees who could be **"reasonably anticipated,"** as the result of performing their job duties, to face contact with blood and other potentially infectious materials
- **"Good Samaritan"** acts such as assisting a co-worker with a nosebleed would not be considered occupational exposure

OSHA's Bloodborne Pathogens standard, 29 CFR 1910.1030, does not apply to construction, agriculture or maritime.

The term **"reasonably anticipated"** contact means potential contact as well as actual contact with blood or other potentially infectious materials.

Scope

The scope of the Bloodborne Pathogens standard is not limited to employees in these jobs. The hazard of exposure to infectious materials affects employees in many types of industries and is not restricted to the health care industry.

- Physicians, nurses and emergency room personnel
- Orderlies, housekeeping personnel, and laundry workers
- Dentists and other dental workers
- Laboratory and blood bank technologists and technicians
- Medical examiners
- Morticians
- Law enforcement personnel
- Firefighters
- Paramedics and emergency medical technicians
- Anyone providing first-response medical care
- Medical waste treatment employees
- Home healthcare workers

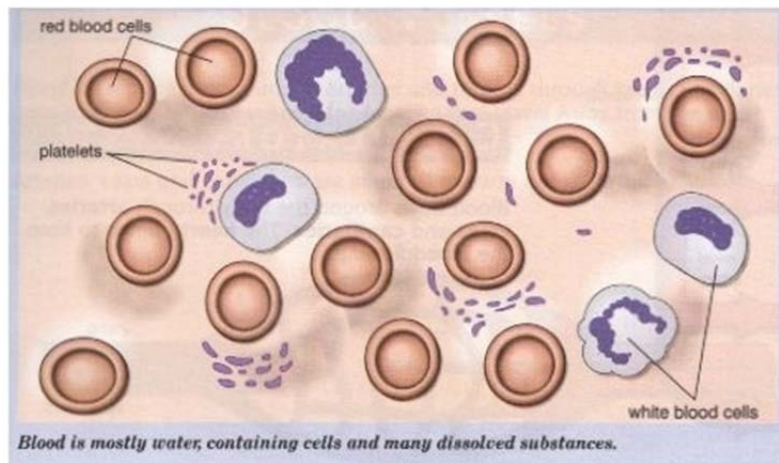
The scope of the Bloodborne Pathogens standard is not limited to employees in these jobs. The hazard of exposure to infectious materials affects employees in many types of industries and is not restricted to the health care industry.

How does Exposure Occur?

- Most common: needlesticks
- Cuts from other contaminated sharps (scalpels, broken glass, etc.)
- Contact of mucous membranes (for example, the eye, nose, mouth) or broken (cut or abraded) skin with contaminated blood

It is estimated that 600,000 to 800,000 needlestick injuries occur each year in the United States.

“Contaminated sharps” means any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.



Blood Types

ABO Blood group system:

The most important of blood-typing systems, the ABO blood group is the determinant for transfusion reactions and organ transplantation. Unlike the other blood-typing systems, the ABO blood types have far-ranging significance other than transfusion or transplantation, including the determination of many of the digestive and immunological characteristics of the body.

The ABO blood group is comprised of four blood types: O, A, B and AB. Type O has no true antigen, but carries antibodies to both A and B blood. Type A and type B carry the antigen named for their blood type and make antibodies to each other. Type AB does not manufacture any antibodies to other blood types because it has both A and B antigens.

Whole Blood: Whole blood is living tissue circulating through the heart, arteries, veins, and capillaries carrying nourishment, electrolytes, hormones, vitamins, antibodies, heat, and oxygen to the body's tissues. Whole blood contains red blood cells, white blood cells and platelets suspended in a watery fluid called plasma.

Red Blood Cells: The oxygen-carrying components of the blood are usually transfused in cases of chronic blood loss. They also may be used during or after surgery or to treat anemia or trauma. Red blood cells (**RBCs**) are perhaps the most recognizable component of whole blood. RBCs contain hemoglobin, a complex iron-containing protein that carries oxygen throughout the body and gives blood its red color. The percentage of blood volume composed of red blood cells is called the "hematocrit." The average hematocrit in an adult male is 47 percent. There are about one billion red blood cells in two to three drops of blood, and for every 600 red blood cells, there are about 40 platelets and one white cell.

RBCs may be treated and frozen for extended storage, up to 10 years. Patients who benefit most from transfusions of red blood cells include those with chronic anemia resulting from kidney failure, malignancies or gastrointestinal bleeding and those with acute blood loss resulting from trauma. Since red blood cells have reduced amounts of plasma, they are well suited for treating anemia patients who would not tolerate the increased volume provided by whole blood, such as patients with congestive heart failure or those who are elderly or debilitated.

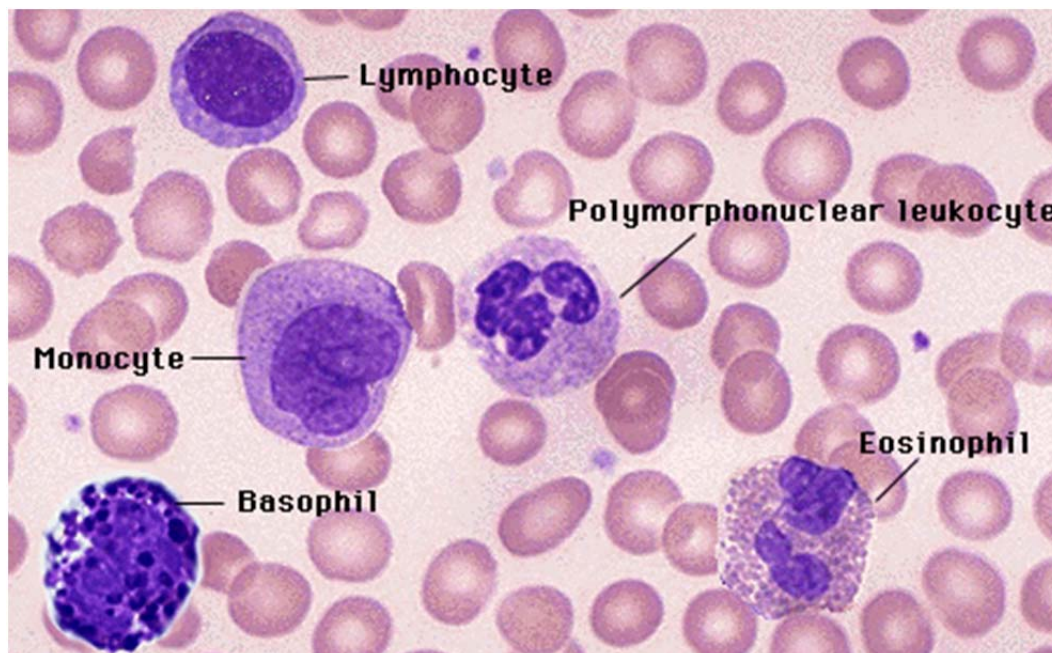
White Blood Cells: White blood cells (**WBCs**) are responsible for protecting the body from invasion by foreign substances such as bacteria and viruses. The majority of white blood cells are produced in the bone marrow, where they outnumber red blood cells by two to one. However, in the blood stream, there are about 600 red blood cells for every white blood cell. There are several types of white blood cells. Granulocyte and macrophages protect against infection by surrounding and destroying invading bacteria and viruses, and lymphocytes aid in the immune defense.

Platelets: The component of your blood that assists in clotting, platelets are used to treat patients who are undergoing chemotherapy and radiation treatment and cannot produce enough platelets to control bleeding.

Many people who receive platelets are bone marrow transplant, cancer or leukemia patients. Some surgery patients receive platelets to help control bleeding.

Plasma: The liquid in which the blood cells are suspended, it is most commonly used to treat victims of shock and burns. Plasma also can be further processed to produce such blood products as Factor VIII, which hemophiliacs use to control bleeding.

Cryoprecipitate: A component of plasma, it is used to treat a number of clotting disorders, including Von Willebrand's Disease and fibrinogen deficiency.



Both T and B cells are involved in the immune response and under the light microscope cannot be distinguished. Surface markers are used to distinguish T and B cells.

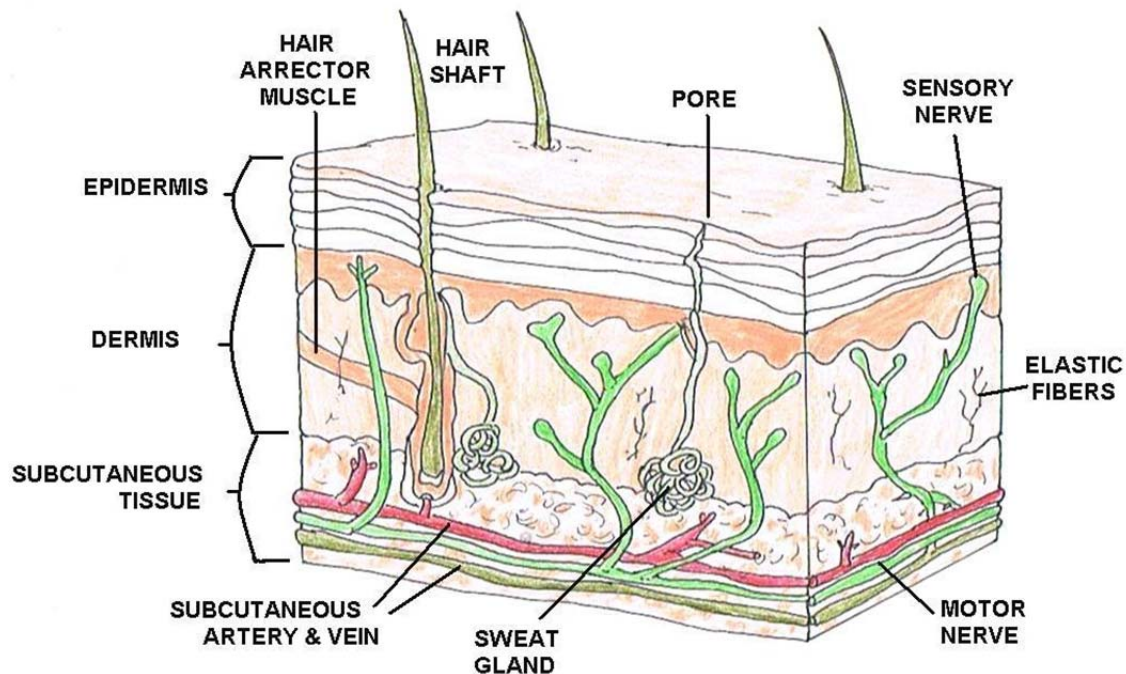


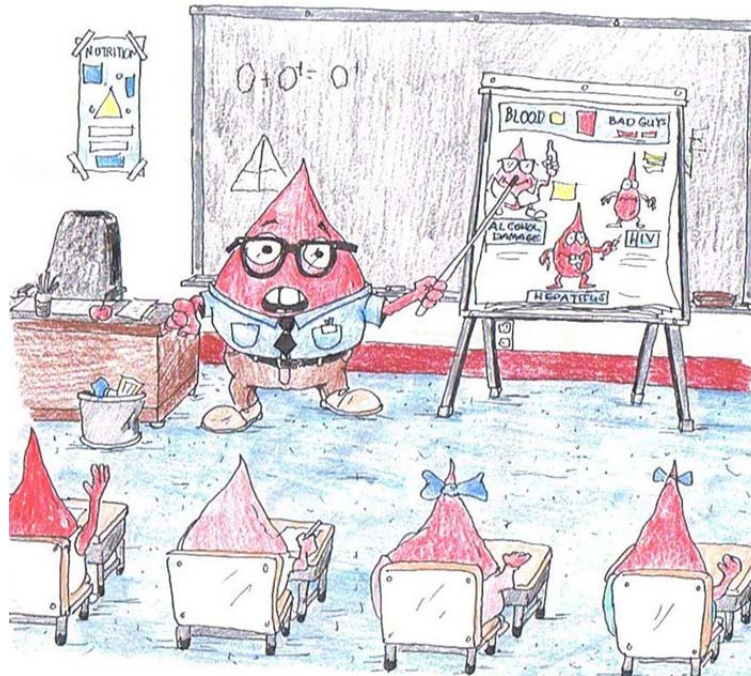
Blood Donor

Human Skin

The skin is an organ that forms a protective barrier against germs (and other organisms) and keeps the inside of your body inside your body, and keeps what's outside of your body outside. Skin also helps maintain a constant body temperature. Human skin is only about 0.07 inches (2 mm) thick.

Skin is made up of two layers, an outer layer (called the epidermis) and an inner layer (called the dermis). The outer layer is a tough protective layer that contains melanin (which protects against the rays of the sun and gives the skin its color). The inner layer contains nerve endings, sweat glands, oil glands, and hair follicles. Under the skin is a fatty layer of subcutaneous tissue.





Epidermis: Stratified Squamous Epithelium. 30-50 cell layers thick or 0.007-0.12mm

- **Stratum Corneum** - cornified dead cells
- **Stratum Lucidum** - thin, clear layer found on palms and soles
- **Stratum Granulosum** - fibers of keratin
- **Stratum Spinosum** - several layers of cells
- **Stratum Germinativum** - mitosis; pigment producing melanocytes

Dermis (Corium): This layer is collagenous, elastic, supportive, gives skin tone, and lines of tension on skin surface; decreasing amount of elastic fiber is associated with aging. It is also highly vascular and glandular, many nerve endings and hair follicles, motor impulses transmitted from the central nervous system to the skin by autonomic nerve fibers.

Sensory receptors respond to various tactile, pressure, temperature, and ticklish or painful sensations. Dermal blood vessels transport nutrients, oxygen, chemicals and white blood cells to the cellular structures. They also regulate the body's temperature.

- **Papillary Layer** - upper layer of the dermis with papillae projections
- **Reticular Layer** - has tough, flexible mesh-like fibers

Hypodermis (subcutaneous layer): The deepest layer, it is composed of loose fibrous connective tissue and adipose cells interlaced with blood vessels. Females have an approximately 8% thicker hypodermis layer than males. This layer stores lipids, insulates and cushions the body, and regulates temperature.

BBP Definitions

Biological Hazard The term biological hazard or biohazard is taken to mean any viable infectious agent that presents a risk, or a potential risk, to the well-being of humans.

Medical Wastes/Infectious Wastes All laboratory waste emanating from human or animal tissues, blood or blood products or fluids; all cultures of tissues or cells of human origin or cultures of etiologic agents; specimens of human or animal parts or tissues removed by surgery, autopsy, or necropsy.

Universal Precautions Refers to a system of infectious disease control that assumes that every direct contact with body fluids is infectious and requires every employee exposed to be protected as though such body fluids were infected with blood-borne pathogens. All infectious/medical material must be handled according to Universal Precautions (OSHA Instruction CPL 2-2.44A)

The following universal precautions must be taken.

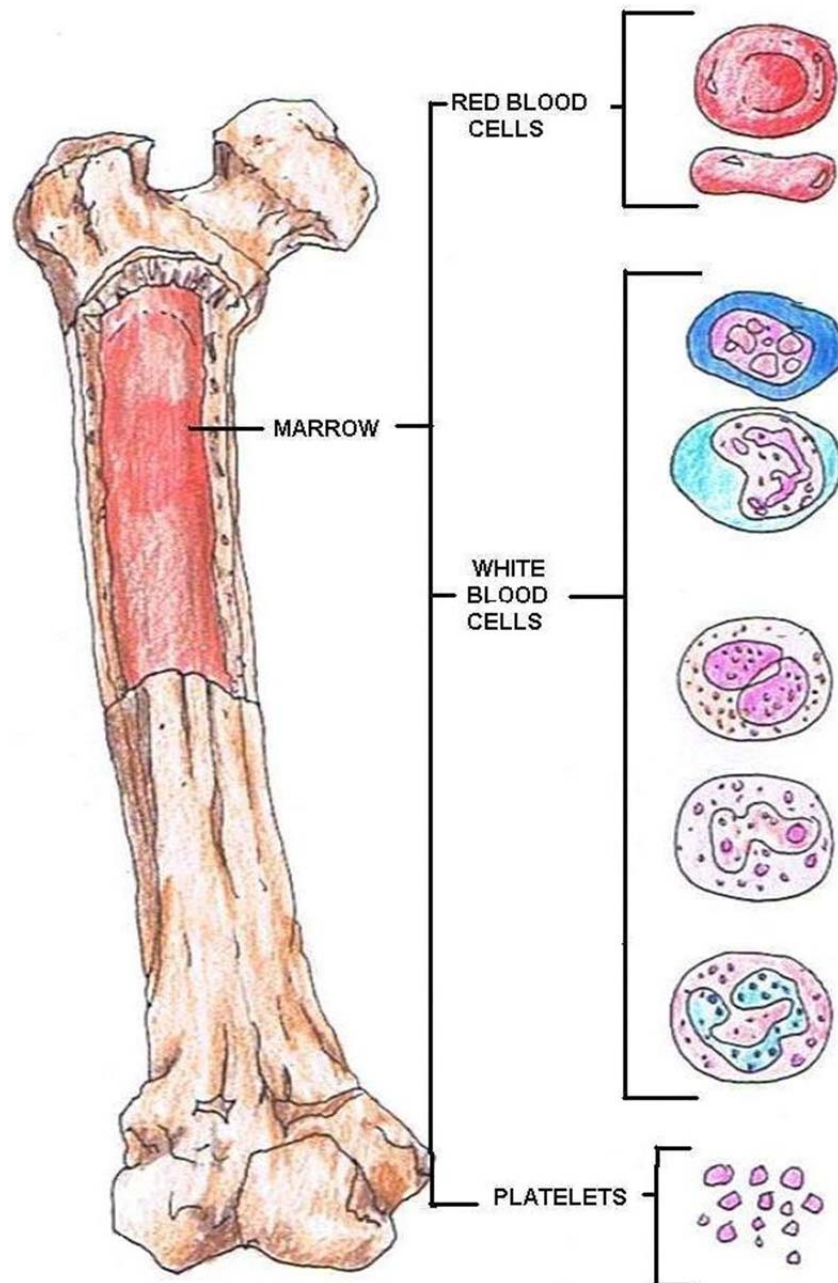
1. Gloves must be made of appropriate disposable material, usually intact latex or vinyl. They must be used:
 - a. when the employee has cuts, abraded skin, chapped hands, dermatitis, or the like.
 - b. when examining abraded or non-intact skin of a patient with active bleeding.
 - c. while handling blood or blood products or other body secretions during routine procedures.
2. Gowns, aprons, or lab coats must be worn when splashes of body fluid on skin or clothing are possible.
3. Mask and eye protection are required when contact of mucosal membranes (eyes, mouth or nose) with body fluids is likely to occur (e.g. splashes or aerosolization).
4. Resuscitation equipment, pocket masks, resuscitation bags, or other ventilation equipment must be provided to eliminate the need for direct mouth to mouth contact.

Glove removal

With both hands gloved, peel one glove off from top to bottom and hold it in the gloved hand. With the exposed hand, peel the second glove from the inside, tucking the first glove inside the second. Dispose of the gloves promptly. Never touch the outside of the glove with bare skin. Every time you remove your gloves wash your hands with soap and water as soon as possible.

Proper Glove removal





Plasma - Plasma is 92% water, 7% protein and 1% minerals. Plasma is the source of gamma globulin, albumin and clotting factors. Plasma is used to treat clotting disorders, burn victims and shock.

Plateletpheresis

An apheresis procedure where platelets are collected.

Platelets

Colorless cells whose main function is to control bleeding. Platelets are essential to normal blood clotting. They can be wiped out during treatment for cancer, leukemia, aplastic anemia and other diseases.

Exposure Control Plan

Identifies jobs and tasks where occupational exposure to blood or other potentially infectious material occurs.

Describes how the employer will:

- Use engineering and work practice controls
- Ensure use of personal protective equipment
- Provide training
- Provide medical surveillance
- Provide hepatitis B vaccinations
- Use signs and labels

1910.1030(c)(1)(i) (OSHA Rule)

The exposure control plan is the key provision of the standard because it requires the employer to identify individuals who will receive the training, protective equipment, vaccination and other protections of the standard.

For more information, see OSHA Instruction CPL 2-2.44E, ***Enforcement Procedures for the Occupational Exposure to Bloodborne Pathogens Standard, Appendix D, Model Exposure Control Plan.***

Exposure Control Plan

- Written plan required
- Plan must be reviewed at least annually to reflect changes in:
 - ✓ tasks, procedures, or assignments which affect exposure, and
 - ✓ technology that will eliminate or reduce exposure
- Annual review must document employer's consideration and implementation of safer medical devices
- Must solicit input from potentially exposed employees in the identification, evaluation and selection of engineering and work practice controls
- Plan must be accessible to employees

1910.1030(c)(1)(i) (OSHA Rule)

Employees who must be consulted are those non-managerial employees responsible for direct patient care who are potentially exposed to injuries from contaminated sharps.



Un-Contained Medical Waste



Properly Contained Medical Waste



Sharps Container

Universal Precautions

- Treat all human blood and certain body fluids as if they are infectious
- Must be observed in all situations where there is a potential for contact with blood or other potentially infectious materials

1910.1030(d)(1) (OSHA Rule)

Universal Precautions is an approach to infection control used to protect employees from exposure to all human blood and other potentially infectious materials.

Alternative concepts in infection control are called Body Substance Isolation (**BSI**) and Standard Precautions. These methods define all body fluids and substances as infectious. These concepts are acceptable alternatives to Universal Precautions provided that facilities using them adhere to all other provisions of this standard.

General Procedures

The following procedures must be followed by personnel when in medical rooms or laboratories.

All supervisors must ensure that their staff is trained in proper work practices, the concept of universal precautions, personal protective equipment, and in proper cleanup and disposal techniques.

Resuscitation equipment, pocket masks, resuscitation bags, or other ventilation equipment must be provided to eliminate the need for direct mouth to mouth contact in groups where resuscitation is a part of their responsibilities.

Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a potential for exposure to any health hazard.

Food and drink must not be stored in refrigerators, freezers, or cabinets where blood or other potentially infectious material is stored or in other areas of possible contamination.

According to the level of risk, wearing laboratory or protective clothing may be required for persons entering infectious disease laboratories. Likewise, showers with a germicidal soap may be required before exit.

Gowns, aprons, or lab coats must be worn whenever there is a possibility that body fluids could splash on skin or clothing.

Gloves must be made of appropriate disposable material, usually intact latex or vinyl. They must be used in the following circumstances:

- ✓ When the employee has cuts, abraded skin, chapped hands, dermatitis, or similar conditions.
- ✓ When examining abraded or non-intact skin of a patient with active bleeding.
- ✓ While handling blood or blood products or other body secretions during routine laboratory procedures.

Employees must wash their hands immediately, or as soon as possible, after removal of gloves or other personal protective equipment and after hand contact with blood or other potentially infectious materials.

All personal protective equipment must be removed immediately upon leaving the work area, and if this equipment is overtly contaminated, it must be placed in an appropriate area or container for storage, washing, decontamination, or disposal.

Contaminated clothing must not be worn in clean areas or outside the building. All procedures involving blood or other potentially infectious agents must be performed in a manner that will minimize splashing, spraying, and aerosolization.



When the employee is receiving training in phlebotomy.

(x) Masks, Eye Protection, and Face Shields. Masks in combination with eye protection devices, such as goggles or glasses with solid side shields, or chin-length face shields, shall be worn whenever splashes, spray, spatter, or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can be reasonably anticipated.

(xi) Gowns, Aprons, and Other Protective Body Clothing. Appropriate protective clothing such as, but not limited to, gowns, aprons, lab coats, clinic jackets, or similar outer garments shall be worn in occupational exposure situations. The type and characteristics will depend upon the task and degree of exposure anticipated.

(xii) Surgical caps or hoods and/or shoe covers or boots shall be worn in instances when gross contamination can reasonably be anticipated (e.g., autopsies, orthopedic surgery).

Engineering and Work Practice Controls

Engineering and Work Practice Controls

- These are the primary methods used to control the transmission of HBV and HIV
- When occupational exposure remains after engineering and work practice controls are put in place, personal protective equipment (PPE) must be used

1910.1030(d)(2) (OSHA Rule)

Employers must solicit input from non-managerial employees responsible for direct patient care who are potentially exposed to injuries from contaminated sharps in the identification, evaluation and selection of engineering and work practice controls.

Engineering Controls

These controls reduce employee exposure by either removing the hazard or isolating the worker.

Examples:

- Sharps disposal containers
- Self-sheathing needles
- Safer medical devices
 - ✓ Needleless systems
 - ✓ Sharps with engineered sharps injury protections

Safer Medical Devices

- **Needleless Systems:** a device that does not use needles for the collection or withdrawal of body fluids, or for the administration of medication or fluids
- **Sharps with Engineered Sharps Injury Protections:** a non-needle sharp or a needle device used for withdrawing body fluids, accessing a vein or artery, or administering medications or other fluids, with a built-in safety feature or mechanism that effectively reduces the risk of an exposure incident

Work Practice Controls

These controls reduce the likelihood of exposure by altering how a task is performed.

Examples:

- Wash hands after removing gloves and as soon as possible after exposure
- Do not bend or break sharps
- No food or smoking in work areas
- Shearing or breaking of contaminated needles is prohibited.





Which one of these photos has an OSHA BBP Violation?

Contaminated Needles

Contaminated needles and other contaminated sharps must not be bent, recapped, or removed except as noted below:

- The employer can demonstrate that no alternative is feasible or that such action is required by a specific medical or dental procedure.
- Such bending, recapping or needle removal must be accomplished through the use of a mechanical device or a one-handed technique.

Other work practice controls are listed in **1910.1030(d)(2)**.

Personal Protective Equipment

- Specialized clothing or equipment worn by an employee for protection against infectious materials
- Must be properly cleaned, laundered, repaired, and disposed of at no cost to employees
- Must be removed when leaving area or upon contamination



1910.1030(d)(3) (OSHA Rule)

When there is occupational exposure, PPE must be provided at no cost to the employee to prevent blood or other potentially infectious materials from passing through or contacting the employees' work or street clothes, undergarments, skin, eye, mouth, or other mucous membranes.

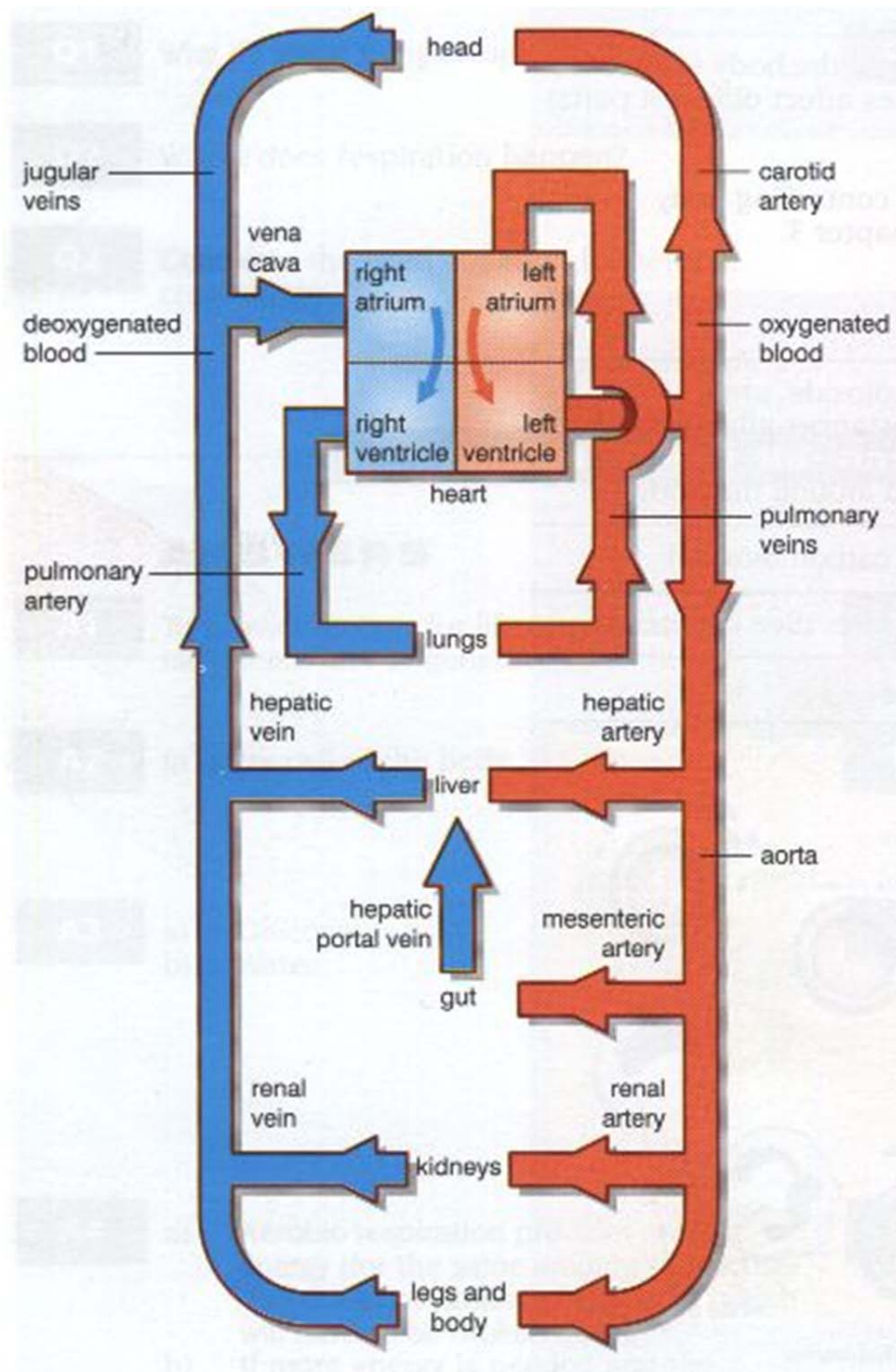
Examples of PPE

- Gloves
- Gowns
- Face shields
- Eye protection
- Mouthpieces and resuscitation devices



The employer must ensure that appropriate PPE in the appropriate sizes is readily accessible at the worksite or is issued to employees.

Hypoallergenic gloves, glove liners, powderless gloves, or other similar alternatives must be readily accessible to those employees who are allergic to the gloves normally provided.



Human Blood Circulation

Personal Protective Equipment for Worker Protection Against HIV and HBV Transmission

TASK	GLOVES	APRON	MASK	EYEWEAR
Control of Bleeding w/ spurting blood	X	X	X	X
Bleeding control with minimal bleeding	X			
Emergency Child Birth	X	X	X	X
Blood Drawing	X			
Handling & Cleaning Instruments	X			
Cleaning Bio Spills	X			
Taking Temperature				
Giving Injection	X			
Measuring Blood Pressure				

The examples provided in this table are based on application of universal precautions.

Universal precautions are intended to supplement, rather than replace, recommendation for routine infection control, such as hand washing and using gloves to prevent gross microbial contamination of hands (e.g., contact with urine or feces).



Personal Protective Equipment is specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.



Personal protective equipment -- (i) Provision. When there is occupational exposure, the employer shall provide, at no cost to the employee, appropriate personal protective equipment such as, but not limited to, gloves, gowns, laboratory coats, face shields or masks and eye protection, and mouthpieces, resuscitation bags, pocket masks, or other ventilation devices. Personal protective equipment will be considered "appropriate" only if it does not permit blood or other potentially infectious materials to pass through to or reach the employee's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used.

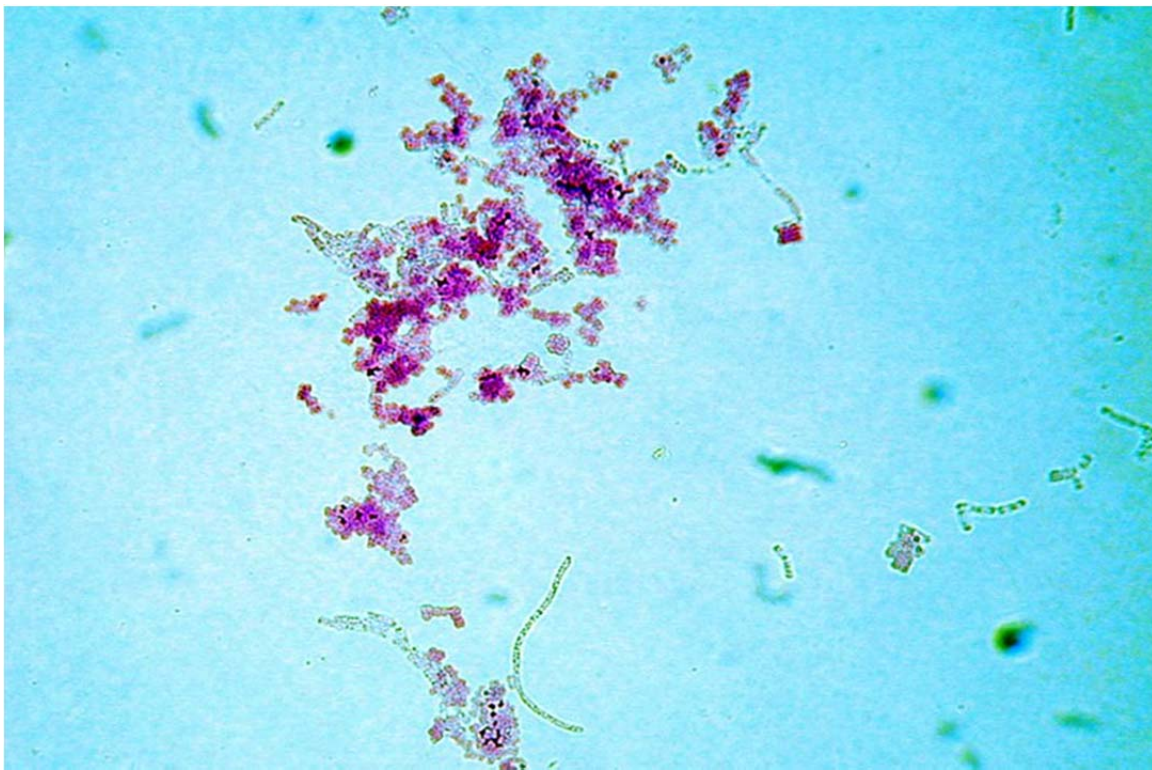
Bloodborne Pathogen Control (*Company Policy Example*)

Universal Precautions and General Safety Rules

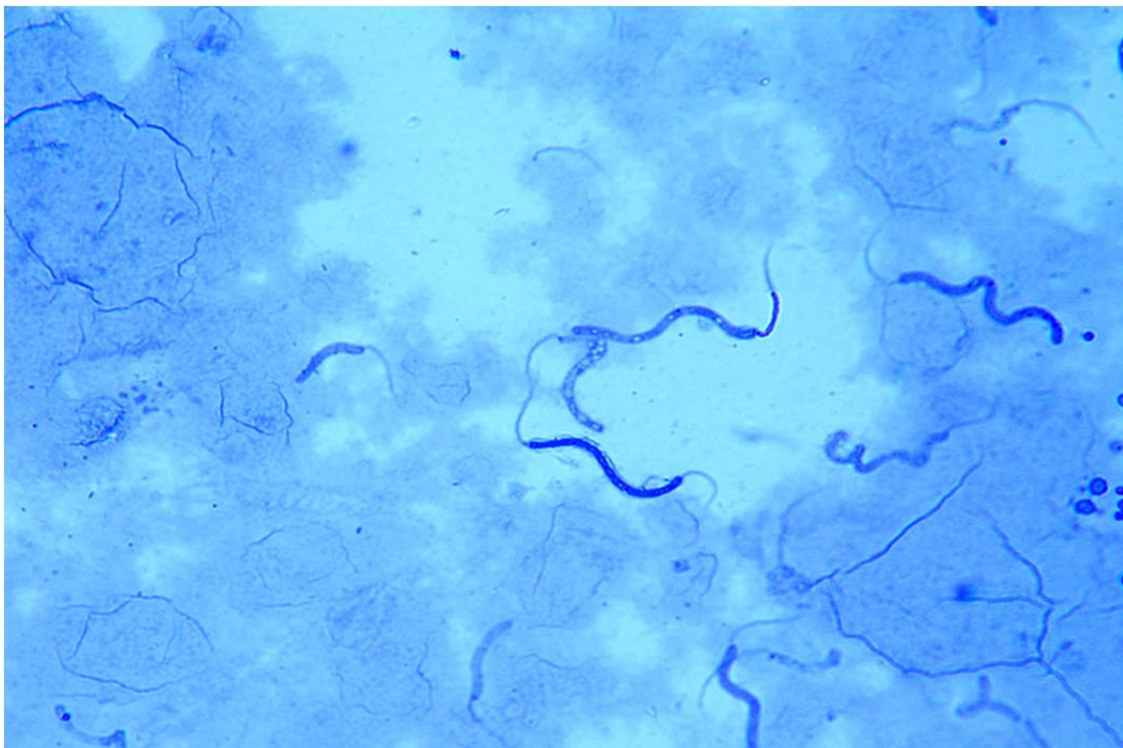
For Posting

Exposure Determination: Town/Company will not perform invasive medical treatment or provide intravenous medication. Therefore, the exposure to Blood-Borne Pathogens, as defined in item # 3 below, is determined to be from routine and emergency first aid treatment of common workplace injuries. The following Universal Precautions and General Safety Rules have been established to prevent the spread of viral and bacterial organisms (namely HIV/HAV/HBV). In all cases, the Universal Precautions and General Safety Rules should be followed.

1. Before and immediately after providing patient care, wash exposed areas (hands, arms, etc.) with antibacterial soap.
2. Don and use the required personal protective equipment for the medical care given as outlined in the Personal Protective Equipment for Worker Protection Poster.
3. Treat all human body fluids and items soiled with human body fluids (blood, blood products, semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid, concentrated HIV/HAV/HBV, and saliva (in dental settings) as if contaminated with HIV/HAV/HBV. (**Note:** Feces, urine, nasal secretions, sputum, sweat, tears, or vomitus need not be treated as contaminated unless they contain visible blood)
4. No smoking, eating, drinking or storage of food products are permitted in patient treatment areas. Non-medical items, such as clothing and personal effects, should not be stored in the treatment facility.
5. Patient treatment areas will be maintained in a near sanitary condition at all times. Daily and at least once per shift, the Occupational Health Facility will be disinfected with antibacterial/viral solution (at least 10% Chlorine Bleach or equivalent). All medical and personal protective equipment contaminated with human body fluids will be disinfected before being returned for use again.
6. To avoid special handling, all clothing contaminated with human body fluid will be presoaked (sprayed on the affected areas) with the antibacterial/viral solution before being sent to the laundry. (**Note:** Gloves and eye protection should be worn when handling contaminated clothing until presoaked for 10 minutes)
7. Any spills of body fluid will be presoaked (sprayed on the affected area) with antibacterial/viral solution for 10 minutes before being removed. (**Note:** Gloves and eye protection should be worn when handling spills of body fluids)
8. Medical Wastes (those soiled with covered human body fluids) will be treated following the Medical Wastes Treatment and Disposal Procedures before being discarded as ordinary wastes.
9. Any suspected exposure to HIV/HAV/HBV by human body fluid contact (via broken skin, human bites, needle sticks, etc.) should be reported to your Supervisor immediately.



Archeobacteria X 1000



Bacterial Flagella 1000x

Housekeeping

Must develop a written schedule for cleaning and decontamination at the work site based on the:

- Location within the facility
- Type of surface to be cleaned
- Type of soil present
- Tasks or procedures being performed

1910.1030(d)(4)(i) (OSHA Rule)

The term “**work site**” refers not only to permanent fixed facilities such as hospitals, dental/medical offices, etc., but also includes temporary non-fixed workplaces (blood mobiles, ambulances, etc.).

1910.1030(d)(4)(ii)(A) (OSHA Rule)

Appropriate disinfectants include diluted bleach solution, EPA registered tuberculocides, and sterilants. The lists of these EPA Registered Products are available from the National Antimicrobial Information Network at (800) 447-6349.

Work surfaces must be decontaminated with an appropriate disinfectant:

- After completion of procedures,
- When surfaces are contaminated, and
- At the end of the work shift



Employees will wash hands with soap and water as soon as practical after exposures to BBP or OPIM and after removal of PPE. When hand-washing facilities are not immediately available, use of antiseptic or germicidal wipes will be utilized, followed by proper hand washing as soon as possible.

Regulated Waste 1910.1030(d)(4)(iii) (OSHA Rule)

Must be placed in closeable, leak-proof containers built to contain all contents during handling, storing, transporting or shipping and be appropriately labeled or color-coded.

Laundry

- Handle contaminated laundry as little as possible and use PPE
- Must be bagged or containerized at location where used
- No sorting or rinsing at location where used
- Must be placed and transported in labeled or color-coded containers

1910.1030(d)(4)(iv) (OSHA Rule)

When a facility uses Universal Precautions in the handling of all soiled laundry, alternative labeling or color-coding is sufficient if it permits all employees to recognize that the containers require handling in compliance with Universal Precautions.



1910.1030(g)(1) (OSHA Rule)

Labels must be predominantly fluorescent orange or orange-red with lettering and symbols in a contrasting color.

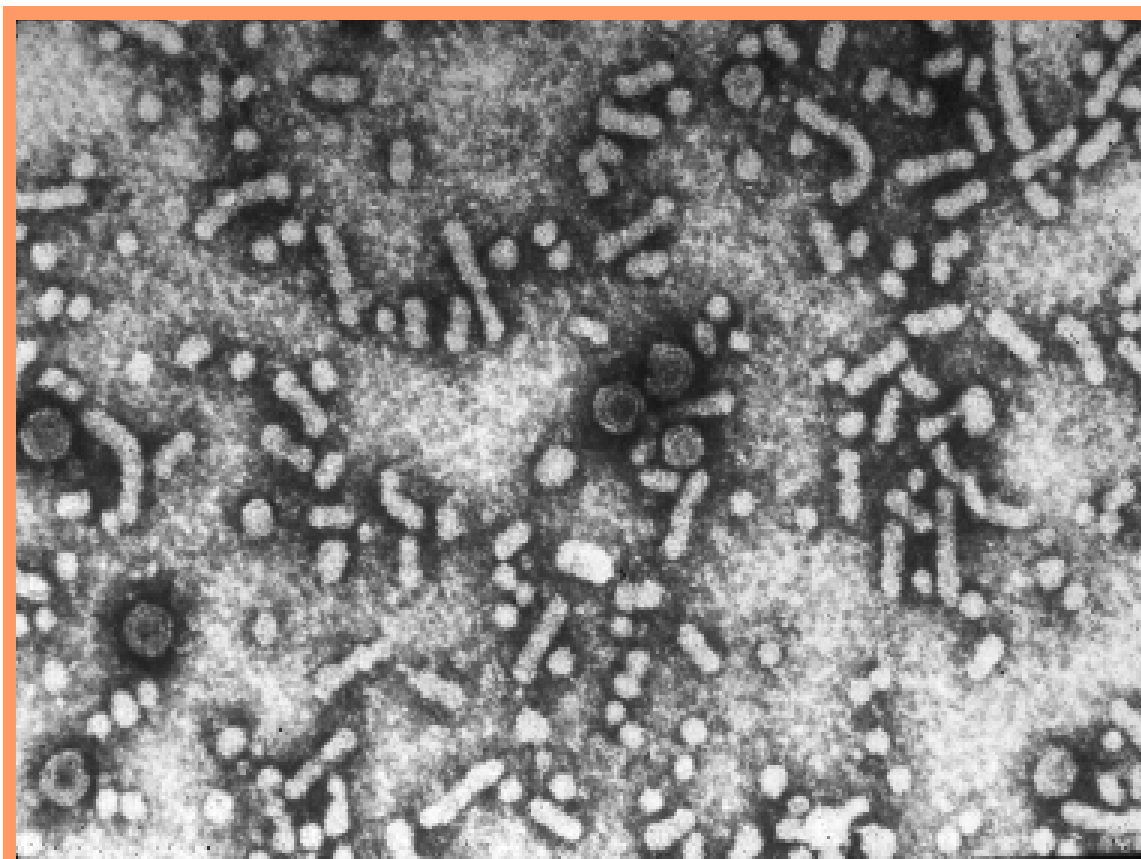
Labels must be affixed as close as feasible to the container by string, wire, adhesive, or other method that prevents their loss or unintentional removal.



Hepatitis Glossary

Acute hepatitis C	Newly acquired symptomatic hepatitis C virus (HCV) infection.
ALT	Alanine aminotransferase.
Anti-HCV	Antibody to HCV that develops in response to HCV infection; detectable in persons with acute, chronic, and resolved infection.
AST	Aspartate aminotransferase.
Chronic (persistent) HCV Infection	Persistent infection with HCV; characterized by detection of HCV RNA $\geq$ 6 months after newly acquired infection.
Chronic hepatitis C	Liver inflammation in patients with chronic HCV infection; characterized by abnormal levels of liver enzymes.
CSTE	Council of State and Territorial Epidemiologists.
DNA	Deoxyribonucleic acid.
EIA	Enzyme immunoassay.
FDA	U.S. Food and Drug Administration.
HBV	Hepatitis B virus.
HCC	Hepatocellular carcinoma.
HCV	Hepatitis C virus.
HCV-positive	Positive for anti-HCV as verified by supplemental testing or positive for HCV RNA.
HCV RNA	Hepatitis C virus ribonucleic acid.
HIV	Human immunodeficiency virus.
IG	Immune globulin.
IM	Intramuscular.
IV	Intravenous
MSM	Men who have sex with men.
NHANES III	Third National Health and Nutrition Examination Survey.
NIH	National Institutes of Health.
Positive predictive value	Probability that a positive screening test is truly positive; dependent on prevalence of disease in a population.
Qualitative RT-PCR for HCV RNA	Test to detect HCV RNA by amplification of viral genetic sequences.
Qualitative assays for HCV RNA	Test to detect HCV RNA concentration (viral load) by amplification of viral genetic sequences of by signal amplification.
Resolved HCV infection	Recovery following hepatitis C virus infection; characterized by sustained disappearance of serum HCV RNA and normalization of liver enzymes.
RIBA™	Recombinant immunoblot assay.
RNA	Ribonucleic acid.

RT-PCR	Reverse transcriptase polymerase chain reaction.
STD	Sexually transmitted disease.
Supplemental anti-HCV test	Additional test (i.e., RIBA™) used to verify a positive anti-HCV result obtained by EIA.



Hepatitis C

Hepatitis Introduction

An inflammation of the liver; may be caused by bacterial or viral infection, parasitic infestation, alcohol, drugs, toxins, or transfusion of incompatible blood. Although many cases of hepatitis are not a serious threat to health, the disease can become chronic and can sometimes lead to liver failure and death.

There are four major types of viral hepatitis:

1. hepatitis A, caused by infection with the hepatitis A virus, which is spread by fecal-oral contact;
2. hepatitis B, caused by infection with the hepatitis B virus (HBV), which is most commonly passed on to a partner during intercourse, especially during anal sex, as well as through sharing of drug needles;
3. non-A, non-B hepatitis, caused by the hepatitis C virus, which appears to be spread through sexual contact as well as through sharing of drug needles (another type of non-A, non-B hepatitis is caused by the hepatitis E virus, principally spread through contaminated water);
4. delta hepatitis, which occurs only in persons who are already infected with HBV and is caused by the HDV virus; most cases of delta hepatitis occur among people who are frequently exposed to blood and blood products, such as persons with hemophilia.

Hepatitis B Vaccination Requirements

OSHA Requirements

- Must be made available, free of charge at a reasonable time and place, to all employees at risk of exposure within 10 working days of initial assignment unless:
 - ✓ employee has had the vaccination
 - ✓ antibody testing reveals immunity
- The vaccination must be performed by a licensed healthcare professional.
- Must be provided even if employee initially declines but later decides to accept the vaccination.
- Employees who decline the vaccination must sign a declination form.
- Employees are not required to participate in antibody prescreening program to receive vaccination series.
- Vaccination booster doses must be provided if recommended by the U.S. Public Health Service.

1910.1030(f) (OSHA Rule)

Must be provided according to U.S. Public Health Service (**USPHS**) recommendations. See www.usphs.gov for more information.

1910.1030 Appendix A (OSHA Rule)

Hepatitis B Vaccine Declination (Mandatory)

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

This form must be used and cannot be edited.

Hepatitis-B Virus (HBV) Vaccinations (*Company Policy Example*)

Occupational Health Professionals and those required to provide patient care on a routine basis will be offered Hepatitis-B Virus (HBV) Vaccinations at Town/Company expense.

Affected Employees hired after March 1, 1992, will be offered HBV Vaccinations at the time of hire. Current Employees will be offered HBV Vaccinations when this program is implemented. Employees that transfer to a job or their job is reclassified to include exposure to blood-borne pathogens will be offered HBV Vaccinations within 10 working days of the transfer or reclassification.

The choice for HBV vaccination is not mandatory. If an affected Employee chooses not to have the vaccination at the initial offering, they will have the opportunity to be vaccinated when they are ready. The Town/Company will document the offer, acceptance or declination, and vaccination dates with the Notice of HBV Vaccinations Form.



STD Superspreaders

Who's most likely to acquire and spread STDs—and why you're not immune.

By Rich Maloof for MSN Health & Fitness

By fact or fiction, by stats or by stigma, a handful of groups within our population have been linked to elevated STD risk. Some assumptions feed the fallacy that only certain “types” of people acquire sexually transmitted diseases, when the plain fact is that nearly everyone who has sexual relations is vulnerable.

However, official statistics and figures culled by researchers do reveal groups that are disproportionately affected. Who are they? Are the high rates explained by factors beyond their control, and is the health care system somehow failing these people? Moreover, are the high STD rates among specific groups having an impact on the rest of the population? Let's take a look.

The Military

As if our men and women in uniform didn't face enough threat to their well-being, the U.S. Army, Navy, Air Force and Marines have historically had higher STD rates than the civilian population. The running theory has always been that personnel of a sexually active age with long tours away from home—especially those deployed to countries with limited health care—simply find or put themselves at higher risk.

In October 2006, a study of 1,700 women on active duty in support of the war in Iraq found that 2.5 percent were infected, most with genital herpes, chlamydia, or genital HPV. Though 95 percent of the female soldiers with STDs were redeployed without any health complications, the study was evidence of our need for more extensive STD screening in the military.

A sweeping report, this one covering sexually transmitted infections of both men and women in the military from 2000 through 2005, found elevated reports of chlamydia, gonorrhea, nongonococcal urethritis, and syphilis in all branches of the military. The Army steadily led the other three branches. However, the numbers peaked in 2002, and in 2005 the rates for gonorrhea were actually lower than among civilians.

Still, STDs remain a big problem in the military. Unfortunately, viral infections—which can be treated but not cured—seem to be more commonly reported among the military than bacterial infections.

Statistics are currently lacking but the subsequent impact on hometown communities is assumed to be significant.

Internet Hook-Ups

Meeting someone on the Internet doesn't have to carry more risk than any other means of hooking up. But as always, the chance of finding a safe partner dwindles when we seek an anonymous companion. Worsening the problem is that some sites allow people to connect based unapologetically on high-risk activities. The July 2007 edition of the journal *Sexually Transmitted Diseases* cites two studies providing evidence that “Internet-based sex partner recruitment for unprotected sex has emerged as an important risk factor for increases in syphilis among [men who have sex with men].”

One of those studies also contained a positive element. Researchers from Denver concluded that many male and female subjects had used the Internet to seek information about STDs.

Cons and Ex-Cons

The relationship between STDs and prison inmates is a revolving-door problem: There are high rates of infected people entering jail, high infection rates inside of jails, and high potential for impact on the communities where ex-cons are released.

As *STI* notes, many studies have shown a high prevalence of STDs among people entering jail and juvenile facilities. The authors write, "In some locations, a substantial proportion of all early syphilis cases are reported from correction facilities." The bad news extends to men and women alike; among adolescent women entering 57 juvie halls in 2005, a 14.2 percent median (more than 50 percent higher than the national percentage) tested positive for chlamydia.

The organization Human Rights Watch has come down hard on prison officials in the United States, saying that opportunities to protect prisoners against HIV and STDs have been squandered. "Despite overwhelming evidence that condom use prevents the transmission of HIV," the organization noted, "U.S. prison officials continue to limit the availability of condoms to incarcerated persons. Less than 1 percent of U.S. correctional facilities provide condoms to inmates."

Correctional health and public health advocates are concerned for people on both sides of the prison wall. A recent study spanning 1997–2004 and involving 43,000 people found that screening in county jails was associated with decreased prevalence of gonorrhea and chlamydia in surrounding communities with high incarceration rates. In other words, preventing and treating STDs within prisons helped keep diseases from reaching the public.

Intravenous Drug Users

It's an established fact that any number of diseases, including those we identify as sexually transmitted, can be spread by sharing needles used for intravenous drugs. The capability for HIV and hepatitis, especially, to be spread by sharing sharps is at the heart of controversial needle exchange programs.

Some of the highest HIV rates on record appear to result from a trifecta of risk. A study published in April 2006 looked at infection rates for intravenous drug-using men who had sex with other men. Of the 227 subjects recruited from the streets of San Francisco, the majority (68 percent) had been paid for sex, and less than half (41 percent) used condoms. The prevalence of HIV among them was 12 percent.

Migrant Workers

Uncounted, uninsured, and often unable to access health care, migrant workers in the U.S. represent another challenge in STD prevention and treatment.

While there are few studies illuminating the health status of immigrant workers countrywide, a handful of snapshots have provided insight. Low socioeconomic status, education, and literacy were cited as barriers to healthcare for Latino day workers in a 2003 study. The researchers, whose work was based on 292 Latino men working in

San Francisco, also noted that low levels of condom use, poor safe-sex knowledge, and high-risk sexual behaviors could contribute to the potential for STD infection.

A frequently cited study from 1992 found high rates of syphilis, HIV and tuberculosis among migrant farm workers in Immokalee, Fla. Though its statistics are long outdated now, the study's closing editorial made a point that remains central. The survey "identified a substantial number of migrant farm workers with unrecognized and untreated preventable diseases," it read. "In particular, treatment and counseling of these persons could prevent transmission of STDs to their sex partners and, for TB, to those with whom they live and travel."

The sad truth highlighted by these studies is that people are spreading and suffering from diseases that are preventable. Immigrant health is often politicized, but there's little arguing with the benefits of STD awareness and preventive services that break through language and cultural barriers. Such programs not only help immigrants and their families but maintain a baseline of health in the towns where they live.

Socioeconomics and Sex

Though we're describing STD prevalence among a few isolated groups, high rates can be influenced by a number of social, cultural, and economic factors—which not only make the numbers more daunting but the problem more difficult to solve. When the CDC looked at eight southern communities in 1999 to understand why rates of syphilis were high, they made a direct connection between socioeconomics and sexual health. In Lowndes County, Ala., where the median income was \$15,584 per year, there was no public library, no YMCA, no swimming pools. "It is reported that the primary source of recreation for teens in the county is sex," the report said.

We're All Connected

If you're feeling immune to the risks faced by all the groups described here, consider that STD statistics continue to bring all sorts of surprises. For several conditions, declining trends have been reversed in recent years. Even as we fight back infection rates with education and science, the number of groups *not* at risk seems to shrink.

The sexual health of our country ultimately affects everyone who is sexually active. Even when we take precautions, it's nearly impossible to gauge when we are in range of the risk emanating from other places in the vast sexual network. The special populations spotlighted here are links in the same chain that connect you to risk in your own life. By recognizing the connection we can maintain our health, maintain our humanity, and help break the chain of STD transmission.



Acquired Immunodeficiency Syndrome (AIDS)

AIDS is the most severe manifestation of the infection Human Immunodeficiency Virus (HIV). The Centers for Disease Control and Prevention (CDC) lists numerous opportunistic infections and cancers that, in the presence of HIV infection, constitute an AIDS diagnosis. In 1993, the CDC expanded the criteria for an AIDS diagnosis in adults and adolescents to include CD4+ T-cell count at or below 200 cells per microliter in the presence of HIV infection.

In persons (age 5 and older) with normally functioning immune systems, CD4+ T-cell counts usually range from 500 - 1,500 cells per microliter. Persons living with AIDS often have infections of the lungs, brain, eyes, and other organs, and frequently suffer debilitating weight loss, diarrhea, and a type of cancer called Kaposi's Sarcoma. See HIV Disease; Opportunistic Infection; AIDS Wasting Syndrome.

Acute HIV Infection

The period of rapid viral replication immediately following exposure to HIV; an estimated 80 to 90 percent of individuals with primary HIV infection develop an acute syndrome characterized by flu-like symptoms of fever, malaise, lymphadenopathy, pharyngitis, headache, myalgia, and sometimes rash.

Following primary infection, seroconversion and a broad HIV-1 specific immune response occur, usually within an average of 3 weeks after transmission of HIV. It was previously thought that HIV was relatively dormant during this phase. However, it is now known that during the time of primary infection, high levels of plasma HIV RNA can be documented.

Questions and Answers: HIV is the Cause of AIDS

What is AIDS?

AIDS stands for acquired immunodeficiency syndrome. A diagnosis of AIDS is made by a physician using certain clinical or laboratory standards.

What causes AIDS?

AIDS is caused by infection with a virus called human immunodeficiency virus (HIV). This virus is passed from one person to another through blood-to-blood and sexual contact. In addition, infected pregnant women can pass HIV to their babies during pregnancy or delivery, as well as through breast feeding. People with HIV have what is called HIV infection. Most of these people will develop AIDS as a result of their HIV infection.

What body fluids transmit HIV?

These body fluids have been proven to spread HIV:

- blood
- semen
- vaginal fluid
- breast milk
- other body fluids containing blood

These are additional body fluids that may transmit the virus that health care workers may come into contact with:

- fluid surrounding the brain and the spinal cord.
- fluid surrounding bone joints.
- fluid surrounding an unborn baby.

How does HIV cause AIDS?

HIV destroys a certain kind of blood cells--CD4+ T cells (helper cells)--which are crucial to the normal function of the human immune system. In fact, loss of these cells in people with HIV is an extremely powerful predictor of the development of AIDS. Studies of thousands of people have revealed that most people infected with HIV carry the virus for years before enough damage is done to the immune system for AIDS to develop.

However, recently developed sensitive tests have shown a strong connection between the amount of HIV in the blood and the decline in CD4+ T cell numbers and the development of AIDS. Reducing the amount of virus in the body with anti-HIV drugs can slow this immune destruction.

An author indicated in a recently published book that AIDS is caused by HHV-6 rather than HIV. Is this true?

No, this is not true. Both HHV-6 and HIV infect the same kind of cells in a person's body.

These cells are called CD4+ T cells (helper cells). However, AIDS will not develop in someone who is not infected with HIV. Infection with HHV-6 does not lead to infection with HIV. HHV-6, one of the eight known human herpesviruses, is common throughout the world, with over 90% of adults in many populations being infected. Most people are infected with HHV-6 between the ages of 6 months and 2 years old, soon after they lose their mother's antibodies.

HHV-6 is the cause of roseola [**ro ZEE o la**], a usually mild childhood disease that is also called exanthem subitum [**eg ZAN them SUBI tum**] or sixth disease. Approximately 30% of all children get roseola, usually before 2 years of age.

Why do some people make statements that HIV does not cause AIDS?

The epidemic of HIV and AIDS has attracted much attention both within and outside the medical and scientific communities. Much of this attention comes from the many social issues--homosexuality, drug use, poverty--related to this disease. Although the scientific evidence is overwhelming and compelling that HIV is the cause of AIDS, the disease process is not yet completely understood.

This incomplete understanding has led some persons to make statements that AIDS is not caused by an infectious agent or is caused by a virus that is not HIV. This is not only misleading, but may have dangerous consequences.

Before the discovery of HIV, evidence from epidemiologic studies involving tracing of patients' sex partners and cases occurring in persons receiving transfusions of blood or blood clotting products had clearly indicated that the underlying cause of the condition was an infectious agent.

HIV Infection

Infection with HIV has been the sole common factor shared by AIDS cases throughout the world among homosexual men, transfusion recipients, persons with hemophilia, sex partners of infected persons, children born to infected women, and occupationally exposed health care workers.

Recommendations to prevent HIV involve guidance to avoid or modify behaviors that pose a risk of transmitting the virus as well as the use of tests to screen donors of blood and organs.

The inescapable conclusion of more than 15 years of scientific research is that people, if exposed to HIV through sexual contact or injecting drug use, may become infected with HIV. If they become infected, most will eventually develop AIDS.

How can I get more information about AIDS?

The CDC operates a free telephone service that is available 24-hour, 7 days a week. You can contact the CDC National STD and AIDS Hotlines at 1-800-342-2437. Service for Spanish-speaking audiences and the Deaf are also available.

Combating Complacency in HIV Prevention

In the United States, complacency about the need for HIV prevention may be among the strongest barriers communities face as they plan to meet the next century's prevention needs. The great success that many people, but not all, have had with new highly active antiretroviral therapies (HAART, also known as drug "**cocktails**") and the resulting decline in the number of newly reported AIDS cases and deaths are indeed good news.

The underlying reality, however, is that the HIV epidemic in our country is far from over. This is true not only for the nation, but for the continuing number of HIV-infected individuals who now must face years - perhaps a lifetime - of multiple daily medications, possible unpleasant or severe side effects, and great expense associated with the medicines needed to suppress HIV and prevent opportunistic infections.

The success of HAART is good news for the people living longer, better lives because of it, but the availability of treatment may lull people into believing that preventing HIV infection is no longer important. This complacency about the need for prevention adds a new dimension of complexity for both program planners and individuals at risk.

- While the number of AIDS cases is declining, the number of people *living* with HIV infection is growing. This increased prevalence of HIV in the population means that even more prevention efforts are needed, not fewer. For individuals at risk, increased prevalence means that each risk behavior carries an increased risk for infection. This makes the danger of relaxing preventive behaviors greater than ever.

- Past prevention efforts have resulted in behavior change for many individuals and have helped slow the epidemic overall. However, many studies find that high-risk behaviors, especially unprotected sex, are continuing at far too high a rate. This is true even for some people who have been counseled and tested for HIV, including those found to be infected.
- The long-term effectiveness of HAART is unknown. Further, HIV may develop resistance to these drugs. The powerful treatments are complicated and involve taking large numbers of pills. Even the most motivated patients may forget to take all their medications or skip doses. Some patients have been known to take "**drug holidays**," completely stopping their medications for a number of days or weeks.

These drug treatments are less effective when treatment schedules are not followed. Diversions from the prescribed treatment regimen increase the possibility of drug resistance developing, which would greatly narrow future treatment options for those infected with a drug-resistant strain of HIV.

And, if the development of drug-resistance is coupled with a relaxation in preventive behaviors, resistant strains could be transmitted to others and spread widely.

- Research among gay and bisexual men suggests that some individuals are less concerned about becoming infected than in the past and may be inclined to take more risks.

This may be equally true in other groups at risk who might believe they no longer need to use condoms because protease inhibitors are so effective in treating HIV disease. The truth is, despite medical advances, HIV remains a serious and usually fatal disease that requires complex, costly, and difficult treatment regimens.

- These treatments don't work for everyone. Sometimes when they do work, they have unpleasant or intolerable side effects. Some people can't take them because the interaction with their other drugs causes serious problems. Still others find it extremely difficult to maintain the drug treatment schedules. As we continue working to develop better treatment options, we must not lose sight of the fact that preventing HIV infection in the first place precludes the need for people to follow these difficult regimens.

The Challenge of Monitoring the HIV/AIDS Epidemic

The "**treatment effect**" on trends in the AIDS epidemic not only increases our need for combating complacency, but means that we have never been closer to losing our ability to monitor the epidemic.

- Until recently, AIDS cases provided a reliable picture of trends in the HIV epidemic. Before highly effective treatments were available, researchers could take into account the time between HIV infection and progression to AIDS and estimate where and how many new infections were occurring based on observed cases of disease. Today, trends in AIDS cases and deaths may provide a valuable measure of groups for whom highly effective treatment is not available or has not succeeded.

- However, they no longer tell us enough about where and how many new infections are occurring - information critical for addressing the increasing need for prevention and treatment services. To allow the U.S. to target programs and resources most effectively, we must be able to keep pace with where the epidemic is going. This means we need to improve our ability to track early HIV infections, *before* they progress to AIDS.

Pay Attention to Prevention! It works...

Sustained, comprehensive prevention efforts begun in the 1980s have had a substantial impact on slowing the HIV/AIDS epidemic in our country. While it is difficult to measure prevention - or how many thousands of infections did not occur as a result of efforts to date - we know the epidemic was growing at rate of over 80% each year in the mid-1980s and has now stabilized.

While the occurrence of approximately 40,000 new infections annually is deeply troubling, we have made tremendous progress. We also have more scientific evidence than ever before on which prevention programs are most effective. There is no question that prevention works and remains the best and most cost-effective approach for bringing the HIV/AIDS epidemic under control and saving lives.

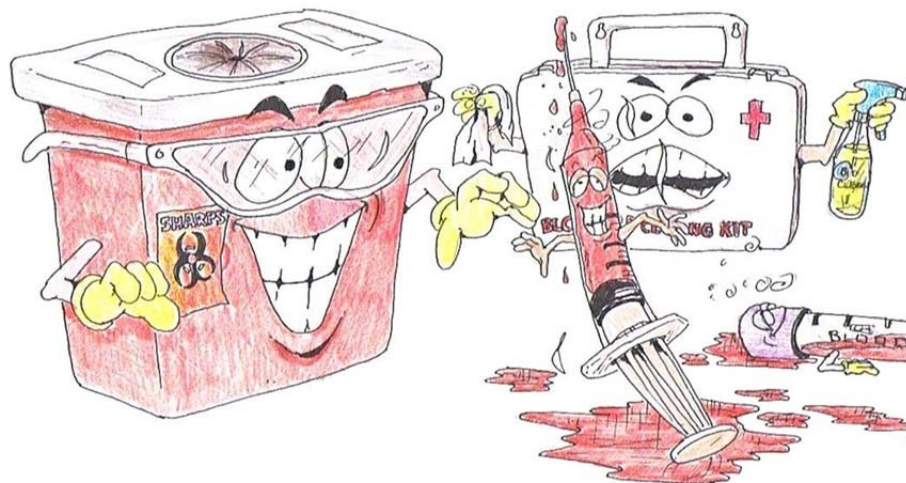
HIV prevention programs have been proven effective.

- Many studies indicate that prevention programs can contribute to changes in personal behavior that reduce risks of infection, and these changes are sustained over time. A 1997 scientific consensus conference sponsored by the National Institutes of Health that reviewed existing data on the effectiveness of HIV behavioral interventions concluded that "behavioral interventions to reduce risk for HIV/AIDS are effective and should be disseminated widely."
- Comprehensive school-based HIV and sex education programs have been shown to delay the initiation of sexual intercourse, reduce the frequency of intercourse, reduce the number of sex partners, or increase the use of condoms or other contraceptives.
- Efforts to reduce risks of injection drug users through policy changes also have been evaluated and found to be very effective. For example, both New York and Connecticut reported significant reductions in the sharing of drug injection equipment after implementation of programs and policies that increased access to sterile injection equipment.
- Perinatal prevention programs that identify and treat pregnant women who are HIV infected have shown dramatic success in reducing HIV transmission to their babies.
- Screening the blood supply for HIV and heat-treating blood products for the treatment of hemophilia have nearly eliminated HIV transmission through these early transmission routes.
- Postexposure prophylaxis for health care workers has shown some success in reducing HIV transmission rates among those with occupational exposure to HIV-infected blood.
- Numerous HIV prevention programs have been shown to be cost-effective when compared against the resources required to treat and deliver HIV medical care to a person over the remaining years of their life. With the rising costs of lifetime treatment of HIV, effective prevention has become even more cost effective.

- New CDC estimates find that if only 1,255 infections are prevented each year, CDC's federally funded HIV prevention efforts in the United States are cost effective. If only 3,995 infections are prevented, our nation's investment in HIV prevention has actually saved money.

Comprehensive HIV prevention programs work best.

- People with HIV risk behaviors need an array of prevention messages, skills, and support to help them reduce sexual and drug-related risks. Drug injectors, for example, not only need strategies to help them stop using drugs or sharing needles, but also need to learn ways to protect themselves from sexual transmission if their partner has ever injected drugs and may have shared needles.
- Substance use is a major problem in this country, and the intersection of substance use and sexual HIV transmission cannot be overlooked. Ideally, everyone who abuses any drug (including alcohol) should be offered counseling and treatment to help them stop using drugs and prevent HIV infection. HIV prevention interventions for the vast majority of substance users who are *not* in treatment also must address the sexual risks that are common among people who use drugs, including "**crack**" cocaine, marijuana, and alcohol.
- Each and every generation of young people needs comprehensive, sustained health information and interventions that help them develop life-long skills for avoiding behaviors that could lead to HIV infection. Such comprehensive programs should include the involvement of parents as well as educators.
- The most effective programs start at an early age and are designed to encourage the adoption of healthy behaviors, such as exercising and eating a healthy diet, and to prevent the initiation of unhealthy ones, such as drug use, excessive alcohol consumption, smoking, and premature sexual activity, **before** they start.
- Scientific studies show that treatment of other sexually transmitted diseases can greatly reduce the risk of transmitting and acquiring HIV.



Prevention provides multiple opportunities for intervention.

- *Primary HIV prevention* means keeping people from becoming infected with HIV in the first place. Interventions must focus not only on uninfected populations - there also is a major role for preventing further infections by focusing on infected individuals and helping them develop skills for reducing the risk of infecting others.
- *Secondary HIV prevention* means keeping people who already are HIV-infected safe and healthy by helping them avoid opportunistic infections and stopping the infection from progressing to AIDS.
- In all prevention efforts, there is a growing need to address the link between HIV treatment and prevention. In some cases, such as preventing perinatal transmission to infants by providing antiretroviral drugs to the mother, treatment *is* prevention. We also know that the treatment of other STDs can greatly reduce a person's risk for sexually acquired HIV infection. And, scientists even now are exploring the possibility that combination drug therapies may reduce infectivity. With the lines between prevention and treatment beginning to fade, ongoing services for people who are HIV positive must balance medical advances with the behavioral and social support needed to preserve their quality of life and prevent the spread of infection.
- We must maintain a focus on behavioral strategies. Even a vaccine doesn't stop a disease unless people use it - and in the case of HIV, a vaccine is unlikely to confer 100% lifelong immunity. Because no medical advance can succeed on its own, people must adapt their behaviors to work in tandem with it. To do this, they need several things:
- Access to prevention services and new medical treatments. For example, pregnant women who may not know they are infected with HIV cannot reduce the risk of transmission to their children unless they first get prenatal care that includes routine HIV counseling and voluntary testing. Those found to be infected then must have access to antiretroviral drugs.
- *Assistance in developing skills* to use new medical treatments. HAART, for example, involves complex treatment regimens and may require the development of compliance-related skills. For example, people may need to learn how to deal with side effects, what drug interactions might occur, how to lessen the risk of developing drug resistance, or how to cope with complicated schedules.
- *Support and encouragement* from family, friends, care providers, and the community at large will help people make and sustain behavioral changes in their lives.

Today, more than ever, we must recognize that medical advances do not negate the need for preventing disease-in fact, the availability of newer and better treatments often *increases* the need for prevention.

How well we continue our work to develop integrated approaches to prevention and treatment may well define the future course of the HIV pandemic.

Solution to rubber allergy



Rubber latex replacement

People with an allergy to rubber latex could benefit from a new substitute product extracted from a Mexican plant. Rubber latex is a key component in products such as most surgical gloves and condoms and can put severe allergy sufferers into potentially fatal anaphylactic shock. Health care workers are particularly prone to problems because of the use of surgical gloves as part of their daily working routines.

The allergic reaction is caused by proteins in the latex - a fluid extracted from the Brazilian rubber tree - and has become far worse since the 1980s as a result of the HIV and Aids epidemic, which led to dramatic increases in the manufacture of rubber latex products. Mass production has led, in some cases, to falling production standards - in particular, failures to wash away the damaging proteins.

New Scientist magazine reports a team of researchers at the US Department of Agriculture's Western Regional Research Center in Albany, California, now say they have proved that latex from the guayule plant, a perennial shrub native to Mexico, is free of the allergic proteins found in rubber latex. It is estimated that 20 million people in the US are allergic to traditional latex.

Katrina Cornish and colleagues at the center tested guayule latex gloves by filling them with a solution containing HIV, hepatitis B and herpes simplex viruses. None of the viruses passed through the gloves during an hour-long test.

Longer shelf life

A similar test with guayule condoms was just as effective and Ms Cornish said the new latex appears to have a longer shelf life and is harder to pierce than the traditional version. A Philadelphia company, Yulex, is now planning to commercially produce 300 medical products using the guayule latex. Lesley Fudge, clinical nurse manager for theatres at Frenchay Hospital, Bristol, which has campaigned on the issue of latex gloves, said she welcomed the new advance but would want to see proof that it did not have its own side-effects.

Some hospital trusts have switched to use alternatives such as vinyl gloves and condom manufacturer Durex introduced its Avanti range in 1997, which is made of polyurethane.

Frequently Asked Questions and Answers About Co-infection with HIV and Hepatitis C Virus

Why should HIV-infected persons be concerned about coinfection with HCV?

About one quarter of HIV-infected persons in the United States are also infected with hepatitis C virus (**HCV**). HCV is one of the most important causes of chronic liver disease in the United States and HCV infection progresses more rapidly to liver damage in HIV-infected persons. HCV infection may also impact the course and management of HIV infection.

The latest U.S. Public Health Service/Infectious Diseases Society of America (**USPHS/IDSA**) guidelines recommend that all HIV-infected persons should be screened for HCV infection. Prevention of HCV infection for those not already infected and reducing chronic liver disease in those who are infected are important concerns for HIV-infected individuals and their health care providers.

Who is likely to have HIV-HCV coinfection?

The hepatitis C virus (**HCV**) is transmitted primarily by large or repeated direct percutaneous (i.e., passage through the skin by puncture) exposures to contaminated blood. Therefore, coinfection with HIV and HCV is common (50%-90%) among HIV-infected injection drug users (**IDUs**). Coinfection is also common among persons with hemophilia who received clotting factor concentrates before concentrates were effectively treated to inactivate both viruses (i.e., products made before 1987).

The risk for acquiring infection through perinatal or sexual exposures is much lower for HCV than for HIV. For persons infected with HIV through sexual exposure (e.g., male-to-male sexual activity), coinfection with HCV is no more common than among similarly aged adults in the general population (3%-5%).

What are the effects of coinfection on disease progression of HCV and HIV?

Chronic HCV infection develops in 75%-85% of infected persons and leads to chronic liver disease in 70% of these chronically infected persons. HIV-HCV coinfection has been associated with higher titers of HCV, more rapid progression to HCV-related liver disease, and an increased risk for HCV-related cirrhosis (scarring) of the liver. Because of this, HCV infection has been viewed as an opportunistic infection in HIV-infected persons and was included in the 1999 USPHS/IDSA Guidelines for the Prevention of Opportunistic Infections in Persons Infected with Human Immunodeficiency Virus.

It is not, however, considered an AIDS-defining illness. As highly active antiretroviral therapy (**HAART**) and prophylaxis of opportunistic infections increase the life span of persons living with HIV, HCV-related liver disease has become a major cause of hospital admissions and deaths among HIV-infected persons.

The effects of HCV coinfection on HIV disease progression are less certain. Some studies have suggested that infection with certain HCV genotypes is associated with more rapid progression to AIDS or death. However, the subject remains controversial. Since coinfecting patients are living longer on HAART, more data are needed to determine if HCV infection influences the long-term natural history of HIV infection.

How can coinfection with HCV be prevented?

Persons living with HIV who are not already coinfecting with HCV can adopt measures to prevent acquiring HCV. Such measures will also reduce the chance of transmitting their HIV infection to others.

Not injecting or stopping injection drug use would eliminate the chief route of HCV transmission; substance-abuse treatment and relapse-prevention programs should be recommended. If patients continue to inject, they should be counseled about safer injection practices; that is, to use new, sterile syringes every time they inject drugs and never reuse or share syringes, needles, water, or drug preparation equipment.

Toothbrushes, razors, and other personal care items that might be contaminated with blood should not be shared. Although there are no data from the United States indicating that tattooing and body piercing persons are at increased risk for HCV infection, these procedures may be a source for infection with any bloodborne pathogen if proper infection control practices are not followed.

Although consistent data are lacking regarding the extent to which sexual activity contributes to HCV transmission, persons having multiple sex partners are at risk for other sexually transmitted diseases (**STDs**) as well as for transmitting HIV to others. They should be counseled accordingly.

How should patients coinfecting with HIV and HCV be managed?

General guidelines

Patients coinfecting with HIV and HCV should be encouraged to adopt safe behaviors (as described in the previous section) to prevent transmission of HIV and HCV to others.

Individuals with evidence of HCV infection should be given information about prevention of liver damage, undergo evaluation for chronic liver disease and, if indicated, be considered for treatment. Persons coinfecting with HIV and HCV should be advised not to drink excessive amounts of alcohol.

Avoiding alcohol altogether might be wise because the effects of even moderate or low amounts of alcohol (e.g., 12 oz. of beer, 5 oz. of wine or 1.5 oz. hard liquor per day) on disease progression are unknown. When appropriate, referral should be made to alcohol treatment and relapse-prevention programs. Because of possible effects on the liver, HCV- infected patients should consult with their health care professional before taking any new medicines, including over-the-counter, alternative or herbal medicines.

Susceptible coinfecting patients should receive hepatitis A vaccine because the risk for fulminant hepatitis associated with hepatitis A is increased in persons with chronic liver disease. Susceptible patients should receive hepatitis B vaccine because most HIV-infected persons are at risk for HBV infection.

The vaccines appear safe for these patients and more than two-thirds of those vaccinated develop antibody responses. Prevacination screening for antibodies against hepatitis A and hepatitis B in this high-prevalence population is generally cost-effective.

Post vaccination testing for hepatitis A is not recommended, but testing for antibody to hepatitis B surface antigen (anti-HBs) should be performed 1-2 months after completion of the primary series of hepatitis B vaccine. Persons who fail to respond should be revaccinated with up to three additional doses.

HAART has no significant effect on HCV. However, coinfecting persons may be at increased risk for HAART-associated liver toxicity and should be closely monitored during antiretroviral therapy. Data suggest that the majority of these persons do not appear to develop significant and/or symptomatic hepatitis after initiation of antiretroviral therapy.

Treatment for HCV Infection

A Consensus Development Conference Panel convened by The National Institutes of Health in 1997 recommended antiviral therapy for patients with chronic hepatitis C who are at the greatest risk for progression to cirrhosis. These persons include anti-HCV positive patients with persistently elevated liver enzymes, detectable HCV RNA, and a liver biopsy that indicates either portal or bridging fibrosis or at least moderate degrees of inflammation and necrosis. Patients with less severe histological disease should be managed on an individual basis.

In the United States, two different regimens have been approved as therapy for chronic hepatitis C: monotherapy with alpha interferon and combination therapy with alpha interferon and ribavirin. Among HIV-negative persons with chronic hepatitis C, combination therapy consistently yields higher rates (30%-40%) of sustained response than monotherapy (10%-20%).

Combination therapy is more effective against viral genotypes 2 and 3, and requires a shorter course of treatment; however, viral genotype 1 is the most common among U.S. patients. Combination therapy is associated with more side effects than monotherapy, but, in most situations, it is preferable. At present, interferon monotherapy is reserved for patients who have contraindications to the use of ribavirin.

Studies thus far, although not extensive, have indicated that response rates in HIV-infected patients to alpha interferon monotherapy for HCV were lower than in non-HIV-infected patients, but the differences were not statistically significant. Monotherapy appears to be reasonably well tolerated in coinfecting patients. There are no published articles on the long-term effect of combination therapy in coinfecting patients, but studies currently underway suggest it is superior to monotherapy.

However, the side effects of combination therapy are greater in coinfecting patients. Thus, combination therapy should be used with caution until more data are available.

The decision to treat people coinfecting with HIV and HCV must also take into consideration their concurrent medications and medical conditions. If CD4 counts are normal or minimally abnormal ($> 400/\mu\text{l}$), there is little difference in treatment success rates between those who are coinfecting and those who are infected with HCV alone.

Other Treatment Considerations

Persons with chronic hepatitis C who continue to abuse alcohol are at risk for ongoing liver injury, and antiviral therapy may be ineffective. Therefore, strict abstinence from alcohol is recommended during antiviral therapy, and interferon should be given with caution to a patient who has only recently stopped alcohol abuse.

Typically, a 6-month abstinence is recommended for alcohol abusers before starting therapy; such patients should be treated with the support and collaboration of alcohol abuse treatment programs.

Although there is limited experience with antiviral treatment for chronic hepatitis C of persons who are recovering from long-term injection drug use, there are concerns that interferon therapy could be associated with relapse into drug use, both because of its side effects and because it is administered by injection.

There is even less experience with treatment of persons who are active injection drug users, and an additional concern for this group is the risk for reinfection with HCV. Although a 6-month abstinence before starting therapy also has been recommended for injection drug users, additional research is needed on the benefits and drawbacks of treating these patients.

Regardless, when patients with past or continuing problems of substance abuse are being considered for treatment, such patients should be treated only in collaboration with substance abuse specialists or counselors. Patients can be successfully treated while on methadone maintenance treatment of addiction.

Because many coinfecting patients have conditions or factors (such as major depression or active illicit drug or alcohol use) that may prevent or complicate antiviral therapy, treatment for chronic hepatitis C in HIV-infected patients should be coordinated by health care providers with experience in treating coinfecting patients or in clinical trials. It is not known if maintenance therapy is needed after successful therapy, but patients should be counseled to avoid injection drug use and other behaviors that could lead to reinfection with HCV and should continue to abstain from alcohol.

Infections in Infants and Children

The average rate of HCV infection among infants born to women coinfecting with HCV and HIV is 14% to 17%, higher than among infants born to women infected with HCV alone.

Data are limited on the natural history of HCV infection in children, and antiviral drugs for chronic hepatitis C are not FDA-approved for use in children under aged 18 years. Therefore, children should be referred to a pediatric hepatologist or similar specialist for management and for determination for eligibility in clinical trials.

BBP Exposure

What to do if an exposure occurs? (OSHA Recommendations)

- Wash exposed area with soap and water
- Flush splashes to nose, mouth, or skin with water
- Irrigate eyes with water or saline
- Report the exposure
- Direct the worker to a healthcare professional

Treatment should begin as soon as possible after exposure, preferably within 24 hours, and no later than 7 days.

Post-Exposure Follow-Up (OSHA Recommendations)

- Document routes of exposure and how exposure occurred
- Record injuries from contaminated sharps in a sharps injury log, if required
- Obtain consent from the source individual and the exposed employee and test blood as soon as possible after the exposure incident
- Provide risk counseling and offer post-exposure protective treatment for disease when medically indicated in accordance with current U.S. Public Health Service guidelines
- Provide written opinion of findings to employer and copy to employee within 15 days of the evaluation

1910.1030(f)(3), (4) & (5) (OSHA Rule)

The requirement to establish and maintain a sharps injury log applies to any employer who is required to maintain a log of occupational injuries and illnesses under 29 CFR 1904.

If the employee consents to baseline blood collection, but does not give consent at that time for HIV serologic testing, the sample must be preserved for at least 90 days.

Current U.S. Public Health Service guidelines: *Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposure to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis*, June 29, 2001.

See <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5011a1.htm> or call the National Clinician's Hotline at 1-888-448-4911.

Cuts (Company Policy Example)

If an employee has a needle stick, cut, or mucous membrane exposure to another person's body fluids he/she must report the incident immediately to the Town/Company's medical facility.

Blood Exposure (Company Policy Example)

All employees exposed to human blood and blood products must report to the Town/Company's medical facility for information and possible inclusion in the Hepatitis B Immunization Program.

Infection Control Plan (Company Policy Example)

The purpose of the Infection Control Plan is to protect the health and safety of the persons directly involved in handling the materials, Town/Company personnel and the general public by ensuring the safe handling, storage, use, processing, and disposal of infectious medical waste. This plan complies with OSHA requirement proposed for 29 CFR 1910.1030, Blood Borne Pathogens.

Universal precautions: Refers to a system of infectious disease control which assumes that every direct contact with body fluids is infectious and requires every employee exposed to be protected as though such body fluids were infected with blood-borne pathogens. All infectious/medical material must be handled according to Universal Precautions (OSHA Instruction CPL 2-2.44A).

The following universal precautions must be taken.

1. Gloves must be made of appropriate disposable material, usually intact latex or vinyl. They must be used:
 - a. when the employee has cuts, abraded skin, chapped hands, dermatitis, or the like.
 - b. when examining abraded or non-intact skin of a patient with active bleeding.
 - c. while handling blood or blood products or other body secretions during routine procedures.
2. Gowns, aprons, or lab coats must be worn when splashes of body fluid on skin or clothing are possible.
3. Mask and eye protection are required when contact of mucosal membranes (eyes, mouth or nose) with body fluids is likely to occur (e.g. splashes or aerosolization).
4. Resuscitation equipment, pocket masks, resuscitation bags, or other ventilation equipment must be provided to eliminate the need for direct mouth to mouth contact.

Waste Disposal Plan (Company Policy Example)

1. Medical/Infectious waste must be segregated from other waste at the point of origin.
2. Medical/Infectious waste, except for sharps (e.g. razor blades, broken glass, needles, etc.) capable of puncturing or cutting must be contained in double disposable red bags conspicuously labeled with the words, "**INFECTIOUS WASTE -- BIOHAZARD.**"
3. Infectious sharps must be contained for disposal in leak-proof, rigid puncture resistant containers.
4. Infectious waste thus contained as described in procedures 2 and 3 above must be placed in reusable or disposable leak-proof bins or barrels which must be conspicuously labeled with the words, "**INFECTIOUS WASTE -- BIOHAZARD.**" These waste barrels are to be picked up regularly by an outside Town /Company licensed to handle infectious wastes.
5. Spills/Disinfectants: a solution of sodium hypo chlorite (household bleach) diluted 1:9 with water must be used to disinfect, following initial cleanup of a spill with a chemical germicide approved as a hospital disinfectant.
6. Spills must be cleaned up immediately.
7. After removing gloves, and/or after contact with body fluids, hands and other skin surfaces must be washed thoroughly and immediately with soap or other disinfectant in hot water.

8. Other biological wastes that do not contain radioactive or hazardous substances may be disinfected by steam sterilization (autoclave) and then disposed of in the regular trash.
9. Liquid biohazard waste may be disposed of in the sewage system following chemical decontamination.
10. Reusable glassware must be decontaminated in sodium hypochlorite (household bleach) solution (1:9) prior to rinsing and acid washing. Then the glassware must be sterilized in an autoclave.

Post Exposure Treatment and Notification Procedures

(Company Policy Example)

Should an affected Employee or an Employee acting as a **"Good Samaritan"** be occupationally exposed to HIV/HAV/HBV, the affected Employee will report the exposure to the Town/Company's medical facility. The Town/Company will provide for the Employee to be tested for HIV/HAV/HBV at Town /Company expense.

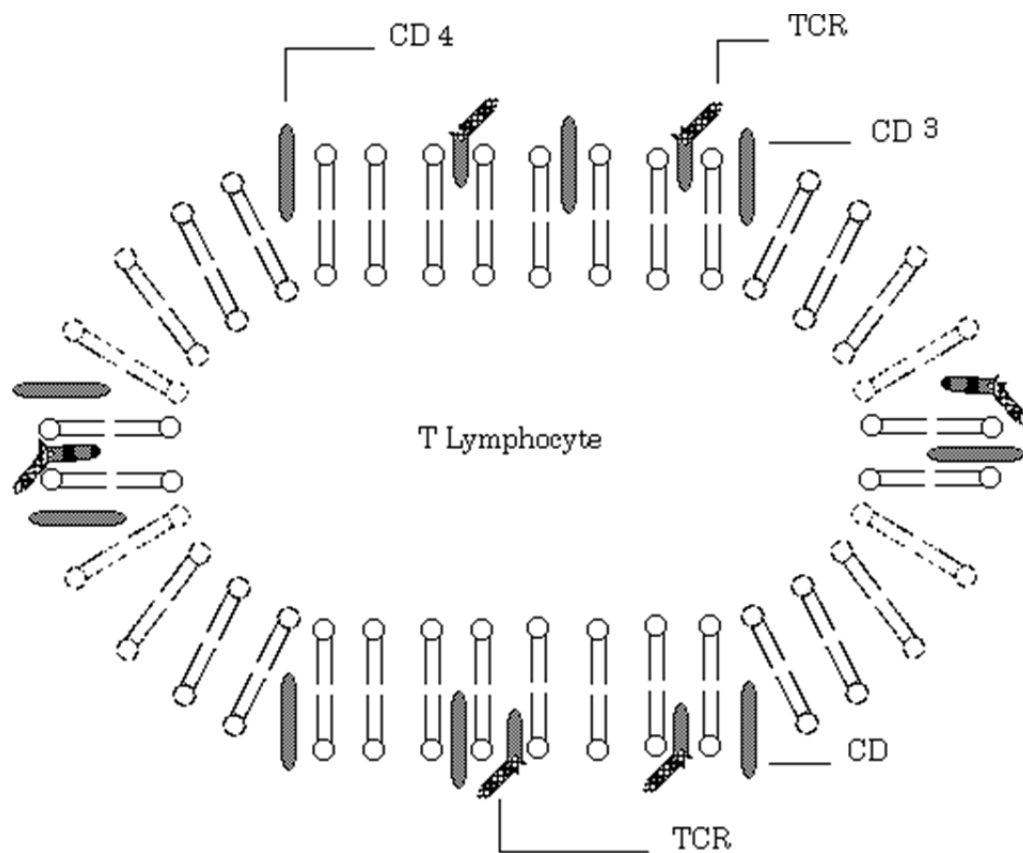
Following the initial blood test at time of exposure, seronegative Employees will be retested at 6 weeks, 12 weeks and 6 months to determine if transmission has occurred. During this period, the Employee will follow the recommendations provided by the Doctor or the U. S. Public Health Service.

An **"occupational exposure"** is defined as blood or body fluid contact from an injured or ill Employee to the affected Employee or injury by a contaminated sharp object.

Following the report of exposure, Town/Company will contact the exposure source and request that person be tested for HIV/HAV/HBV at Town/Company expense. The request is not mandatory and if refused will not effect that Employee's future employment.

During all phases of Post Exposure, the confidentiality of the affected Employee and exposure source will be maintained on a **"need to know basis"**. Town/Company will use the Blood-Borne Pathogens Exposure and Treatment form to document the exposure and offer of medical assistance to the affected Employee and use the Medical Consent for Blood-Borne Pathogens Testing form for the exposure source.

The results of any HIV/HAV/HBV tests conducted will be provided to the exposed and source Employees within 5 business days of receipt.



Lymphocytes

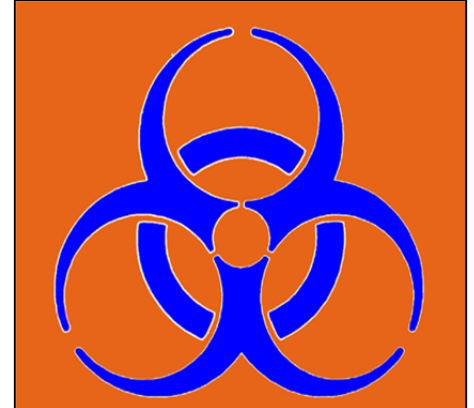
A leukocyte that directs the formation of antibodies, and that has memory.

Biohazard Warning Labels

Warning labels required on:

- ✓ Containers of regulated waste
- ✓ Refrigerators and freezers containing blood and other potentially infectious materials
- ✓ Other containers used to store, transport, or ship blood or other potentially infectious materials

Red bags or containers may be substituted for labels



1910.1030(g)(1) (OSHA Rule)

Labels must be predominantly fluorescent orange or orange-red with lettering and symbols in a contrasting color.

Labels must be affixed as close as feasible to the container by string, wire, adhesive, or other method that prevents their loss or unintentional removal.

Medical Wastes (*Company Policy Example*)

Medical/infectious waste must be segregated from other waste at the point of origin.

Medical/infectious waste, except for sharps (i.e., razor blades, broken glass, needles, etc.) capable of puncturing or cutting, must be contained in double disposable red bags conspicuously labeled with the words **"INFECTIOUS WASTE"** and **"BIOHAZARD."**

Used needles or other sharps (razor blades, broken glass, scalpels, etc.) must not be sheared, bent, broken, recapped, or resheathed.

Infectious sharps must be contained for disposal in leak-proof, rigid puncture-resistant containers. Infectious waste contained as described above must be placed in reusable or disposable leak-proof bins or barrels that are conspicuously labeled with the words **"INFECTIOUS WASTE"** and **"BIOHAZARD."**

These waste barrels are picked up regularly by an outside Town/Company licensed to handle infectious wastes.

All infectious agents, equipment, or apparatus must be disinfected in an autoclave or otherwise disinfected before being washed or disposed of. Each individual working with infectious bio-hazardous agents is responsible for disinfection and disposal of these agents.

Biological wastes that do not contain radioactive or hazardous substances may be disinfected by steam sterilization (autoclave) then disposed of in the regular trash. Liquid bio-hazardous waste may be disposed of in the sewage system following chemical decontamination.

Reusable glassware must be decontaminated in a sodium hypochlorite (household bleach) solution (1:9) prior to rinsing and acid washing. The glassware must then be sterilized in an autoclave.

To minimize the hazard to firefighters or emergency response personnel, at the close of each work day and before the building is closed, all infectious or toxic material must be placed in a refrigerator, placed in an incubator, or autoclaved or otherwise disinfected.

Infectious agents must not be placed in an autoclave and left overnight in anticipation of autoclaving the next day.

Floors, laboratory benches, and other surfaces in buildings where infectious agents are handled must be disinfected with a suitable germicide, such as 1:9 sodium hypochlorite solution (household bleach) as often as necessary as determined by the supervisor.

The surroundings must be disinfected after completion of operations involving planting, pipetting, centrifuging, and similar procedures with infectious agents.

Infectious agents must not be dumped into the building drainage system without prior disinfection.



Control of Bloodborne Pathogens Program
(Company Policy Example)

***Medical Waste Treatment and Disposal
Procedures***

FOR POSTING

1. All Medical Wastes (those soiled with/or covered in human body fluids) will be placed in a red leak-proof container marked either *Biohazard* or *Medical Waste*. All other wastes will be discarded following customary procedures. **(Note:** Soiled feminine hygiene/sanitary napkins, soiled facial tissues, etc. are not considered a biohazard or medical waste. Pretreatment is not necessary; however, Employees should wear personal protective equipment and wash hands with antibacterial soap afterwards)

2. Don and use the required personal protective equipment when handling medical wastes as outlined in the *Personal Protective Equipment for Worker Protection* Poster.

3. At the end of each shift, all accumulated medical wastes will be treated to remove biohazards using the following procedure:

1- Prepare a solution of 10 percent chlorine bleach to water (approximately 2 cups chlorine bleach to 1 gallon of water)

2- Pour solution over the medical wastes and thoroughly saturate

3- Let stand for 10 minutes and then drain into sink

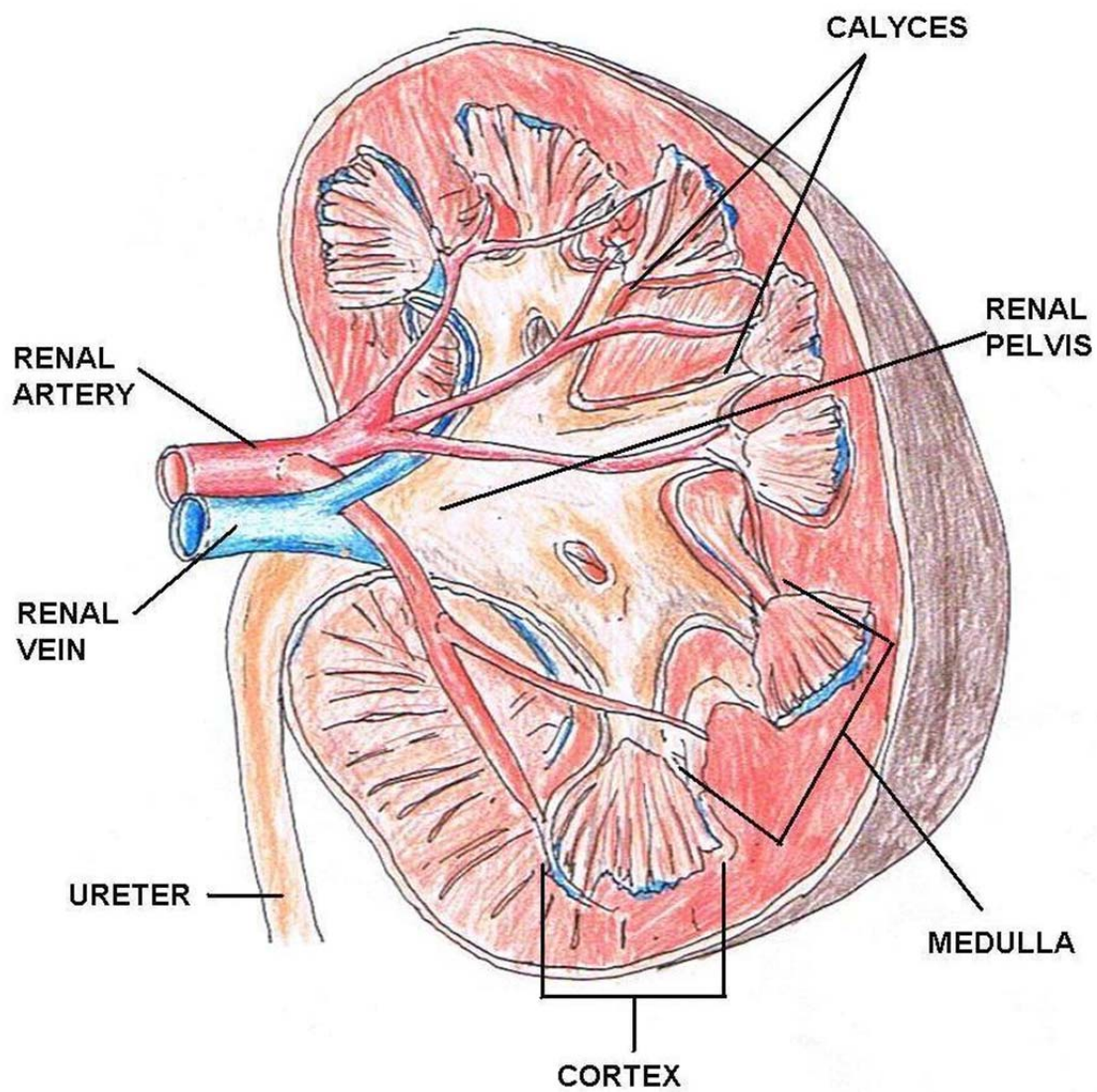
4- Discard as ordinary wastes

Caution: Sharp objects (broken glass, hypodermic needles, etc.) should not be handled by hand to prevent accidental punctures and lacerations

4. Rinse medical wastes container and return for use again.

5. Wash hands and exposed areas with antibacterial soap.

KIDNEY



BBP Training Elements

- Copy of the standard (*In rear of course*)
- Modes of transmission
- Site-specific exposure control plan
- Hazard recognition
- Use of engineering controls, work practices and PPE
- Live question and answer sessions



1910.1030(g)(2)(vii) & (viii) (OSHA Rule)

The person conducting the training must be knowledgeable in the subject matter covered by the elements contained in the training program as it relates to the workplace that the training will address.

OSHA does allow video or distance training, but employees still must have access to a “live” person (even if by phone or electronically) to answer questions – i.e., there must be an opportunity for interactive questions and answers with the person conducting the training session.

You can call TLC on any BBP questions or e mail info2tlch2o.com.

Control of Blood-Borne Pathogens Training Certificate

Name: _____ **Date** _____

I certify that I have received training on Blood-Borne Pathogens. The content of this training included:

1. Town/Company Policy
2. Types and transmission of blood-borne pathogens
3. General Safety Rules
4. Universal Precautions
5. Use of Personal Protective Equipment
6. Medical Waste Disposal Procedures
7. Post Exposure Treatment and Procedures
8. HBV Vaccinations

Employee's Signature

Date

Trainer's Signature/Title

Date



Proper Signage is important



Containers ready for final disposal

BBP Training Requirements (Company Policy Example)

Training

All personnel assigned duties as EMT's, Paramedics, First Aid Station Staff, HAZMAT responders, Custodial Employees (*those that clean rest rooms, etc.*) will receive initial and annual training by a qualified medical practitioner on the Bloodborne Pathogen Program. Additionally, personnel trained in First Aid shall be offered this annual training.

All new and current affected Employees will be trained initially and annually thereafter.

The content of BBP training program should include:

- 1. Town/Company Policy**
- 2. Types and transmission of Blood-Borne Pathogens**
- 3. General Safety Rules**
- 4. Universal Precautions**
- 5. Use of Personal Protective Equipment**
- 6. Medical Waste Disposal Procedures**
- 7. Post Exposure Treatment and Procedures**
- 8. HBV Vaccinations**

Documentation of training will be by Control of Blood-Borne Pathogens Training Certificate.

All Employees not affected by this Program will receive an overview of the program requirements during scheduled department Safety Meetings with documentation by Safety Meeting Minutes Form.

- Provide at no cost to employees during working hours
- Provide at time of initial assignment to a job with occupational exposure and at least annually thereafter
- Additional training needed when existing tasks are modified or new tasks are required which affect the worker's occupational exposure
- Maintain training records for 3 years

1910.1030(g)(2) & (h)(2) (OSHA Rule)

Training records must be maintained for 3 years from the date training occurred and include the following information:

- Dates of the training sessions
- Contents or a summary of the training sessions
- Names and qualifications of persons conducting the training
- Names and job titles of all persons attending the training sessions





Sample Lesson Plan – Bloodborne Pathogens

Lesson Plan

General Industry Outreach Training Program (10-hour)

Topic: Bloodborne Pathogens

Overview of the OSHA Standard

This standard limits occupational exposure to blood and other potentially infectious materials since any exposure could result in transmission of bloodborne pathogens, which could lead to disease or death. Acquired Immunodeficiency Syndrome (**AIDS**), Hepatitis B and Hepatitis C are serious concerns for workers exposed to blood and other potentially infectious materials.

Bloodborne pathogen exposure may occur in many ways, but needlestick injuries are the most common cause. Exposure may also occur through contact of contaminants with the nose, mouth, eyes, or skin.

The standard covers all employees who could be “**reasonably anticipated**” to face contact with blood and other potentially infectious materials as a result of performing their job duties.

To reduce or eliminate the hazards of occupational exposure, an employer must implement an exposure control plan for the worksite with details on protection measures. Engineering controls are the primary means of eliminating or minimizing employee exposure and include the use of safer medical devices.

Work practice controls such as hand washing are stressed by the standard. Appropriate personal protective equipment must be used when necessary. The standard requires that the Hepatitis B vaccination be made available to all employees who have occupational exposure to blood. The standard specifies procedures to be made available to all employees who have had an exposure incident.

Step 1: Planning the Lesson

Instructional Materials

1. PowerPoint presentation.
2. Instructor notes.
3. Other materials.

Instructional Objectives

1. Complete the required topics for the OSHA 10- hour course.
2. Complete the following optional topics:
 - a. Company Rules
 - b. Related Safety
3. Present *Bloodborne Pathogens* to [number] participants.
4. Incorporate active participation in each lesson.
5. Provide a quiz or short evaluation at the end of the course.
6. Ensure feedback from participants at various points in the training.

Guest Speakers/Presenters and Topics/Responsibilities.

Step 2: Presenting the Lesson

Lesson Introduction

Introductory remarks or transition from previous lesson.

Learning Objectives/Outcomes.

Upon completion of the lesson, participants will be able to:

1. Give at least 3 examples of workers who are at risk of exposure to bloodborne pathogens.

Possible responses.

Physician, nurse, police, firefighter

2. List the three ways exposure to bloodborne pathogens commonly occurs.

Possible responses.

- Needlesticks.
- Cuts from other contaminated sharps such as scalpels or broken glass.
- Contact of the eye, nose, mouth or cut/abraded skin with contaminated blood.

3. Describe at least 5 key aspects of a Bloodborne Pathogen Exposure Control Plan.

Possible responses.

- Must be a written plan.
- Identifies jobs and tasks where occupational exposure to blood or other potentially infectious material occurs.
- Describes how the employer will use engineering and work controls.
- Describes how the employee will ensure use of personal protective equipment (PPE).
- The plan must be accessible to employees.
- Must be reviewed at least annually to reflect changes in technology that will help eliminate or reduce employee exposure.

4. Explain how properly used PPE and appropriate housekeeping methods protect against exposure to bloodborne pathogens.

Possible responses.

- Gowns, gloves, face shields, eye protection, mouthpieces and resuscitation devices provide a barrier between potential contaminants and susceptible parts of the body.
- Cleaning and decontamination of work surfaces reduce the chances of exposure to a bloodborne pathogen.

5. List three important steps to take if exposed to a bloodborne pathogen.

Possible responses.

- Wash exposed area with soap and water.
- Flush splashes to nose, mouth or skin with water.
- Irrigate eyes with water or saline.
- Report the exposure.
- Seek the assistance of a health care professional to determine what
- Follow-up actions or treatment may be needed.

Planned Activities, Discussion, or Participant Interaction.

Step 3: Evaluating Student Learning and Instruction

Lesson Evaluation and Comments.

Medical Recordkeeping Requirements

Reporting and Recordkeeping

Any reports required by OSHA will be maintained by the Occupational Health Department. All reports (Training Certificates, Notice of HBV Vaccinations, exposure reports) will be maintained for 30 years. Occupationally contracted HBV or HIV will be recorded on the OSHA 200 Log of Occupational Injuries and Illnesses as an illness.

Exposures to blood-borne pathogens from contact with sharps will be recorded on the OSHA 200 Log of Occupational Injuries and Illnesses if treatment such as gamma globulin, hepatitis B immune globulin or hepatitis B vaccine is prescribed by a Physician.

- Employee's name and social security number
- Employee's hepatitis B vaccination status
- Results of examinations, medical testing, and post-exposure evaluation and follow-up procedures
- Health care professional's written opinion
- Information provided to the health care professional
- Employee medical records must be kept confidential and not disclosed or reported without the employee's written consent (unless required by law)
- Medical records must be maintained for duration of employment plus 30 years according to OSHA's rule governing access to employee exposure and medical records

1910.1030(h) OSHA Rule)

Access to employee exposure and medical records: 1910.1020



Human serum albumin

A plasma protein that aids the body in maintaining blood pressure.



Self-Sheathing Safety Device to Limit Needlesticks



Sharps Injury Log

Facts About Needlesticks

- 1 million accidental needlesticks are reported annually in the U.S.
- There is an accidental needlestick reported every 30 seconds
- 66% of accidental needlesticks are **Not** reported
- 3 million people are accidentally stuck with a needle each year in the US
- 86% of all occupationally related infectious disease transmissions result from accidental needlesticks
- 89% of healthcare workers with HIV-AIDS and Hepatitis, contracted the disease from an accidental needlestick
- 12,000 healthcare workers contract Hepatitis each year, due to a needlestick
- 18,000 healthcare workers are infected each year with Hepatitis, HIV and other blood-borne diseases, resulting from accidental needlesticks
- 86% of those infected are nurses
- 300 healthcare workers die each year as a result of infections from needlesticks
- The Federal Occupational Safety & Health Administration's Blood-Borne Pathogen Standard requires employers to "isolate or remove the blood-borne pathogens hazard from the (healthcare) workplace."
- Over \$3 billion is spent annually in the US to treat accidental needlesticks. This does **not** include the costs resulting from death, loss of income, civil suits, judgments and insurance
- New "*Safety Syringe*" technology has been available for years, but it is not being used in most facilities to eliminate the risk of disease, injury and death due to accidental needlesticks

OSHA Requirements

Employers must maintain a sharps injury log for the recording of injuries from contaminated sharps

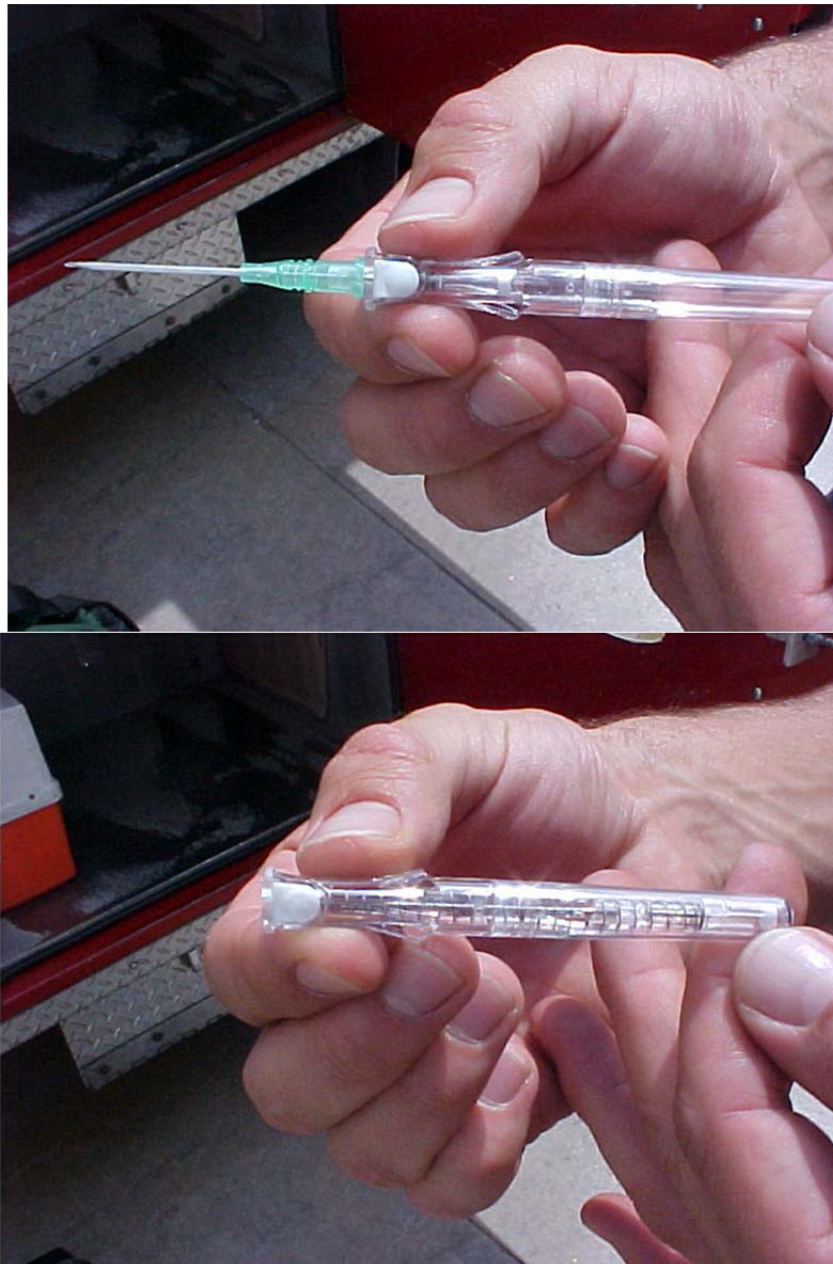
- The log must be maintained in a way that ensures employee privacy and must contain, at a minimum:
 - ✓ Type and brand of device involved in the incident
 - ✓ Location of the incident
 - ✓ Description of the incident

1910.1030(h)(5) (OSHA Rule)

The purpose of the sharps injury log is to aid in the evaluation of devices being used in the workplace and to quickly identify problem areas in the facility. It must be reviewed at least annually during the review and update of the Exposure Control Plan.

If the data is made available to other parties (e.g., supervisors, safety committees, employees), any information that could be used to identify the employee must be withheld to protect the employee's privacy.

The requirement to establish and maintain a sharps injury log applies to any employer who is required to maintain a log of occupational injuries and illnesses under 29 CFR 1904, OSHA's recordkeeping rule. The sharps injury log must be maintained for the period required by 29 CFR 1904.6.



Retractable Safety Device to Limit Needlesticks

Hypodermic needles and syringes shall be used only for parenteral injection and aspiration of fluids from laboratory animals and diaphragm bottles. Only needle-locking syringes or disposable syringe-needle units (i.e., the needle is integral to the syringe) shall be used for the injection or aspiration of other potentially infectious materials. Extreme caution shall be used when handling needles and syringes. A needle shall not be bent, sheared, replaced in the sheath or guard, or removed from the syringe following use. The needle and syringe shall be promptly placed in a puncture-resistant container and autoclaved or decontaminated before reuse or disposal.

West Nile Virus

West Nile virus was first recognized in the United States in 1999 as the cause of severe and fatal human illness in metropolitan New York City. West Nile virus is commonly found in Africa, West and Central Asia, and the Middle East. It is not known how the virus was first introduced into the United States, but since the initial appearance it has spread rapidly, and by 2001 was found throughout the eastern half of the country.

How is West Nile virus transmitted? Public health officials are assuring Americans that the blood supply is safe, as scientists at the Centers for Disease Control work to determine if a Georgia woman's donated organs may have infected four transplant recipients with the West Nile virus.



Questions remain over whether the woman contracted the virus from a mosquito bite or from one of the 37 units of blood she received before she died in August of injuries stemming from a car crash.

Concerns have arisen over the lack of a West Nile screening process in donated blood and organs. One report suggests the possibility that blood donors might be asked about whether they have recently been bitten by a mosquito.

Dr. Kirsten Alcorn, director of transfusion services at the Washington Hospital Center in Washington, D.C., believes this is an impractical solution.

"I think the rate of infection in humans is so low, with such a minimal illness in most individuals, that it would be nearly impossible to accurately screen donors on anything other than them feeling well and not being in an immediate period after not having felt well," she says. "Most blood centers do defer donors temporarily after even minor illnesses."

Dr. John Fung, chief of transplant surgery at the University of Pittsburgh, agrees, and says a mosquito bite-screening process would probably be detrimental to the blood supply. ***"I believe that denying blood donation for a period of two-three weeks after a mosquito bite may be an overreaction and lead to exacerbation of an already critically low blood supply,"*** he says.

"The way to assure that the blood supply is safe is to enhance donation, to improve screening methods and in the case of West Nile virus, to go after the source and reduce the mosquito population," he says.

"No one can promise that there won't be transmission of something. This is the current situation, even with very reliable hepatitis- and HIV-screening tools," he adds.

Cases Surpass Last Year's Outbreak

Outbreaks of the potentially fatal virus have been on the rise this year. So far, with several months to go during which the disease can be transmitted, there have been 371 human cases and 16 deaths, says Dawn Wesson, associate professor of tropical medicine at the Tulane School of Public Health and Tropical Medicine in New Orleans.

By contrast, there were just 149 cases and 18 deaths altogether from 1999 to 2001, says Wesson, adding: ***"So far this year we have already surpassed the case total of the first three years combined. We could exceed 500 cases this year."***

Principal Transmission Cycle of West Nile Virus

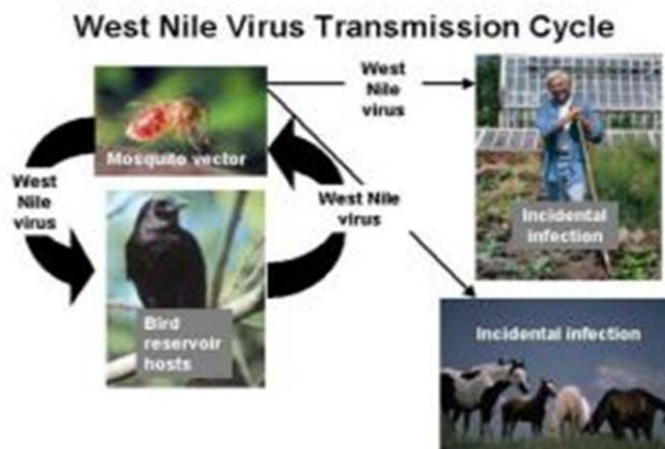
The principal transmission cycle of West Nile virus involves several species of mosquitoes and various species of birds. Mosquitoes become infected with West Nile virus when they feed on a bird carrying the virus in its blood. After 10 to 14 days, the virus can be transmitted to another bird, person, or other animal that the mosquito bites.

During blood feeding the mosquito injects the virus, contained in its saliva, into the bird, animal, or person – where the virus replicates and may cause illness.

See the CDC West Nile virus Web site for updated information:

<http://www.cdc.gov/ncidod/dvbid/westnile/>

Although humans and some other animals may get sick when infected with West Nile virus, it is thought that they usually do not develop enough virus in the bloodstream to infect mosquitoes. For this reason, humans and animals such as horses are referred to as incidental hosts.



The main role that people play in contributing to the continuing cycle of West Nile virus is by maintaining environments (especially standing water) in which mosquitoes can lay eggs.

What are the symptoms of West Nile Virus infection?

Most people who are infected with West Nile virus will not develop symptoms. Some people may become ill 3 to 15 days after the bite of an infected mosquito. Evidence suggests that a minority of infected persons will develop a mild illness with fever, headache, body aches, and sometimes skin rash and swollen glands. There are no known long-term effects due to mild illness.

West Nile virus infection infrequently results in a severe illness, however, known as West Nile encephalitis. Encephalitis is an inflammation of the brain that may be marked by headache, high fever, stiff neck, stupor, disorientation, coma, tremors, convulsions, muscle weakness, and paralysis. A small number of cases have been fatal.

Who is at risk for West Nile virus infection?

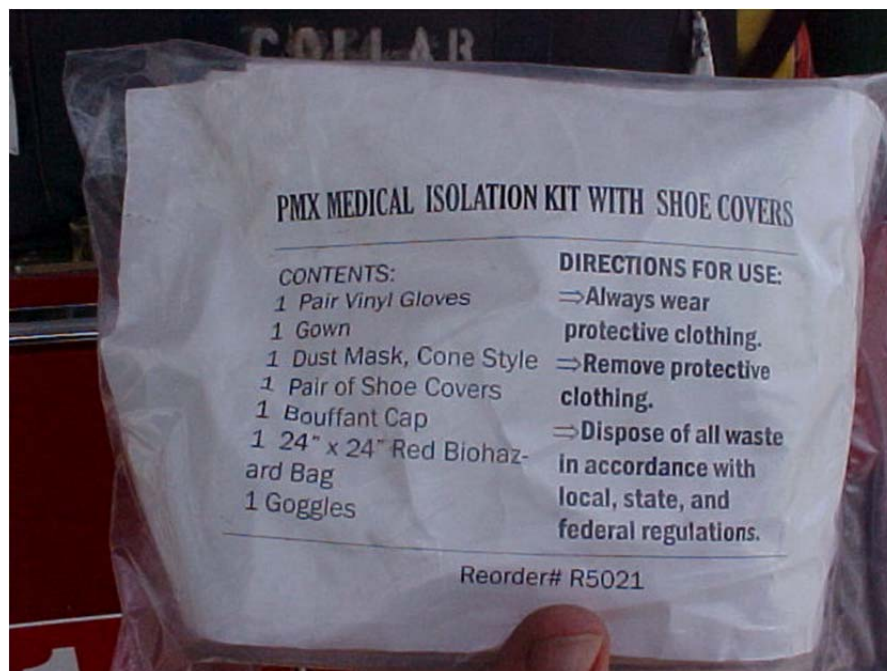
People are only at risk for becoming infected with West Nile virus when in areas where the virus is circulating in nature. In northern states, this is during the summer months, but in southern states transmission may occur year-round. The risk of West Nile encephalitis (the severe form of disease) is higher for persons 50 years of age and older.

Even in areas where West Nile virus transmission is occurring, infection of humans is still relatively rare. A study carried out in 1999 among residents in the most affected areas of New York City showed that 2.6% had been infected with West Nile virus. Studies elsewhere have shown a lower infection rate. As noted earlier, most infected persons have no or only mild symptoms.

There is no documented evidence that a pregnancy is at risk due to a mother's infection with West Nile virus.



Paramedic getting a disposable BBP protection kit



The employer shall provide a training program to employees who have no prior experience in handling human pathogens. Initial work activities shall not include the handling of infectious agents. A progression of work activities shall be assigned as techniques are learned and proficiency is developed. The employer shall assure that employees participate in work activities involving infectious agents only after proficiency has been demonstrated.

Sunflower Fire Department

Standard Operating Guidelines Example

Category: Operations	S.O.G.# 2-2:5
Section: Safety	Title: Infection Control Procedures
Subject: Infection Control Procedures	Page: 1 of 11
Draft: 2/2/92	
Revised: 3/14/02	

Subject: Infection Control Procedures for the Sunflower Fire Department

Purpose: The purpose of this SOG is to describe the equipment, procedures and policies concerning infection control efforts of the Sunflower Fire Department. This SOG compliments the Town Of Sunflower's Infection Control Program

Scope: The procedures outlined below shall be applied in all phases and all areas of PFD operation.

The Sunflower Fire Department is extremely concerned with the potential exposure of firefighters and all emergency workers to contagious diseases in the performance of their duties. These duties may expose firefighters to infectious agents without warning from the patient being treated.

To minimize the risk of exposure, all firefighters shall be provided with the necessary equipment and training to include initial and continuing education on infection control procedures and equipment.

REFERENCES:

Town of Sunflower Infection Control Program

OSHA regulations:

29 CFR Part 1910.1030 *Occupational Exposure to Bloodborne Pathogens* (Final Rule)

29 CFR Part 1910.20 *Access to Employee Exposure and Medical Records*

Definitions:

Blood - human blood, human blood components, and products made from human blood.

Bloodborne Pathogens - pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Contaminated - the presence or the reasonably anticipate presence of blood or other potentially infectious materials on an item or surface.

Decontamination - the use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

Employee's duties - the duties of employees designated as part of their job description. Employees who are not designated to render first aid and who perform unanticipated or collateral "Good Samaritan" acts are excluded from coverage since such an action does not constitute "occupational exposure".

HBV - hepatitis B virus

HIV - human immunodeficiency virus

Occupational exposure - the reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

Other Potentially Infectious Materials (OPIM) - any of the following:

Human body fluids including semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva or any other body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids

Any unfixed tissue or organ (other than intact skin) from a human (living or dead)

HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues potentially infected by HIV or HBV.

Parenteral - the piercing of mucous membranes or the skin barrier through such events as needlesticks, human bites, cuts, and abrasions.

Personal Protective Equipment (PPE) - the specialized clothing or equipment worn by an employee for protection against a hazard.

Post Exposure Prophylaxis (PEP) - Actions, counseling, and training provided after a serious exposure incident.

Universal Precaution - an approach to infection control. According to the concept of Universal Precaution, all human blood and certain human body fluids are treated as if known to be infectious for BBP or OPIM.

Work Practice Controls - controls that reduce the likelihood of exposure by altering the manner in which a task is performed.

EQUIPMENT:

The SFD shall provide firefighters and EMS personnel with the appropriate equipment and supplies to minimize the spread and effect of contagious or infectious agents. The equipment will be readily available to any provider on the scene and will be kept in serviceable condition. This will include but is not limited to the following:

- o Disposable patient use items: Bag-Valve-Masks, airways, blankets, oxygen delivery devices, thermometer covers, suction catheters, head immobilizers, etc.
- o Cleaning supplies: Disinfecting agents, soaps, disposable towels, red biohazard bags, etc.
- o Personal protective equipment: Latex gloves, masks, eye protection, gowns, sharps containers, etc.

PROCEDURES:

Implementation Methodology

- o Universal precautions will be observed in order to prevent contact with BBP or OPIM. All blood or OPIM will be considered infectious regardless of the perceived status of the source individual.
- o Engineering and work practice controls will be utilized to eliminate or minimize exposure to employees. The following engineering controls will be the minimum utilized:
 - Disposable sharps containers will be utilized.
 - Contaminated needles and other contaminated sharps shall not be bent, recapped, or handled without due care. The use of needleless or self-sheathing catheters is encouraged.
 - Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a reasonable likelihood of occupational exposure.

- All procedures involving BBP or OPIM shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances.
- Any blood or OPIM shall be placed in a container that prevents leakage during collection, handling, processing, storage, transport, or shipping. The use of absorbent materials to soak up spilled liquids should be done whenever possible.
- The use of properly marked and/or labeled containers will be used as required.
- Disposable sharps containers will not be opened, cleaned, or reused, and will only be filled to 3/4 full.
- Employees will wash hands with soap and water as soon as practical after exposures to BBP or OPIM and after removal of PPE. When hand-washing facilities are not immediately available, use of antiseptic or germicidal wipes will be utilized, followed by proper hand washing as soon as possible

Personal Protective Equipment:

Whenever the possibility of a provider being contaminated by a patient's body fluids exists, the provider must employ some sort of barrier protection. This will be even more important if the provider has some sort of open injury on their skin. The use of latex gloves will usually suffice as protection, double or triple gloving may be used if in the judgment of the provider it is deemed appropriate. If the splashing/spraying of body fluids is expected or likely, more complete protection may be required. These situations will require the use of goggles(eye protection), gowns, masks and gloves. These barrier protection devices shall be considered disposable and not used for more than one patient contact.

Protective equipment that has become contaminated shall be removed and disposed of immediately or as soon as possible. All protective equipment used will be removed and properly disposed of as soon as possible, either at the scene or at the hospital. Protective equipment that is soiled at an incident will not be worn in any PFD apparatus or brought back to the station except that equipment which is in a red biohazard bag.

Examples of treatments that may require the use of gloves are when starting IVs, drawing blood, handling a patient that is incontinent, providing airway maneuvers, controlling bleeding and bandaging. Goggles (eye protection) and masks will be employed when performing intubation or situations that may potentially result in body fluids spraying or splattering.

Uniforms that become contaminated will be changed as soon as is practical. Uniforms that are contaminated will be placed in a red biohazard bag until they can be correctly laundered and will be cleaned separately from normal laundry items. At no time will contaminated uniforms, or any other item for that matter, be taken

home to be cleaned. If the uniform is not able to be cleaned by processes available at the station it shall be disposed of and replaced at no cost to the provider. Personnel will also cleanse the skin area underneath the contaminated clothing by the appropriate method.

Hand Washing:

One of the most important considerations to affect infection control is the use of frequent hand washing. Providers shall wash their hands as soon as possible after each patient contact whether gloves were used or not. The use of anti-microbial soap is preferred and should be available on each SFD unit along with a water source. If soap and water are not readily available the provider will use the disposable anti-microbial wipes that will be kept on all EMS equipped apparatus. After using these wipes the provider will wash their hands as soon as soap and water is available.

Disposable Supplies:

The use of disposable medical equipment and supplies will be encouraged to reduce the possibility of cross contamination and handling of soiled equipment. At no time will a disposable item be used on more than one patient or attempted to be cleaned and restocked.

Handling of Soiled Equipment:

It is understood that some contamination of equipment will occur during the treatment and transportation phase of an incident. All providers should attempt to keep equipment as clean as possible. If it becomes necessary to handle soiled equipment, providers shall at least wear gloves and if necessary, masks and goggles, to avoid the splashing or flinging of potentially infected material onto their mucous membranes. Care will be taken while handling contaminated equipment to avoid unnecessary contamination of personnel. As soon as practical, contaminated equipment shall be placed in a red biohazard bag then transported to a suitable area to be cleaned. Disposable items shall then be disposed of properly, this means they will be placed in a red biohazard bag and taken to the hospital and placed in a trash receptacle marked with biohazard label.

Reusable equipment shall be cleaned in an appropriate location where possible contamination controls can be maintained. Gross particulate matter shall be rinsed off and washed down a sewer drain. Equipment shall then be cleaned and or soaked in either a 10% bleach solution or approved equivalent for at least ten minutes, then air dried if possible. The soaking time requirement may be adjusted to reflect the disinfectant instructions.

After decontaminating the equipment, any items used for cleaning and the general area shall be either cleaned/disinfected or disposed of in an appropriate manner.

Sharps:

Engineering controls mandated by OSHA require the use of "safer needle devices", such as needle-less systems and /or self-sheathing needles. These devices will be used whenever they are available. Sharps will be considered to be needles, syringes, IV catheters, scalpels and drug injection devices. All sharps should be handled with the utmost of care to avoid needle sticks and shall be placed in a suitable sharps container as soon as possible after use. (IV access needles shall be placed in a sharps container immediately, if no other possible alternative exists, then the needle can be sheathed by using the one-handed scoop technique.) Small sharps containers shall be kept in the trauma box on each ALS unit. These containers shall be disposed of at the hospital as soon as possible after the incident. At no time should providers stick needles into upholstered items or any place other than a sharps container.

Vaccinations:

All SFD personnel are encouraged to keep their immunizations up to date. These include but are not limited to: Measles, Mumps, Rubella, Tetanus, and Influenza. Most of these immunizations are available through the Gila County Health Dept. free of charge. In addition, all personnel will be offered free Hepatitis B vaccinations. If a provider wishes not to receive the HBV vaccination, they must sign a declination form to be kept in their personal file. If a provider who has signed a declination for the HBV vaccination changes his/her mind, the vaccination process will be initiated as soon as possible.

HBV titer checks may be done whenever deemed necessary by the department. Any required prophylactic actions will be provided for by the department.

Training

Training and information will be conducted upon initial assignment to tasks where occupational exposure may occur and on an annual basis. Training will include the following topics (as needed according to OSHA interpretation letters):

- Information about BBP, OPIM and OSHA standard for Bloodborne Pathogens.
- General explanation of symptoms of bloodborne diseases.
- An explanation of the modes of transmission of BBP.
- An explanation of the employer's exposure control plan.
- An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to BBP and OPIM.
- An explanation of the use and limitations of methods that will prevent or reduce exposure, including appropriate engineering controls, work practices, and PPE.
- Information about the types, proper uses, location, removal, handling, decontamination and disposal of PPE.
- An explanation regarding the basis for selection of PPE.

- Information regarding the appropriate actions to be taken in an emergency involving direct exposure to BBP or OPIM.
- An explanation of the symbols, labels and or color-coding required for bio-hazardous waste materials on packaging materials.
- An opportunity for interactive questions and answers with the person conducting the training session.

EXPOSURES:

This procedure outlines the process for SFD employees who, during the performance of their duties, are exposed to infectious diseases such as, but not limited to: hepatitis, HIV, tuberculosis, meningitis, or other biological agents such as scabies, lice, etc.

All exposures must be reported and documented

If a provider has an exposure incident they are entitled to a confidential medical evaluation and follow-up. However, the provider must report the exposure immediately so that documentation and tracking can begin. Any treatment, testing or additional follow-up which is medically necessary will be provided to the provider by the Department.

When an exposure occurs, immediate decontamination shall begin. Any soiled protective equipment will be removed, and the skin surface/mucous membrane area rinsed with water. Any skin area will then be thoroughly cleaned with an antimicrobial soap and water. If the exposure involves a needle stick/ wound, immediately bleed the wound and wash thoroughly with soap and water and bandage.

If emergency treatment is required as a result of the exposure incident, it will be provided through the Sunflower Regional Medical Center (SRMC) Emergency Room or by Sunflower Fire Department personnel as required.

Appropriate departmental and town notifications and documentation will be done as soon as possible. For severe exposures this may include:

- o Non-Routine Encounter Form
- o Supervisors Report of Industrial Injury
- o Personal Accident/Injury Report
- o Report of Significant Work Exposure to Bodily Fluids [ICA Form] (see appendix A)
- o Addendum to ICA report of Significant Work Exposure to Bodily Fluids (see appendix A)

The SRMC Emergency Room Staff/Physician will be consulted for possible medical treatment and Exposure documentation and follow-up as outlined in O.S.H.A. 1910.1030 (f) (3) (II) (A)

The Town of Sunflower's health provider will review the incident with the employee and determine the level of risk. Prophylaxis will be recommended and offered depending on the level of exposure. PEP will be decided on a case-by-case basis, based on the exposure risk and likelihood of infection in known or possible source patients.

Where a less severe exposure occurs (i.e. a severity rating of "Minimal" or "Probable None") the following paperwork should be completed:

- o Sunflower Fire Department Infectious Exposure Form
- o Supervisors Report of Industrial Injury
- o Non-Routine Encounter Form

The employee's immediate supervisor should be contacted in all cases of exposure.

MEDICAL EXPOSURE SEVERITY RATING:

- SIGNIFICANT
 - o Source blood, urine, feces, semen, saliva, mucous, tears or other medical contaminant to provider's blood through direct entry point (i.e. break in skin).
- MODERATE
 - o Source blood, urine, feces, mucous or other medical contaminant to provider's mucous membranes (i.e. eye, mouth). These membranes can be rinsed to reduce exposure severity.
- MINIMAL
 - o Patient blood, urine, feces or other medical contaminant to provider's intact skin. Skin can be cleaned.
 - o Patient skin in contact with provider's mucous membranes. Membranes can be rinsed.
- PROBABLE NONE
 - o Provider in area, but no direct contact with patient or body fluids.
 - o Patient's skin in contact with provider's intact skin. Skin can be cleaned.

OFF-DUTY EXPOSURES:

Due to the hazardous nature of some communicable diseases, providers shall be required to report to their supervisor when they have received a confirmed exposure that has occurred off-duty or is being medically treated or tested due to presenting signs or symptoms. Verbal notification shall be followed up with a note or letter from the provider's physician describing the disease exposed to, treatment required, and fitness for regular duty relative to the communicability hazard to fellow workers and civilians at emergency incidents.

RECORD KEEPING

Medical Records - The Town shall establish and maintain an accurate record for each employee with occupational exposure, in accordance with 29 CFR 1910.1020 and 1910.1030. (Department Heads are responsible for insuring that a copy of these records is forwarded to Administrative Services.) This record shall include:

- Employee name and social security number
- A copy of the employee's HEP B vaccination status including the dates of all of the vaccinations and any medical records relative to the same.
- A copy of all results of examinations, medical testing and follow-up procedures as required by exposure incidents.
- The employer's copy of the healthcare professional's written opinion required for exposure incidents.
- A copy of the information provided to the healthcare professional as required by exposure incidents.

The employer shall maintain all such records confidential and shall not disclose or report any of the contents without the employee's express written consent to any person within or outside the workplace except as required by this section or as may be required by law.

The employer shall maintain these medical records for at least the duration of employment plus 30 years in accordance with 29 CFR 1910.1020

Training Records - (Department Heads are responsible for insuring that a copy of these records is forwarded to Administrative Services.) Training records shall include the following information

- The names and job titles of all persons attending the training session(s)
- The dates of the training session(s)
- The contents or a summary of the training session(s)
- The name(s) and qualifications of person(s) conducting the training
- The employer shall maintain these training records for 3 years from the date on which the training occurred.

Infection Exposure Form *Example*

Sunflower Fire Department

EXPOSED EMPLOYEE : _____ RANK : _____

SOCIAL SECURITY NUMBER : _____ HOME PHONE : _____

INCIDENT NUMBER : _____ TYPE OF CALL : _____

NAME OF PATIENT : _____ SEX : _____ AGE : _____

SUSPECTED OR CONFIRMED DISEASE: _____

PT. TRANSPORTED TO : _____ BY : _____

DATE OF EXPOSURE : _____ TIME OF EXPOSURE : _____

WHAT WERE YOU EXPOSED TO : BLOOD _____ FECES _____ URINE _____
SALIVA _____ VOMITUS _____ SPUTUM _____ OTHER _____

WHAT PART (S) OF YOUR BODY BECAME EXPOSED: BE SPECIFIC :

DID YOU HAVE ANY OPEN CUTS, SORE OR RASHES THAT BECAME EXPOSED; BE SPECIFIC :

HOW DID EXPOSURE OCCUR:

DID YOU SEEK MEDICAL ATTENTION: _____

WHEN: _____

WHERE: _____

COPIES OF FORM TO EMS COORDINATOR _____ BASE STATION COORDINATOR _____
CHIEF _____

Glossary

Acidosis

Excessive acidity of body fluids due to accumulation of acids as may happen in diabetes or kidney disease.

Allogeneic

Blood from someone else that matches yours, usually from a volunteer blood donor. Also referred to as homologous blood.

Alloimmunization

The process of making an antibody against a foreign antigen.

Antibody

Proteins that react with antigens on red blood cells and may destroy transfused red blood cells.

Anticoagulant

A substance that prevents the clotting or thickening of blood.

Antigen

A substance on the surface of red blood cells that elicits an immune response when transfused into a patient who lacks that antigen.

Aphaeresis

A procedure where whole blood is removed from the body and a desired component is retained, while the remainder of the blood is returned to the donor.

Aplastic Anemia

An anemia caused by deficient red blood cell production by the bone marrow.

Autoimmune

The process of making antibodies against one's self (one's intrinsic antigens).

Bacterial Sepsis

An overwhelming infection of the blood and body organs.

Blood drive captains

Enthusiastic representatives of an organization that publicize the blood drive and recruit donors.

Blood type

Everyone's blood falls into one of four groups, or types: A, B, AB or O. The type depends on the presence or absence of certain substances on red blood cells. Blood types are inherited.

Bone marrow

The soft tissue located in the cavities of bones which is responsible for blood cell and platelet production.

CMV (Cytomegalo Virus)

A virus that may cause flu-like symptoms in the general population, but may cause severe disease in premature babies, bone marrow transplant recipients, and AIDS patients.

Component

A "part" of blood. Blood is made up of different "parts" or components: red blood cells, plasma, platelets and several types of white blood cells. Each component has its own job to do. We can separate blood into components so patients can be transfused only with what they need.

Cross match

To find similarities between a patient's blood and a donor's blood using laboratory tests.

Dilutional coagulopathy

Usually seen in patients with trauma after receiving multiple red blood transfusions. The transfusions dilute the body's own platelets and coagulation factors, which may predispose to bleeding. These individuals may require platelet and plasma transfusions.

Donate / donation

To give blood. A blood donation is a little less than one pint. Specific components can also be donated.

Engraftment

The process by which transplanted or transfused cells (for example, after a bone marrow transplant) begin to grow and reproduce themselves within the recipient.

Ethnic

Pertaining to people with origins from different parts of the world.

Erythrocytapheresis

An apheresis procedure where red blood cells are collected.

Extracorporeal

Blood circulation occurring outside of the body, for example, in an apheresis machine during donation.

Factor XIII

A clotting factor that stabilizes blood clots.

Factor VIII-Rich Cryoprecipitate

Contains the clotting factor used to control bleeding in hemophiliacs.

Febrile

Having a fever

Fibrinogen

A protein involved in coagulation. Fibrinogen reacts with other molecules to produce blood clots.

Graft-versus-host disease (GVHD)

A reaction where transplanted or transfused cells attack the recipient's own cells.

Granulocytes

A type of white blood cell that attacks and destroys foreign substances.

Hematocrit

A measure of the amount of red blood cells in your body.

Hematologic

Of the blood.

Hematologist

A blood specialist.

Hematopoiesis

The formation of and development of blood cells.

Hemoglobin

The molecule in the red blood cell that carries oxygen. Hemoglobin combines with oxygen in the lungs and releases it in the tissues. It is what makes blood red.

Hemostasis

The process of clotting.

HLA type

Antigens present on most cells of the body which are unique to the individual. It may be considered to be the individual's genetic fingerprint.

HTLV

A virus that may cause blood or nerve disease.

Human serum albumin

A plasma protein that aids the body in maintaining blood pressure.

Hypoxemia

Low oxygen levels in the blood.

Idiopathic thrombocytopenic purpura (ITP)

An autoimmune disease where the body makes antibodies against its own platelets.

Immunoglobulin alpha (IgA)

A type of immunoglobulin present in blood and body secretions which may aid in fighting infections.

Immunosuppressed

A condition brought about by disease or chemotherapy where the individual is highly susceptible to infection.

Irradiated red blood cells

Red blood cells treated with radiation to inactivate white blood cells which may cause graft-versus-host disease.

Leukocyte

Another term for a white blood cell.

Leukocyte-reduced blood components

Prevent transfusion reactions caused by white cells contaminating red cell and platelet preparations and may reduce the likelihood of certain infections.

Leukoreduced

Removal of white blood cells from products in order to prevent certain transfusion reactions such as fever, chills, and alloimmunization.

Lymphocytes

A leukocyte that directs the formation of antibodies, and that has memory.

Metabolic

Pertaining to all chemical functions within the body.

Neoplastic disease

Another term for cancer.

Neurologic

Refers to the brain, spinal cord, and nerves.

Nonhemolytic

Refers to transfusion reactions where the red blood cell is not destroyed.

Oncologic

A term for the study of cancer.

Pathologic

A term for disease.

Perioperative Autologous Transfusions (PAT)

The recovery, washing and reinfusion of a patient's own blood, which has been lost, during and after surgery in order to reduce the need for transfusions.

Peripheral stem cell collection and processing

The removal, separation and freezing of peripheral blood or marrow, which contain stem cells, for later reinfusion to restore a patient's blood manufacturing capability after radiation or chemotherapy.

Plasma - Plasma is 92% water, 7% protein and 1% minerals. Plasma is the source of gamma globulin, albumin and clotting factors. Plasma is used to treat clotting disorders, burn victims and shock.

Plateletpheresis

An apheresis procedure where platelets are collected.

Platelets

Colorless cells whose main function is to control bleeding. Platelets are essential to normal blood clotting. They can be wiped out during treatment for cancer, leukemia, aplastic anemia and other diseases.

Prophylactic

Preventative.

Rare Blood Reference Laboratory and Frozen Rare Blood Storage Program

Used to identify and cross-match rare blood groups and components for hospitals, and then supply those units.

Red Cells

Red cells transport oxygen to body cells and remove carbon dioxide. Red cells contain iron in the hemoglobin.

Renal

Of the kidney.

Rh

The Rh factor is an inherited blood group on red blood cells like the ABO blood types. About 85% of the people in this country have it. Those who have it are "**Rh-positive**," those who don't are "**Rh-negative**."

Saline

Salt water.

Sickle cell disease

A disease in which the affected person makes an abnormal hemoglobin. Sickle cell disease is inherited.

Special Diagnostics Laboratory

Performs sophisticated assays for infectious disease on behalf of hospitals.

Special Donor Services

Maintains files of donors who have volunteered for the National Marrow Donor Registry, so they can be matched with patients anywhere in the country who are in need of an unrelated bone marrow transplant.

Therapeutic apheresis

Enables hospitals to separate certain blood components from a patient and either replace or treat them before reinfusion.

Transfusion

Replacing blood or blood components a body has lost in surgery, through an accident, or as a result of medical treatment such as chemotherapy.

Thrombocytopenia

A low platelet count.

Thrombotic thrombocytopenic purpura (TTP)

A disease state in which red blood cells and platelets are destroyed and the body produces excessive blood clots which may damage the kidneys and nervous system.

von Willebrand disease

A type of blood clotting disorder.

Warfarin effect

Refers to the effect of thinning of the blood by a medication known as warfarin or coumadin.

White Cells (Leukocytes)

The protective cells in the bloodstream. They attack bacteria by squeezing through capillary walls to reach the area of infection.

§ 1910.1030 Bloodborne pathogens. OSHA Rule

(a) Scope and Application. This section applies to all occupational exposure to blood or other potentially infectious materials as defined by paragraph (b) of this section.

(b) Definitions. For purposes of this section, the following shall apply:

Assistant Secretary means the Assistant Secretary of Labor for Occupational Safety and Health, or designated representative.

Blood means human blood, human blood components, and products made from human blood.

Bloodborne Pathogens means pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Clinical Laboratory means a workplace where diagnostic or other screening procedures are performed on blood or other potentially infectious materials.

Contaminated means the presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

Contaminated Laundry means laundry which has been soiled with blood or other potentially infectious materials or may contain sharps.

Contaminated Sharps means any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

Decontamination means the use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

Director means the Director of the National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designated representative.

Engineering controls means controls (e.g., sharps disposal containers, self-sheathing needles, safer medical devices, such as sharps with engineered sharps injury protections and needleless systems) that isolate or remove the bloodborne pathogens hazard from the workplace.

Exposure Incident means a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.

Handwashing Facilities means a facility providing an adequate supply of running potable water, soap and single use towels or hot air drying machines.

Licensed Healthcare Professional is a person whose legally permitted scope of practice allows him or her to independently perform the activities required by paragraph (f) Hepatitis B Vaccination and Post-exposure Evaluation and Follow-up.

HBV means hepatitis B virus.

HIV means human immunodeficiency virus.

Needleless systems means a device that does not use needles for:

- (1) The collection of bodily fluids or withdrawal of body fluids after initial venous or arterial access is established;
- (2) The administration of medication or fluids; or
- (3) Any other procedure involving the potential for occupational exposure to bloodborne pathogens due to percutaneous injuries from contaminated sharps.

Occupational Exposure means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

Other Potentially Infectious Materials means

- (1) The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids;
- (2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and
- (3) HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Parenteral means piercing mucous membranes or the skin barrier through such events as needlesticks, human bites, cuts, and abrasions.

Personal Protective Equipment is specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

Production Facility means a facility engaged in industrial-scale, large-volume or high concentration production of HIV or HBV.

Regulated Waste means liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.

Research Laboratory means a laboratory producing or using research-laboratory-scale amounts of HIV or HBV. Research laboratories may produce high concentrations of HIV or HBV but not in the volume found in production facilities.

Sharps with engineered sharps injury protections means a nonneedle sharp or a needle device used for withdrawing body fluids, accessing a vein or artery, or administering medications or other fluids, with a built-in safety feature or mechanism that effectively reduces the risk of an exposure incident.

Source Individual means any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee. Examples include, but are not limited to, hospital and clinic patients; clients in institutions for the developmentally disabled; trauma victims; clients of drug and alcohol treatment facilities; residents of hospices and nursing homes; human remains; and individuals who donate or sell blood or blood components.

Sterilize means the use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospores.

Universal Precautions is an approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

Work Practice Controls means controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g., prohibiting recapping of needles by a two-handed technique).

(c) Exposure control -- (1) Exposure Control Plan. (i) Each employer having an employee(s) with occupational exposure as defined by paragraph (b) of this section shall establish a written Exposure Control Plan designed to eliminate or minimize employee exposure.

(ii) The Exposure Control Plan shall contain at least the following elements:

(A) The exposure determination required by paragraph(c)(2),

(B) The schedule and method of implementation for paragraphs (d) Methods of Compliance, (e) HIV and HBV Research Laboratories and Production Facilities, (f) Hepatitis B Vaccination and Post-Exposure Evaluation and Follow-up, (g) Communication of Hazards to Employees, and (h) Recordkeeping, of this standard, and

(C) The procedure for the evaluation of circumstances surrounding exposure incidents as required by paragraph (f)(3)(i) of this standard.

(iii) Each employer shall ensure that a copy of the Exposure Control Plan is accessible to employees in accordance with 29 CFR 1910.20(e).

(iv) The Exposure Control Plan shall be reviewed and updated at least annually and whenever necessary to reflect new or modified tasks and procedures which affect occupational exposure and to reflect new or revised employee positions with occupational exposure. The review and update of such plans shall also:

(A) Reflect changes in technology that eliminate or reduce exposure to bloodborne pathogens; and

(B) Document annually consideration and implementation of appropriate commercially available and effective safer medical devices designed to eliminate or minimize occupational exposure.

(v) An employer, who is required to establish an Exposure Control Plan shall solicit input from non-managerial employees responsible for direct patient care who are potentially exposed to injuries from contaminated sharps in the identification, evaluation, and selection of effective engineering and work practice controls and shall document the solicitation in the Exposure Control Plan.

(vi) The Exposure Control Plan shall be made available to the Assistant Secretary and the Director upon request for examination and copying.

(2) Exposure determination. (i) Each employer who has an employee(s) with occupational exposure as defined by paragraph (b) of this section shall prepare an exposure determination. This exposure determination shall contain the following:

(A) A list of all job classifications in which all employees in those job classifications have occupational exposure;

(B) A list of job classifications in which some employees have occupational exposure, and

(C) A list of all tasks and procedures or groups of closely related task and procedures in which occupational exposure occurs and that are performed by employees in job classifications listed in accordance with the provisions of paragraph (c)(2)(i)(B) of this standard.

(ii) This exposure determination shall be made without regard to the use of personal protective equipment.

(d) Methods of compliance -- (1) General -- Universal precautions shall be observed to prevent contact with blood or other potentially infectious materials. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials.

(2) Engineering and work practice controls. (i) Engineering and work practice controls shall be used to eliminate or minimize employee exposure. Where occupational exposure remains after institution of these controls, personal protective equipment shall also be used.

(ii) Engineering controls shall be examined and maintained or replaced on a regular schedule to ensure their effectiveness.

(iii) Employers shall provide handwashing facilities which are readily accessible to employees.

(iv) When provision of handwashing facilities is not feasible, the employer shall provide either an appropriate antiseptic hand cleanser in conjunction with clean cloth/paper towels or antiseptic towelettes. When antiseptic hand cleansers or towelettes are used, hands shall be washed with soap and running water as soon as feasible.

(v) Employers shall ensure that employees wash their hands immediately or as soon as feasible after removal of gloves or other personal protective equipment.

(vi) Employers shall ensure that employees wash hands and any other skin with soap and water, or flush mucous membranes with water immediately or as soon as feasible following contact of such body areas with blood or other potentially infectious materials.

(vii) Contaminated needles and other contaminated sharps shall not be bent, recapped, or removed except as noted in paragraphs (d)(2)(vii)(A) and (d)(2)(vii)(B) below. Shearing or breaking of contaminated needles is prohibited.

(A) Contaminated needles and other contaminated sharps shall not be bent, recapped or removed unless the employer can demonstrate that no alternative is feasible or that such action is required by a specific medical or dental procedure.

(B) Such bending, recapping or needle removal must be accomplished through the use of a mechanical device or a one-handed technique.

(viii) Immediately or as soon as possible after use, contaminated reusable sharps shall be placed in appropriate containers until properly reprocessed. These containers shall be:

(A) Puncture resistant;

(B) Labeled or color-coded in accordance with this standard;

(C) Leakproof on the sides and bottom; and

(D) In accordance with the requirements set forth in paragraph (d)(4)(ii)(E) for reusable sharps.

(ix) Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a reasonable likelihood of occupational exposure.

(x) Food and drink shall not be kept in refrigerators, freezers, shelves, cabinets or on countertops or benchtops where blood or other potentially infectious materials are present.

(xi) All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances.

(xii) Mouth pipetting/suctioning of blood or other potentially infectious materials is prohibited.

(xiii) Specimens of blood or other potentially infectious materials shall be placed in a container which prevents leakage during collection, handling, processing, storage, transport, or shipping.

(A) The container for storage, transport, or shipping shall be labeled or color-coded according to paragraph (g)(1)(i) and closed prior to being stored, transported, or shipped. When a facility utilizes Universal Precautions in the handling of all specimens, the labeling/color-coding of specimens is not

necessary provided containers are recognizable as containing specimens. This exemption only applies while such specimens/containers remain within the facility. Labeling or color-coding in accordance with paragraph (g)(1)(i) is required when such specimens/containers leave the facility.

(B) If outside contamination of the primary container occurs, the primary container shall be placed within a second container which prevents leakage during handling, processing, storage, transport, or shipping and is labeled or color-coded according to the requirements of this standard.

(C) If the specimen could puncture the primary container, the primary container shall be placed within a secondary container which is puncture-resistant in addition to the above characteristics.

(xiv) Equipment which may become contaminated with blood or other potentially infectious materials shall be examined prior to servicing or shipping and shall be decontaminated as necessary, unless the employer can demonstrate that decontamination of such equipment or portions of such equipment is not feasible.

(A) A readily observable label in accordance with paragraph (g)(1)(i)(H) shall be attached to the equipment stating which portions remain contaminated.

(B) The employer shall ensure that this information is conveyed to all affected employees, the servicing representative, and/or the manufacturer, as appropriate, and prior to handling, servicing, or shipping so that appropriate precautions will be taken.

(3) Personal protective equipment -- (i) Provision. When there is occupational exposure, the employer shall provide, at no cost to the employee, appropriate personal protective equipment such as, but not limited to, gloves, gowns, laboratory coats, face shields or masks and eye protection, and mouthpieces, resuscitation bags, pocket masks, or other ventilation devices. Personal protective equipment will be considered "appropriate" only if it does not permit blood or other potentially infectious materials to pass through to or reach the employee's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used.

(ii) Use. The employer shall ensure that the employee uses appropriate personal protective equipment unless the employer shows that the employee temporarily and briefly declined to use personal protective equipment when, under rare and extraordinary circumstances, it was the employee's professional judgment that in the specific instance its use would have prevented the delivery of health care or public safety services or would have posed an increased hazard to the safety of the worker or co-worker. When the employee makes this judgment, the circumstances shall be investigated and documented in order to determine whether changes can be instituted to prevent such occurrences in the future.

(iii) Accessibility. The employer shall ensure that appropriate personal protective equipment in the appropriate sizes is readily accessible at the worksite or is issued to employees. Hypoallergenic gloves, glove liners, powderless gloves, or other similar alternatives shall be readily accessible to those employees who are allergic to the gloves normally provided.

(iv) Cleaning, Laundering, and Disposal. The employer shall clean, launder, and dispose of personal protective equipment required by paragraphs (d) and (e) of this standard, at no cost to the employee.

(v) Repair and Replacement. The employer shall repair or replace personal protective equipment as needed to maintain its effectiveness, at no cost to the employee.

(vi) If a garment(s) is penetrated by blood or other potentially infectious materials, the garment(s) shall be removed immediately or as soon as feasible.

(vii) All personal protective equipment shall be removed prior to leaving the work area.

(viii) When personal protective equipment is removed it shall be placed in an appropriately designated area or container for storage, washing, decontamination or disposal.

(ix) Gloves. Gloves shall be worn when it can be reasonably anticipated that the employee may have hand contact with blood, other potentially infectious materials, mucous membranes, and non-intact skin; when performing vascular access procedures except as specified in paragraph (d)(3)(ix)(D); and when handling or touching contaminated items or surfaces.

(A) Disposable (single use) gloves such as surgical or examination gloves, shall be replaced as soon as practical when contaminated or as soon as feasible if they are torn, punctured, or when their ability to function as a barrier is compromised.

(B) Disposable (single use) gloves shall not be washed or decontaminated for re-use.

(C) Utility gloves may be decontaminated for re-use if the integrity of the glove is not compromised. However, they must be discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration or when their ability to function as a barrier is compromised.

(D) If an employer in a volunteer blood donation center judges that routine gloving for all phlebotomies is not necessary then the employer shall:

- (1) Periodically reevaluate this policy;
- (2) Make gloves available to all employees who wish to use them for phlebotomy;
- (3) Not discourage the use of gloves for phlebotomy; and
- (4) Require that gloves be used for phlebotomy in the following circumstances:
 - (i) When the employee has cuts, scratches, or other breaks in his or her skin;
 - (ii) When the employee judges that hand contamination with blood may occur, for example, when performing phlebotomy on an uncooperative source individual; and
 - (iii) When the employee is receiving training in phlebotomy.

(x) Masks, Eye Protection, and Face Shields. Masks in combination with eye protection devices, such as goggles or glasses with solid side shields, or chin-length face shields, shall be worn whenever splashes, spray, spatter, or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can be reasonably anticipated.

(xi) Gowns, Aprons, and Other Protective Body Clothing. Appropriate protective clothing such as, but not limited to, gowns, aprons, lab coats, clinic jackets, or similar outer garments shall be worn in occupational exposure situations. The type and characteristics will depend upon the task and degree of exposure anticipated.

(xii) Surgical caps or hoods and/or shoe covers or boots shall be worn in instances when gross contamination can reasonably be anticipated (e.g., autopsies, orthopedic surgery).

(4) Housekeeping. (i) General. Employers shall ensure that the worksite is maintained in a clean and sanitary condition. The employer shall determine and implement an appropriate written schedule for cleaning and method of decontamination based upon the location within the facility, type of surface to be cleaned, type of soil present, and tasks or procedures being performed in the area.

(ii) All equipment and environmental and working surfaces shall be cleaned and decontaminated after contact with blood or other potentially infectious materials.

(A) Contaminated work surfaces shall be decontaminated with an appropriate disinfectant after completion of procedures; immediately or as soon as feasible when surfaces are overtly contaminated or after any spill of blood or other potentially infectious materials; and at the end of the work shift if the surface may have become contaminated since the last cleaning.

(B) Protective coverings, such as plastic wrap, aluminum foil, or imperviously-backed absorbent paper used to cover equipment and environmental surfaces, shall be removed and replaced as soon as feasible when they become overtly contaminated or at the end of the workshift if they may have become contaminated during the shift.

(C) All bins, pails, cans, and similar receptacles intended for reuse which have a reasonable likelihood for becoming contaminated with blood or other potentially infectious materials shall be inspected and decontaminated on a regularly scheduled basis and cleaned and decontaminated immediately or as soon as feasible upon visible contamination.

(D) Broken glassware which may be contaminated shall not be picked up directly with the hands. It shall be cleaned up using mechanical means, such as a brush and dust pan, tongs, or forceps.

(E) Reusable sharps that are contaminated with blood or other potentially infectious materials shall not be stored or processed in a manner that requires employees to reach by hand into the containers where these sharps have been placed.

(iii) Regulated Waste.

(A) Contaminated Sharps Discarding and Containment. (1) Contaminated sharps shall be discarded immediately or as soon as feasible in containers that are:

- (i) Closable;
- (ii) Puncture resistant;
- (iii) Leakproof on sides and bottom; and
- (iv) Labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard.

(2) During use, containers for contaminated sharps shall be:

- (i) Easily accessible to personnel and located as close as is feasible to the immediate area where sharps are used or can be reasonably anticipated to be found (e.g., laundries);
- (ii) Maintained upright throughout use; and
- (iii) Replaced routinely and not be allowed to overfill.

(3) When moving containers of contaminated sharps from the area of use, the containers shall be:

- (i) Closed immediately prior to removal or replacement to prevent spillage or protrusion of contents during handling, storage, transport, or shipping;
- (ii) Placed in a secondary container if leakage is possible. The second container shall be:
 - (A) Closable;
 - (B) Constructed to contain all contents and prevent leakage during handling, storage, transport, or shipping; and
 - (C) Labeled or color-coded according to paragraph (g)(1)(i) of this standard.
- (4) Reusable containers shall not be opened, emptied, or cleaned manually or in any other manner which would expose employees to the risk of percutaneous injury.
- (B) Other Regulated Waste Containment. (1) Regulated waste shall be placed in containers which are:
 - (i) Closable;
 - (ii) Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping;
 - (iii) Labeled or color-coded in accordance with paragraph (g)(1)(i) this standard; and
 - (iv) Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.
- (2) If outside contamination of the regulated waste container occurs, it shall be placed in a second container. The second container shall be:
 - (i) Closable;
 - (ii) Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping;
 - (iii) Labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard; and
 - (iv) Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.
- (C) Disposal of all regulated waste shall be in accordance with applicable regulations of the United States, States and Territories, and political subdivisions of States and Territories.
- (iv) Laundry.
 - (A) Contaminated laundry shall be handled as little as possible with a minimum of agitation. (1) Contaminated laundry shall be bagged or containerized at the location where it was used and shall not be sorted or rinsed in the location of use.
 - (2) Contaminated laundry shall be placed and transported in bags or containers labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard. When a facility utilizes Universal Precautions in the handling of all soiled laundry, alternative labeling or color-coding is sufficient if it permits all employees to recognize the containers as requiring compliance with Universal Precautions.
 - (3) Whenever contaminated laundry is wet and presents a reasonable likelihood of soak-through or leakage from the bag or container, the laundry shall be placed and transported in bags or containers which prevent soak-through and/or leakage of fluids to the exterior.
 - (B) The employer shall ensure that employees who have contact with contaminated laundry wear protective gloves and other appropriate personal protective equipment.
 - (C) When a facility ships contaminated laundry off-site to a second facility which does not utilize Universal Precautions in the handling of all laundry, the facility generating the contaminated laundry must place such laundry in bags or containers which are labeled or color-coded in accordance with paragraph (g)(1)(i).
- (e) HIV and HBV Research Laboratories and Production Facilities. (1) This paragraph applies to research laboratories and production facilities engaged in the culture, production, concentration, experimentation, and manipulation of HIV and HBV. It does not apply to clinical or diagnostic laboratories engaged solely in the analysis of blood, tissues, or organs. These requirements apply in addition to the other requirements of the standard.
 - (2) Research laboratories and production facilities shall meet the following criteria:
 - (i) Standard microbiological practices. All regulated waste shall either be incinerated or decontaminated by a method such as autoclaving known to effectively destroy bloodborne pathogens.
 - (ii) Special practices.
 - (A) Laboratory doors shall be kept closed when work involving HIV or HBV is in progress.
 - (B) Contaminated materials that are to be decontaminated at a site away from the work area shall be placed in a durable, leakproof, labeled or color-coded container that is closed before being removed from the work area.

(C) Access to the work area shall be limited to authorized persons. Written policies and procedures shall be established whereby only persons who have been advised of the potential biohazard, who meet any specific entry requirements, and who comply with all entry and exit procedures shall be allowed to enter the work areas and animal rooms.

(D) When other potentially infectious materials or infected animals are present in the work area or containment module, a hazard warning sign incorporating the universal biohazard symbol shall be posted on all access doors. The hazard warning sign shall comply with paragraph (g)(1)(ii) of this standard.

(E) All activities involving other potentially infectious materials shall be conducted in biological safety cabinets or other physical-containment devices within the containment module. No work with these other potentially infectious materials shall be conducted on the open bench.

(F) Laboratory coats, gowns, smocks, uniforms, or other appropriate protective clothing shall be used in the work area and animal rooms. Protective clothing shall not be worn outside of the work area and shall be decontaminated before being laundered.

(G) Special care shall be taken to avoid skin contact with other potentially infectious materials. Gloves shall be worn when handling infected animals and when making hand contact with other potentially infectious materials is unavoidable.

(H) Before disposal all waste from work areas and from animal rooms shall either be incinerated or decontaminated by a method such as autoclaving known to effectively destroy bloodborne pathogens.

(I) Vacuum lines shall be protected with liquid disinfectant traps and high-efficiency particulate air (HEPA) filters or filters of equivalent or superior efficiency and which are checked routinely and maintained or replaced as necessary.

(J) Hypodermic needles and syringes shall be used only for parenteral injection and aspiration of fluids from laboratory animals and diaphragm bottles. Only needle-locking syringes or disposable syringe-needle units (i.e., the needle is integral to the syringe) shall be used for the injection or aspiration of other potentially infectious materials. Extreme caution shall be used when handling needles and syringes. A needle shall not be bent, sheared, replaced in the sheath or guard, or removed from the syringe following use. The needle and syringe shall be promptly placed in a puncture-resistant container and autoclaved or decontaminated before reuse or disposal.

(K) All spills shall be immediately contained and cleaned up by appropriate professional staff or others properly trained and equipped to work with potentially concentrated infectious materials.

(L) A spill or accident that results in an exposure incident shall be immediately reported to the laboratory director or other responsible person.

(M) A biosafety manual shall be prepared or adopted and periodically reviewed and updated at least annually or more often if necessary. Personnel shall be advised of potential hazards, shall be required to read instructions on practices and procedures, and shall be required to follow them.

(iii) Containment equipment. (A) Certified biological safety cabinets (Class I, II, or III) or other appropriate combinations of personal protection or physical containment devices, such as special protective clothing, respirators, centrifuge safety cups, sealed centrifuge rotors, and containment caging for animals, shall be used for all activities with other potentially infectious materials that pose a threat of exposure to droplets, splashes, spills, or aerosols.

(B) Biological safety cabinets shall be certified when installed, whenever they are moved and at least annually.

(3) HIV and HBV research laboratories shall meet the following criteria:

(i) Each laboratory shall contain a facility for hand washing and an eye wash facility which is readily available within the work area.

(ii) An autoclave for decontamination of regulated waste shall be available.

(4) HIV and HBV production facilities shall meet the following criteria:

(i) The work areas shall be separated from areas that are open to unrestricted traffic flow within the building. Passage through two sets of doors shall be the basic requirement for entry into the work area from access corridors or other contiguous areas. Physical separation of the high-containment work area from access corridors or other areas or activities may also be provided by a double-doored clothes-change room (showers may be included), airlock, or other access facility that requires passing through two sets of doors before entering the work area.

(ii) The surfaces of doors, walls, floors and ceilings in the work area shall be water resistant so that they can be easily cleaned. Penetrations in these surfaces shall be sealed or capable of being sealed to facilitate decontamination.

- (iii) Each work area shall contain a sink for washing hands and a readily available eye wash facility. The sink shall be foot, elbow, or automatically operated and shall be located near the exit door of the work area.
- (iv) Access doors to the work area or containment module shall be self-closing.
- (v) An autoclave for decontamination of regulated waste shall be available within or as near as possible to the work area.
- (vi) A ducted exhaust-air ventilation system shall be provided. This system shall create directional airflow that draws air into the work area through the entry area. The exhaust air shall not be recirculated to any other area of the building, shall be discharged to the outside, and shall be dispersed away from occupied areas and air intakes. The proper direction of the airflow shall be verified (i.e., into the work area).
- (5) Training Requirements. Additional training requirements for employees in HIV and HBV research laboratories and HIV and HBV production facilities are specified in paragraph (g)(2)(ix).
- (f) Hepatitis B vaccination and post-exposure evaluation and follow-up -- (1) General. (i) The employer shall make available the hepatitis B vaccine and vaccination series to all employees who have occupational exposure, and post-exposure evaluation and follow-up to all employees who have had an exposure incident.
- (ii) The employer shall ensure that all medical evaluations and procedures including the hepatitis B vaccine and vaccination series and post-exposure evaluation and follow-up, including prophylaxis, are:
 - (A) Made available at no cost to the employee;
 - (B) Made available to the employee at a reasonable time and place;
 - (C) Performed by or under the supervision of a licensed physician or by or under the supervision of another licensed healthcare professional; and
 - (D) Provided according to recommendations of the U.S. Public Health Service current at the time these evaluations and procedures take place, except as specified by this paragraph (f).
- (iii) The employer shall ensure that all laboratory tests are conducted by an accredited laboratory at no cost to the employee.
- (2) Hepatitis B Vaccination. (i) Hepatitis B vaccination shall be made available after the employee has received the training required in paragraph (g)(2)(vii)(I) and within 10 working days of initial assignment to all employees who have occupational exposure unless the employee has previously received the complete hepatitis B vaccination series, antibody testing has revealed that the employee is immune, or the vaccine is contraindicated for medical reasons.
- (ii) The employer shall not make participation in a prescreening program a prerequisite for receiving hepatitis B vaccination.
- (iii) If the employee initially declines hepatitis B vaccination but at a later date while still covered under the standard decides to accept the vaccination, the employer shall make available hepatitis B vaccination at that time.
- (iv) The employer shall assure that employees who decline to accept hepatitis B vaccination offered by the employer sign the statement in appendix A.
- (v) If a routine booster dose(s) of hepatitis B vaccine is recommended by the U.S. Public Health Service at a future date, such booster dose(s) shall be made available in accordance with section (f)(1)(ii).
- (3) Post-exposure Evaluation and Follow-up. Following a report of an exposure incident, the employer shall make immediately available to the exposed employee a confidential medical evaluation and follow-up, including at least the following elements:
 - (i) Documentation of the route(s) of exposure, and the circumstances under which the exposure incident occurred;
 - (ii) Identification and documentation of the source individual, unless the employer can establish that identification is infeasible or prohibited by state or local law;
 - (A) The source individual's blood shall be tested as soon as feasible and after consent is obtained in order to determine HBV and HIV infectivity. If consent is not obtained, the employer shall establish that legally required consent cannot be obtained. When the source individual's consent is not required by law, the source individual's blood, if available, shall be tested and the results documented.
 - (B) When the source individual is already known to be infected with HBV or HIV, testing for the source individual's known HBV or HIV status need not be repeated.

(C) Results of the source individual's testing shall be made available to the exposed employee, and the employee shall be informed of applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual.

(iii) Collection and testing of blood for HBV and HIV serological status;

(A) The exposed employee's blood shall be collected as soon as feasible and tested after consent is obtained.

(B) If the employee consents to baseline blood collection, but does not give consent at that time for HIV serologic testing, the sample shall be preserved for at least 90 days. If, within 90 days of the exposure incident, the employee elects to have the baseline sample tested, such testing shall be done as soon as feasible.

(iv) Post-exposure prophylaxis, when medically indicated, as recommended by the U.S. Public Health Service;

(v) Counseling; and

(vi) Evaluation of reported illnesses.

(4) Information Provided to the Healthcare Professional. (i) The employer shall ensure that the healthcare professional responsible for the employee's Hepatitis B vaccination is provided a copy of this regulation.

(ii) The employer shall ensure that the healthcare professional evaluating an employee after an exposure incident is provided the following information:

(A) A copy of this regulation;

(B) A description of the exposed employee's duties as they relate to the exposure incident;

(C) Documentation of the route(s) of exposure and circumstances under which exposure occurred;

(D) Results of the source individual's blood testing, if available; and

(E) All medical records relevant to the appropriate treatment of the employee including vaccination status which are the employer's responsibility to maintain.

(5) Healthcare Professional's Written Opinion. The employer shall obtain and provide the employee with a copy of the evaluating healthcare professional's written opinion within 15 days of the completion of the evaluation.

(i) The healthcare professional's written opinion for Hepatitis B vaccination shall be limited to whether Hepatitis B vaccination is indicated for an employee, and if the employee has received such vaccination.

(ii) The healthcare professional's written opinion for post-exposure evaluation and follow-up shall be limited to the following information:

(A) That the employee has been informed of the results of the evaluation; and

(B) That the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials which require further evaluation or treatment. (iii) All other findings or diagnoses shall remain confidential and shall not be included in the written report.

(6) Medical recordkeeping. Medical records required by this standard shall be maintained in accordance with paragraph (h)(1) of this section.

(g) Communication of hazards to employees -- (1) Labels and signs. (i) Labels. (A) Warning labels shall be affixed to containers of regulated waste, refrigerators and freezers containing blood or other potentially infectious material; and other containers used to store, transport or ship blood or other potentially infectious materials, except as provided in paragraph (g)(1)(i)(E), (F) and (G).

(C) These labels shall be fluorescent orange or orange-red or predominantly so, with lettering and symbols in a contrasting color.

(D) Labels shall be affixed as close as feasible to the container by string, wire, adhesive, or other method that prevents their loss or unintentional removal.

(E) Red bags or red containers may be substituted for labels.

(F) Containers of blood, blood components, or blood products that are labeled as to their contents and have been released for transfusion or other clinical use are exempted from the labeling requirements of paragraph (g).

(G) Individual containers of blood or other potentially infectious materials that are placed in a labeled container during storage, transport, shipment or disposal are exempted from the labeling requirement.

(H) Labels required for contaminated equipment shall be in accordance with this paragraph and shall also state which portions of the equipment remain contaminated.

(I) Regulated waste that has been decontaminated need not be labeled or color-coded.

(ii) Signs. (A) The employer shall post signs at the entrance to work areas specified in paragraph (e), HIV and HBV Research Laboratory and Production Facilities, which shall bear the following legend:

(B) These signs shall be fluorescent orange-red or predominantly so, with lettering and symbols in a contrasting color.

(2) Information and Training. (i) Employers shall ensure that all employees with occupational exposure participate in a training program which must be provided at no cost to the employee and during working hours.

(ii) Training shall be provided as follows:

(A) At the time of initial assignment to tasks where occupational exposure may take place;

(B) Within 90 days after the effective date of the standard; and

(C) At least annually thereafter.

(iii) For employees who have received training on bloodborne pathogens in the year preceding the effective date of the standard, only training with respect to the provisions of the standard which were not included need be provided.

(iv) Annual training for all employees shall be provided within one year of their previous training.

(v) Employers shall provide additional training when changes such as modification of tasks or procedures or institution of new tasks or procedures affect the employee's occupational exposure. The additional training may be limited to addressing the new exposures created.

(vi) Material appropriate in content and vocabulary to educational level, literacy, and language of employees shall be used.

(vii) The training program shall contain at a minimum the following elements:

(A) An accessible copy of the regulatory text of this standard and an explanation of its contents;

(B) A general explanation of the epidemiology and symptoms of bloodborne diseases;

(C) An explanation of the modes of transmission of bloodborne pathogens;

(D) An explanation of the employer's exposure control plan and the means by which the employee can obtain a copy of the written plan;

(E) An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials;

(F) An explanation of the use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices, and personal protective equipment;

(G) Information on the types, proper use, location, removal, handling, decontamination and disposal of personal protective equipment;

(H) An explanation of the basis for selection of personal protective equipment;

(I) Information on the hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge;

(J) Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials;

(K) An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available;

(L) Information on the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident;

(M) An explanation of the signs and labels and/or color coding required by paragraph (g)(1); and

(N) An opportunity for interactive questions and answers with the person conducting the training session.

(viii) The person conducting the training shall be knowledgeable in the subject matter covered by the elements contained in the training program as it relates to the workplace that the training will address.

(ix) Additional Initial Training for Employees in HIV and HBV Laboratories and Production Facilities. Employees in HIV or HBV research laboratories and HIV or HBV production facilities shall receive the following initial training in addition to the above training requirements.

(A) The employer shall assure that employees demonstrate proficiency in standard microbiological practices and techniques and in the practices and operations specific to the facility before being allowed to work with HIV or HBV.

(B) The employer shall assure that employees have prior experience in the handling of human pathogens or tissue cultures before working with HIV or HBV.

(C) The employer shall provide a training program to employees who have no prior experience in handling human pathogens. Initial work activities shall not include the handling of infectious agents. A progression of work activities shall be assigned as techniques are learned and proficiency is developed. The employer shall assure that employees participate in work activities involving infectious agents only after proficiency has been demonstrated.

(h) Recordkeeping -- (1) Medical Records. (i) The employer shall establish and maintain an accurate record for each employee with occupational exposure, in accordance with 29 CFR 1910.20.

(ii) This record shall include:

- (A) The name and social security number of the employee;
- (B) A copy of the employee's hepatitis B vaccination status including the dates of all the hepatitis B vaccinations and any medical records relative to the employee's ability to receive vaccination as required by paragraph (f)(2);
- (C) A copy of all results of examinations, medical testing, and follow-up procedures as required by paragraph (f)(3);
- (D) The employer's copy of the healthcare professional's written opinion as required by paragraph (f)(5); and
- (E) A copy of the information provided to the healthcare professional as required by paragraphs (f)(4)(ii)(B)(C) and (D).

(iii) Confidentiality. The employer shall ensure that employee medical records required by paragraph (h)(1) are:

- (A) Kept confidential; and
- (B) Not disclosed or reported without the employee's express written consent to any person within or outside the workplace except as required by this section or as may be required by law.

(iv) The employer shall maintain the records required by paragraph (h) for at least the duration of employment plus 30 years in accordance with 29 CFR 1910.20.

(2) Training Records. (i) Training records shall include the following information:

- (A) The dates of the training sessions;
- (B) The contents or a summary of the training sessions;
- (C) The names and qualifications of persons conducting the training; and
- (D) The names and job titles of all persons attending the training sessions.

(ii) Training records shall be maintained for 3 years from the date on which the training occurred.

(3) Availability. (i) The employer shall ensure that all records required to be maintained by this section shall be made available upon request to the Assistant Secretary and the Director for examination and copying.

(ii) Employee training records required by this paragraph shall be provided upon request for examination and copying to employees, to employee representatives, to the Director, and to the Assistant Secretary.

(iii) Employee medical records required by this paragraph shall be provided upon request for examination and copying to the subject employee, to anyone having written consent of the subject employee, to the Director, and to the Assistant Secretary in accordance with 29 CFR 1910.20.

(4) Transfer of Records. (i) The employer shall comply with the requirements involving transfer of records set forth in 29 CFR 1910.20(h).

(ii) If the employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, the employer shall notify the Director, at least three months prior to their disposal and transmit them to the Director, if required by the Director to do so, within that three month period.

(5) Sharps injury log. (i) The employer shall establish and maintain a sharps injury log for the recording of percutaneous injuries from contaminated sharps. The information in the sharps injury log shall be recorded and maintained in such manner as to protect the confidentiality of the injured employee. The sharps injury log shall contain, at a minimum:

- (A) The type and brand of device involved in the incident,
- (B) The department or work area where the exposure incident occurred, and
- (C) An explanation of how the incident occurred.

(ii) The requirement to establish and maintain a sharps injury log shall apply to any employer who is required to maintain a log of occupational injuries and illnesses under 29 CFR 1904.

(iii) The sharps injury log shall be maintained for the period required by 29 CFR 1904.6.

(i) Dates -- (1) Effective Date. The standard shall become effective on March 6, 1992.

(2) The Exposure Control Plan required by paragraph (c) of this section shall be completed on or before May 5, 1992.

(3) Paragraph (g)(2) Information and Training and (h) Recordkeeping shall take effect on or before June 4, 1992.

(4) Paragraphs (d)(2) Engineering and Work Practice Controls, (d)(3) Personal Protective Equipment, (d)(4) Housekeeping, (e) HIV and HBV Research Laboratories and Production Facilities, (f) Hepatitis B Vaccination and Post-Exposure Evaluation and Follow-up, and (g) (1) Labels and Signs, shall take effect July 6, 1992.

APPENDIX A TO SECTION 1910.1030 -- HEPATITIS B VACCINE DECLINATION (MANDATORY)

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring hepatitis B virus (**HBV**) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Source

[56 FR 64175, Dec. 6, 1991, as amended at 57 FR 12717, Apr. 13, 1992; 57 FR 29206, July 1, 1992; 66 FR 5318, 5325, Jan. 18, 2001]

§ 1904.8 Recording criteria for needlestick and sharps injuries.

[Effective Jan. 1, 2002.]

(a) Basic requirement. You must record all work-related needlestick injuries and cuts from sharp objects that are contaminated with another person's blood or other potentially infectious material (as defined by 29 CFR 1910.1030). You must enter the case on the OSHA 300 Log as an injury. To protect the employee's privacy, you may not enter the employee's name on the OSHA 300 Log (see the requirements for privacy cases in paragraphs 1904.29(b) (6) through 1904.29(b) (9)).

(b) Implementation. (1) What does "other potentially infectious material" mean? The term "other potentially infectious materials" is defined in the OSHA Bloodborne Pathogens standard at § 1910.1030(b). These materials include:

(i) Human bodily fluids, tissues and organs, and

(ii) Other materials infected with the HIV or hepatitis B (HBV) virus such as laboratory cultures or tissues from experimental animals.

(2) Does this mean that I must record all cuts, lacerations, punctures, and scratches? No, you need to record cuts, lacerations, punctures, and scratches only if they are work-related and involve contamination with another person's blood or other potentially infectious material. If the cut, laceration, or scratch involves a clean object, or a contaminant other than blood or other potentially infectious material, you need to record the case only if it meets one or more of the recording criteria in § 1904.7.

(3) If I record an injury and the employee is later diagnosed with an infectious bloodborne disease, do I need to update the OSHA 300 Log? Yes, you must update the classification of the case on the OSHA 300 Log if the case results in death, days away from work, restricted work, or job transfer. You must also update the description to identify the infectious disease and change the classification of the case from an injury to an illness.

(4) What if one of my employees is splashed or exposed to blood or other potentially infectious material without being cut or scratched? Do I need to record this incident? You need to record such an incident on the OSHA 300 Log as an illness if:

(i) It results in the diagnosis of a bloodborne illness, such as HIV, hepatitis B, or hepatitis C; or

(ii) It meets one or more of the recording criteria in § 1904.7.

Source

[36 FR 12612, July 2, 1971, as amended at 49 FR 50718, Dec. 31, 1984; 59 FR 15600, Apr. 1, 1994; 66 FR 5916, 6128, Jan. 19, 2001]

[PUBLISHER'S NOTE: This section was revised at 66 FR 5916, 6129, Jan. 19, 2001, effective Jan. 1, 2002. For the convenience of the user, the section has been set out twice. The version effective Jan. 1, 2002, immediately follows this note. For the version effective until Jan. 1, 2002, see the other version, also numbered § 1904.9.]

(a) Basic requirement. If an employee is medically removed under the medical surveillance requirements of an OSHA standard, you must record the case on the OSHA 300 Log.

(b) Implementation. (1) How do I classify medical removal cases on the OSHA 300 Log? You must enter each medical removal case on the OSHA 300 Log as either a case involving days away from work or a case involving restricted work activity, depending on how you decide to comply with the medical removal requirement. If the medical removal is the result of a chemical exposure, you must enter the case on the OSHA 300 Log by checking the "poisoning" column.

(2) Do all of OSHA's standards have medical removal provisions? No, some OSHA standards, such as the standards covering bloodborne pathogens and noise, do not have medical removal provisions. Many OSHA standards that cover specific chemical substances have medical removal provisions. These standards include, but are not limited to, lead, cadmium, methylene chloride, formaldehyde, and benzene.

(3) Do I have to record a case where I voluntarily removed the employee from exposure before the medical removal criteria in an OSHA standard are met? No, if the case involves voluntary medical removal before the medical removal levels required by an OSHA standard, you do not need to record the case on the OSHA 300 Log.

References

OSHA Standard

29 CFR 1910 Subpart Z (1910.1030)

http://www.osha-slc.gov/OshStd_data/1910_1030.html

29 CFR 1910 Subpart Z (1910.1030 App A) Hepatitis B Vaccine Declination

http://www.osha-slc.gov/OshStd_data/1910_1030_APP_A.html

OSHA Publications

<http://www.osha-slc.gov/OshDoc/Additional.html>

- 3128 Bloodborne Pathogens and Acute Care Facilities
- 3129 Controlling Occupational Exposure to Bloodborne Pathogens in Dentistry
- 3130 Occupational Exposure to Bloodborne Pathogens – Precautions for

Emergency Responders

- 3131 Bloodborne Pathogens and Long-Term Care Workers

OSHA References/Resources

- CPL 2-2, 44D, Enforcement Procedures for the Occupational Exposure to Bloodborne Pathogens, Appendix C – Web Site Resource List
http://www.osha-slc.gov/OshDoc/Directive_pdf/CPL_2-2_69.pdf
- OSHA Technical Links – Bloodborne Pathogens
<http://www.osha-slc.gov/SLTC/bloodbornepathogens/index.html>
- OSHA Technical Links – Needlestick Prevention
<http://www.osha-slc.gov/SLTC/needlestick/index.html>
- Protecting Nursing Home Workers: OSHA's Safety and Health Program Approach
<http://www.osha-slc.gov/SLTC/nursinghome/training/nursing/index.html>
- Video: *As It Should be Done: Workplace Precautions Against Bloodborne Pathogens*
<http://www.osha-slc.gov/SLTC/video/asitshouldbedone/video.html>

Information by Phone

- **CDC National STD and AIDS Hotlines**
English 1-800-342-2437 (AIDS)
Spanish 1-800-344-7432
Deaf/Hard of Hearing (TTY)
1-800-243-7889
- **CDC National Prevention Information Network**
1-800-458-5231
Deaf/Hard of Hearing (TTY)
1-800-243-7012
- **HIV/AIDS Treatment Information service**
1-800-HIV-0440 (448-0440)
- **AIDS Clinical Trials Information Service**
1-800-TRIALS-A (874-2572)

Information by Mail

- **Technical Information & Communications Branch**
Division of HIV/AIDS Prevention,
NCHSTP, CDC
1600 Clifton Road, NE, M/S E-49
Atlanta, Georgia 30333
- **CDC National Prevention Information Network**
P.O. Box 6003,
Rockville, MD 20849-6003

Summary

- OSHA's Bloodborne Pathogens standard prescribes safeguards to protect workers against the health hazards from exposure to blood and other potentially infectious materials, and to reduce their risk from this exposure
- Implementation of this standard not only will prevent hepatitis B cases, but also will significantly reduce the risk of workers contracting AIDS, Hepatitis C, or other bloodborne diseases

For more information on Bloodborne Pathogens, see OSHA's web site at www.osha.gov



We welcome you to complete the assignment in Microsoft Word. You can easily find the assignment at www.abctlc.com. Once complete, just simply fax or e-mail the answer key along with the registration page to us and allow two weeks for grading. Once we grade it, we will mail a certificate of completion to you. Call us if you need any help. If you need your certificate back within 48 hours, you may be asked to pay a rush service fee of \$50.00.

You can download the assignment in Microsoft Word from TLC's website under the Assignment Page. www.abctlc.com You will have 90 days in order to successfully complete this assignment with a score of 70% or better. If you need any assistance, please contact TLC's Student Services. Once you are finished, please mail, e-mail or fax your answer sheet along with your registration form.