

Crime and Trauma Scene BioRecovery



**The Manual For BioRecovery Technicians
and Trauma Waste Practitioners**

SECOND EDITION

**BY
Kent A. Berg**

Adopted as the official training manual of the American BioRecovery Association

BioRecovery Technician Manual Copyright 2006 by Kent A. Berg

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ISBN

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P.O. Box 817
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Comment [1]: Here Berg is claiming copyright to everything in this book. This means he is claiming he wrote it unless he specifically gives credit to another source.

This book is dedicated to...

Cheryl Berg, Kelly Berg, Jessica Berg, Homer Berg, Marilyn Berg, Mary Heintz, Charles Heintz, David Katchick, ...and all of the victims and their families who prior to the advent of BioRecovery Services had to suffer the emotional trauma and biological dangers of scene clean-up.

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Preface

The BioRecovery Technician performs a unique service. Although there are many competent technicians, their numbers are far too few to fill the national need for their services. It is most important not only to increase their numbers but also to provide a standardized educational approach for them that will help establish a uniform standard of competency in this vital industry.

With this in mind, this standard textbook was developed for use by both student and teacher. The goal was to compile and write a text to provide a standard educational reference for those engaged in this work, particularly for those just entering it. In particular: (1) that it be comprehensive enough to meet the full requirements of future training courses; (2) that it be clear enough to be understood by those with limited previous training; and (3) that it be sufficiently illustrated to provide not only basic factual information but in some degree to teach the skills involved.

It was the consensus of the American BioRecovery Association and myself that this book be implemented as part of an educational system that parallels the arrangements of those already in existence for other areas of restoration. It must embody the necessary subject material and must be taught by those with recognized teaching ability. The instructors must also be professionally familiar with the information to be presented.

I am deeply indebted to those who helped make this text possible and I extend my special gratitude to my wife, Cheryl, whose understanding has transcended the disruption of an orderly life.

Kent A. Berg

Comment [2]: The American Bio-Recovery Association has chosen to make this book the basis for their training course. We have notated over 75 acts of plagiarism, trademark infringement, and copyright infringement by Berg.

This means that ABRA's training course is based on plagiarism, trademark and copyright infringement. Yet on ABRA's web site they claim, "ABRA has set the gold standard for ethics, education and technical expertise in the industry."

We think not.

Overview of BioRecovery

Twenty years ago, no one thought much about getting blood on themselves. Aside from the repulsive nature of blood, the very thought of blood being the carrier of deadly and debilitating diseases was furthest from our minds.

Today, with HIV, Hepatitis, Syphilis, AIDS, Tuberculosis, and other diseases, Federal and State agencies have issued regulations outlining the precautions needed to handle blood and body fluids.

BioRecovery Technicians provide regulatory-compliant on-site cleaning, decontamination, and restoration of property damaged by blood, body fluids, decomposition, projectiles, animal contamination, and other physical destruction associated with dead or injured victims. Services range from removing bloodstains from a carpet to the clean up of large-scale multi-casualty scenes.

By deciding to read this book, you have taken a large step toward a task that many say they could never do. In fact, those in this profession often receive praise and respect for having the fortitude and compassion to help their fellow human beings in this unique manner.

In order for you, the reader, to provide this service, you must first know the challenges. The information in this book is technical in nature, very much on par with a Hazardous Materials Technician. Your primary goal is to render a contaminated area safe from biohazards and from the psychological impact of the scene itself, through the use of specialized techniques and supplies.

As a BioRecovery Technician, you will be among the ranks of a very special group of people who provide this unique and critically needed service. This is an industry in its infancy, but one that is growing at a break-neck pace. Those who are entering the world of biorecovery now will be the ones who help shape its future, and their own.

CHAPTER 1 INTRODUCTION TO MICROBIOLOGY

Introduction to Microbiology

In an effort to have a more comprehensive working knowledge of the bio-hazardous environment, the BioRecovery Technician should have a basic understanding of microbes and their role in the disease process. This knowledge will help ensure that more effective cleaning and disinfection strategies can be developed and performed.

MICROBES

Micro means small. **Microbes** literally means small organism. These organisms are so small they can only be seen through a microscope.

Scientific nomenclature assigns each organism two names. The **genus**, the first name, is always capitalized, and the specific epithet (**species**), which follows, is not capitalized. The scientific names of organisms are always either underlined or italicized.

Most microbes are not harmful and indeed play a vital role in maintaining our environment. Many are actually useful to us. The safe, useful ones are called **non-pathogens** because they do not produce disease. Microbes that cause disease in humans are called **pathogens** or pathogenic organisms. Infection occurs when these pathogens invade the body and cause disease.

Although there are six types of microbes, only three types will be discussed in this book: Bacteria, Viruses, and Fungi.

BACTERIA

Bacteria are microbes that have very simple cellular structures and lack a nuclear membrane (a sac-like structure in a cell that contains the cell's genetic material). Instead, the genetic material (DNA) floats free in the cell. The normal method of replication for bacteria is Binary Fission. In Binary Fission, bacterial cells simply increase their cell mass slightly, replicate their DNA (and several other components), and then each cell divides equally into two daughter cells. Bacteria are capable of extremely rapid cell replication, multiplying at geometric growth rates. This makes them a danger when they invade human or animal tissue. Dividing every ten minutes, a single bacterial cell can produce a mass consisting of over a million cells in less than three hours.

Bacteria Can Survive in Various Environments

Many bacteria are capable of movement in their environment either by flagella or gliding motility. Flagella are long, flexible, spiral shaped structures that help to push the microbe through solution. Some bacteria are saprophytic (feeding on non-living organisms) and others are parasitic (feeding on living organisms). In addition, they can

Comment [3]: Stolen from *Nursing Assistant: A Nursing Approach* by Barbara R. Hegner, Barbara Acello, and Esther Caldwell. This nursing book is now on its 10th edition; a quick search shows editions available long before Berg "wrote" his book.

Berg clearly, clearly plagiarized from this book. He has stolen copyrighted materials and passed them off as his work. And he has accepted money for this class and his "book."

Comment [4]: Stolen from: *Microbiology An Introduction*, by Gerard J. Tortora, Berdell R. Funke, and Christine L. Case. Chapter 1 "The Microbial World and You," second section "Naming and Classifying Microorganisms," first heading "Nomenclature."

Comment [5]: Stolen from *Nursing Assistant: A Nursing Approach*.

Comment [6]: The highlighted sentences turn up on ten different search engine results on Google when you search for "bacterial cells simply increase their cell mass slightly". The websites are all "pay per paper" or "pay for essay" sites; each of which make it very clear that the essays are not to be used without proper citations. And certainly not to be copied and pasted in to a for-profit book. Berg is shameless in his plagiarism.

Comment [7]: http://bs.kaist.ac.kr/~mbt/lect/Microbial_2.htm

This is a website from 2001, the lecture probably taken from a textbook. It is clearly the same information.

be aerobic or anaerobic (needing or not needing oxygen to survive). To ensure their survival, a few bacteria species, such as *Bacillus* and *Clostridium* create resting structures (endospores) that resemble a hard protective shell, allowing the microbe to lie dormant for a period of time, even in the harshest of environments.

In 1922, King Tut's tomb is discovered. Several of its discoverers die from mysterious causes, although the culprit later turns out to be the bacteria living on the mummy.

BACTERIA NAMES AND SHAPES

Bacteria come in three basic shapes, which includes spheres, rods, and spirals. They grow in groups called colonies. If we look at a small part of a colony under a microscope, we see that bacteria typically are arranged in pairs, clusters or chains.

Pairs are referred to as diplo-

Chains are referred to as strepto-

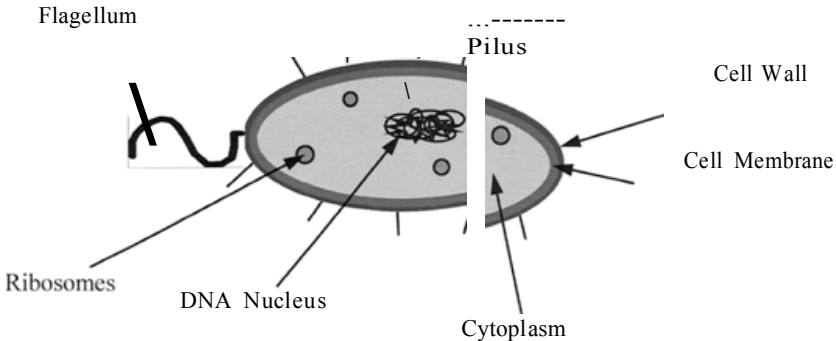
Clusters are referred to as staphylo-

The Rod shape is called Bacillus. (Pleural is Bacilli)

The rigid spiral shape is called Spirillum.

Flexible or undulating spiral shapes are called Spirochete.

The Spherical shape is called Coccus. (Pleural is Cocci)



Drawing of "General Bacteria" (Not all bacteria contain the structures depicted).

Flagellum: A protein filament that spins or whips producing locomotion.

Pili: (or Fimbriae): Hairlike appendages that help cells adhere to surfaces.

Ribosomes: Synthesize proteins in the cell

Cell Wall: a semi-rigid structure giving the characteristic shape of the cell.

Comment [8]: Much of this section on bacteria was taken from *Nursing Assistant: A Nursing Approach* by Barbara R. Hegner, Barbara Acello, and Esther Caldwell. The highlighted section is plagiarized from the Microbes section, next heading Bacteria, then Arrangments. Mr. Berg rearranges the order of some of the material but it, too, is from *Nursing Assistant: A Nursing Approach*.

allows certain molecules and ions pass through.
Cytoplasm: Refers to everything inside the plasma membrane.
DNA Nucleus: Genetic material

TYPES OF BACTERIA

Most bacteria have a cell wall, and for those that do, there are two basic types of walls, "Gram-positive" and "Gram-negative". This nomenclature is the result of a technique developed by Christian Gram, a Danish physician where he applied a stain to various bacteria. Bacteria that take up the stain and retain it are called "Gram-Positive". Bacteria that don't retain the stain are called "Gram-Negative". These bacteria contain **toxins**. Toxins are literally poisons.

GRAM-NEGATIVE BACTERIA

Gram-Negative bacteria contain Lipid A *endotoxins*, which remain in the cell or cellular components. When Gram-Negative bacteria enter the human body and are attacked by the body's defenses, the cell disintegrates in the bloodstream, releasing the endotoxin.

Examples of Gram-Negative bacteria:

Pseudomonas – can infect urinary tracts, burns, and wounds. They are resistant to antibiotics.

Legionella - the species that cause the respiratory disease legionellosis.

Escherichia coli - *E. coli* is one of the most common inhabitants of the human intestinal tract. Toxins produced by *E. coli* can cause a very serious food borne disease.

Salmonella- Almost all members of the genus *Salmonella* are pathogenic. Typhoid fever is caused by *Salmonella typhi*; most cause a less serious gastrointestinal disease called salmonellosis.

Haemophilus influenzae is a common cause of meningitis.

GRAM-POSITIVE BACTERIA

Gram-positive bacteria contain *exotoxins* that may be released at the time of cell death or destruction of the cell wall. These exotoxins can be aerosolized. When inhaled by humans, these exotoxins induce respiratory inflammation and airway restriction, and enhance the potential for the allergic and infectious disease responses, even in very low concentrations.

Examples of Gram-Positive bacteria are:

Bacillus - These rod-shaped bacteria are distinguished by possession of endospores. *Bacillus anthracis* is the cause of anthrax in humans and animals.

Streptococcus - *Streptococcus pyogenes* causes scarlet fever, pharyngitis (sore throat), and rheumatic fever. *Streptococcus pneumoniae* is the most common cause of human pneumonia.

Mycobacterium tuberculosis is the cause of tuberculosis.

Comment [9]: The sentences in yellow are found in a number reprinted/reposted articles dealing with sewer damage and sewer remediation and sewer backup. Mr. Berg merely swapped out "endotoxin" in the original for "exotoxin" here. The article, *Public & Occupational Health Risks From Exposure to Sewage Contamination*, written by Eugene C. Cole, Dr PH, at Brigham Young University, appears to be the basis for most of the articles referenced above. You can read it here: http://www.varneycleanare.com/Sewer_Damage.html

VIRUSES

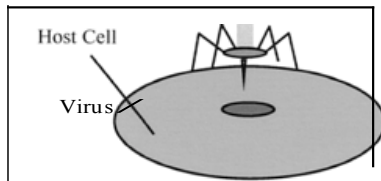
A virus is the smallest microbe. So small in fact, it can only be visualized with the help of electron microscopes. Viruses are classified by:

- The type of nucleic acid core (DNA or RNA)
- Their clinical properties (tissue they infect and other factors)

Viruses are not cellular. They are mostly made up of a protein shell protecting a single strand of DNA or RNA. There may also be a covering of fat-like material over the capsule, called a lipid envelope (making the virus more infectious). Viruses lack most of the internal structure and machinery which characterizes 'life', including the biosynthetic machinery that is necessary for reproduction. In order for a virus to replicate it must infect a suitable host cell. A virus slips through a cell's defense and inserts its own blueprint for replicating itself. The cell is tricked into constructing duplicates of the virus. The newly created viruses escape from the cell and then float about dormant until one happens to come into contact with a new host cell.

Viruses exist in two distinct states. When not in contact with a host cell, the virus remains entirely dormant. During this time there are no internal biological activities occurring within the virus, and in essence the virus is no more than a static organic particle. In this simple, clearly non-living state, fully developed virus particles are referred to as 'virions'. Virions can remain in this dormant state for extended periods of time, waiting patiently to come into contact with the appropriate host. When this occurs, it becomes active and is then referred to as a virus. It now displays properties typified by living organisms, such as reacting to its environment and directing its efforts toward self-replication. Viruses cause a number of diseases, but what is not commonly known is that some viruses (called **oncogenic viruses**) cause cancer.

Example: Virus forms hole in host cell wall using lysozyme and drives its hollow tail through to inject DNA



Major Viral Families That Infect Humans:

Adenoviridae (Adenovirus) Causes the common cold. Arenaviridae (Lassa fever virus) Bunyaviridae (*Hantavirus*)
Hepatitis A and C-G Hepadnaviridae (Hepatitis B)
Herpesviridae Herpes simplex 1-8, chickenpox, Epstein-Barr and Cytomegalovirus
Reoviridae (Rotavirus)
Retroviridae (Human Immunodeficiency Virus HIV)
Rhabdoviridae (Rabies) Togaviridae (Rubella)

Comment [10]: Again, plagiarized from Nursing Assistant: A Nursing Approach.

Comment [11]: Plagiarized from <http://www.dform.com/projects/t4/virus.html>
September 9, 2003 6:26:12 PM

Comment [12]: Mixture of paraphrase and verbatim from <http://www.dform.com/projects/t4/virus.html>
September 9, 2003 6:26:12 PM

Comment [13]: Plagiarized from <http://www.dform.com/projects/t4/virus.html>
September 9, 2003 6:26:12 PM

FUNGI

Yeasts are unicellular nonfilamentous fungi. **Molds** are multicellular fungi and form *mycelia* of long filaments (*hyphae*). Both reproduce by *spores*.

A fungal infection is a **mycosis**. Yeasts and molds are commonly associated with infection in humans and are known as opportunistic parasites. (A parasite is an organism that lives in or on another organism without benefiting the host organism.) Under normal conditions, the organisms are harmless. However, when the human immune system is impaired and unable to protect the body, these organisms can invade the body and cause severe infections. Fungi are not only potentially allergenic (causing allergic reactions) and toxigenic (producing toxic chemicals), but some strains may cause an infectious and potentially fatal pulmonary disease. Mycotoxins from a variety of molds present a serious health threat when ingested or inhaled. These mycotoxins are present in the cell wall of the organism and can be released and still be potent even after the death of the fungus.

Comment [14]: Plagiarized from *Nursing Assistant: A Nursing Approach* by Barbara R. Hegner, Barbara Acello, and Esther Caldwell.

Fungi that are hazardous to humans include: *Histoplasma capsulatum* (Histoplasmosis) *Cryptococcus neoformans*
Aspergillus fumigatus
Aspergillus clavus *Aspergillus parasiticus* *Aspergillus versicolor* *Penicillium expansum* *Penicillium chrysogenum* *Stachybotrys chartarum* *Trichoderma*



(atra)

DESCENDING ORDER OF RESISTANCE TO GERMICIDAL CHEMICALS

(Martin S. Favero)

BACTERIAL SPORES

Bacillus subtilis



MYCOBACTERIA

Mycobacterium tuberculosis var. *bovis*



NONLIPID OR SMALL VIRUSES

Polio virus



FUNGI

Trichophyton spp.



VEGETATIVE BACTERIA

Pseudomonas aeruginosa



LIPID OR MEDIUM-SIZED VIRUSES

Herpes simplex virus *Hepatitis B virus*
Human immunodeficiency virus

CHAPTER2 DISEASE AND DEFENSE

WARNING:

Before you consider a career as a biorecovery technician, you should receive a medical evaluation to determine your current health status. A medical history and physical exam should be performed with attention to cancer, steroid therapy, immunodeficiencies, pulmonary disease, diabetes mellitus, and other immunocompromising conditions.

DISEASE AND DEFENSE

With all of the pathogens in the environment, why don't more people get sick? The answer is that the human body has a number of defenses against disease. The body's first line of defense includes skin, mucous membranes in the nose and throat, tears, the tiny hairs in the nose, bleeding, urination, and sweating. These protectors either block harmful microbes from entering the body, or wash them away.

If pathogenic microbes get beyond the first line of defense, human blood has a second line of defense known as the **immune system**. If pathogenic microbes enter the bloodstream, they will be attacked by cells called **macrophages** (also known as white blood cells). These cells will attack and dissolve any foreign microbes.

Our bodies also produce **antibodies** that go after specific diseases. For example, if you have already had chicken pox, then your body's chicken pox antibodies will have been activated to prevent further infection. If you have received a **vaccine** for a particular disease, it helps your body create antibodies for that disease.

Development of Disease

The development of disease follows a certain sequence of steps. The **incubation period** is the time between actual infection and the first appearance of signs or symptoms. The **prodromal period** follows the incubation period in some diseases and is characterized by mild symptoms of the disease. During the **period of illness**, the overt symptoms of the disease are apparent. During the **period of decline**, the signs and symptoms subside. The patient regains his or her pre-diseased state during the **period of convalescence**.

Comment [15]: Mixture of paraphrasing and verbatim from *Microbes: Redefined Personality* by S. R. Joshi. Mr. Berg also changed "germs" in the original to "pathogenic microbes" here. <http://www.amazon.com/Microbes-Redefined-Personality-S-Joshi/dp/813130230X>

Comment [16]: This is a mixture of paraphrasing and verbatim taken from a study guide based on information found in Chapter 14 of *Microbiology An Introduction*, by Gerard J. Tortora, Berdell R. Funke, and Christine L. Case.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

[REDACTED]

Hepatitis B Virus (HBV)

Also referred to as "Serum Hepatitis". Hepatitis B has been around the longest. It is the most prevalent form of Hepatitis. It infects over 300,000 people annually, and has over one million "carriers" in the U.S. It is caused by the Hepatitis B Virus, which attacks and replicates in liver cells. HBV is a bloodborne disease that is highly concentrated in the blood and serous fluids. HBV is transmitted by exposure to the blood or body fluids of an infected person through breaks in the skin and mucosal tissue. In the general public, it is most frequently transmitted through sexual contact, sharing of needles, cuts by contami

-nated items, and from mothers to babies before or during birth. The chances of becoming infected with HBV from a single contaminated cut or puncture are 6% to 30% depending on the amount of virus present in the source individual. The incubation period ranges from 45 to 160 days. Chronic HBV often progresses to cirrhosis of the liver, with a fatality rate of 1.4%. Technicians who have received Hepatitis B vaccine and have developed immunity to the virus are at virtually no risk for infection. For those who have not received the vaccine, the drug Immune Globulin can be administered and has shown to be effective if given immediately after exposure. [REDACTED]

Comment [17]: The majority of this section is paraphrased from <http://www.hcvadvocate.org/2002site/Oldsite/200109/page4.htm>

[REDACTED]

[REDACTED] e

Deficiency Syndrome (AIDS)

AIDS is caused by the HIV virus. HIV is spreading rapidly and it is estimated that HIV currently infects over five million people in the U.S. alone. AIDS in this country is the leading cause of death in men ages 25 through 44. [REDACTED]

Comment [18]: Absolutely untrue. The CDC page on HIV and AIDS (updated April 2013) states: "More than 1.1 million people in the United States are living with HIV infection, and almost 1 in 5 (18.1%) are unaware of their infection."

Comment [19]: This is from a study published in 1995 and is no longer true.

[REDACTED]

In addition to "flu-like" symptoms, other symptoms include unexplained, persistent fatigue; unexplained fever; night sweats; chills; sudden and unexplained weight loss of more than ten pounds; diarrhea that continues for several weeks; a persistent dry cough; purple or pink spots or bumps on or under the skin, inside the mouth or nose, or around the eyes. These spots are generally harder than the skin around them. Such spots are referred to as Kaposi's Sarcoma. White spots around or in the mouth caused by a fungal infection is known as Thrush. This infection may last for weeks.

The average risk of HIV infection after a puncture wound or cut exposure to HIV-infected blood is 0.3% (i.e. three-tenths of one percent, or about 1 in 300). Stated another way, 99.7% of puncture wound/cut exposures do not lead to infection.

The risk after exposure of the eye, nose, or mouth to HIV-infected blood is estimated to be, on average, 0.1% (1 in 1,000).

The risk after exposure of the skin to HIV-infected blood is estimated to be less than 0.1%. A small amount of blood on intact skin probably poses no risk at all. There have been no documented cases of HIV transmission due to an exposure involving a small amount of blood on intact skin (a few drops of blood on skin for a short period of time). The risk may be higher if the skin is damaged (for example, by a recent cut) or if the contact involves a large area of skin or is prolonged (for example, being covered in blood for hours).

Currently there is no vaccine for HIV, and no known cure. However, results from a small number of studies suggest that the use of Zidovudine after certain occupational exposures may reduce the chance of HIV transmission.

Post-exposure treatment is not recommended for all occupational exposures to HIV because most exposures do not lead to HIV infection and because the drugs used to prevent infection may have serious side effects. Taking these drugs for exposures that pose a lower risk for infection may not be worth the risk of the side effects. You should discuss the risks and side effects with a health-care provider before starting post-exposure treatment for HIV.

[REDACTED]

[REDACTED]

[REDACTED]

Comment [20]: This is plagiarized from Iowa Medicine: Journal of the Iowa Medical Society, Volume 78 (1988); however, this section from the Journal was reprinted in "Silent War: Infection Control for Emergency Responders," (1992) which we suspect is the book Berg plagiarized from.

It is also found here: <http://heart-intl.net/HEART/Math/Comp/AIDSfactSheet.htm> (

Comment [21]: Plagiarized from http://www.cdc.gov/oralhealth/infectioncontrol/faq/bloodborne_exposures.htm

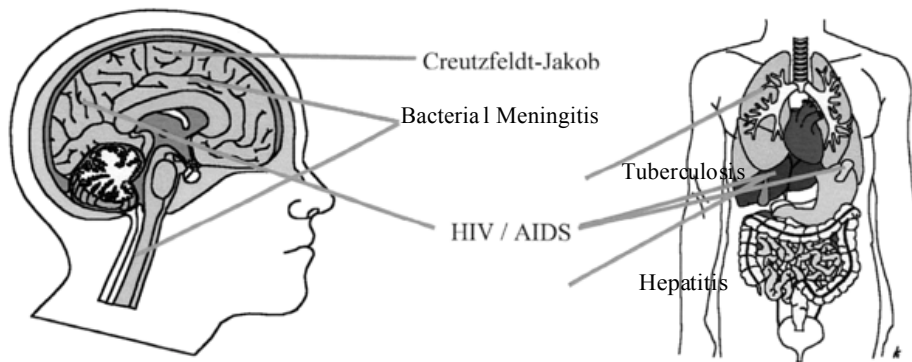
While the CDC does not expressly forbid reprinting of information, this is just another example of Mr. Berg wanting people to believe that he wrote this information, instead of giving credit where credit is due.

Comment [22]: Paraphrased. Found in a number of sources, including <http://www.dentalcare.com/media/en-US/education/ce397/ce397-appendix-g.pdf>

[REDACTED]

[REDACTED]

[REDACTED]



WARNING:

The death of the source individual does not result in the instantaneous inactivation of HIV or HBV that may be present in the individual's blood and body fluid. HTV has been found active in postmortem bodies 18 hours after death.

CHAPTER3 ORIENTATION TO OSHA'S BLOODBORNE PATHOGEN REGULATION

ORIENTATION TO THE OSHA BLOODBORNE PATHOGENS REGULATIONS

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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2. [REDACTED]

3. [REDACTED]

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4. [REDACTED]
 5. [REDACTED]
 6. [REDACTED]
 7. [REDACTED]
[REDACTED]
- [REDACTED]

The following pages in this chapter represent the latest published version of the Code of Federal Regulations, 29CFR1910.1030. This regulation is enforced by the **United States Department of Labor-Occupational Safety and Health Administration**. Willful violations of this regulation can result in fines typically ranging from \$7,000 to \$70,000. It is written for your protection as an employee, and for the safety of the public. It is the industry bible that instructs you and protects you. Know it well.

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.

1910.1030(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

Comment [23]: Beginning of OSHA regulations. Obviously not written by Berg.

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 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.

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). **1910.1030(c)**

Exposure Control --

1910.1030(c)(I)

Exposure Control Plan.

1910.1030(c)(I)(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.

1910.1030(c)(I)(ii)

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

1910.1030(c)(I)(ii)(A)

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

..1910.1030(c)(1)(ii)(B)

1910.1030(c)(I)(ii)(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

1910.1030(c)(I)(ii)(C)

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

1910.1030(c)(I)(iii)

Each employer shall ensure that a copy of the Exposure Control Plan is accessible to employees in accordance with 29 CFR 1910.1020(e).

1910.1030(c)(I)(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:

1910.1030(c)(I)(iv)(A)

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

1910.1030(c)(I)(iv)(B)

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

1910.1030(c)(I)(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.

1910.1030(c)(2)

Exposure Determination.

1910.1030(c)(2)(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:

1910.1030(c)(2)(i)(A)

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

1910.1030(c)(2)(i)(B)

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

1910.1030(c)(2)(i)(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.

1910.1030(c)(2)(ii)

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

1910.1030(d)

Methods of Compliance --

1910.1030(d)(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.

1910.1030(d)(2)

Engineering and Work Practice Controls.

1910.1030(d)(2)(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.

1910.1030(d)(2)(ii)

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

1910.1030(d)(2)(iii)

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

1910.1030(d)(2)(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.

1910.1030(d)(2)(v)

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

1910.1030(d)(2)(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.

1910.1030(d)(2)(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.

1910.1030(d)(2)(vii)(A)

1910.1030(d)(2)(vii)(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.

1910.1030(d)(2)(vii)(B)

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

1910.1030(d)(2)(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:

1910.1030(d)(2)(viii)(A)

Puncture resistant;

1910.1030(d)(2)(viii)(B)

Labeled or color-coded in accordance with this standard;

1910.1030(d)(2)(viii)(C)

Leakproof on the sides and bottom; and

1910.1030(d)(2)(viii)(D)

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

1910.1030(d)(2)(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.

1910.1030(d)(2)(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.

1910.1030(d)(2)(xi)

1910.1030(d)(2)(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.

1910.1030(d)(2)(xii)

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

1910.1030(d)(2)(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.

1910.1030(d)(2)(xiii)(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.

1910.1030(d)(2)(xiii)(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.

1910.1030(d)(2)(xiii)(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.

1910.1030(d)(2)(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.

1910.1030(d)(2)(xiv)(A)

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

1910.1030(d)(2)(xiv)(B)

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

1910.1030(d)(3)

Personal Protective Equipment --

1910.1030(d)(3)(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.

1910.1030(d)(3)(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

judgement, the circumstances shall be investigated and documented in order to determine whether changes can be instituted to prevent such occurrences in the future.

1910.1030(d)(3)(iii)

Access ibility. The employer shall ensure that appropriate personal protective equipment in the appropriate sizes is readily accessible at the worksite or is issued to employees. Hypo-allergenic gloves, glove liners, powderless gloves, or other similar alternatives shall be readily accessible to those employees who are allergic to the gloves normally provided.

1910.1030(d)(3)(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.

1910.1030(d)(3)(v)

1910.1030(d)(3)(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. **1910.1030(d)(3)(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.

1910.1030(d)(3)(vii)

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

1910.1030(d)(3)(viii)

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

1910.1030(d)(3)(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.

1910.1030(d)(3)(ix)(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.

1910.1030(d)(3)(ix)(B)

1910.1030(d)(3)(ix)(B)

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

1910.1030(d)(3)(ix)(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.

1910.1030(d)(3)(ix)(D)

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

1910.1030(d)(3)(ix)(D) (1)

Periodically reevaluate this policy;

1910.1030(d)(3)(ix)(D)(2)

Make gloves available to all employees who wish to use them for phlebotomy;

1910.1030(d)(3)(ix)(D) (3)

Not discourage the use of gloves for phlebotomy; and

1910.1030(d)(3)(ix)(D) (4)

Require that gloves be used for phlebotomy in the following circumstances:

1910.1030(d)(3)(ix)(D) (4)(i)

When the employee has cuts, scratches, or other breaks in his or her *skin*;

1910.1030(d)(3)(ix)(D) (4)(ii)

When the employee judges that hand contamination with blood may occur, for example, when performing phlebotomy on an uncooperative source individual; and

1910.1030(d)(3)(ix)(D)(4)(iii)

When the employee is receiving training in phlebotomy.

1910.1030(d)(3)(x)

1910.1030(d)(3)(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.

1910.1030(d)(3)(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.

1910.1030(d)(3)(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, orthopaedic surgery).

1910.1030(d)(4)

Housekeeping --

1910.1030(d)(4)(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.

1910.1030(d)(4)(ii)

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

1910.1030(d)(4)(i)(A)

1910.1030(d)(4)(ii)(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.

1910.1030(d)(4)(ii)(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.

1910.1030(d)(4)(ii)(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.

1910.1030(d)(4)(ii)(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.

1910.1030(d)(4)(ii)(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.

1910.1030(d)(4)(iii)

Regulated Waste --

...J 910.1030(d)(4)(ii)(A)

1910.1030(d)(4)(iii)(A)

Contaminated Sharps Discarding and Containment.

1910.1030(d)(4)(iii)(A)(1)

Contaminated sharps shall be discarded immediately or as soon as feasible in containers that are:

1910.1030(d)(4)(iii)(A)(1)(i)

Closable;

1910.1030(d)(4)(iii)(A)(1)(ii)

Puncture-resistant;

1910.1030(d)(4)(iii)(A)(1)(iii)

Leakproof on sides and bottom; and

1910.1030(d)(4)(iii)(A)(1)(iv)

Labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard.

1910.1030(d)(4)(iii)(A)(2)

During use, containers for contaminated sharps shall be:

1910.1030(d)(4)(iii)(A)(2)(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);

1910.1030(d)(4)(iii)(A)(2)(ii)

Maintained upright throughout use; and

1910.1030(d)(4)(iii)(A)(2)(iii)

Replaced routinely and not be allowed to overfill.

1910.1030(d)(4)(iii)(A)(3)

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

1910.1030(d)(4)(iii)(A)(3)(i)

Closed immediately prior to removal or replacement to prevent spillage or protrusion of contents during handling, storage, transport, or shipping;

1910.1030(d)(4)(iii)(A)(3)(ii)

Placed in a secondary container if leakage is possible. The second container shall be:

1910.1030(d)(4)(iii)(A)(3)(ii)(A)

Closable;

1910.1030(d)(4)(iii)(A)(3)(ii)(B)

Constructed to contain all contents and prevent leakage during handling, storage, transport, or shipping; and 1910.1030(d)(4)(iii)(A)(3)(ii)(C)

Labeled or color-coded according to paragraph (g)(1)(i) of this standard.

1910.1030(d)(4)(iii)(A)(3)(iii)

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.

1910.1030(d)(4)(iii)(B)

Other Regulated Waste Containment --

1910.1030(d)(4)(iii)(B)(1)

Regulated waste shall be placed in containers which are:

1910.1030(d)(4)(iii)(B)(1)(i)

Closable;

1910.1030(d)(4)(iii)(B)(1)(ii)

Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping;

1910.1030(d)(4)(iii)(B)(1)(iii)

Labeled or color-coded in accordance with paragraph (g)(1)(i) this standard; and

1910.1030(d)(4)(iii)(B)(1)(iv)

Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

1910.1030(d)(4)(iii)(B)(2)

If outside contamination of the regulated waste container occurs, it shall be placed in a second container. The second container shall be: 1910.1030(d)(4)(iii)(B)(2)(i)

Closable;

1910.1030(d)(4)(iii)(B)(2)(ii)

Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping;

1910.1030(d)(4)(iii)(B)(2)(iii)

Labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard; and

1910.1030(d)(4)(iii)(B)(2)(iv)

Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

1910.1030(d)(4)(iii)(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.

1910.1030(d)(4)(iv)

1910.1030(d)(4)(iv)

Laundry.

1910.1030(d)(4)(iv)(A)

Contaminated laundry shall be handled as little as possible with a minimum of agitation.

1910.1030(d)(4)(iv)(A)(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.

1910.1030(d)(4)(iv)(A)(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.

1910.1030(d)(4)(iv)(A)(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.

1910.1030(d)(4)(iv)(B)

The employer shall ensure that employees who have contact with contaminated laundry wear protective gloves and other appropriate personal protective equipment.

1910.1030(d)(4)(iv)(C)

1910.1030(d)(4)(iv)(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).

1910.1030(e)

HIV and HBV Research Laboratories and Production Facilities.

1910.1030(e)(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.

1910.1030(e)(2)

Research laboratories and production facilities shall meet the following criteria:

1910.1030(e)(2)(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.

1910.1030(e)(2)(ii)

Special Practices.

1910.1030(e)(2)(ii)(A)

Laboratory doors shall be kept closed when work involving HIV or HBV is in progress.

1910.1030(e)(2)(ii)(B)

1910.1030(e)(2)(ii)(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.

1910.1030(e)(2)(ii)(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.

1910.1030(e)(2)(ii)(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.

1910.1030(e)(2)(ii)(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.

1910.1030(e)(2)(ii)(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.

1910.1030(e)(2)(ii)(G)**1910.1030(e)(2)(ii)(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.

1910.1030(e)(2)(ii)(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.

1910.1030(e)(2)(ii)(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.

1910.1030(e)(2)(ii)(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.

1910.1030(e)(2)(ii)(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.

1910.1030(e)(2)(ii)(L)

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

1910.1030(e)(2)(ii)(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.

1910.1030(e)(2)(iii)

Containment Equipment.

1910.1030(c)(2)(iii)(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.

1910.1030(c)(2)(iii)(B)

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

1910.1030(e)(3)

HIV and HBV research laboratories shall meet the following criteria:

1910.1030(e)(3)(i)

1910.1030(c)(3)(i)

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

1910.1030(c)(3)(ii)

An autoclave for decontamination of regulated waste shall be available.

1910.1030(c)(4)

HIV and HBV production facilities shall meet the following criteria:

1910.1030(e)(4)(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.

1910.1030(e)(4)(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.

1910.1030(e)(4)(iii)

1910.1030(e)(4)(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.

1910.1030(e)(4)(iv)

Access doors to the work area or containment module shall be self-closing.

1910.1030(e)(4)(v)

An autoclave for decontamination of regulated waste shall be available within or as near as possible to the work area.

1910.1030(e)(4)(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).

1910.1030(e)(S)

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).

1910.1030(f)

Hepatitis B Vaccination and Post-exposure Evaluation and Follow-up --

1910.1030(f)(1)

1910.1030(f)(1)

General.

1910.1030(f)(1)(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.

1910.1030(f)(1)(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:

1910.1030(f)(1)(ii)(A)

Made available at no cost to the employee;

1910.1030(f)(1)(ii)(B)

Made available to the employee at a reasonable time and place;

1910.1030(f)(1)(ii)(C)

Performed by or under the supervision of a licensed physician or by or under the supervision of another licensed healthcare professional; and

1910.1030(f)(1)(ii)(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).

1910.1030(f)(1)(iii)

The employer shall ensure that all laboratory tests are conducted by an accredited laboratory at no cost to the employee.

1910.1030(f)(2)

1910.1030(f)(2)**Hepatitis B Vaccination.****1910.1030(f)(2)(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.

1910.1030(f)(2)(ii)

The employer shall not make participation in a prescreening program a prerequisite for receiving hepatitis B vaccination.

1910.1030(f)(2)(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.

1910.1030(f)(2)(iv)

The employer shall assure that employees who decline to accept hepatitis B vaccination offered by the employer sign the statement in Appendix A.

1910.1030(f)(2)(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).

1910.1030(1)(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:

1910.1030(f)(3)(i)

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

1910.1030(f)(3)(ii)**1910.1030(f)(3)(ii)**

Identification and documentation of the source individual, unless the employer can establish that identification is infeasible or prohibited by state or local law; **1910.1030(f)(3)(ii)(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.

1910.1030(f)(3)(ii)(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.

1910.1030(f)(3)(ii)(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.

1910.1030(f)(3)(iii)

Collection and testing of blood for HBV and HIV serological status;

1910.1030(f)(3)(iii)(A)

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

1910.1030(f)(3)(iii)(B)

1910.1030(f)(3)(iii)(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.

1910.1030(f)(3)(iv)

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

1910.1030(f)(3)(v)

Counseling; and

1910.1030(f)(3)(vi)

Evaluation of reported illnesses.

1910.1030(f)(4)

Information Provided to the Healthcare Professional.

1910.1030(f)(4)(i)

The employer shall ensure that the healthcare professional responsible for the employee's Hepatitis B vaccination is provided a copy of this regulation.

1910.1030(f)(4)(ii)

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

1910.1030(f)(4)(ii)(A)

A copy of this regulation;

1910.1030(f)(4)(ii)(B)

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

1910.1030(f)(4)(ii)(C)

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

1910.1030(f)(4)(ii)(D)

1910.1030(f)(4)(ii)(D)

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

1910.1030(f)(4)(ii)(E)

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

1910.1030(f)(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.

1910.1030(f)(5)(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.

1910.1030(f)(S)(ii)

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

1910.1030(f)(S)(ii)(A)

That the employee has been informed of the results of the evaluation; and

1910.1030(f)(S)(ii)(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.

1910.1030(f)(S)(iii)

1910.1030(f)(S)(i)(D)

All other findings or diagnoses shall remain confidential and shall not be included in the written report.

1910.1030(f)(6)

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

1910.1030(g)

Communication of Hazards to Employees --

1910.1030(g)(1)

Labels and Signs --

1910.1030(g)(1)(i)

Labels.

1910.1030(g)(1)(i)(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).

1910.1030(g)(1)(i)(B)

Labels required by this section shall include the following legend: **1910.1030(g)(1)(ii)**



1910.1030(g)(1)(ii)

Signs.

1910.1030(g)(1)(ii)(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:

**NAME OF THE INFECTIOUS AGENT. SPECIAL
REQUIREMENTS FOR ENTERING THE AREA.
NAME, TELEPHONE NUMBER OF
RESPONSIBLE PERSON.**

1910.1030(g)(1)(ii)(B)

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

1910.1030(g)(2)

Information and Training.

1910.1030(g)(2)(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.

1910.1030(g)(2)(ii)

Training shall be provided as follows:

1910.1030(g)(2)(ii)(A)

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

1910.1030(g)(2)(ii)(B)

Within 90 days after the effective date of the standard; and

1910.1030(g)(2)(ii)(C)

At least annually thereafter.

1910.1030(g)(2)(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.

1910.1030(g)(2)(iv)

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

1910.1030(g)(2)(v)

1910.1030(g)(2)(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.

1910.1030(g)(2)(vi)

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

1910.1030(g)(2)(vii)

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

1910.1030(g)(2)(vii)(A)

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

1910.1030(g)(2)(vii)(B)

A general explanation of the epidemiology and symptoms of bloodborne diseases;

1910.1030(g)(2)(vii)(C)

An explanation of the modes of transmission of blood borne pathogens;

1910.1030(g)(2)(vii)(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;

1910.1030(g)(2)(vii)(E)

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

1910.1030(g)(2)(vii)(F)

1910.1030(g)(2)(vii)(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;

1910.1030(g)(2)(vii)(G)

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

1910.1030(g)(2)(vii)(H)

An explanation of the basis for selection of personal protective equipment;

1910.1030(g)(2)(vii)(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;

1910.1030(g)(2)(vii)(J)

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

1910.1030(g)(2)(vii)(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;

1910.1030(g)(2)(vii)(L)

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

1910.1030(g)(2)(vii)(M)

1910.1030(g)(2)(vii)(M)

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

1910.1030(g)(2)(vii)(N)

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

1910.1030(g)(2)(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.

1910.1030(g)(2)(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.

1910.1030(g)(2)(ix)(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.

1910.1030(g)(2)(ix)(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.

1910.1030(g)(2)(ix)(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.

1910.1030(h)

Recordkeeping --

1910.1030(h)(1)

Medical Records.

1910.1030(h)(1)(i)

The employer shall establish and maintain an accurate record for each employee with occupational exposure, in accordance with 29 CFR 1910.1020.

1910.1030(h)(1)(ii)

This record shall include:

1910.1030(h)(1)(ii)(A)

The name and social security number of the employee;

1910.1030(h)(1)(ii)(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);

1910.1030(h)(1)(ii)(C)

A copy of all results of examinations, medical testing, and follow-up procedures as required by paragraph (f)(3);

1910.1030(h)(1)(ii)(D)

The employer's copy of the healthcare professional's written opinion as required by paragraph (f)(5); and..1910.1030(h)(1)(ii)(E)

1910.1030(h)(1)(ii)(E)

A copy of the information provided to the healthcare professional as required by paragraphs (f)(4)(ii)(B)(C) and (D).

1910.1030(h)(1)(iii)

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

1910.1030(h)(1)(iii)(A)

Kept confidential; and

1910.1030(h)(1)(iii)(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.

1910.1030(h)(1)(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 1910.1020.

1910.1030(h)(2)

Training Records.

1910.1030(h)(2)(i)

Training records shall include the following information:

1910.1030(h)(2)(i)(A)

The dates of the training sessions;

1910.1030(h)(2)(i)(B)

The contents or a summary of the training sessions;

1910.1030(h)(2)(i)(C)

The names and qualifications of persons conducting the training; and

1910.1030(h)(2)(i)(D)

The names and job titles of all persons attending the training sessions.

1910.1030(h)(2)(ii)

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

1910.1030(h)(3)

Availability.

1910.1030(h)(3)(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.

1910.1030(h)(3)(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.

1910.1030(h)(3)(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 1910.1020.

1910.1030(h)(4)

Transfer of Records.

1910.1030(h)(4)(i)

The employer shall comply with the requirements involving transfer of records set forth in 29 CFR 1910.1020(h).

1910.1030(h)(4)(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.

1910.1030(h)(S)

Sharps injury log.

1910.1030(h)(S)(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:

1910.1030(h)(S)(i)(A)

The type and brand of device involved in the incident.

1910.1030(h)(S)(i)(B)

The department or work area where the exposure incident occurred, and

1910.1030(h)(S)(i)(C)

An explanation of how the incident occurred.

1910.1030(h)(S)(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.

1910.1030(h)(S)(iii)

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

1910.1030(i)

Dates --

1910.1030(i)(1)

Effective Date. The standard shall become effective on March 6, 1992.

1910.1030(i)(2)

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

1910.1030(i)(3)

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

1910.1030(i)(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.

[56 FR 64004, Dec. 06, 1991, as amended at 57 FR 12717, April 13, 1992; 57 FR 29206, July 1, 1992; 61 FR 5507, Feb. 13, 1996; 66 FR 5325 Jan., 18, 2001]

Comment [24]: End of OSHA regulations. Obviously not written by Berg.

CHAPTER 4

PROTECTING YOURSELF ON THE JOB

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[REDACTED]

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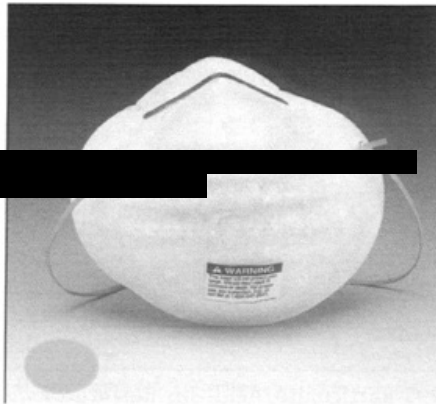
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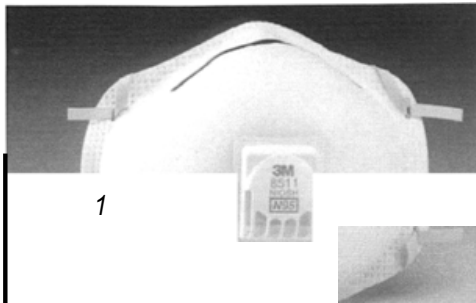
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[REDACTED]

These same masks are worn by health care personnel to reduce exposure to airborne Tuberculosis virus, and other particulate **down to 0.5 microns**. The high efficiency of these masks gives additional protection and peace-of-mind to the technician.



N-95 particulate respirators are available with or without the exhalation valve shown here. It is an effective facepiece respirator that is 95% efficient at stopping solid and liquid particulates free of oil down to 0.5 microns

Comment [25]: We would like to point out that “down to .05 microns” is incorrect. Respirators are rated at **.03 microns**.

Berg should not be teaching anything about Respiratory Protection if he gets this basic fact wrong.

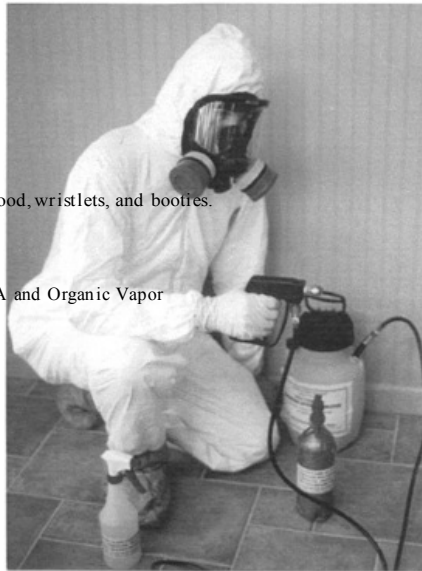
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Full Protection:

An ASTM certified Tyvek suit, complete with integral hood, wristlets, and booties.

ASTM certified latex gloves.

A full-face respirator with stacked cartridges for HEPA and Organic Vapor



[REDACTED]

[REDACTED]



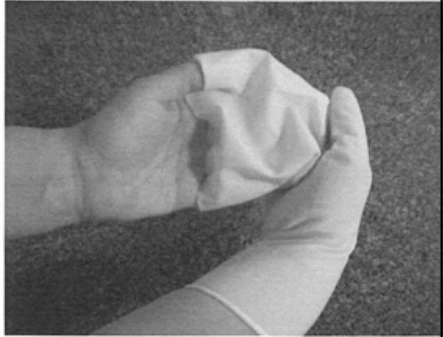
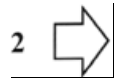
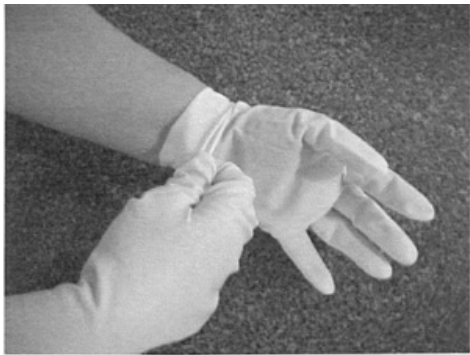
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Dusts, Fumes and Mists can cause irritation of the respiratory tract. This tract includes the nose, mouth, throat, trachea, and lungs. Tissue damage can occur that may make breathing difficult. Dust particles also can clog the lungs.

Gasses and vapors are generally associated with the use of chemicals or off-gassing of liquids and *solids*. In addition to causing similar damage as dust, fumes and mists, these toxins may damage other internal organs.

WARNING: Oxygen deficiency in the air can cause unconsciousness and death. Make sure that the environment you are working in is well ventilated. Do not enter confined spaces unless you are trained and the space is monitored by a gas meter.

Filtering Facepiece Respirators are made of fibers that trap and hold hazardous particles.

Air Purifying Respirators use cartridges that contain **sorbents** that hold gasses or vapors; fibers that trap and hold hazardous particles; or both. It is important to use the specific cartridge designed for the hazard and for your respirator.

Before using your respirator, be sure to read and understand all labels and instructions.

Remember that only a properly fitted respirator will offer protection. Use only respirators that you have been successfully fit-tested for. If the shape of your face changes (fractures, surgery); or dental configuration changes (dentures, tooth loss) you must be retested for proper fit.

You must also fit test your Air Purifying Respirator prior to each use.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

For work in an environment that has the potential to contain airborne m. tuberculosis, a filtering face-piece respirator with a HEPA claim or an Elastomeric Facepiece Respirator with HEPA filter is required.

Comment [26]: Clearly stolen from <http://www.kent.edu/facilitiesplanning/safety/upload/respiratory-protection-brochure.pdf>

Comment [27]: Nope. Wrong. Berg should really stop trying to teach Respiratory Protection if he can't even get the basics correct.

A user does NOT perform a "fit test" every time. A user should perform a "user seal check" every time he/she uses a respirator.

Anyone who actually knows anything about using a respirator or Respiratory Protection knows the fundamental differences between the two tests and does not confuse them.

Comment [28]: This is also incorrect. N95 respirators were designed for m. tuberculosis workers and N95 respirators are NOT HEPA-rated. Berg doesn't seem to understand Respiratory Protection very well.



Half-Face Elastomeric Respirator



Full-Face Elastomeric Respirator

NOTE: When putting on all protective equipment, be sure it fits well, is positioned properly, and eliminates exposure. When removing the disposable PPE, remove it in such a way as to be inside-out when removal is completed. This reduces accidental exposure.

When handling the full-face respirator or goggles, be sure to wear clean gloves. Use PPE when cleaning these reusable items (which should be done as soon as practical after the scene cleaning is completed).

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INJURY/EXPOSURE PROCEDURES

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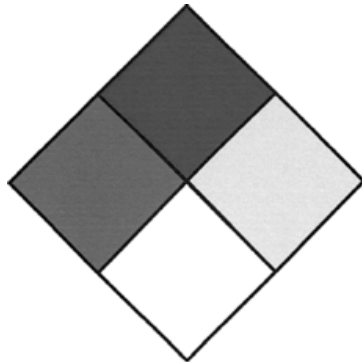
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If this wound came in contact with another's blood or OPIM, this would be a reportable injury / exposure. Post-exposure testing and treatment would need to be started immediately. In any case, wash the wound thoroughly with soap and water, render the appropriate first aid, then notify your employer.

CHAPTERS INTRODUCTION TO HAZCOM & MSDS



INTRODUCTION TO THE HAZARD COMMUNICATION PLAN AND MATERIAL SAFETY DATA SHEETS (MSDS)

[REDACTED]

[REDACTED]

[REDACTED]

MATERIAL SAFETY DATA SHEETS

The Material Safety Data Sheet (MSDS) is a detailed information bulletin prepared by the manufacturer or importer of a chemical that describes the physical and chemical properties, physical and health hazards, routes of exposure, precautions for safe handling and use, emergency and first-aid procedures, and control measures. Information on an MSDS aids in the selection of safe products and helps prepare employers and employees to respond effectively to daily exposure situations as well as to emergency situations.

The MSDS/s are a comprehensive source of information for all types of employers. There may be information on the MSDS that is not useful to you or not important to the safety and health in your particular operation. Concentrate on the information that is applicable to your situation. Generally, hazard information and protective measures should be the focus of concern.

Your Rights

1. Your workplace is required to have Material Safety Data Sheets available for every single hazardous chemical or substance you use or encounter as a part of your job.
2. These must be readily available for employee review at all times you are in the workplace. In other words, they cannot be locked in an office or filing cabinet to which you do not have access.
3. If you request to see an MSDS for a product you use at work, and your employer cannot show it to you, after one working day you may refuse to work with that product until you are shown the correct MSDS.
4. If you request your own personal copy of a MSDS, your employer has 15 working days to provide it.

Comment [29]: Just a quick search found that this is plagiarized from a standard OSHA template about Hazard Communication. Here is one: <http://www.ehs.okstate.edu/modules/msds.htm>
Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

**SAMPLE MATERIAL SAFETY DATA SHEET FOR WEXFORD
CHEMICAL COMPANY - WEX-CIDE - READY TO USE DISINFECTANT**

WEXFORD LABS INC -- READY TO USE WEX-CIDE

===== MSDS

Safety Information

=====F SC:6840

MSDS Date: 11/1511994 MSDS Num: BWWRL LITN: OOF039280 Product ID: READY
TO USE WEX-CIDE MFN: 01 Responsible Party Cage: G0390 Name: WEXFORD
LABS INC Address: 325 LEFFINGWELL AVE City: KIRKWOOD MO 63122-5000 Info
Phone Number: 314-966-4134 Emergency Phone Number: 314-966-4134 Review Ind: Y
Published: Y

===== Preparer Co.

when other than Responsible Party Co.

===== Cage:

00390 Assigned Ind: Y Name: WEXFORD LABS INC Address: 325 LEFFINGWELL
AVE City: KIRKWOOD MO 63122-5000

===== Contractor

Summary

=====

Cage: 56301 Name: WEXFOIRD LABS, INC Address: 325 LEFFINGWELL AVENUE
City: KIRKWOOD MO 63 122 Phone: 314-966-4134 Cage: G0390 Name: WEXFORD
LABS INC Address: 325 LEFFINGWELL AVE City: KIRKWOOD MO 63 122-5000
Phone:314-966 -4134

===== Ingredients

===== Cas: 90-43-7

RTECS #: DV5775000 Name: 0-PHENYL PHENOL% Wt: 0.026 -----
--- Cas: 120-32-1 RTECS #: G07175000 Name: 0-BENZYL-P-CHLOROPHENOL
ORTHO-BENZYL-PARA-CHLOROPHENOL % Wt: 0.023

===== Health

Hazards Data

===== Route Of

Entry Inds - Inhalation: NO Skin: NO Ingestion: NO Carcinogenicity Inds - NTP: NO
IARC: NO OSHA: NO Effects of Exposure: EYES: IRRITATION. HARMFUL IF
SWALLOWED. Explanation Of Carcinogenicity: NONE Signs And Symptoms Of
Overexposure: IRRITATION First Aid: EYES/SKIN: WASH W/WATER. OBTAIN
MEDICAL ATTENTION IN ALL CASES.

===== Handling

and Disposal

=====

Spill Release Procedures: PICK UP MATERIAL W/WET VACUUM PICKUP,
SQUEEGEE & PAN/MOP. FLUSH AREA THOROUGHLY W/WATER. ALLOW TO
DRY. Waste Disposal Methods: THROUGH CONVENTIONAL SEWAGE SYSTEM.
Handling And Storage Precautions: STORE AT ROOM TEMP. DON'T LEAVE
CONTAINERS OPEN. Other Precautions: AVOID CONTACT W/EYES, SKIN. KEEP
OUT OF REACH OF CHILDREN. AVOID CLOTHING CONTACT.

Explosion Hazard Information

Flash
 Point Text: NONE TO BOILING Extinguishing Media: SUITABLE TO ORIGIN OF
 FIRE Fire Fighting Procedures: NONE Unusual Fire/Explosion Hazard: NONE

Control
 Measures

Respiratory Protection: NONE Protective Gloves: REQUIRED Eye Protection:
 REQUIRED Other Protective Equipment: NONE NEEDED Supplemental Safety and
 Health: PH: 2.5-2.9.

Physical/

Chemical Properties

B.P. Text:
 >212F Spec Gravity: 1.01 PH: (SUPP) Solubility in Water: 100% Appearance and Odor:
 CLEAR TRANSPARENT LIQUID W/LIGHT CITRIC ODOR

Reactivity

Data

Stability Indicator: YES Materials To Avoid: STRONG ALKALIS Hazardous
 Polymerization Indicator: NO

Toxicological Information

Ecological

Information

MSDS

Transport Information

Regulatory

Information

Other

Information

HAZCOM

Label

Product ID: LABEL COVERED UNDER EPA REGS - HAZCOM LABEL NOT
 AUTHORIZED

CHAPTER 6 CONFINED SPACE OPERATIONS

Confined Space Operations

Confined spaces and permit-required confined spaces pose a significant health and safety threat to the biorecovery technician. Always think of confined spaces as dangerous.

Recognizing confined spaces:

By memorizing the following criteria, you will be able to recognize an area that is classified as a confined space.

A confined space is a space that:

1. Is large enough and configured in such a way that an employee can bodily enter and perform assigned work, AND

[REDACTED]

2. Has limited or restricted means for entry or exit, AND

[REDACTED]

[REDACTED]

3. Is not designed for continuous employee occupancy.

[REDACTED]

Comment [30]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

Comment [31]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

Comment [32]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

1. Contains or has the potential to contain a hazardous atmosphere.

Comment [33]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

A. Oxygen deficits or enrichments:

An oxygen deficit may be caused by decomposition of organic materials such as sewage, chemical reactions such as rust, and displacement by other gases and/or vapors. Even if there is enough oxygen when you enter, it can be used up by your presence and your work. Remember that an oxygen deficit or enrichment cannot be detected by smell; only a gas and vapor detector will work. Rusting pipes, dead animals and decaying matter in a confined space may help give you a hint that a deficit is present.

Comment [34]: Mixture of paraphrasing and verbatim from <http://www.jacam.com/HSE%20Docs/HSE%20Handbook%202012.pdf>

B. Flammable gases, vapors, mists, and dusts:

Chemicals and gases can explode suddenly from cigarettes, static electricity, sparks, or heat.

Comment [35]: Plagiarized <http://www.jacam.com/HSE%20Docs/HSE%20Handbook%202012.pdf>

C. Toxic Materials:

Toxic materials may be present in a solid, liquid, or gas. Toxins can harm your breathing and nervous system. Often, you cannot see or smell them. Some gases, vapors and dusts can burn or smother you quickly. Others don't have obvious effects and so are especially dangerous.

Comment [36]: Mixture of paraphrasing and verbatim from <http://www.jacam.com/HSE%20Docs/HSE%20Handbook%202012.pdf>

2. Contains or has the potential to contain an engulfment hazard.

Comment [37]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

3. Contains an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.

[REDACTED]

4. Contains ANY other recognized safety or health hazards.

[REDACTED]

Comment [38]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

Comment [39]: Plagiarized from OSHA, 1910.146(b).

Again, while OSHA information is regarded as public domain, Berg clearly wants students and others to believe that he wrote this.

Class A, B or C

Confined spaces are classified by how dangerous they are for your health. This depends on oxygen levels, fire dangers ("flammability"), and poison dangers ("toxicity").

Class A confined spaces are very dangerous. Their oxygen levels may be low. Explosions may be likely. They may have high levels of toxic gases or chemicals.

Class B spaces present dangers if proper safety steps are not followed.

Class C spaces have possible hazards, but special work procedures are not necessary. Only trained persons should decide whether a space is Class A, B or C.

Prepare Carefully

Always prepare before entering a confined space. Use the right ventilation and Personal Protective Equipment. Make sure all equipment is tested and grounded.

Cut off gas, power, steam or water lines into the confined space. Post a permit stating that you *are* inside.

Have a qualified person test the air for oxygen, flammability, and toxicity. Test high, low and in the corners.

Have at least one "buddy" outside, connected to you by lifeline. Your buddy should know cardiopulmonary resuscitation ("CPR"), first aid, and how to use safety equipment. Stay in contact with your buddy.

Stay alert and don't smoke or eat while in a confined space.

Comment [40]: No, this is incorrect. Berg is quoting a NIOSH document titled "Criteria for a Recommended Standard, dated December 1979. These "classes" were never adopted by OSHA. Berg is teaching things that are just not true.

Comment [41]: Plagiarized from <http://www.jacam.com/HSE%20Docs/HSE%20Handbook%202012.pdf> This JCAM document was first written in 2004.

CHAPTER 7

LOCKOUT / TAGOUT OPERATIONS

Lockout / Tagout Operations

Comment [42]: This section on Lockout/Tagout is a mixture of plagiarized and paraphrased materials.

Purpose

When responding to a scene where a machine is contaminated with blood or OPIM, simply unplugging the machine may not be enough. Many serious accidents have occurred when someone thought a machine or the electricity was safely off.

Comment [43]: Plagiarization, earliest instance found in <https://www.case.edu/ehs/News/archive/Oct94.htm>

Ensuring Machines Stay OFF

In accordance with the requirements of OSHA regulation 1910.147, Lockout / tagout ensures that machines and power remain temporarily off. Without a lockout / tagout system, there is the possibility that a machine could suddenly start up, causing injury or death.

Comment [44]: Plagiarization, earliest instance found in <https://www.case.edu/ehs/News/archive/Oct94.htm>

Lockout / tagout procedures are employed to lockout energy isolating devices whenever maintenance or servicing is done on machines or equipment. It is used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any cleaning or maintenance.

Comment [45]: Mixture of verbatim and deletions from 1910.147 App A

The OSHA standard does not apply in the following situations:

While servicing or maintaining cord and plug connected electrical equipment, provided that the equipment is unplugged from the energy source; and the plug remains under the exclusive control of the employee performing the servicing and/or maintenance; and

During hot tap operations that involve transmission and distribution systems for gas, steam, water, or petroleum products when they are performed on pressurized pipelines provided that continuity of service is essential, shutdown of the system is impractical, and employees are provided with alternative protection that is equally effective.

Seven Step to Prepare for Lockout / Tagout

1. Prepare for shutdown. Think, plan and check. Think through the entire procedure. Identify all parts of any systems that need to be shut down. Determine what switches, equipment and people will be involved. Carefully plan how restarting will take place.
2. Communicate. Notify all those who need to know that a lockout / tagout procedure is taking place.
3. Identify all appropriate power sources, whether near or far from the job site. Include electrical circuits, hydraulic and pneumatic systems, spring energy and gravity systems.
4. Shut down the machine or equipment using the procedures established for the machine or equipment. An orderly shutdown helps avoid any additional or increased hazards. Neutralize all appropriate power at the source. Disconnect electricity. Block movable parts. Release or block spring energy. Drain or bleed hydraulic and pneumatic lines. Lower suspended parts to rest positions.
5. Lock out all power sources. Use a lock designed only for this purpose. Each technician should have a personal lock and key.
6. Tag out all power sources and machines. Tag machine controls, pressure lines, starter switches and suspended parts. Tags should include your name, department, how to reach you, the date and time of tagging and the reason for the lockout.
7. Do a complete test. Double check all the steps above. Do a personal check. Push start buttons, test circuits and operate valves to test the system to assure it is off.

Comment [46]: Plagiarized from <http://www.osh.net/directory/safety/loto.htm>

Unlike osha.gov, osh.net is a for-profit company. It is NOT OSHA nor osha.gov. Berg is plagiarizing.

Comment [47]: Found in a number of companies' safety plans. We found one from 1995.

(found here http://www.ccmsi.com/shared/uploads/01252_lockouttagout_2009n.pdf and posted on that website in 2009 but the poster itself reads "1995.")

Restoring Power

[REDACTED]

[REDACTED]

2. [REDACTED]

3. [REDACTED]

4. [REDACTED]

Use of Tagout ONLY

When the energy-isolating device cannot be locked out, tagout must be used. When using tagout, the biorecovery technician must comply with all tagout-related provisions of the standard and, in addition to the normal training required for all employees, must understand the following limitations of tags:

1. Tags are essentially warning devices affixed to energy-isolating devices and do not provide the physical restraint of a lock.
2. When a tag is attached to an isolating means, it is not to be removed except by the person who applied it, and it is never to be bypassed, ignored, or otherwise defeated.
3. Tags must be legible and understandable by all employees.
4. Tags and their means of attachment must be made of materials that will withstand the environmental conditions encountered in the workplace.
5. Tags may evoke a false sense of security. They are only one part of an overall energy control program.
6. Tags must be securely attached to the energy-isolating devices so that they cannot be detached accidentally during use.

NOTE: Most industrial sites have their own lockout/tagout program in place. Biorecovery Technicians must insure that they personally check each step of the program, and hold the key to the lockout devices while working on a machine.

Comment [48]: Plagiarized from <http://www.osh-net/directory/safety/loto.htm>



Sample Tag

Although there are many variations of this tag, this is the basic concept. On the back of the tag will be a place for the name of the person who is actually at risk inside the machinery. Only that person should install and remove the lock or tag that keeps the machine turned off. In addition, the time, date, and description of equipment locked out may be listed.

CHAPTERS OTHER REGULATED HAZARDS

Other Regulated Hazards

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

CHAPTER 9

BIORECOVERY EQUIPMENT AND SUPPLIES

BIORECOVERY EQUIPMENT AND SUPPLIES

[REDACTED]



[REDACTED]



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]





[REDACTED] (there must be an OSHA Respiratory Protection Plan in place to wear a HEPA respirator mask.)

Comment [49]: Berg is wrong yet again. An employer must have a Written Respiratory Protection Plan in place if any employee is required to wear ANY respirator. Berg seems to think it only applies to a "HEPA respirator."

[REDACTED]

[REDACTED]

[REDACTED]

FULL FACE RESPIRATORS - These respirators will have full-face shields, and replaceable filter cartridges. There must be an OSHA Respiratory Protection Plan in place to use these respirators.

J [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Comment [50]: Berg is wrong yet again. An employer must have a Written Respiratory Protection Plan in place if any employee is required to wear ANY respirator. Berg seems to think it only applies to a "HEPA respirator."

BioRecovery Techn



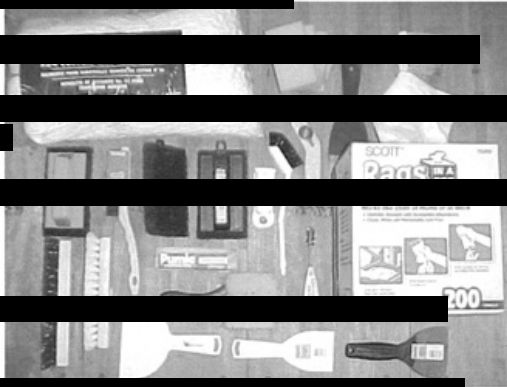


[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED]





[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

The steam-vapor machine deep-cleans in a non-destructive manner by using heat and moisture to open the microscopic "pores" contained in most solid surfaces - where chemicals can't reach trapped contaminants and stain particles. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

USING A STEAM VAPOR MACHINE:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

All surfaces - even glass and metal - have pores just like skin does. The superheated vapor works because heat opens the pores, allowing trapped contaminants to be released. If you don't wipe off the released contaminants immediately, it may get trapped once again when the surface cools. Be thorough but move quickly. The build-up of hot steam on a surface may cause damage.

Comment [51]: Copied from boilerplate information regarding steam cleaning (for example, <http://steamcleansydney.com/>).

Comment [52]: Boilerplate information found www.steamvictoria.com.au/userguide.php and poltidubai.com/guide.html



STATISTICS

The temperature of the vapor at the tip of the nozzle is between 190 and 225F. degrees - depending on the brush you are using (having a towel wrapped over a brush raises the temperature), but the vapor is so fine that it cools to under 100 F. degrees 9-10 inches from the tip when vented into the air.

WARNING: A towel clipped over a brush can get hot enough to bum you as long as vapor passes through it, but it will cool within seconds after the vapor is turned off.

Most protein-based stains - such as blood, vomit, and body fluids - can be "set" by heat at temperatures above 180 degrees or by the passage of time. Once they are "set" they are chemically bonded to the surface they are on and cannot be easily removed. Most of them can be removed more easily by soaking them for 10-15 minutes beforehand with an enzyme or detergent product.

Man-made carpet fibers all have a melting point of 300 degrees or above, so they cannot be melted by the heat generated by the steam vapors, but they are like hair in that they can be heat-set to retain a physical shape at temperatures ranging from as low as 185 degrees to around 250 degrees. In other words, you can't melt them but you can change their shape with the heat generated by a vapor system, especially if you linger too long in one place. Normal back-and-forth motion used in cleaning a carpet prevents heat buildup in the fibers.

Always start cleaning with low pressure and increase it only if the substance being cleaned requires it. Stay in the habit of using low or medium pressure whenever possible - it will extend your running time and is usually enough force for most cleaning tasks.

Use only a heavy-duty extension cord rated for 15 amps.

Comment [53]: Boilerplate info; example:
<http://www.steamit.com.au/support/tips-tricks/>

Comment [54]: Paraphrased and altered for an American audience from
<http://steamworks.co.nz/customer-care/logon/carpet/>

Comment [55]: Boilerplate info; example:
<http://www.steamit.com.au/support/tips-tricks/>

WHICH ACCESSORY TO USE

Use the **triangular brush** for upholstery, spot cleaning carpets, detailing corners of floors, walls, etc. Clip a towel over the brush for cleaning upholstery, drapes, or textured vinyl wallpaper.

Use the **nozzle attachment** for concentrating the vapor on a surface, or blowing loose debris out of cracks and crevices.

Use the **bronze bristle brush** on most metal surfaces. It is also ideal for cleaning chrome, brass and glass.

Use the **nylon bristle brush** on soft surfaces.

Comment [56]: Boilerplate information; mixture of verbatim and substitutions; found here: <http://poltidubai.com/accessories.html>

SPECIFIC SURFACE APPLICATIONS

VINYL FLOORS-Vinyl floors are generally easy to clean. When faced with blood in the seams, or tarry blood, the steam vapor generator can be effective. But, do not allow heat to build up in the vinyl. High temperatures can soften it enough to affect its texture. Work fast. If you use the rectangular brush, use with medium pressure and no towel. Wipe up the contaminants immediately after applying the steam.

WOOD PARQUET-Use the rectangular brush with a towel and low pressure. Move fast to avoid heat or moisture buildup in the wood.

WOOD SURFACES - GENERAL-Avoid getting natural wood too wet or hot. Use the triangular brush with a towel and low pressure. Work quickly to avoid heat or moisture buildup from damaging the finish or warping the wood.

ACOUSTICAL TILE CEILINGS- The heat from a steam-vapor unit will destroy these tiles. Do not attempt to use this device to clean this type of ceiling.

WALLS-For latex paint and wallpaper, use the triangular brush with at least two layers of toweling. Use low heat and move quickly.

UPHOLSTERY-Apply a detergent by misting the affected area. Use low pressure with the triangular brush and a towel. Follow up by wiping or vacuuming.

Comment [57]: Boilerplate info; combination of verbatim and paraphrasing; available in a number of places; example: <http://steamworks.co.nz/>

OZONE GENERATORS

BACKGROUND

Ozone is a molecule composed of three atoms of oxygen. Two atoms of oxygen form the basic oxygen molecule-the oxygen we breathe that is essential to life. The third oxygen atom can detach from the ozone molecule, and re-attach to molecules of other substances, thereby altering their chemical composition. It is this ability to oxidize other substances that forms the basis of ozone's value in combating odors of decomposition.

Comment [58]: Plagiarized, <http://www.epa.gov/iaq/pubs/ozongen.html>

THE HISTORY OF OZONE

Ozone has been extensively used for water purification, but ozone chemistry in water is not the same as ozone chemistry in air. There is currently a great deal of controversy regarding the benefits versus the risks involved with indoor ozone use. The Environmental Protection Agency and other government research groups have published data that questions the efficiency of ozone generators in combating odors and eliminating biological contaminants from the air. These studies have primarily been done at concentrations well below the levels used by remediation companies and may not give a true picture of its ability at higher concentrations.

Comment [59]: Mixture of verbatim and paraphrasing; <http://www.epa.gov/iaq/pubs/ozongen.html>

THE HAZARDS OF OZONE

The same chemical properties that allow high concentrations of ozone to react with organic material outside the body give it the ability to react with similar organic material that makes up the body, and potentially cause harmful health consequences. When inhaled, ozone can damage the lungs. Relatively low amounts can cause chest pain, coughing, shortness of breath, and throat irritation. Ozone may also worsen chronic respiratory diseases such as asthma. You must ensure that no person or pet becomes exposed. In addition, ozone can adversely affect indoor plants, and damage materials such as rubber, electrical wire coatings, fabrics, and artwork containing susceptible dyes and pigments.

Comment [60]: Combination of verbatim and additions and deletions. Berg adds the words in white and deletes a few others. <http://www.epa.gov/iaq/pubs/ozongen.html>

THE MACHINE

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

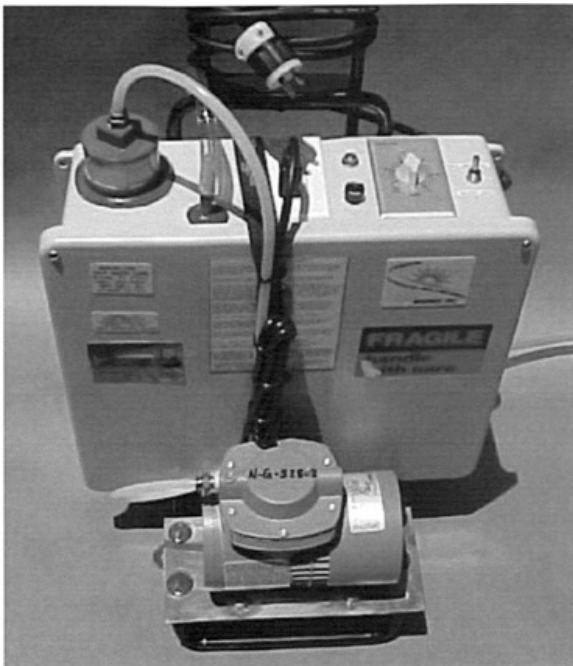
[REDACTED]

[REDACTED]

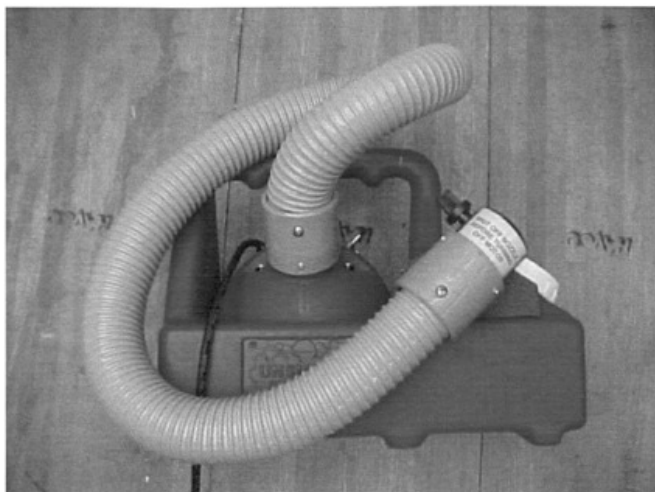
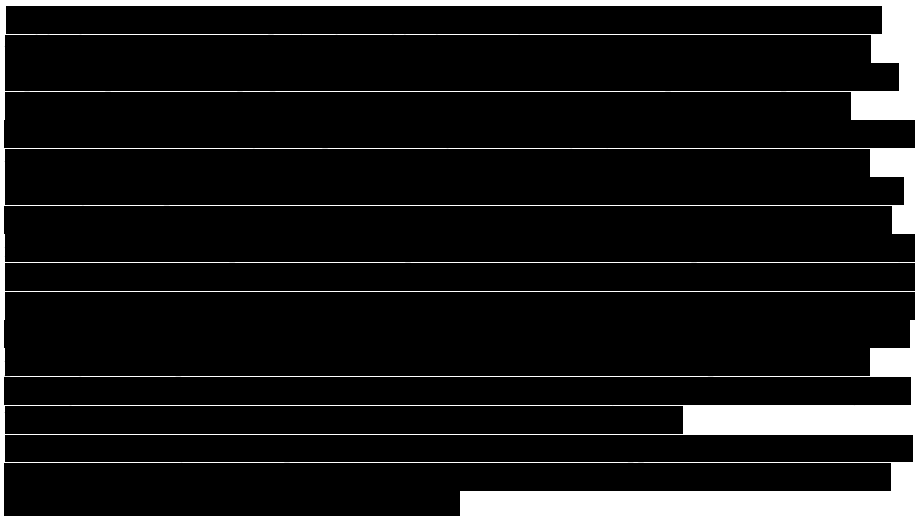
[REDACTED]

DANGER – DO NOT ENTER
OZONE FUMIGATION IN PROGRESS
QUESTIONS? Call (your phone number)

When you return, sniff the air for odors. If the odor remains, activate the ozone generator for additional treatment time.



ULTRA LOW-VOLUME FOGGER



WARNING
Use extreme caution when using an ULV fogger. Liquids conduct electricity, and spraying a mist into a live electrical outlet or appliance may expose you to an electrical shock. In addition, some chemicals may be flammable. Be sure to extinguish any pilot lights or open flames prior to fogging.

ULV foggers generally consist of a liquid storage tank, a pump, a corrugated hose, and an adjustable nozzle. The hose allows the operator to direct the fog into hard to reach areas without tilting the unit. Be sure to wear respiratory and eye protection when fogging.

THERMAL FOGGERS

[REDACTED]

[REDACTED]

[REDACTED]

WARNING :
The chemicals used in thermal foggers are **combustible**. Extinguish or turn off all pilot lights, open flame or electricity. Use caution not to over-fog. These units produce a great deal of heat and can cause burns.



CHAPTER 11 CHEMICALS OF BIORECOVERY

CHEMICALS OF BIORECOVERY

[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]

[REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

The U.S. Environmental Protection Agency (EPA) defines antimicrobials (disinfectants, sanitizers, and sterilants) as pesticides. The worker safety requirements for pesticides closely parallel those for other hazardous materials, including: scope of regulations, material use, labeling, hazard communication, exposure records, training, respirator protection if applicable, safety equipment, lighting, and equipment maintenance.

Pesticide regulations cover and apply to any employee who handles (i.e. mixes, applies, maintains, services or cleans contaminated equipment, etc.) antimicrobial products. Make sure your employer meets these regulations.

[REDACTED]

Because hypochlorites and other antimicrobials are substantially inactivated in the presence of blood, the surface should be cleaned before a final application of an EPA-registered disinfectant is applied.

Cleaning is the most important step in the disinfection process. Cleaning refers to the removal of all foreign material (e.g., soil, blood, tissue) from an object. There are several important points to be made regarding the cleaning process:

- The presence of foreign material will protect microbes from exposure to antimicrobials.

Comment [61]: Plagiarized from <http://safetyservices.ucdavis.edu/snfn/safetynets/snml/sn85/SN85pdf>

Comment [62]: Plagiarized from <http://safetyservices.ucdavis.edu/snfn/safetynets/snml/sn85/SN85pdf>

Comment [63]: Paraphrased from http://www.cdc.gov/hicpac/disinfection_sterilization/6_0disinfection.html

“Because hypochlorites and other germicides are substantially inactivated in the presence of blood 63, 548, 555, 556, large spills of blood require that the surface be cleaned before an EPA-registered disinfectant or a 1:10 (final concentration) solution of household bleach is applied 557.”

- Physical cleaning eliminates large numbers of microbes, thereby increasing the efficiency of the disinfection process.
- The presence of organic matter may inhibit the ability of the antimicrobial solution to eliminate microorganisms.
- An item cannot be considered disinfected if it has body substances encrusted onto it, even if the item has gone through a disinfection process.

[REDACTED]

[REDACTED]

mediate level disinfectants) which eliminates many or all pathogenic microorganisms which may be present on an inanimate object, with the exception of bacterial spores.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

IMPORTANT NOTE:

[REDACTED]

[REDACTED]

Comment [64]: Plagiarized from "Mechanisms of Transmission of Pathogenic Organisms in the Health Care Setting and Strategies for Prevention and Control." This appears to be a nursing/healthcare professional's textbook. Berg is an EMT, is he not? In any case, he DID NOT write this text; he merely changed a few words, and/or eliminated others. He obviously wants the reader to believe that he wrote this information. For shame.

Comment [65]: Again, plagiarized from "Mechanisms of Transmission of Pathogenic Organisms in the Health Care Setting and Strategies for Prevention and Control." "Disinfection is a process which eliminates many or all pathogenic microorganisms which may be present on an inanimate object, with the exception of bacterial spores."

DISINFECTING

[REDACTED]

1. [REDACTED]

2. [REDACTED]

3. [REDACTED]

4. [REDACTED]

5. [REDACTED]

6. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Chlorine and Chlorine Compounds- (Sodium Hypochlorites)

Sodium Hypochlorites, the most widely used of the chlorine disinfectants, are available in liquid form as 5.25% household chlorine bleach. They have a broad spectrum of antimicrobial activity and are inexpensive and fast acting. Problems with hypochlorites include their corrosiveness, inactivation by organic matter, and relative instability. The microbiocidal activity of chlorine is largely attributable to undisassociated hypochlorous acid.

[REDACTED]

Comment [66]: Oh look, it's the CDC again:
http://www.cdc.gov/hicpac/disinfection_sterilization/6_0disinfection.html#a2 Look under the section titled: Chlorine and Chlorine Compounds.

Because hypochlorites and other germicides are substantially inactivated in the presence of large amounts of *blood*, the surface should be cleaned before an EPA-registered disinfectant or a 1:10 solution of household bleach is applied (dilute 1 part household bleach to 9 parts water).

Phenolics-

[REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED]

The bactericidal

The bactericidal action of quaternary ammonium compounds has been attributed to inactivation of energy-producing enzymes, denaturation of essential cell proteins, and disruption of the cell membrane. Quats can be used directly as disinfectants or can be combined with detergents,

Quats can be used directly as disinfectants or can be combined with detergents,

[REDACTED]

Use only EPA-registered quaternaries sold as hospital disinfectants (10-50 ppm concentrations). In this concentration, quats are fungicidal, algacidal, bactericidal, and virucidal against lipophilic viruses ;they are not sporicidal and generally are not tuberculocidal, but are effective against a wide variety of organisms including HIV (some also have a HBV claim) when left in contact with the contaminants for at least ten minutes. Remember, Quats are easily inactivated by organic matter.

[REDACTED]

[REDACTED] As an antiseptic chemical, it can be safely used to disinfect skin and mucous membrane surfaces and act by "denaturing" or altering the molecular structure of bacterial proteins, destroying the cells.

[REDACTED]

[REDACTED]

[REDACTED]

- [REDACTED]
- 2. [REDACTED]
- 3. [REDACTED]

[REDACTED]

Comment [71]: Taken from "Disinfection, Sterilization, and Preservation," which properly cites where the authors of that book found their information.

Comment [72]: Plagiarized from <http://www.cfsph.iastate.edu/BRM/resources/Disinfectants/Disinfection101.pdf>

Comment [73]: Plagiarized from "Sterilization Methods and Control" Butterworths laboratory aids, author MR Breach

[REDACTED]

[REDACTED]
[REDACTED]
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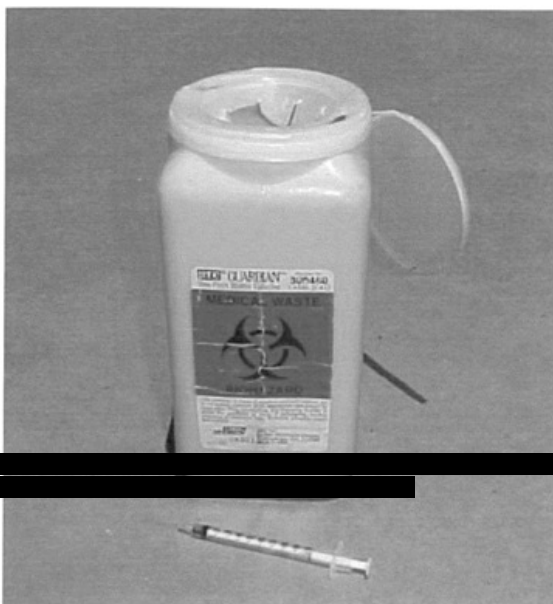
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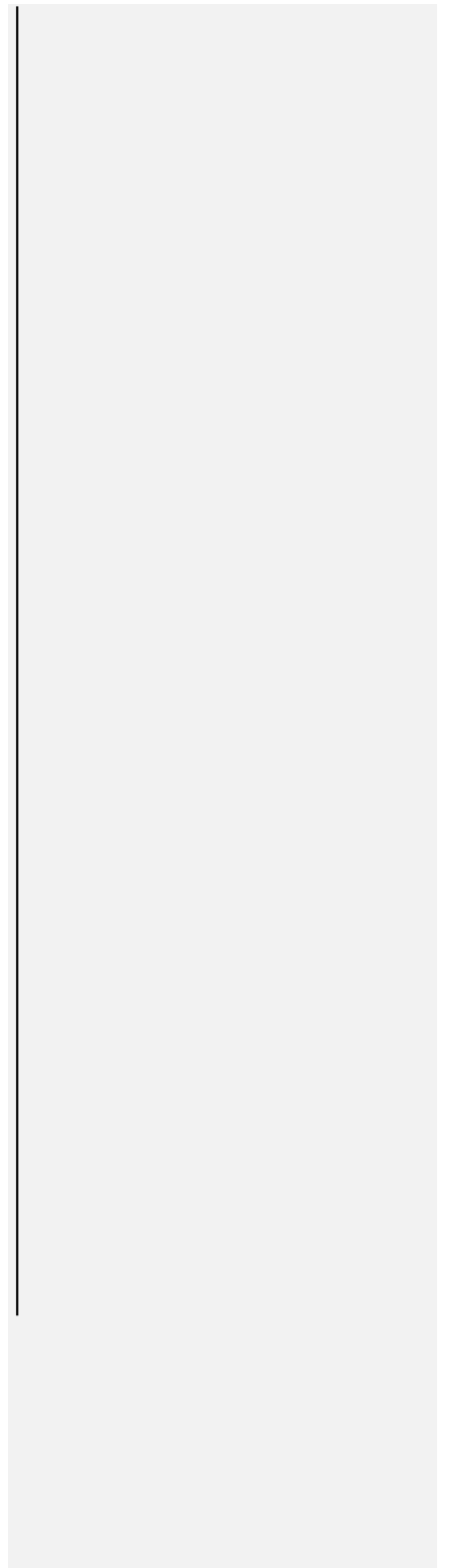
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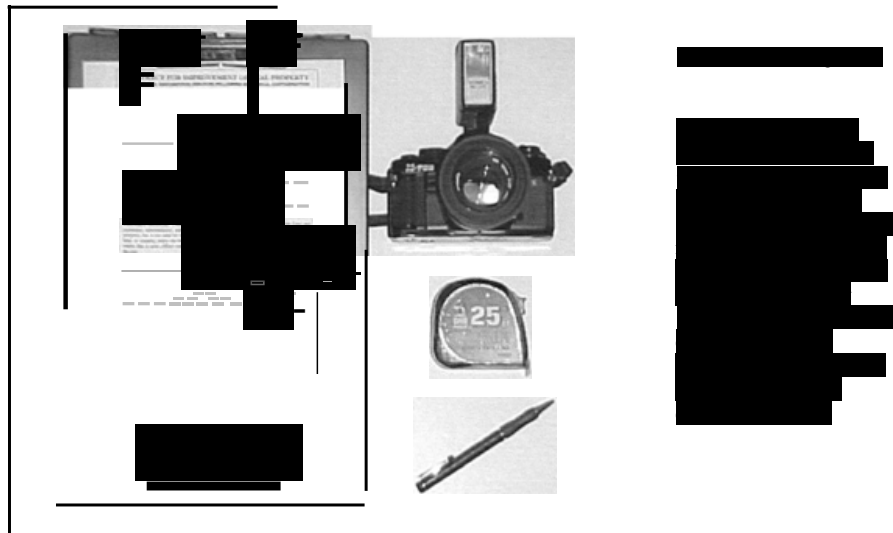
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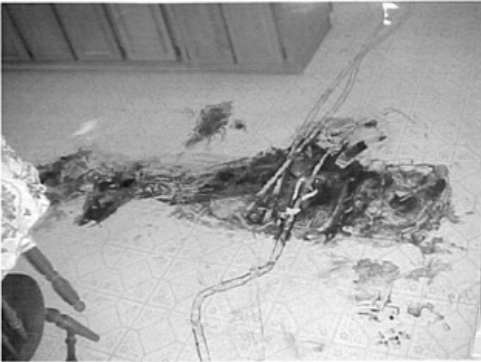
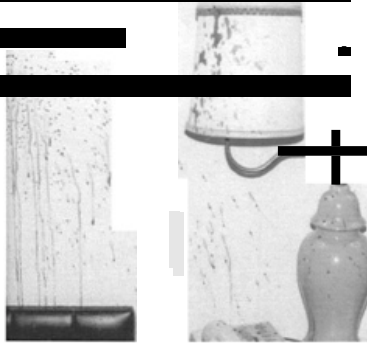
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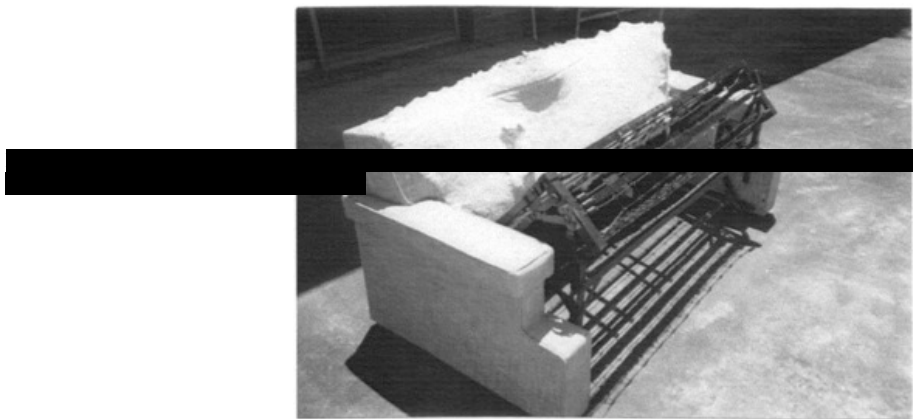
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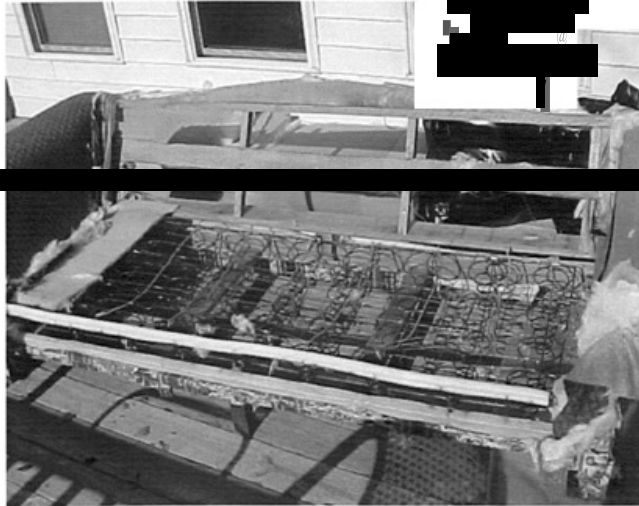
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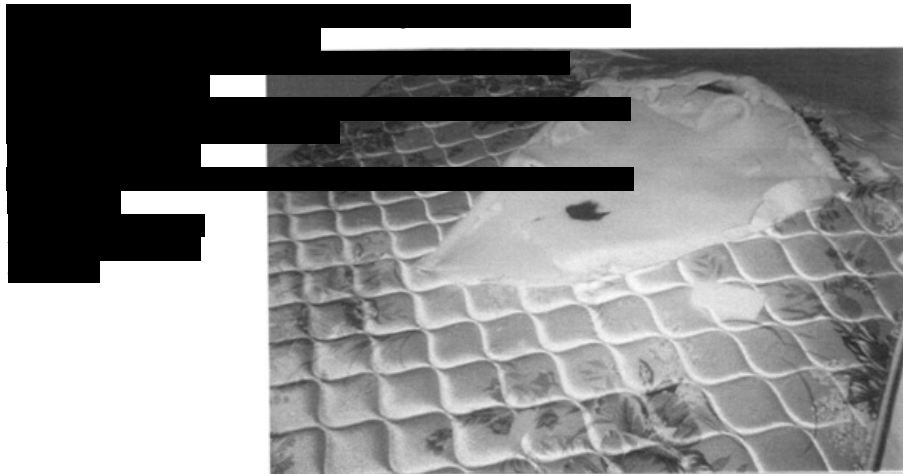


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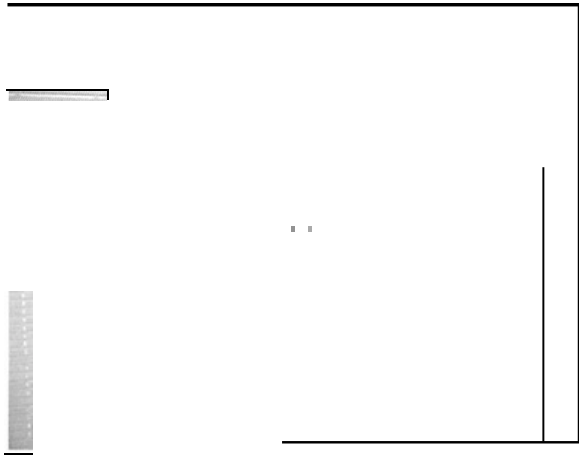
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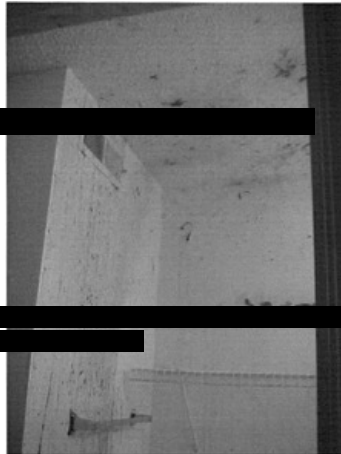
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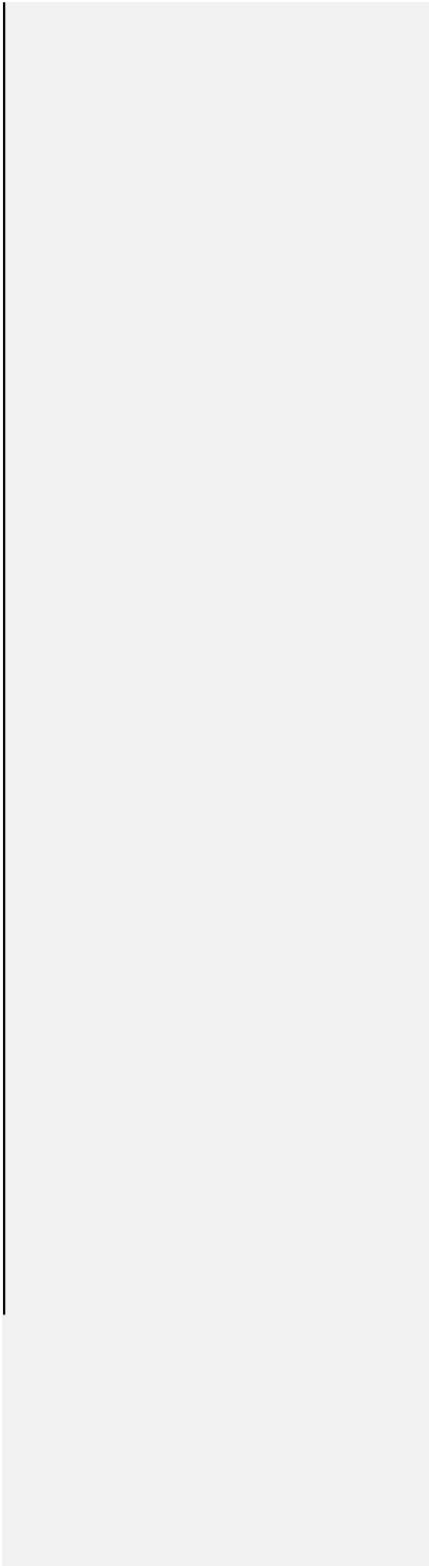
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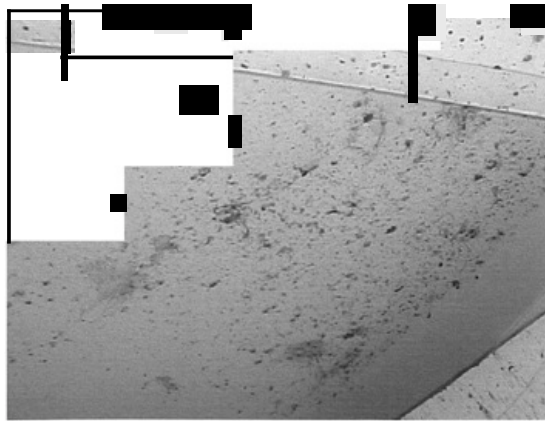
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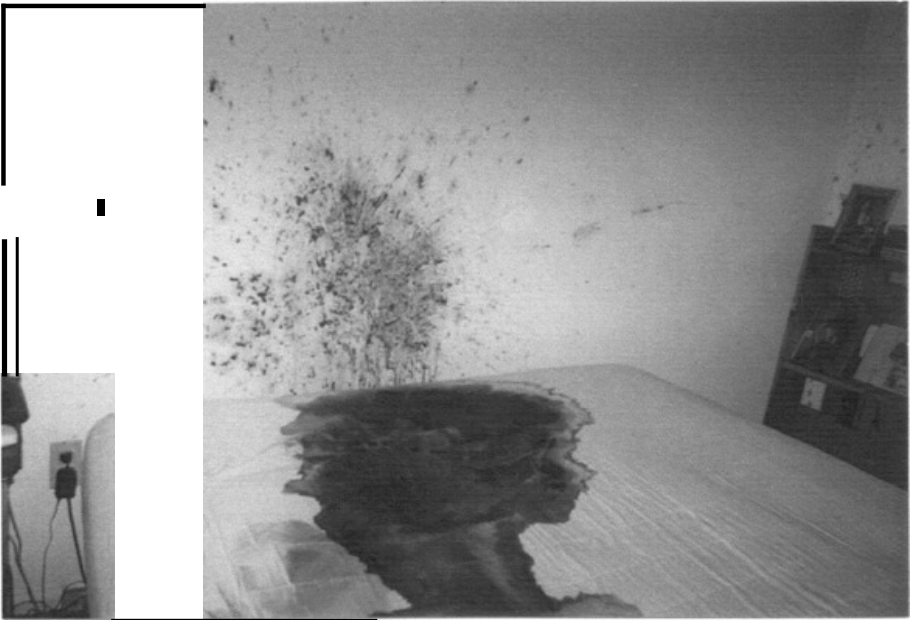
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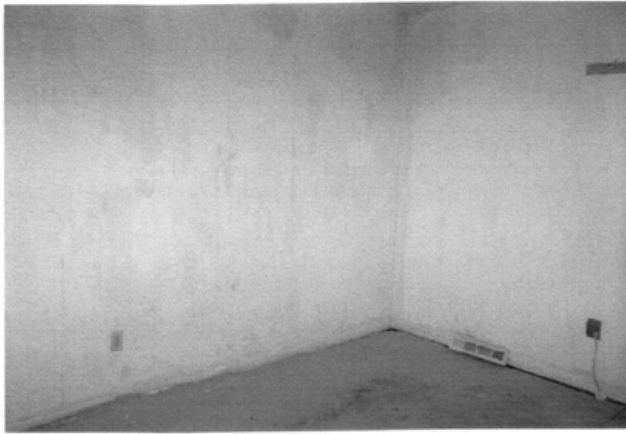


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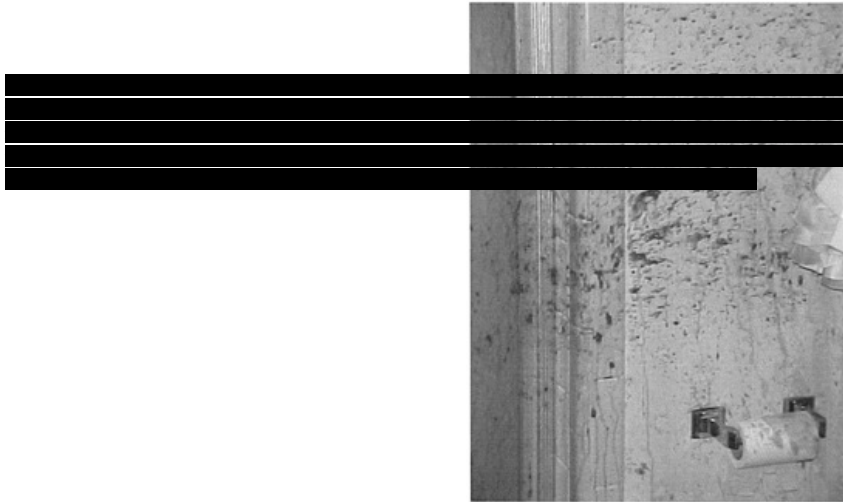


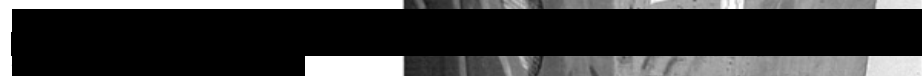
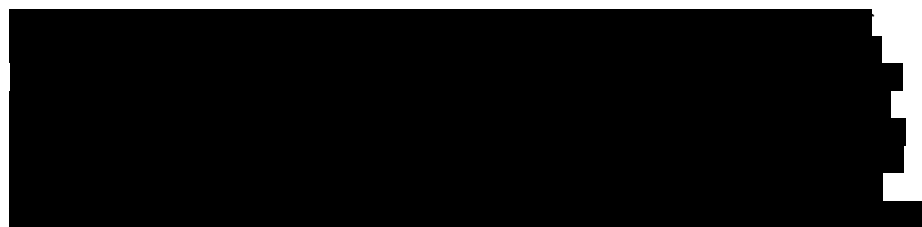
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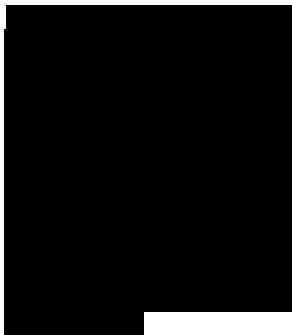
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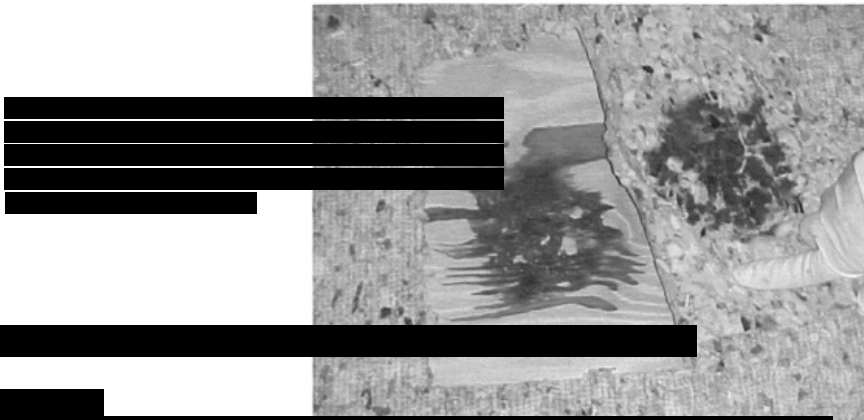


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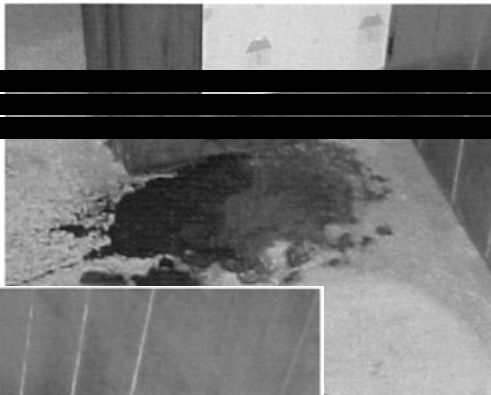
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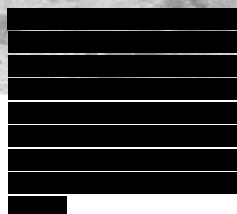
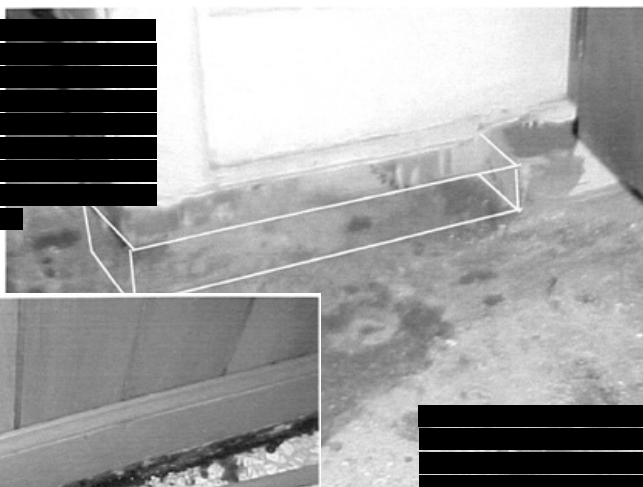
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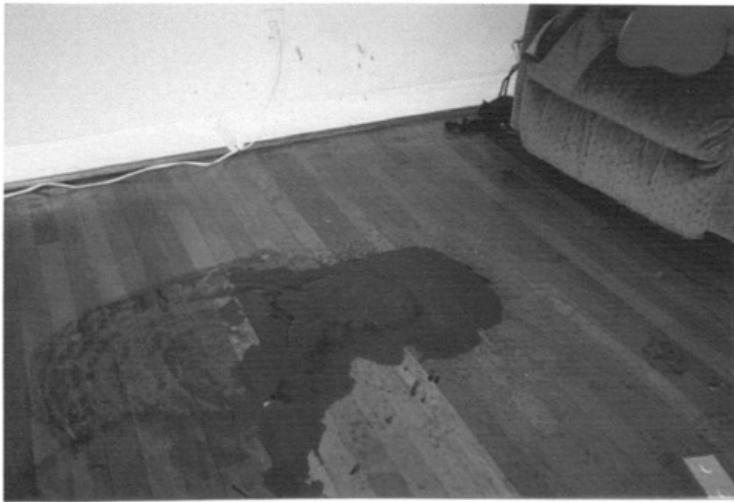




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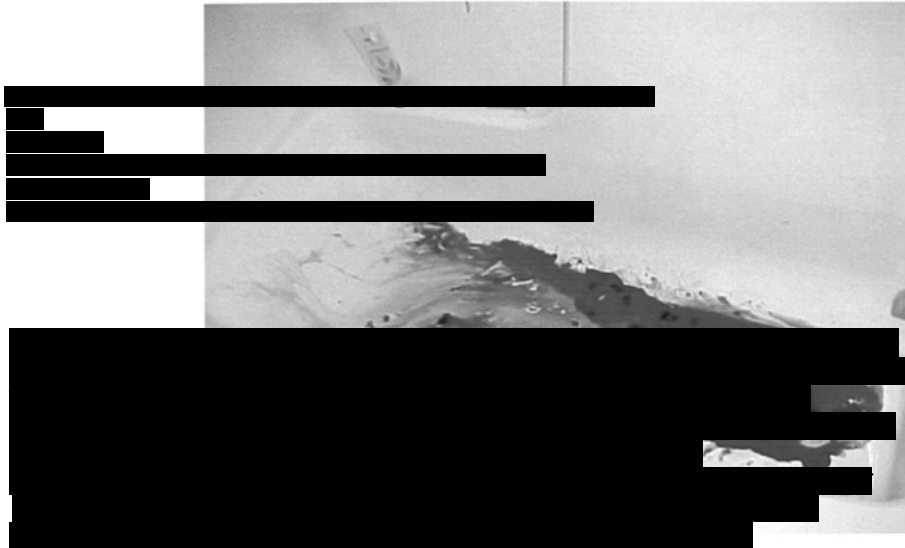
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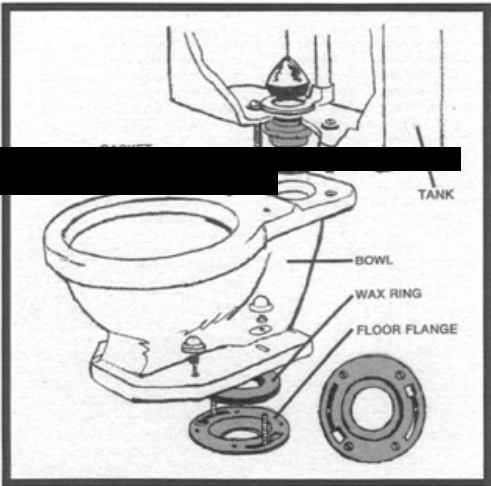


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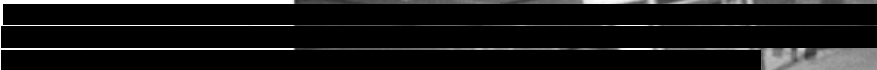
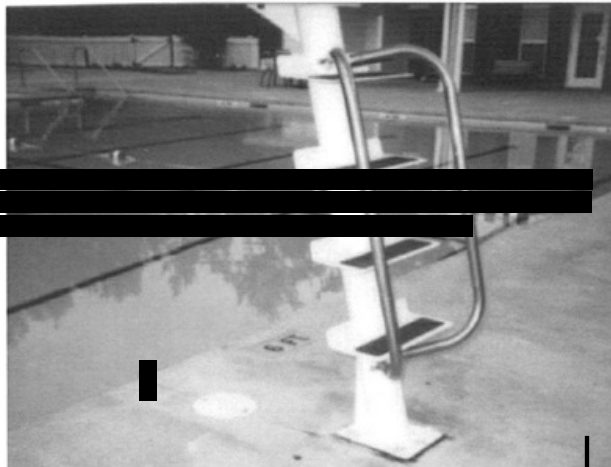


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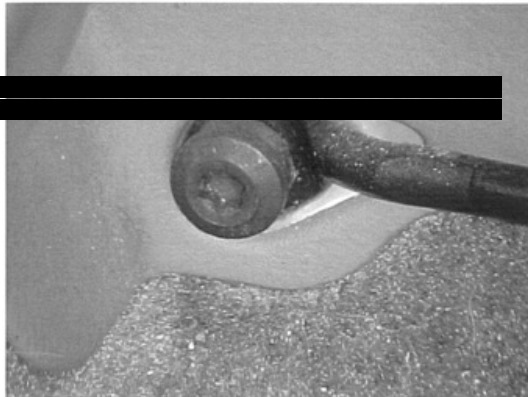
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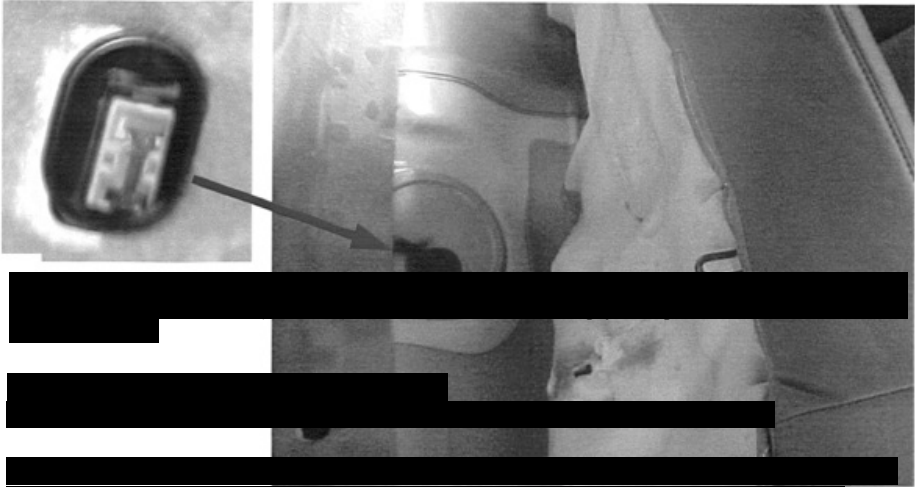
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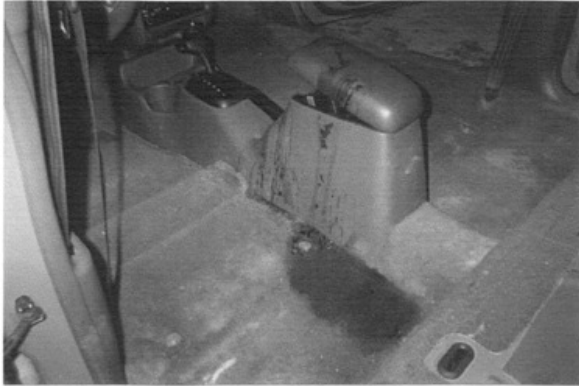
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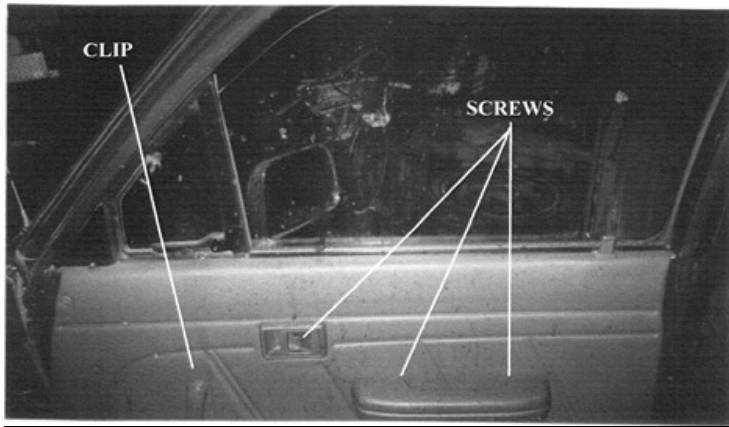


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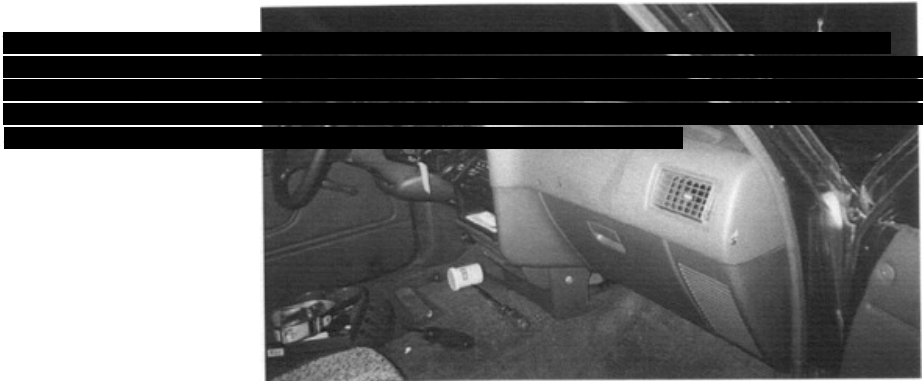


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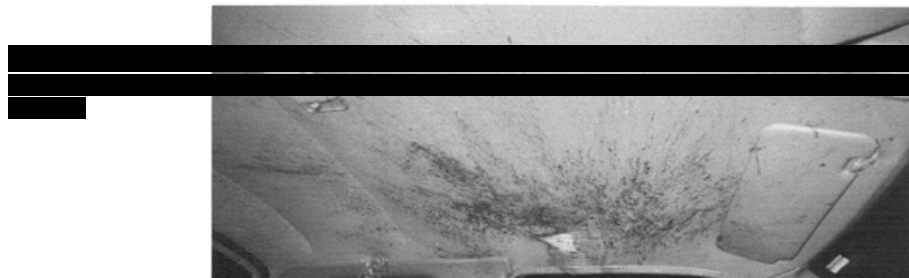
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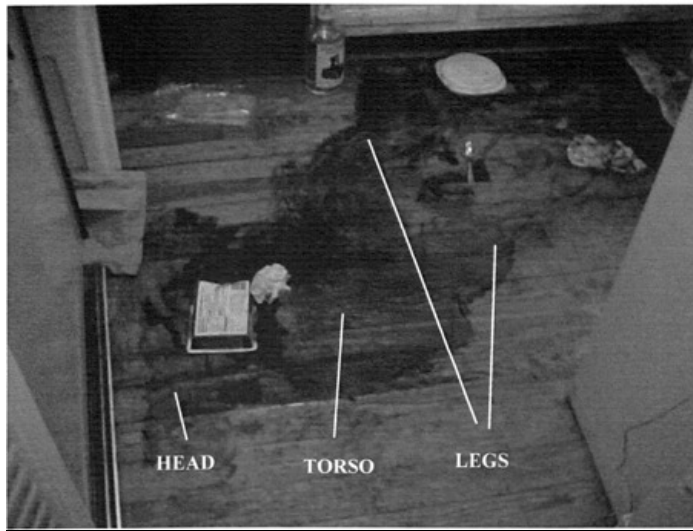
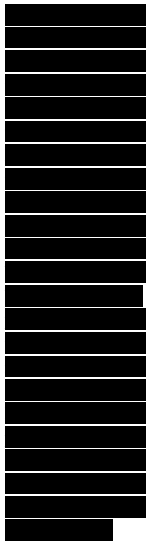
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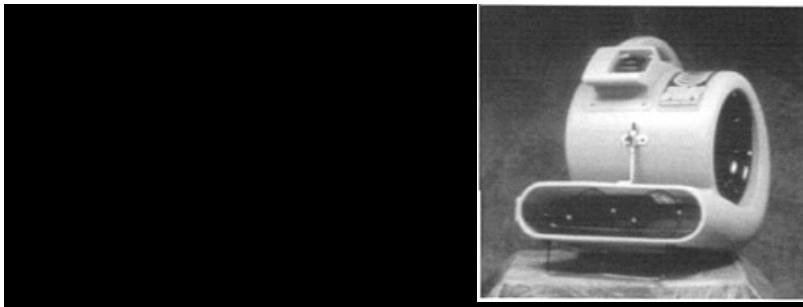
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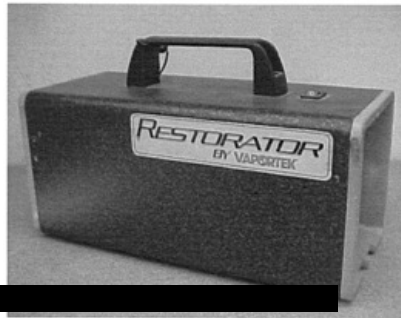


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Putrescine and Cadaverine

Putrescine, chemical name 1-4-butanediamine). This compound is a byproduct of the oxidation and decomposition of short chain diamines by biological system enzymes (diamine oxidase). Putrescine is a biogenic polyamine which was initially identified and detected in decaying animal tissues but is now known to be present in all cell and certain bacterial cultures. It is a strong irritant and lachrymator (tear producer) but very little else is currently known about its toxicology. From what is known this chemical can be hazardous to humans and should be recognized, evaluated and controlled in the workplace environment.

The majority of the studies in the scientific literature about the effects of aliphatic amines like putrescine are related to the local health effects which are primarily irritation and sensitization. Minimal information is available due to the lack of industrial experience, very few chronic animal studies and the scarcity of reliable exposure information with signs and symptoms. Very few actual toxic effects have been observed and recorded during real exposure situations. Some known hazards associated with exposure are:

Depression of blood pressure in animals

Skin and Eye irritation

Mucus membrane and respiratory tract irritation

Repeated chronic overexposure causes pulmonary edema

Comment [74]: Plagiarized from <http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=1045> and <http://toxnet.nlm.nih.gov/cgi-bin/sis/search/r?dbs+hsdb:@term+@rn+@rel+110-60-1>

CHAPTER 15

NON-BIOHAZARD CLEAN-UP

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Numerous methods of staining are used by law enforcement to develop or enhance blood-contaminated latent prints. These methods depend on staining the protein components of blood to form a more visible impression, (commonly dark blue or black.) Among these methods are Amido Black, Leuco-Crystal Violet, Coomassie Blue, Hungarian Red, and Luminol.

[REDACTED]

Coomassie Blue is a reagent like Amido Black and is also methanol-based.

Crowle's Stain contains a toxic substance (trichloroacetic acid), but is water-based.

Hungarian Red is a recently developed, water-based staining solution. A special characteristic of Hungarian Red is that the traces fluoresce under green light, making it possible to visualize weak traces, even when they are present on a dark surface.

Leuco Crystal Violet is a coloring reagent for blood that is based on the blood-catalyzed reaction of hydrogen peroxide with a cationic triarylmethane dye. It is often called the more familiar name Gentian Violet.

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Comment [75]: Plagiarized from www.medtechforensics.com/catalog/LE.doc, dated 07/06 (07/06 Medtech Forensics, Inc., Order Line: (800) 596-6420 www.medtechforensics.com)

Comment [76]: http://www.bvda.com/EN/sect1/en_1_11a.html

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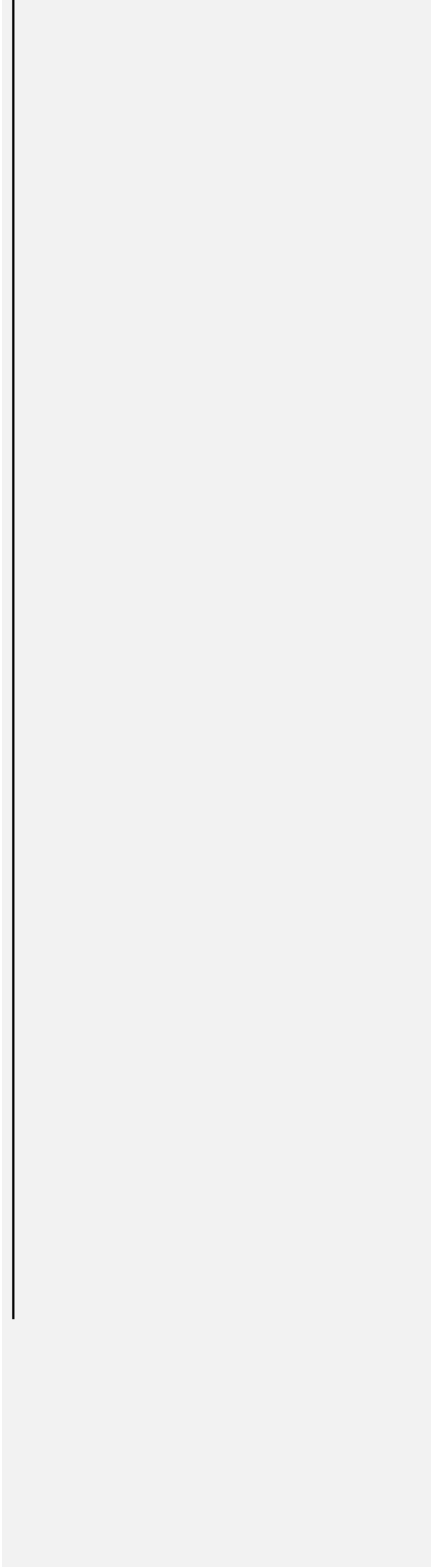
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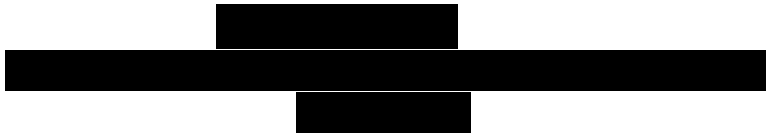
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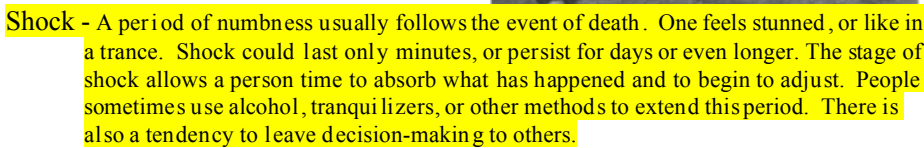


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When such feelings seem overwhelming, major decisions are deferred. Other grievors, family members, counselors, or others can help to interpret and deal with these feelings. These emotions include a multitude of losses: loss of control over one's life; loss of trust in God or other people; loss of a sense of fairness or justice; loss of future.

BioRecovery Technician Manual Copyright 2006 by Kent A. Berg

Panic - A death can often make the future seem uncertain. Panic in the face of the unknown prevents concentration and defers acceptance of the finality of death.

Guilt - Many people fault or blame themselves in the event of a death.

Hostility - People in grief naturally ask "why?", "Why him?", "Why now?", "Why like this?". Most of these questions have no answers. The resulting frustration causes resentment and anger. They need someone to blame.

Depression - Grievers, typically, but in varying degrees, experience loneliness and depression.

Aimlessness - At times in the grieving process, a kind of drifting occurs. Mourners find it difficult to return to familiar, even necessary, activities.

Hope - In time and with effort, hope grows. They can express emotions without embarrassment or apology.

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Comment [77]: Plagiarized from
"Grief is Not a Sign of Weakness,"
a publication of the THEOS
Foundation, Inc, 1980

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These are a few suggestions of what to do in addition to seeking counseling:

- **Get ample rest**
 - **Maintain a good diet**
 - **Exercise**
 - **Take time for leisure activities**
 - **Find and talk to supportive peers or family members about the incident**
 - **Learn about post-traumatic stress disorder**
 - **Spend time with family and friends**
- [REDACTED]

Comment [78]: <http://helid.digicollection.org/en/d/Jh0682e/10.7.html>
Plagiarized from "Mental Health Services in Disasters" by Raquel E. Cohen

CHAPTER 20

LEGAL ISSUES AND DOCUMENTATION

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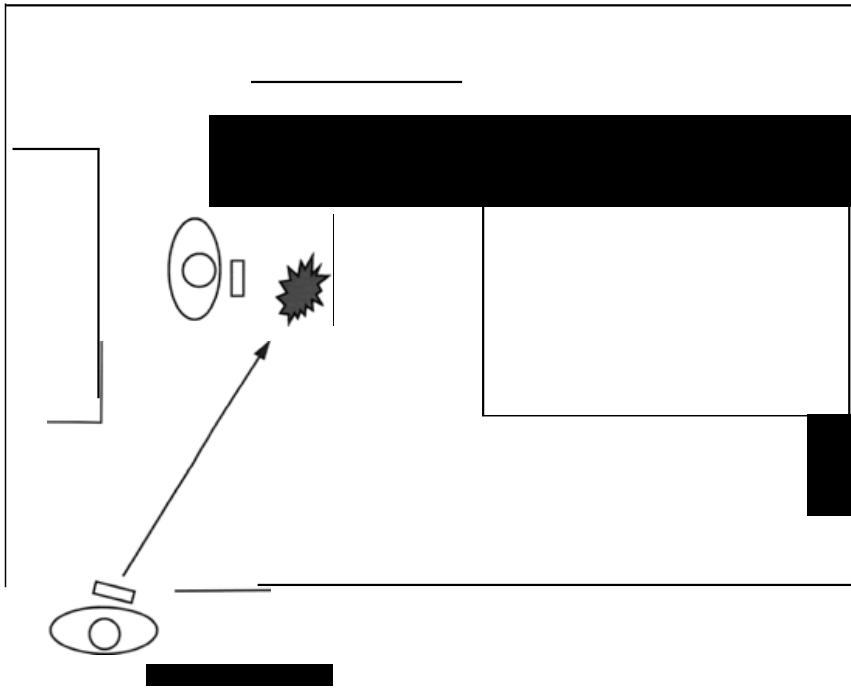
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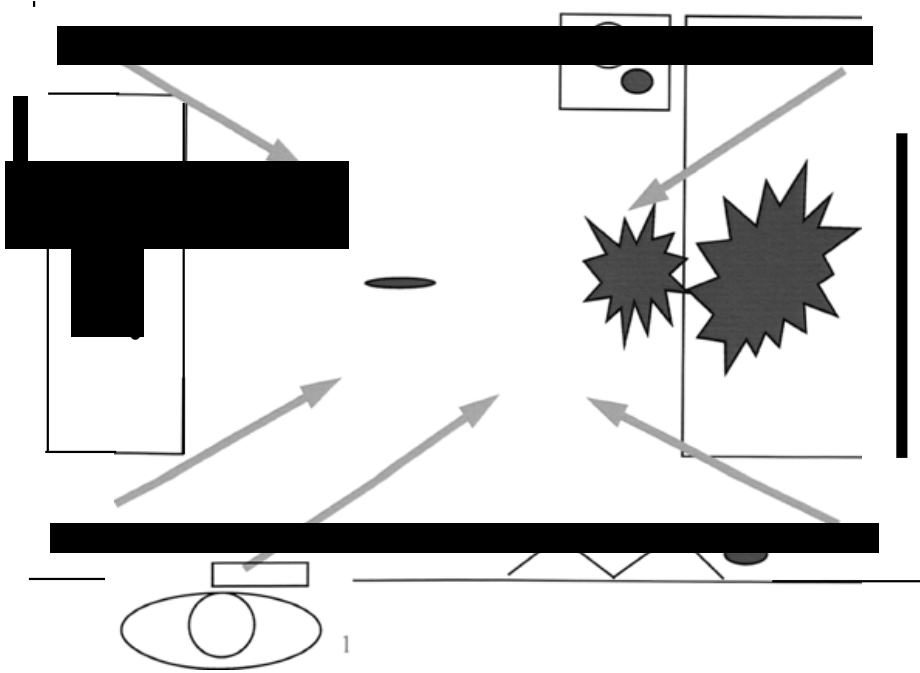
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The FraudOut Team has deleted the back cover.