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ARMSTRONG LABORATORY

INFECTIOUS AND HAZARDOUS WASTE PROTOCOL FOR MEDICAL FACILITIES

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Medical Treatment Facilities that generate infectious and medical waste have found its management to be a difficult problem. Looking for the ideal waste management system that is both workable and cost-effective can result in little or no management without some idea of the possible solutions and how to implement them effectively. This technical report provides a perspective on the risks and purpose of waste management and how the management scheme may be approached in a generic fashion. It serves as an overview of waste management concepts, risks posed by infectious and other medical waste, and identifies the basic objectives of waste management. The report defines the scope of the many common problems and identifies suggested areas of responsibility. Various broad waste categories are summarized as well as special waste categories that may require unique management methods. Included is a waste management outline to guide the waste manager in establishing a viable comprehensive waste management strategy.

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I. INTRODUCTION

The purpose of this technical report is to provide Air Force medical facilities with guidance on the handling, storing, treatment and disposal of medical waste. Medical waste consists of four categories, general refuse (household and administrative area type refuse), infectious waste, hazardous waste and radioactive waste. All categories of waste except general refuse have different applicable federal laws. Our intent is to provide the hospitals with a general understanding of these laws, and help them establish programs to minimize their waste and comply with these laws.

II. DEFINITIONS

Accumulation site: A site which is located away from the source of generation of hazardous waste, and where hazardous waste may be stored less than 90 days without a Resource Conservation Recovery Act (RCRA) hazardous waste storage permit.

Antineoplastic agent: A chemical agent that will prevent the growth of malignant cells. These chemicals are often used to treat cancer.

Antineoplastic drugs (AD): Drugs which are toxic to rapidly proliferating neoplastic tissue. They are used to inhibit the growth of tumors through disruption of the cell cycle and destruction of actively growing cells. Antineoplastic drugs are listed in Appendix A.

Biohazard: An infectious agent presenting a risk or potential risk to the well-being of man either directly through an infection or indirectly through disruption of his environment.

Biological safety cabinet (BSC), Class II: A laminar (streamline) flow, ventilated device, developed to protect the worker and the worker's materials. The cabinets have an open front with inward air flow for personnel protection and HEPA filtration for both product protection and exhaust air.

Bloodborne diseases: Disease caused by organisms that can be transmitted through contact with blood or it's by-products. Examples include: malaria, hepatitis B, hepatitis non-A non-B, leptospirosis, relapsing fever, viral fevers (dengue, yellow fever, and Colorado tick fever).

Bloodborne pathogens: Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to hepatitis B and human immunodeficiency viruses.

Carcinogens: An agent or substance which is responsible for malignant changes.

Note: This report was accomplished by the Air Force Occupational and Environmental Health Laboratory (AFOEHL), which is now the Armstrong Laboratory, Occupational and Environmental Health Directorate.

CDC: Centers for Disease Control. This agency advises hospitals on policies and procedures to control diseases. This includes how to protect the health and safety of both hospital employees and patients. They do not have enforcement powers.

Certification: Procedures performed by trained individuals to ensure the BSC meets performance criteria and consistently maintains protective effectiveness. Certification includes visual examination for gross damage, leak tests, measurement and direction of the air flow, and measurement of the air velocity. Currently, Harvard University is the only institution providing a course of instruction for certification of biological safety cabinets.

Chemotherapeutic agent: Treatment of disease by chemical agents. First applied to use of chemicals that affect the causative organism unfavorably, but do not harm the patient.

Chemotherapy: The use of chemical agents for the prevention or treatment of disease.

Class II, Type A: Cabinets which have a fixed work opening with a minimum inflow velocity of 75 linear feet per minute. The design allows for recirculation of approximately 70% of the total cabinet air. It is not intended for use with flammable solvents, toxic agents, or radioactive materials. It may be installed to discharge exhaust air into the room, but it is preferable to discharge exhaust outdoors.

Class II, Type B: This type has a vertical sliding sash and a design to maintain an inward linear airflow of 100 feet per minute at a work opening of 8 inches. The average downward vertical flow air velocity is 100 linear feet per minute. The cabinet requires installation which will discharge exhaust air outdoors. Because 70% of the air flowing through the work area is exhausted outdoors, the Type B cabinet may be used with a wider range of chemicals. It is not recommended for use with explosive vapors.

Cytotoxic agent: Possesses a specific destructive action on certain cells; used particularly in referring to the lysis of cells by immune phenomena and to antineoplastic agents that selectively kill dividing cells.

Defense Logistics Agency, Defense Reutilization and Marketing Office (DLA/DRMO): The agency responsible for contracting the disposal of hazardous waste. Local DRMOs are authorized to accept accountability, but not physical custody for disposal of noncontrolled RCRA-regulated hazardous waste items in NSN 6505 stock class. (See AFM 67-1, Vol. V, 30 Nov 87). The medical treatment facility should contact the local DRMO to coordinate the inclusion of hazardous waste disposal in the base service contract.

Some antineoplastic drug wastes can be classified as hazardous wastes and are listed in Appendix A. These wastes are identified by specific U-listed hazardous waste numbers assigned to them by the Environmental Protection Agency (EPA).

DOT: Department of Transportation. This department regulates all shipping of hazardous material, hazardous waste, radioactive waste, and in the states covered by the Medical Waste Tracking Act, infectious waste.

EPA: Environmental Protection Agency. This agency regulates waste disposal of all material that could impact the environment.

Hazard communication: The purpose of hazard communication is to ensure hazardous chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs that includes container labeling, material safety data sheets, and employee training ("right to know").

Hazardous material: OSHA defines a hazardous material as any chemical which is a physical or health hazard. This is based on its potential for burning, exploding or otherwise causing an injury to workers or the likelihood that exposure to it will result in acute or chronic health effects among employees.

Hazardous waste: The EPA defines hazardous waste in 40 CFR Part 261 as a solid waste whose characteristics may cause an increase in mortality, serious irreversible illnesses, pose a potential substantial health or environmental hazard when improperly treated, stored, transported, disposed of, or otherwise managed. The characteristic is determined by standard tests of ignitability, reactivity, toxicity, and corrosivity defined in 40 CFR 261 subpart C or detected by the generator through his knowledge of the waste. Subpart D contains lists of known hazardous waste.

High efficiency particulate air (HEPA) filters: Filters which have minimum efficiency of 99.97% in removal of particles 0.3 um or larger. The filters are not effective for volatile materials because they do not capture vapors and gases.

Infection Control: Precautions used when taking care of patients to prevent the spread of infection. Procedures, policies, and precautions used to reduce or prevent patient care personnel from acquiring infections through exposure to infected patients, patient to patient transmission of infectious disease and patient care personnel to patient transmission.

Infectious waste: The EPA defines infectious waste as waste capable of causing an infection (pathogen). To cause an infection the waste must have a pathogen of sufficient virulence and quantity, a portal of entry and a susceptible host.

Laminar airflow: An entire body of air moving with uniform direction at uniform velocity along parallel flow lines.

Malignant: Unregulated growth of cells which have the ability to invade local tissues and, if not checked by treatment, spread to distant sites in the body, and may cause death. A cancerous growth.

National Institute of Occupational Safety and Health (NIOSH): An institute of the Department of Health and Human Services to conduct research in occupational safety and health. Along with the U.S. Department of Labor Mine Safety and Health Administration, it is the approval agency for respirators.

Neoplasm: A new growth of abnormal cells or tissues having benign or malignant characteristics; a tumor.

NRC: Nuclear Regulatory Commission. This agency is responsible for all regulations pertaining to radioactive material. The Air Force Radioisotope Committee regulates all Air Force radioactive permits for the NRC.

OSHA: Occupational Safety and Health Administration. This agency is responsible for protecting the workers. Typically, OSHA regulations only pertain to material up to the point of disposal, then EPA regulations apply.

Pathogen: Any disease producing microorganism.

Resource Conservation Recovery Act (RCRA): Public Law No. 94-580, enacted 21 October 1976. The law which directed the Environmental Protection Agency (EPA) to promulgate regulations to protect human health and the environment from improper management of hazardous waste.

Satellite Accumulation Site: An area that may accumulate up to 55 gallons of hazardous waste in containers at or near the point of generation, without a RCRA hazardous waste storage permit. This area may collect one type of waste or collect various types of wastes in separate containers, as long as the total quantity of waste in the area does not exceed 55 gallons.

Smoke split: Determined by an airflow smoke patterns test. The airflow along the entire perimeter of the work access opening should be inward; the airflow within the work area should be downward with no dead spots or refluxing; ambient air should not pass on or over the work surface; and there should be no refluxing to the outside at the window wiper gasket and side seals of a BSC.

Threshold Limit Value (TLV): Limits for chemical substance in the work environment issued by the American Conference of Governmental Industrial Hygienists. TLV refers to airborne concentrations of substances and the conditions under which it is believed workers may have repeated exposures day after day without suffering adverse effect. Three categories of TLVs are specified as follows:

Threshold Limit Value - Ceiling (TLV-C): The concentration that should not be exceeded during any part of the working exposure.

Threshold Limit Value - Short Term Exposure Limit (TLV-STEL): A 15-minute time-weighted average exposure which should not be exceeded at any time during a workday even if the 8-hour TWA is within the TLV. Exposure at the STEL should not exceed 15 minutes and not be repeated more than four times a day. There should be at least 60 minutes between successive exposures.

The Threshold Limit Value - Time Weighted Average (TLV-TWA): The time-weighted average concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

Universal precautions: The need for health care workers to consider all patients as potentially infected with HIV and/or other blood-borne pathogens

and to adhere rigorously to infection control precautions to minimize the risk of exposure to blood and body fluids of all patients. Established for worker protection, not a waste category.

III. RESPONSIBILITIES

Commander: Oversees all hazardous waste and infectious waste programs. Is liable for improper disposal of waste. Ensures that the facility is in compliance with all federal, state, and local laws.

BES: The bioenvironmental engineering staff's responsibility pertains to the identification and characterization of the waste. They conduct the base's industrial hygiene program. This program evaluates all biological, physical, and chemical hazards the workers' are exposed to, and ensures they are adequately protected either through the use of engineering controls or protective equipment. They also ensure the workers' have adequate protection during a spill and declare an area clean after the spill is cleaned up.

EHS: Environmental Health Services investigates all needlesticks, following established needlestick protocol, assists with training requirements, and manages hospital employee health program.

Employees: All hospital employees must comply with the hospital policies on infection control, infectious waste, hazardous waste, and radioactive waste. This includes segregating the waste, not only to ensure the hospital complies with the laws, but also to minimize waste and reduce the Air Force disposal costs.

Infection Control Officer: He conducts formal orientation and review in service training for all hospital personnel on how to prevent infections. He is responsible for complying with AFR 161-41 that includes initiating appropriate isolation precautions, observing patient care practices, and recommends infection control policies and procedures. He also performs surveillance of nosocomial infections and provides data to the infection control committee. He consults on purchase of supplies and equipment and review contracts for housekeeping, linen, and Hospital Aseptic Management Services (HAMS).

Infectious Waste Officer: He is responsible for the disposal of infectious waste and related training on infectious waste segregation for the facility. If it is treated on site, this person monitors the treatment, ensures all required tests are conducted in a timely manner, and trains the employees treating the waste. If the infectious waste is disposed of by a contractor, he monitors the contract. The infectious waste officer is normally the facility manager.

Hazardous Waste Officer: He is responsible for the disposal of all the hospital's hazardous waste. He works with the bioenvironmental engineer, who characterizes the waste, and the base environmental coordinator, who ultimately disposes of the waste. He is responsible for training all hospital personnel on hazardous waste. The medical logistic officer is normally the hazardous waste program officer. The selection of a hazardous waste manager for each facility is important because he is obligated to understand and to

comply with the applicable elements of RCRA and the corresponding U.S. Department of Transportation (DOT) regulations. This individual should be familiar with the regulations and have the ability to organize a program which is practical to implement and addresses both environmental and economic concerns.

Medical Equipment Repair Center (MERC): Ensures all requests for protective equipment, hoods, or biological safety cabinets are identified to the BES prior to purchase.

Pharmacist: Provides training and ensures all personnel preparing, using, or disposing of antineoplastics are identified to environmental health. Responsible for maintaining a loose-leaf, index card, or computerized file containing information on the toxicity, acute exposure treatment, chemical inactivators, solubility, and stability of the antineoplastic drugs used in the medical treatment facility. In addition, a complete policy and procedures manual should be available. (Guidelines for Protecting the Safety and Health of Health Care Workers, US Dept. of Health and Human Services, Sep 88)

Radiation Safety Officer: This is normally the BEE or a health physicist. This person is responsible for ensuring all radiation exposures are as low as reasonable achievable. They are responsible for all radioactive material usage and disposal.

Supervisors: They are responsible for identifying all chemical and biological hazards to the bioenvironmental engineer for characterization. The supervisor ensures all waste (infectious, hazardous, and radioactive) are properly segregated and stored in the workplace. They must identify any new employees to environmental health and ensure these employees get initial training.

IV. INFECTION CONTROL

A. Administrative Procedures: Procedures must be developed to facilitate and monitor compliance. Supervisors should develop standard operating procedures (SOPs) for their work areas on infection control and waste disposal. Supervisors also monitor the workplace to ensure required work practices are observed, and personal protective equipment is provided and properly used. The ICO or the facility manager may perform no notice inspections of any section to ensure compliance with hospital infection control/infectious waste policies. See Appendix B and C for example of MTF Infection Control regulation and checklist.

B. Occupational Exposure to Bloodborne Pathogens (OSHA): The Occupational Safety and Health Administration proposes to reduce occupational exposure to Hepatitis B Virus (HBV), Human Immunodeficiency Virus (HIV) and other bloodborne pathogens under section 6(b) of the Occupational Safety and Health Act of 1970 (the Act), 29 U.S.C. 655. Based on a review of the available data, OSHA has made the determination that certain employees face a significant health risk as a result of occupational exposure to blood and other potential infectious materials because they may contain bloodborne pathogens. The two predominant pathogens of concern are HBV and HIV. In addition, there are approximately 22 other bloodborne pathogens. OSHA concludes this significant health risk can be minimized or eliminated using a

combination of engineering and work practice controls, personal protective clothing and equipment, training, medical follow-up of exposure incidents, vaccinations (where applicable), and other provisions. The other procedures include addressing proper handling and disposal of contaminated waste, labeling, and adequate recordkeeping. An example MTF regulation is found in Appendix D.

C. Engineering and Work Practice Controls: Whenever possible, engineering controls should be used as the primary method of reducing worker exposure. These controls include self-capping protective shields over needles, puncture resistant containers, isolation rooms (for infectious patients), effective ventilation systems, adherence to universal precautions, prohibiting the shearing, bending, or breaking of needles and other sharps, and not permitting recapping.

D. Personal Protective Equipment (PPE): The type of protective equipment should be appropriate for the procedure being performed and the type of exposure anticipated. Because specifying the types of barriers needed for every possible clinical situation is impractical, some judgment must be exercised. The hospital should decide the minimal acceptable level of PPE for high risk procedures involving as trauma and known infectious patients.

E. Training: While AFR 161-41 only requires annual training, our observations indicate more frequent training is required. Training should address universal precautions, how universal precautions interact with infectious waste, employee health programs, the different types of infectious waste, how to segregate the waste, what to do with dual-contaminated waste (antineoplastic, radioactive, hazardous and infectious), how to label the waste, how and where its treated.

F. Medical Follow-up of Occupational Exposures: It is essential to ensure employees receive appropriate medical follow-up after an exposure incident. This includes testing, counseling, and appropriate prophylaxis to reduce the risk of infection and prevent further transmission if an infection should occur. The appropriate follow-up should be in accordance with the current CDC guidelines.

G. Immunizations: All hospital employees, including volunteers and civilians, must be offered the HBV vaccine if they are occupationally exposed one or more times a month to blood or other potentially infectious materials. This should be documented and entered in their medical records.

H. Employee Health: Written guidelines are required for the MTF employee health program. This program includes but is not limited to employment prerequisites, immunizations, sick call procedures, work restrictions, physical examinations, and screening protocols. Reference example hospital regulation in Appendix E.

I. Segregation: Infectious waste should be segregated from noninfectious waste to reduce disposal costs while ensuring the public is protected from infectious diseases. Segregation must be done at the source. Multiple hazards must be further segregated to avoid cross contamination and ensure complete treatment. Infectious waste must be discarded directly into rigid, leakproof containers marked with the biohazard symbol. Red is the usual color

of the infectious waste bags. The following are the regulated medical waste categories (infectious waste) defined by the EPA for the Medical Waste Tracking Act of 1988. The EPA definitions should be accepted by the Air Force to reduce the amount of confusion that persists in waste segregation.

1. Cultures and Stocks: Cultures and stocks of infectious agents and associated biologicals, including: cultures from medical and pathological laboratories; cultures and stocks of infectious agents from research and industrial laboratories; wastes from the production of biologicals; discarded live and attenuated vaccines; and culture dishes and devices used to transfer, inoculate, and mix cultures.

2. Pathological Wastes: Human pathological wastes, including tissues, organs, and body parts and body fluids that are removed during surgery or autopsy, or other medical procedures, and specimens of body fluids and their containers.

3. Human Blood and Blood Products: (1) Liquid waste human blood; (2) products of blood; (3) items saturated and/or dripping with human blood; or (4) items that were saturated and/or dripping with human blood that are now caked with dried human blood; including serum, plasma, and other blood components, and their containers, which were used or intended for use in either patient care, testing and laboratory analysis or the development of pharmaceuticals. Intravenous bags are also included in this category.

4. Sharps: Sharps that have been used in animal or human patient care or treatment or in medical, research, or industrial laboratories, including hypodermic needles, syringes (with or without the attached needle), pasteur pipettes, scalpel blades, blood vials, needles with attached tubing, and culture dishes (regardless of presence of infectious agents). Also included are other types of broken or unbroken glassware that were in contact with infectious agents, such as used slides and cover slips.

5. Animal Waste: Contaminated animal carcasses, body parts, and bedding of animals that were exposed to infectious agents during research (including research in veterinary hospitals), production of biologicals, or testing of pharmaceuticals.

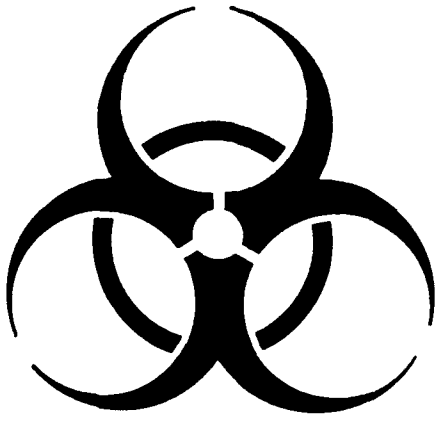
6. Isolation Waste: Biological waste and discarded materials contaminated with blood, excretion, exudates, or secretions from humans who are isolated to protect others from certain highly communicable diseases, or isolated animals known to be infected with highly communicable diseases.

7. Unused Sharps: The following unused, discarded sharps: hypodermic needles, suture needles, syringes, and scalpel blades.

J. Labeling and packaging: Containers and bags must be marked with the universal biohazard symbol. Packaging should not rip, puncture, or burst under normal conditions. Liquid wastes, that can't go through the sanitary sewer should be placed in capped or tightly stoppered bottles which can then be sealed in plastic buckets. Solids and semisolid wastes should be placed in durable tear resistant red bags. Sharps should be placed in impervious, rigid, puncture resistant containers. All biohazard waste containers should be readily available at the point of generation and marked with the biohazard symbol.

BIOHAZARD SYMBOL ----- EXAMPLE OF BIOHAZARD SYMBOL

The Universal Biohazard Symbol



The symbol is fluorescent orange or orange-red. The background may be any color that provides sufficient contrast for the symbol to be clearly defined. For specifications of dimensions, see U.S. Department of Health and Human Services, National Institutes of Health (NIH). Laboratory Safety Monograph. A supplement to the NIH guidelines for Division of Safety, NIH, 1978:114.

V. INFECTIOUS WASTE DISPOSAL:

A. Transportation: Prior to transporting infectious waste all containers must be sealed to prevent leaks and minimize spills. For the same reasons infectious waste must not be compacted.

1. Within the Health Care Facility: Mechanical devices could rupture packaging. Therefore they should not be used when moving infectious wastes. Carts may be used, but must be disinfected prior to any other use within the hospital.

2. From Physically Separated Clinics: Privately Owned Vehicles may NOT be used to transport infectious waste. Government vehicles that are easily disinfected must be used, preferably a closed bed pickup truck.

B. Storage: Infectious waste should be treated as soon as possible. Storage problems can be minimized by controlling the following factors:

1. Ensuring package integrity. This will deter rodents and insects and keep the infectious waste contained, minimizing spills.

2. Controlling the temperature. Both microbial growth and odor problems increase when the temperature increases.

3. Limiting the storage time. Odors will increase with excessive storage time.

4. Controlling access to the storage facility. The facility must have limited access, be clearly identified with the biohazard symbol and kept free of rodents and insects.

C. Waste Minimization: Waste can be minimized by implementing the following method:

1. Reduce the amount of material used. Use purchasing constraints to maintain minimal inventories of items that expire. Substitute reusable supplies for disposal items whenever possible. Evaluate procedures to use minimal quantities of supplies.

2. Reduce the amount of waste generated. Infectious waste is greatly minimized by proper segregation.

3. Volume/weight reduction techniques. Several treatment options will reduce the weight or volume of the treated infectious waste. Incineration will reduce both weight and volume.

D. Treatment Options: (See Table 1)

1. Incineration is the combustion of wastes under excess air conditions to form ash, noncombustible residues, and off-gases. It is effective for all types of wastes and reduces volume by up to 95%. Most pathological incinerators require an operating permit from the state or local air pollution regulatory agency. This type of incinerator cannot be used for hazardous waste. Incinerators should meet the EPA recommended performance standards (reference Appendix F). If the medical facility plans on using incineration the following constraints must be followed:

a. Though not all antineoplastics are listed as hazardous wastes it is recommended the hospital manage all antineoplastic waste as hazardous.

b. Operating temperature must remain within the recommended temperature ranges to ensure good burnout, meet air pollution requirements, and effectively kill infectious agents.

c. Use pollution control devices to reduce particulates and acidity of emissions.

d. Do not overload the incinerator. No more than 50% of the incinerator's volume should be charged at one time. The largest item should be less than 10% of the volume.

e. Monitor waste stream to avoid temperature surges caused by large amounts of wastes high in plastic content.

f. Periodically test the ash to determine if it's a hazardous waste (40 CFR 261.2). If it tests as a hazardous waste it must not be placed in a landfill not disposed of as hazardous waste.

g. Do not incinerate infectious waste at the beginning or end of the burn cycle. This will prevent the release of pathogens into the ash or stack.

2. Chemical Disinfectant: Solvents and laboratory reagents may be treated with additional chemicals or disinfectants to kill the etiological agent. The compatibility and miscibility of the resulting mixture must be considered.

Table 1. TYPES OF MEDICAL WASTE DESIGNATED AS INFECTIOUS AND RECOMMENDED DISPOSAL/TREATMENT METHODS - CDC AND EPA

Source/Type of Medical Waste	CDC		EPA	
	Infectious Waste	Disposal/Treatment Methods	Infectious Waste	Disposal/Treatment Methods
Microbiological (e.g., stocks and cultures of infectious agents	Yes	S and I	Yes	S, I, TI, and C
Blood and blood products (i.e., liquid blood and blood products)	Yes	S, I, and SEW	Yes	S, I, SEW, and C
Pathological (e.g., tissue and organs)	Yes	I	Yes	I, SW, and CB
"Sharps" (e.g., needles)	Yes	S and I	Yes	S and I
Communicable disease isolation	No	-	Yes	S and I
Contaminated animal carcasses, body parts, and bedding	Yes	S and I (carcasses)	Yes	I and SW (not bedding)
Contaminated laboratory wastes	No	-	Optional	If waste is designated infectious, use S or I
Surgery and autopsy wastes	No	-	Optional	If waste is designated infectious, use S or I
Dialysis unit	No	-	Optional	If waste is designated infectious, use S or I
Contaminated equipment	No	-	Optional	If waste is designated infectious, use S, I or GS

S = Steam Sterilization
I = Incineration
SEW = Sanitary Sewer
SW = Steam Sterilization with Incineration or Grinding
IW = Infectious Waste
TI = Thermal Inactivation
C = Chemical Disinfection, for Liquids Only
CB = Cremation or Burial by a Mortician
CS = Gas Terilization

3. Autoclave: Autoclaving is a viable option for clinics and small hospitals. Special attention must be given to flashpoint, potential health hazards, and volatility of the waste. The effectiveness of the autoclave will depend on the type of waste and the parameters used.

a. Record all parameters used for each load including temperature, time, pressure, and the type and quantity of infectious waste in a log book.

b. Monitor the autoclave performance weekly with a biological indicator. This doesn't indicate all waste has been rendered noninfectious, but indicates the sterilizer is operated effectively.

c. This treatment method doesn't reduce weight or volume of the waste.

d. An autoclave used for treating infectious waste should not be used for sterilizing any items.

4. Solvent Reclamation: Distillation can be used to remove contaminants from solvents. Reclaimed solvents usually have a purity of greater than 99%, depending on distillation set up and volume. Tissues, feces, and sediment must be removed and discarded as potentially infectious waste prior to solvent recovery, along with the contaminated filter. If the solvent contains sub-viral particles it should not be reclaimed. Subviral particles can survive exposure to xylene, alcohol, and boiling formalin. Residue separated from the solvent should be disposed of as hazardous waste, if the solvent itself is a hazardous waste. (40 CFR 261.6 B and C)

E. Contigency Plans: All medical facilities need a contingency plan for infectious waste disposal. This plan may be a memorandum of understanding with another hospital (this is usually a reciprocal plan, where if the other facility needed to use our facility we would support them) or a contigency contract (this is an already established contract with a permitted infectious waste transporter to collect the infectious waste as required).

F. State Laws: Because infectious waste is regulated at the state level, every hospital must have a copy of their state regulations. These laws are usually either found in the Department of Health or the Office of Solid Waste Management. Local regulations also need to be researched. Some local water laws prohibit the discharge of blood to the sanitary sewer system.

VI. PHARMACEUTICAL DISPOSAL

A. Antineoplastics: See chapter IX.

B. Not Regulated Medications: These medications should be returned to the manufactor whenever possible. See Appendix G for current listing of return good policies from the 1990 Drug Topics Red Book.

C. Waste Minimization: Whenever practical all waste should be minimized. Some easy methods that won't affect patient care are not mixing the medications until they are required (reduces the amount of unadministered medication

disposed of) keeping minimal amounts, (no more than a four week supply of medication available in the pharmacy, the wards, and clinics), and using the oldest medication first.

VII. RADIONUCLIDE DISPOSAL

Radioactive wastes are defined by NCCLS as "any solid, liquid, or gas emitting radiation of the following types: alpha, beta, or gamma radiation; x-rays; neutrons; high-speed electrons and protons; and other atomic particles." The Nuclear Regulatory Commission (NRC) generally regulates wastes at levels above 0.05 uCi. The method for the proper disposition of radioactive waste will be specified in the facility's NRC license, but there are several methods available.

Decay and discharge is the strategy preferred when the half-life of the nuclide is less than 30 days and when the volume to be discarded is small. Following reduction of radiation to de minimus amounts, the waste is no longer hazardous, and it may then join the routine waste stream. The use of a survey meter to test the waste is encouraged; it is usually acceptable when the residue is less than or equal to twice the background count, but estimation by calculation is acceptable.

To dilute and disperse the radioactive waste through the sanitary sewage system may be permissible. The sink that is used must be specifically designated by the license, and appropriate hazard warnings signage must be posted. All radioactive materials flushed down the drain must be accompanied by copious amounts of water. The amount of radioactive waste that can be disposed of down the sewer in any one day may not exceed the larger of the concentration listed in 10 CFR Part 20, Appendix B, Table I, Column 2 or 10 times the quantity in 10 CFR Part 20, Appendix C. The total amount released into the sewer system may not exceed 1 Ci per year. (Exceptions to this last rule are H_3 [5 Ci per year] and C_{14} [1 Ci per year].) The amount of waste that may be discarded in any one day should be posted.

Incineration is the best method for destroying radioactive animal carcasses and bedding, as well as infectious wastes but the method does require a specific NRC license and waste handlers must be monitored for radiation exposure. The amount of radioactive gases that may be released into the atmosphere may not exceed amounts listed in 10 CFR Part 20, Appendix B.

Concentration and transfer of the material is perhaps the least attractive alternative. It usually ends in burial of the substance in a hazardous waste landfill.

Scintillation cocktail wastes are a special problem. Such wastes have mixed hazards (principally radioactivity and ignitability), and the disposal method must be appropriate to both hazards. Scintillation cocktail waste are usually incinerator-incompatible because of their high energy and plastic content. For this reason recovery of the solvent by distillation is a particularly attractive alternative. The residual material is much more suitable for incineration.

Incineration is another means; moreover, it can reduce by some 90% the volume of material to be sent to the landfill. For incineration to be entirely effective, the type of material in the load and the design of the incinerator and its operating conditions are crucial factors. Not only must the microorganisms be completely destroyed within the incinerator, but gaseous and particulate emissions from the stack must not exceed air-quality standards.

VIII. HAZARDOUS MATERIAL ACQUISITION: All hospitals should develop a strategy for minimizing hazardous material acquisitions. An example hospital regulation is found in Appendix H. The following factors should all be considered:

A. Purchasing Strategy: Chemicals are typically purchased in the largest reasonable quantity possible within the given price range. However, increased disposal costs and limited storage space are causing hospitals to revise this practice. When a small quantity is used from a large container, the excess is retained. In the majority of research laboratories, the scientists prefer to begin each procedure with pure chemicals from an unopened container. The excess is often disposed of at the conclusion of the project. This waste can account for up to 40% of the research laboratory's hazardous waste stream.

In most hospitals the majority of hazardous waste is in the clinical and dental laboratories. These laboratory chemicals are often disposed of when they expire or when the laboratory procedures change and they no longer require these chemicals. By storing smaller quantities within the work areas and in medical logistics, waste will be minimized. This is more economical because the true cost of the chemical is the cost of acquisition and disposal.

B. Inventory Control: A comprehensive chemical management system reports the chemical type, quantity, and location of all chemicals. It allows tracking of the chemical from acquisition to disposal.

C. Substitution: Substitution of a nonhazardous chemical reduces the health hazard to workers and may reduce the amount of hazardous waste generated. Histoclear, Americlear, and Xyless are biodegradable substitutes for Xylene used in most medical procedures. They can normally be disposed of in the sanitary sewer. Substitutes for other chemicals are also available. If a waste is a listed hazardous waste or known to exhibit hazardous waste characteristics, substitution must be considered.

D. Surplus Chemical Exchange: For many of the chemicals used in the laboratories, there may be other users either on the base or at other hospitals who may be able to use the excess quantities.

E. Waste Minimization and Segregation: This is essential for environmental protection, human health and safety, as well as life cycle cost reduction. In order to implement a successful waste minimization program, the commander must fully support it. The idea, less is better, must be practiced at all levels of management.

F. Recycling: In-house recycling is environmentally sound and may be a cost-effective way to manage certain waste chemicals, particularly solvents.

However, if the waste materials retained from previous laboratory tests and experiments are regulated under RCRA from the time of accumulation until they are recycled, the retained waste materials must be labeled, segregated, and stored according to the regulations applicable to the particular class of hazardous waste. The recycling activities and resulting products are not regulated under RCRA, but the residues from recycling will generally be hazardous waste. Both formaldehyde and xylene can be recycled. The purity of the recycled material may be lower than the original product.

G. Worker Safety and Health: Appropriate controls should be decided by the bioenvironmental engineer to include ventilation systems, laboratory hoods, and other engineering controls or protective equipment as required.

IX. HAZARDOUS WASTE:

A. Identification. The first step in establishing a hazardous waste program is determining if the waste is hazardous. There are three steps in the determination process.

1. Determine if waste is excluded in 40 CFR 261.4. The primary exclusion affecting medical facilities is the laboratory exclusion. This exclusion states toxic (T-listed) waste from a laboratory operation can be disposed of in the sanitary sewer if the waste does not exceed 1% of the wastewater entering the wastewater treatment plant. The laboratory operation part of this exclusion can be interpreted differently. If the waste is stored, i.e., samples preserved in formaldehyde, most regulators interpret this to not be a continuous operation. Therefore, the waste cannot be disposed of in the sanitary sewer.

2. Then determine if waste is listed in 40 CFR 261, Subpart D. This section contains several listings. Although all the listings contain materials that are considered hazardous wastes, it should be noted that both the p-listing (acute hazardous waste) and the u-listing (hazardous waste) pertain to commercial chemical products, manufacturing chemical intermediates, or off-specification chemical products. The EPA interpeted this to mean only pure, unused chemicals from these lists need to be disposed of as hazardous waste, unless these chemicals exhibit a hazardous waste characteristic.

3. Determine if waste has any of the hazardous waste characteristics listed in 40 CFR 261, Subpart C. These characteristics are ignitability, corrosivity, reactivity, and toxicity. A brief summary of these characteristics follows.

a. Ignitable. Solid waste is considered to have the characteristic of ignitability if it is a non-aqueous liquid with a flashpoint less than 60 degrees C (140 degrees F); or if it is not a liquid and at Standard Temp and Pressure can cause a fire through friction, absorption of moisture, or spontaneous chemical changes and when ignited burns so vigorously it creates a hazard; or it is an ignitable compressed gas or an oxidizer as defined by 49 CFR 173.151. A solid waste exhibiting ignitability has the EPA hazardous waste number D001.

b. Corrosivity. Solid waste is considered to have this characteristic if it is aqueous and has a pH < 2 or > 12.5 or it is a liquid and corrodes steel faster than 6.35 mm/yr. at 55 degrees C. A solid waste exhibiting corrosivity has the EPA hazardous waste number D002.

c. Reactivity. Solid waste is considered to have the characteristic of reactivity if it's normally unstable and readily undergoes violent change without detonating; reacts violently with water; forms a potentially explosive mixture with water; or when it's mixed with water, it emits a sufficient quantity of toxic vapors to endanger human health or environment, it's a cyanide or sulfide waste which when exposed to chemicals with a pH between 2 and 12.5 can emit a sufficient quantity of toxic vapors to endanger human health or environment, it's capable of detonation when exposed to an initiated source or heated in confinement, it's capable of detonation, explosive decomposition, or reaction at STP, or it's a forbidden explosive as defined in 49 CFR 173.51, a class A explosive as defined in 49 CFR 173.53, a class B explosive as defined in 49 CFR 173.88. A solid waste exhibiting corrosivity has the EPA hazardous waste number D003.

d. Toxic. Solid waste exhibits the characteristic of EP toxicity (using the Toxic Concentration Leachate Procedure) if the contaminant concentration in the extract is greater than or equal to those listed in Table 1 of this part. The EPA hazardous number corresponds to the contaminant number in the table.

B. Collection: The importance of segregating hazardous from nonhazardous wastes at the point of generation cannot be overstated. The mixing of a small quantity of a hazardous waste with a nonhazardous substance will produce a large quantity of a hazardous waste. For listed hazardous waste the EPA does not consider the concentrations of the hazardous substances within the waste mixtures. Large quantities of hazardous waste are always more difficult to handle than small quantities. They are also more expensive to manage. Therefore, all hazardous waste should be collected where it is generated. It must be segregated from the other waste streams and other hazardous waste at this point. Mixtures of hazardous waste will increase the disposal costs, cause turn-in problems with DRMO, and prevent the chemicals from being recycled.

C. Hazardous Waste Storage: Generators of hazardous wastes may accumulate up to 55 gallons of hazardous waste, or one quart of acutely hazardous waste, in satellite areas provided that: (1) the wastes are placed in containers that are in good condition; (2) the wastes are compatible with their containers; and (3) the containers are marked with the words "hazardous wastes" or other words that identify the contents. Any amount in excess of 55 gallons of hazardous waste or one quart of acutely hazardous waste must be transported to a storage area regulated under RCRA within three days of the accumulation of that amount. Because military medical facilities do not deal with large quantities of hazardous waste, this is enough time to properly dispose of the waste. The satellite storage regulations are not applied uniformly. The hospital should not be a hazardous waste accumulation site. Any state that regulates hazardous waste under EPA regulations has the option of allowing satellite storage. Some states do not permit such relaxation of

storage requirements or regulations. Hazardous waste managers should check with their own state agency regarding the status of satellite storage provisions.

D. Empty: An empty hazardous waste container is defined in 40 CFR 261.7. A container or an inner liner removed from a container that contained a hazardous waste (not compressed gases or acute hazardous waste) is considered empty if all wastes have been removed that can be removed by commonly employed practices (pouring, pumping, aspirating etc.) and no more than 2.5 cm remain at the bottom of the container or for containers holding 110 gallons or less, no more than 3% of the total capacity by weight remains.

1. A container that held compressed gas is empty when the pressure approximates atmospheric pressure.

2. A container that held acute hazardous waste is empty when the container or its inner liner has been triple rinsed with a solvent capable of removing the product, cleaned by an equivalent method, or in the case of a container, the inner liner, which was the contact surface has been removed. If this is not possible, the container must be disposed of as hazardous waste.

E. Permits: (A permit is required) any time hazardous waste is treated or disposed. All military bases are permitted as one generator. This permit is managed by the base environmental coordinator, either CE/DEEV or CE/EM. This office is responsible for tracking all hazardous waste generated by the base. They determine if the DRMO or a commercial contractor is to be used for disposal, and they monitor the base hazardous waste program.

F. Transportation: Hazardous waste transported over public roads are subject to either federal or state DOT regulations or both. Even a military installation with multiple generation sites is subject to DOT regulations for transporting hazardous materials on site if its streets are public rather than private roadways. Generators should note that certain hazardous materials and certain quantities of hazardous wastes could be subject to DOT regulations under the Hazardous Materials Transportation Act even though they may not be regulated under EPA.

G. Disposal: All hazardous waste are disposed of through contractors. The DRMO may be used.

If the base decides to use a contractor instead of the DRMO the following criteria should be used to evaluate all potential contractors:

- Competence to handle waste
- Financial stability
- Appropriate permits
- Access to disposal facilities
- Disposal method/site selection
- Reliable transporter
- Education/experience of staff
- Liability insurance
- Storage capability
- References
- Rates

Even if attempts are made to dispose of the material properly, generators of hazardous wastes can still be held responsible for damage caused by their waste to the environment or to personal property. There is no statute of limitations. The generator should retain, for an indefinite time, copies of all manifests and other documentation available, even though RCRA regulations only requires retention for three years.

H. Training: Training is required by the RCRA regulations in Section 265.16 for all personnel who generate, treat, store, or dispose of hazardous waste. Workers must understand the hazards of the wastes and appropriate personal protection, as well as understand safe packaging, appropriate labeling, and recordkeeping. This training is normally conducted by CES/DEEV or CES/EM.

In addition to the specific requirements under RCRA, it should be noted that all employers in Standard Industrial Classification codes 20 through 39 must inform their workers of workplace chemical hazards according to 29 CFR 1910-1200 under the Occupational Safety and Health Administration (OSHA). These OSHA requirements are known as the Hazard Communication Standard and are often referred to as "worker right to know" laws. Under the standard, chemical suppliers must provide material safety data sheets describing the potential hazard of the chemicals they sell. This information may be of use when training workers under the RCRA requirements.

I. Contingency Plans: Base contingency plans for appropriate responses to emergencies must be prepared according to specifications of 40 CFR 264, Subpart D. These plans must be on file with all appropriate state and local agencies.

J. Spill Plans: Each waste management program must have a plan for spill control. Emergency procedures should be specified and posted. Cleanup procedures should be defined before the spill occurs. Employees must be appropriately trained and the proper emergency equipment must be obtained. Certain spilled substances have to be reported to the EPA, and any substance for which a reportable quantity is stored or used must be specifically included in the contingency plan.

K. State Point of Contact: The EPA can authorize state hazardous waste programs to operate in lieu of the federal program. Such state programs must be at least equivalent to and consistent with the federal program. The RCRA regulations do not preclude states from adopting more stringent hazardous waste regulations, and many have done so. All generators should check with state and local authorities to determine their local responsibilities. State contacts for information on local requirements are listed in Table 2.

Table 2. State Solid and Hazardous Waste Agencies

The following is a listing of information numbers at state agencies responsible for the proper disposal of waste materials. The asterisks indicate states having EPA-authorized state hazardous waste programs (as of publication date).

Alabama	(205) 271-7737	Montana*	(406) 444-2821
Alaska	(907) 465-2666	Nebraska*	(402) 471-4217
Arizona*	(602) 257-2211	Nevada*	(702) 885-4670
Arkansas*	(501) 562-7444	New Hampshire*	(603) 271-4608
California	(916) 322-2337	New Jersey*	(609) 292-8341
Colorado*	(303) 320-8333	New Mexico*	(505) 827-0020
Connecticut	(203) 566-5712	New York	(518) 457-3274
Delaware*	(302) 736-4781	North Carolina*	(919) 733-2178
Florida*	(904) 488-0300	North Dakota*	(701) 224-2366
Georgia*	(404) 656-2833	Ohio	(614) 466-7220
Hawaii	(808) 548-6767	Oklahoma*	(405) 271-7266
Idaho	(208) 334-5879	Oregon*	(503) 229-5913
Illinois*	(217) 782-6760	Pennsylvania	(717) 787-7381
Indiana*	(317) 232-4458	Rhode Island*	(401) 277-2797
Iowa	(515) 281-8308	South Carolina*	(803) 758-5681
Kansas*	(913) 862-9360	South Dakota*	(605) 773-3329
Kentucky*	(502) 564-6716	Tennessee*	(615) 741-3424
Louisiana*	(504) 342-1227	Texas*	(512) 463-7830
Maine	(207) 289-2651	Utah*	(801) 538-6170
Maryland*	(301) 225-5709	Vermont*	(802) 828-3395
Massachusetts*	(617) 292-5500	Virginia*	(804) 225-2667
Michigan	(517) 373-2730	Washington*	(206) 459-6301
Minnesota*	(612) 296-7373	West Virginia	(304) 348-5935
Mississippi*	(601) 961-5062	Wisconsin*	(608) 266-0833
Missouri*	(314) 751-3176	Wyoming	(307) 777-7752

X. ANTINEOPLASTIC DRUGS

A. Terminology Used:

1. Shall. Indicates a mandatory requirement.

2. Will. Is also used to indicate a mandatory requirement and in addition is used to express a declaration of intent, probability, or determination.

3. Should. Indicates a preferred method of accomplishment.

4. May. Indicates an acceptable or satisfactory method of accomplishment.

B. Hazards/Human Factors:

1. Hazards. Antineoplastic drugs (ADs) which are used for anticancer therapy are toxic to cells. Some of the toxic effects associated with exposure

to ADs are: localized skin necrosis after contact of ADs with abraded skin; irritant effect on the eyes and mucous membranes; damage to normal skin; human cancers associated with high therapeutic levels of exposure; chromosome damage to cells among people to whom the drugs were administered; drug induced malignant tumors in animals, and new growth and leukemias in humans; human and animal teratogenicity; and organ (liver) damage.

2. Human Factors: Individuals with varying levels of qualifications and experience, working in a variety of jobs have the potential for handling ADs. The risk to workers from handling ADs stem from the combination of the drugs' toxicity and the extent to which workers are directly exposed. The routes of entry of ADs are by inhalation of drug dust and aerosolized particles, skin absorption, and ingestion of the drug which has contaminated food, drink, or smoking materials. Even the highly educated and most qualified professionals may not always exercise basic, essential workplace safety practices. Failure of workers to practice simple precautions, such as handwashing and gloving, and the nonconformance to administrative controls may result in increased exposure. The opportunity for exposures may exist at many points during the handling of these drugs.

C. Requirements

1. Drug Preparation

a. Preparation Area

(1) For the optimal working environment, perform all preparations of ADs in Class II, biological safety cabinet (BSC) which meets National Sanitation Foundation Standard 49 [para C1a(4)(a-e)]. In medical treatment facilities (MTFs) where a BSC is not currently available, the workers wear personal respiratory protection as described in para C1(bX3). If possible, designate an isolated BSC solely for the preparation of ADs. When this is not practical, prepare ADs in a centralized area or keep the number of areas used for AD preparation to a minimum and in a quiet work space away from heating and cooling vents and other personnel. The bioenvironmental engineer will determine the suitability of areas used for AD preparation and installation of a BSC. Prepare ADs on a plastic-backed paper liner and use hydrophobic filters to manipulate AD powders packaged in vials.

(2) Designate the AD preparation area by warning signs reading:

ANTINEOPLASTIC DRUG EXPOSURE IN THIS AREA.

PROTECTIVE GOWNS, GLOVES, (and respirators if no BSC

is installed) ARE REQUIRED AT ALL TIMES. AUTHORIZED

PERSONNEL ONLY.

(3) Post additional instructions that explain spill management, and prohibit eating, storing food, chewing gum, smoking, drinking and applying cosmetics in or around the AD preparation area.

(4) Vertical Airflow Biological Safety Cabinet.

(a) A Class II, Type A cabinet which meets current National Sanitation Foundation Standard 49 is a minimum requirement for a BSC. A Class II, type B BSC is preferred.

(b) Always vent the hood of a Class II, Type B BSC to the outdoors, and a Class II, Type A to the outdoors where feasible. When the BSC is vented to the outdoors, the air must be filtered and discharged at an appropriate height in accordance with recommendations of the American Conference of Governmental Industrial Hygienists' Industrial Ventilation Manual.

(c) BSCs which are used for preparation of ADs must be certified by qualified individuals who have received special training to perform this function. If there are no readily available DOD personnel who have completed this specialty training, this service must be contracted from medical equipment companies who sell or service the cabinets. Certification is required at the time the cabinet is installed, every six months, or anytime the cabinet is moved. Individuals who certify or service these cabinets or change HEPA filters use the same personal protection and exercise the same precautions as personnel who prepare ADs (see para C1b(1-3).

(d) Enter and exit from the BSC in a direct manner perpendicular to the face of the cabinet. Avoid rapid movements of the hands in the cabinet and, laterally through the protective air barrier. For additional operator protection, use the area behind the smoke split (which is identified during the certification of the cabinet) whenever possible, since the airflow direction in that area is away from the operator. Do not work within three inches of the sides of the cabinet, because this is the least efficient area of the cabinet in terms of product and personnel protection.

(e) Operate the unit's blower continuously, 24 hours a day, 7 days a week, in order to maintain uniform pressure in the plenum and clean, filtered air flowing within the hood.

b. Personal Protective Equipment (wear only in work area).

(1) Gloves: Wear disposable surgical latex gloves, which are less permeable than polyvinyl chloride gloves, for all procedures involving antineoplastic drugs, unless the drug manufacturer specifically states some other gloves provide better protection. Always wash hands thoroughly before putting on and after removing gloves. For increased protection, wear double gloves when handling ADs and for cleaning up spills para C7. Never use powdered gloves. Change gloves routinely (approximately every hour) when working steadily with ADs or immediately if gloves are torn or punctured.

(2) Over garments: Wear protective lint-free, low permeability fabric, disposable gowns with closed front, long sleeves and closed cuffs (either elastic or knit) for all procedures involving preparation, administration, disposal and cleanup of ADs. Tuck gown sleeve cuff under the gloves.

(3) Respiratory protection: The American Conference of Governmental Industrial Hygienists (ACGIH) states that exposures to carcinogens must be kept to a minimum, and that workers exposed to confirmed human carcinogens without a TLV should be properly equipped to virtually eliminate all exposure to the carcinogens. The ACGIH further recommends that for confirmed carcinogens with a TLV and for suspected carcinogens, worker exposures by all routes should be carefully controlled to levels consistent with the experimental and human experience data. Because of these stringent recommendations, workers who mix ADs in MTFs where a BSC is not available are required to wear personal respiratory protection. A full facepiece, pressure demand air supplied respirator will afford the highest level of protection. The next most effective level of respiratory protection is provided by a tight fitting, full facepiece, powered air purifying respirator equipped with organic vapor filters and high efficiency particulate air (HEPA) prefilters. A tight fitting, negative pressure, full facepiece respirator equipped with organic vapor filters and HEPA prefilters is the minimum acceptable respiratory protection allowed. All respirators used must be approved by the National Institute of Occupational Safety and Health (NIOSH). All persons who wear respirators shall have the respirators fitted and receive training as specified in AFOSH Standard 161-1, Respiratory Protection Program.

c. Preparation.

(1) Prepare ADs in a BSC on a disposable plastic-backed paper liner. If only a few ADs are prepared each day, change the paper liner after the preparation is completed. Otherwise, change the paper after each shift and after any overt spills. Place all equipment necessary to complete a procedure in the BSC before beginning, and adjust the view screen at the recommended operating position. To minimize the possibility of contamination, keep sterile supplies only in the center in the immediate vicinity of the smoke split, and arrange non-sterile items on either side.

(2) Placement of equipment and supplies is important. Place any routinely used large equipment in the BSC after the location of the smoke split is determined. Continue to place this equipment in the same position each time the cabinet is used.

(3) To prepare ADs, use syringes which are large enough that they need never be more than three-fourths full. Use only syringes and I.V. sets with Luer-lock fittings, since these are less prone to separate than friction fittings. Arrange a non-splash plastic or metal tray lined with sterile gauze pads to collect any excess solution. Empty sterile vials are alternative collection vessels. Leave excess solutions in their vials.

(4) Provide a closable, puncture-resistant, shatter-proof container for the disposal of contaminated sharp/breakable materials. In addition, maintain labeled, sealable plastic or wire tie bags to dispose of boxes and other contaminated materials such as gloves, gowns, and paper liners.

(5) Clean the BSC interior surfaces daily with 70 percent alcohol. Isopropyl alcohol may be used, but is less effective than ethanol as

a bactericidal agent. Decontaminate cabinet surfaces weekly, whenever spills occur, and when service or certification is required. To decontaminate, use a high pH phenol agent followed by rinsing. Remove worktrays, if present, and clean the back of the worktray and the sump below it. Do not use decontamination procedures ordinarily recommended for BSCs, for example, fumigation with a germicidal agent such as formaldehyde, because such procedures do not deactivate ADs and may cause chemical reactions.

d. Drug Preparation Procedures.

(1) Strictly adhere to the general principles of aseptic technique required in drug preparation, to provide worker protection and patient safety. Because of the nature of the airflow pattern in the vertical flow containment hood, proper procedures are not the same as those used in the horizontal laminar flow hood. In general, do not perform manipulations close to the work surface. Keep unsterile items, including liners and hands, downstream from the working area.

(2) Syringes and I.V. bottles. Use syringes and I.V. sets with Luer-lock connections. Label syringes and bottles with patient identification and drug administration information. Label all syringes, I.V. bags, and bottles containing ADs with a distinctive warning label:

ANTINEOPLASTIC AGENT -- HANDLE WITH GLOVES

DISPOSE OF PROPERLY

(3) Needles.

(a) Consider advantages and disadvantages when choosing needle size. Large-bore needles, size 18 or 20, prevent high-pressure syringing of the solutions, but may be more likely to drip solutions.

(b) Attach and prime drug administration sets within the hood, before the drug is added to the fluid. Prime into a sterile gauze pad or sealable plastic bag. This decreases the need to prime the set in a less controlled environment, and ensures that any fluid released during priming contains no drug.

(c) Do not cap, crush or clip needles and syringes used for AD preparation. Discard used syringes and needles in leak proof, puncture proof container with the label:

ANTINEOPLASTIC AGENT -- HANDLE WITH GLOVES

DISPOSE OF PROPERLY

Dispose of the container in accordance with procedures stated in paragraph C8.

(4) Handling Vials.

(a) Venting vials reduces build up of internal pressure and helps reduce the possibility of spillage and spraying when a needle is removed from the septum. Use a hydrophobic filter-needle unit to vent the vial while working within the BSC.

(b) Add diluent slowly to the vial by alternately injecting small amounts, and then allowing displaced air to escape into the syringe. (Do not inject all diluent at once, because a large volume of displaced air will cause the syringe's plunger to back up and possibly spray the drug or create leakage around the needle).

(c) For sealed vials, measure the final solution volume before moving the syringe needle from the vial seal and after pressure has equalized between the vial and syringe.

(d) Wrap a sterile gauze of cotton pledget around the needle and vial top when withdrawing AD solution from a vial. Withdraw from the vial while maintaining a negative pressure.

(5) Handling Ampoules.

(a) Tap down any material remaining in the top of an ampoule before opening it. In order to prevent cuts and to catch aerosolized material, wrap a sterile gauze pad around the ampoule neck before breaking it. Keep the ampoule away from the face when breaking the ampoule top.

(b) When adding diluent, inject the diluent slowly down the inside wall of the ampoule. Tilt the ampoule gently to ensure all powder is wet before agitating to dissolve the contents and prevent dusting.

(c) Hold the needle vertically with the needle pointing upwards; tap the syringe to remove any air bubbles and expel bubbles into a sterile gauze. Never expel bubbles into the air.

2. Drug Administration.

a. Apparel: Personnel who administer ADs wear gloves and gowns as described in para C1b(1,2). For face and eye protection, wear a plastic face shield or splash goggles which meet the standard of ANSI 28.7.1-1968. Wash the face shield and goggles after each use. To dispel fear or misunderstanding, inform patients that personal protective wear is necessary to protect staff against irritating effects of the ADs to eyes and skin.

b. AD Administration Equipment: An assembled administration kit, appropriately packaged and labeled is a convenient way to administer medications. Items needed include:

- gauze 4x4s for cleanups
- disposable plastic backed absorbent liner
- alcohol wipes
- empty vials (5-15 ml) to be used as receptacle for excess drug solution
- puncture-proof container for needles and syringes
- a 4-ml thick sealable zipper lock plastic or wire tie bag (with warning label) large enough to contain waste materials, and accessory warning labels

c. Work Practices.

(1) Wash hands before putting on gloves. If gowns or gloves become contaminated, change immediately.

(2) Watch infusion sets and pumps for any signs of leakage during use.

(3) Place a plastic-backed absorbent pad under the I.V. tubing to catch any leak during administration.

(4) Priming should have already been done in a BSC. If for some reason it is carried out at the bedside, place a sterile gauze over the fitting or needle tip and prime I.V. sets or expel air from syringes into the sterile gauze in a plastic zipper-lock bag. Use an alcohol pledget to wipe clean any drug contamination from syringes, I.V. bottles and bags, and pumps. Do not crush or clip needles and syringes. Dispose of needles and syringes and other AD contaminated material as described in paragraph C8.

d. Caring for Patients Receiving ADs.

(1) Personal Protective Equipment. Wear surgical latex gloves and disposable gowns when handling any blood, vomitus or other excreta from patients who have received ADs in the last 48 hours.

(2) Linen. Place any linen contaminated with ADs, blood, vomitus, urine or other body excreta in specially marked laundry bag with cytotoxic warning label. Place this laundry bag in a second labeled impervious bag. Prewash this impervious laundry bag and its contents, then add the linens to other laundry for an additional wash. While handling linens, the laundry personnel wear surgical latex gloves and gowns.

3. Policies and Procedures.

a. An organized committee develops written policies and procedures for the preparation, administration, and disposal of ADs. The committee determines the equipment needs of various hospital sections and formulates a plan to ensure policies are carried out uniformly throughout the

facility. Members of the committee include: bioenvironmental engineer, medical facility safety maintenance officer, environmental health officer, quality assurance officer, pharmacist, nursing service representative, a physician, and the nospital administrator. Instead of organizing a new committee, the existing pharmacy and therapeutics (P & T) committee could develop the policies and procedures for handling cytotoxic drugs. Representatives listed above who are not regular members of the P&T committee should be included for the purpose of determining methods for handling ADs.

b. Policies and procedures include a method for identifying to the hospital staff, the particular drugs covered by these policies. Policies and procedures must be consistent with applicable government regulations, professional practice standards, and the recommendations of pharmaceutical manufacturers, hospital safety officers, and other knowledgeable persons.

4. Medical Surveillance.

a. Provide preemployment medical evaluations to all employees who have potential exposure to ADs through preparation, administration, housekeeping, waste disposal, transportation, or storage.

b. Use the preplacement history to assess specific risk factors such as smoking and strong family history of cancer. Counsel individuals with risk factors for developing cancer that they may be at higher risk working with ADs.

c. Include a preemployment physical examination with particular attention to the eyes, buccal and nasal mucosal membranes, and the skin, and a baseline complete blood count, including differential.

d. The pharmacy maintains an exposure registry of all staff who routinely prepare or administer ADs.

e. Environmental Health ensures physical examinations are conducted for all employees who have potential exposure as specified above.

f. Acute Exposures.

(1) Acute exposures include direct skin or eye contact, and needle-stick from needles attached to syringes containing ADs. Report and document these exposures on hospital incident forms and in the employee's medical record, and in accordance with requirements of AFR 127-4, Investigating and Reporting U.S. Air Force Accidents. Provide same exam criteria as noted for preemployment.

(2) First aid procedures are stated in paragraph C.7b(1-5) under personnel contamination during spills.

g. Pregnancy. If appropriate procedures are followed, and the pregnant worker uses the recommended protective equipment, reproductive hazards should be reduced. Inform pregnant workers of potential health hazards, including potential reproductive hazards. Give workers who are

pregnant or breast feeding the option to transfer to comparable duties that do not involve the handling of ADs. This will be evaluated IAW the "Fetal Protection Program."

5. Training of Personnel.

a. As a part of the MTF Employee Health Program, notify all temporary and permanent employees who may be required to work with ADs, and provide adequate information about policies and procedures pertaining to their use.

b. Training responsibilities are a joint effort among the pharmacist, environmental health officer, and bioenvironmental engineer. Present an orientation to all personnel involved in any aspect of the handling of ADs (supply and storage personnel, physicians, nurses, pharmacy personnel, technicians, housekeeping). Gear contents of the training to the requirements of the individual's job category. Discuss such areas as the known and potential risks; relevant techniques and procedures for preparation and administration of ADs; the proper use of personal protective and other equipment; BSC design and operation; spill procedures; collecting, segregating, and disposal of AD wastes; medical surveillance and policies.

c. Evaluate and document acceptable staff performance and conformance with established procedures. Written examinations and direct observations of individual performances are acceptable for evaluation. Evaluate knowledge and competence of personnel after the first orientation/ training session, and then annually. Use AF Form 2767, Occupational Health Training and Protective Equipment Fit and Testing, for training documentation. Also document safety training on AF Form 55.

6. Antineoplastic Drug Information System. The pharmacy will maintain a loose-leaf notebook, index card, or computerized file containing information on the toxicity, acute exposure treatment, chemical inactivators, and solubility and stability of ADs used in the medical facility. The pharmacist makes a copy of this file available where drugs are administered in a centralized area, such as the oncology floor. In addition, posts summaries of relevant procedures in the appropriate work area.

7. Spills.

a. Only a properly protected person, who has been trained in the appropriate procedures, will clean up spills and breakages. Identify and isolate spills with a warning sign so other persons in the area are not contaminated.

b. Personnel contamination. Treat overt contamination of gloves or gowns, or direct skin or eye contact as follows:

(1) remove gown or gloves immediately;

(2) wash affected skin area immediately with soap (not germicidal cleaner) and water;

(3) if eye exposure, immediately flood the affected eye with water or isotonic eyewash designated for that purpose for at least 5 minutes;

(4) seek medical attention immediately; and

(5) report and document direct exposure as stated in paragraph C4f(1).

c. Cleanup of small spills outside BSC hood. While wearing gowns, double surgical latex gloves, and eye protection, handle small spills involving less than 5 milliliters or 5 grams of AD as follows:

(1) Wipe liquids with absorbent gauze pads and solids with wet absorbent gauze. Then, clean spill area three times using a detergent solution followed by a clean water rinse.

(2) Place glass fragments in a small puncture proof cardboard or plastic container. Place the container into an AD disposal bag, along with cleaning gauze and other noncleanable contaminated items.

d. Cleanup of large spills of amounts greater than 5 milliliters or 5 grams occurring outside the BSC.

(1) Restrict access to the spill area.

(2) To contain the spill, cover liquids with absorbent sheets or spill control pads, and drug powder with damp towels or cloths.

(3) Wear protective apparel (including respirator) described in paragraph C1b(1-3).

(4) Do not apply chemical inactivators.

(5) Clean all contaminated surfaces thoroughly with detergent solution, rinse with clear water, then wipe with a cloth saturated with 70% alcohol.

(6) Dispose of all contaminated absorbents in an appropriately labeled disposal bag.

e. Cleanup of spills in BSC.

(1) Wear gloves and gown as described in C1b(1,2).

(2) Decontaminate all interior hood surfaces as described in paragraph C7d(5) above.

(3) If HEPA filters of the BSC become contaminated, label the unit "CONTAMINATED-DO NOT USE." Have certified trained personnel change the filter and dispose of it properly as hazardous waste.

f. Spill kits. Keep labeled spill kit in or near AD preparation and administration areas. Items to include are splash goggles, appropriate respirator, two pairs of surgical latex gloves, two sheets (12 x 12) of absorbent material, 250 milliliter and 1 liter spill control pillows, a small scoop for collection of glass fragments, and two large AD disposal bags.

8. Waste Disposal.

a. In addition to EPA, state regulatory agencies may, at their discretion, include other AD wastes as hazardous wastes. Those AD wastes not specifically regulated by EPA or state regulatory agencies are not required to be handled as hazardous wastes for disposal and may be incinerated in the health care facility infectious waste or pathological waste incinerator. The incinerator shall be permitted as required by state or local air pollution regulations and comply with applicable state and local emission standards and design/operating requirements. The same amount of personal protection and precautions will be exercised during all stages of preparation, administration, patient care, spill cleanup, and transportation and storage for all ADs, regardless of disposal requirements based on the EPA listing. However, it is recommended that all AD waste be disposed of as hazardous waste.

b. Maintain careful and frequent inventories of ADs to minimize excess stock levels. Return intact products to the vendor before product expiration dates. In general, minimize intermediate storage, and handling of AD wastes for transfer/transport requirements.

c. Discarded commercial AD products, off specification species, container residues, and spill residues are included for hazardous waste management.

d. Containers.

(1) Discard all AD-related disposable wastes not considered sharps, (e.g., gloves, I.V. sets, gowns, sponges, cloths used to clean spills, and used AD containers) into wire tie bags of 4 mil thick polyethylene or 2 mil polypropylene bags for accumulation and collection in the satellite accumulation sites located near the drug preparation and administration area. Bags should be colored differently from other trash bags and appropriately labeled.

(2) Place all needles, syringes and breakable items in a rigid, puncture proof box before putting them into the polyethylene or polypropylene bag. Do not clip or cap needles or crush syringes. Tape the box before putting it in the AD disposal bag.

(3) Place plastic disposal bags containing AD wastes in a container which is lined with the same type AD bag and equipped with a tight fitting lid. Locate at least one container in every satellite accumulation site where ADs are prepared or administered so the waste does not need to be moved from one area to another. Label the container with the words, "ANTINEOPLASTIC AGENT -- DISPOSE OF PROPERLY." The label letters should be two inches high and painted black on a yellow or white background.

(4) AD waste designated as hazardous waste, which has been placed in labeled containers in an isolated and designated satellite accumulation site near the point of waste generation shall not remain in the area longer than 3 days once a total hazardous waste volume of 55 gallons is accumulated. When this volume of waste exists, secure the container liner bags with a wire tie and remove from the satellite accumulation containers to a separate but designated accumulation site for removal and disposal in accordance with the base hazardous waste management policies.

9. Storage.

a. Limit access to storage areas to authorized personnel. Post a large warning sign, a list of the AD drugs, and signs specifying spill procedures. If possible, segregate facilities for storage of ADs and other drugs. Place identification labels on AD containers and the shelves where these containers are permanently stored.

b. Open any damaged cartons of ADs in an isolated area, while wearing personal protection equipment described in paragraph C1b(1-3). Place broken containers and contaminated packaging in puncture-proof receptacles and AD disposal bags as described in paragraph C8d(1-4).

XI. CONCLUSION: Management of medical facility waste begins with a written plan, see Appendix J. This document should be reviewed annually. It should include precise definitions of the hazards and appropriate containment for each. The training program for the personnel should be comprehensive and current. Waste management should also be part of the quality assurance program for the medical facility, which means that there must be methods for monitoring the system and compliance with the procedures. Finally, any change in the processes or practices carries the potential for new waste requirements. Any change in methodology or increase in the volume of processes should be accompanied by careful review of its impact upon waste handling practice.

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APPENDIX A

COMPREHENSIVE LIST OF ANTINEOPLASTIC DRUGS

(NOT ALL INCLUSIVE)

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Appendix A

COMPREHENSIVE LIST OF ANTINEOPLASTIC DRUGS

(NOT ALL INCLUSIVE)

SUBSTANCE	OTHER NAMES	CAS#	EPA CODE
ACEGLATONE		642-83-1	
ACIVICIN		42228-92-2	
ACLACINOMYCIN	ACLACINOMYCIN A	57576-44-0	
ACLARUBICIN		57576-44-9	
ACODAZOLE HYDROCHLORIDE		55435-65-9	
ACRONINE		7008-42-6	
ACTINOMYCIN C		8052-16-2	
ALTRETAMINE		645-05-6	
AMBOMYCIN	ALAZOPEPTIN	1397-84-8	
AMETANTRONE ACETATE		70711-40-9	
AMINOGLUTETHIMIDE	CYTADREN	125-84-8	
AMIPRILOSE HYDROCHLORIDE	THERAFECTIN	60414-06-4	
AMSACRINE	AMSIDYL	51264-14-3	
ANCITABINE	CYCLO-C	31698-14-3	
ANTHRAMYCIN		4803-27-4	
ASPARAGINASE	CRASNITIN, ELSPAR, LEUCOGEN	9015-68-3	
ASPERLINE		30387-51-0	
AZACITIDINE	MYLOSAR	320-67-2	
AZASERINE		115-02-6	U015
AZATHIOPRINE	IMURAN, AZAMUNE, AZANIN	446-86-6	
AZAURIDINE	TRIAZURE, AZARIBINE	2169-64-4	
AZETEPA		125-45-1	
AZOTOMYCIN		7644-67-9	
BENZODEPA		1980-45-6	
BESTRABUCIL	BETASERC, SERC, VASOMOTAL	75219-46-4	
BISANTRENE	ADAH, ADCA, ZANTRENE	78186-34-2	
BLEOMYCIN SULFATE	BLENOXANE	11056-06-7	
BROPIRIMINE		56741-95-8	
BUSULFAN	MYLERAN	55-98-1	
CACTINOMYCIN	ACTINOMYCIN	8052-16-2	
CALUSTERONE	METHOSARB	17021-26-0	
CARACEMIDE		81424-67-1	
CARBETIMER		82230-03-3	
CARBOPLATIN		41575-94-4	
CARBOQUONE		24279-91-2	
CARMOFUR		61422-45-5	
CARMUSTINE	BICNU	154-93-8	
CARUBICIN	CARMINOMYCIN	50935-04-1	
CHLORAMBUCIL	LEUKERAN	305-03-3	U035
CHLORNAPHAZINE		494-03-1	U026
CHLOROZOTOCIN	D-GLUCOPYRANOSE	54749-90-5	
CHROMOMYCIN	ABURAMYCIN		

COMPREHENSIVE LIST OF ANTINEOPLASTIC DRUGS

(NOT ALL INCLUSIVE)

SUBSTANCE	OTHER NAMES	CAS#	EPA CODE
CISPLATIN	PLATINOL, BRIPLATIN, RANDA	15663-27-1	
CYCLOPHOSPHAMIDE	CYTOXAN, NEOSAR	50-18-0	U058
CYTARABINE	CYTOSAR-U	147-94-4	
DACARBAZINE	DTIC-DOME, DETICIENE, DACATIC	4342-04-4	
DACTINOMYCIN	COSMEGEN, ACTINOMYCIN-D	50-76-0	
DAUNORUBICIN	CERUBIDIN, DAUNOMYCIN	20830-81-3	U059
DEFOSFAMIDE		477-30-5	
DEMECOLCINE			
DENOPTERIN			
DEZAGUANINE		41729-52-6	
DEZAGUANINE MESYLATE		87434-82-0	
DIAZIQUONE		57998-68-2	
DIAZO-5-OXO-L-NORLEUCINE	L-NORLEUCINE	157-03-9	
DOXIFLURIDINE	5-FLUOROURCACIL, FLUTRON	3094-09-5	
DOXORUBICIN	ADRIAMYCIN	23214-92-8	
EFLORNITHINE	ORNIDYL	67037-37-0	
ELLIPTINIUM ACETATE		58337-35-2	
ENOCITABINE	SUNRABIN	55726-47-1	
ENPROMATE		10087-89-5	
EPIROPRIDINE		5696-17-3	
EPIRUBICIN	PHARMORUBUCIN, FARMORUBICIN	56420-45-2	
ESORUBICIN		63521-85-7	
ESTRAMUSTINE		2998-57-4	
ESTRAMUSTINE PHOSPHATE SODIUM	EMCYT, ESTRACYT	52205-73-9	
ETOGLUCID		1954-28-5	
ETOPOSIDE	VEPESID	33419-42-0	
ETORPRINE		18588-57-3	
FAZARABINE		65886-71-7	
FENRETINIDE		65646-68-6	
FLOXURIDINE	FUDR	50-91-9	
FLUDARABINE		21679-14-1	
FLUOROURACIL	EFUDEX, ADRUCIL, FLUOROPLEX	51-21-8	
FOSTRIECIN SODIUM		87860-39-7	
FOTEMUSTINE			
HYDROXYUREA	HYDREA, LITALIR	127-07-1	
IDARUBICIN HYDROCHLORIDE		58957-92-9	
IFOSFAMIDE	CYFOS, IFEX, NAXAMIDE	3778-73-2	
IMPROSULFAN		13425-98-4	
INTERFERON ALPHA-2a	ROFERON-A	76543-88-9	
INTERFERON ALPHA-2b	INTRON-A	76543-88-9	
INTERFERON BETA	FERON, NAFERON, FRONE		

COMPREHENSIVE LIST OF ANTINEOPLASTIC DRUGS

(NOT ALL INCLUSIVE)

SUBSTANCE	OTHER NAMES	CAS#	EPA CODE
INTERFERON GAMMA-1b	POLYERON, IMMUNERON	98059-61-1	
INTERLEUKIN-1			
INTERLEUKIN-2			
IPROPLATIN		62928-11-4	
LENTINAN			
LEUPROLIDE ACETATE	LUPRON	74381-53-6	
LOMUSTINE	CEENU, CCNU, BELUSTINE	13010-47-4	
LONIDAMINE		50264-69-2	
MANNOMUSTINE		576-68-1	
MAYTANSINE		35846-53-8	
MECHLORETHAMINE	MUSTINE, MUTAGEN	51-75-2	
MECHLORETHAMINE HCL	MUSTARGEN	55-86-7	
MEGESTROL ACETATE	MEGACE, OVABAN, MEGESTAT	595-33-5	
MELENGESTROL ACETATE	MGA	2919-66-6	
MELPHALAN	ALKERAN	148-82-3	
MENOGARIL		71628-96-1	U150
MERCAPTOPURINE	PURINETHOL	6112-76-1	
MERCAPTOPURINE		6112-76-1	
METHOTREXATE SODIUM	FOLEX, MEXATE	59-05-2	
METOPRINE	DELCRONOL	7761-45-7	
METUREDLEPA		1661-29-6	
MITHRAMYCIN	MITHRACIN		
MITINDOMIDE		10403-51-7	
MITOBRONITOL	MYEBROL, MYLEOBROMOL	488-41-5	
MITOCARCIN		11056-14-7	
MITOCROMIN		11043-98-4	
MITOGILLIN		1403-99-2	
MITOGUAZONE		459-86-9	
MITOLACTOL	MITOLAC, ELOBROMOL	10318-26-0	
MITOMALCIN		11043-99-5	
MITOMYCIN C	MUTAMYCIN, MITOCIN-C	50-07-7	U010
MITOSPER		11056-15-8	
MITOTANE	LYSODREN	53-19-0	
MITOXANTRONE	NOVANTRONE	70476-82-3	
MOPIDAMOL	RA 223, RAPENTRON	13665-88-8	
MYCOPHENOLIC ACID	MELBEX	24280-93-1	
NIMUSTINE		42471-28-3	
NITRACRINE	C 283, LEDAKRIN	4533-39-5	
NOCODAZOLE		31430-18-9	
NOGALAMYCIN		1404-15-5	
NOVEMBICHIN	EMBICHIN 7, EMBIKHIN 7	1936-40-9	
OLIVOMYCIN	OLIVOMISTIN	11006-70-5	
OXISURAN		27302-90-5	
PELIOMYCIN		1404-20-2	
PENTAMUSTINE	SALISBURYSTIN	73105-03-0	

COMPREHENSIVE LIST OF ANTINEOPLASTIC DRUGS

(NOT ALL INCLUSIVE)

SUBSTANCE	OTHER NAMES	CAS#	EPA CODE
PENTOSTATIN		70384-29-1	
PEPLOMYCIN SULFATE			
PHENAMET	FENESTERIN, FENESTRIN	3546-10-9	
PHENESTERINE	AMEDEL, VERCYTE	54-91-1	
PIPOBROMAN	ANCYTE	2608-24-4	
PIPOSULFAN	THP, THP-ADM, THERARUBICIN	72496-41-4	
PIRARUBICIN	MITHRACIN	18378-89-7	
PLICAMYCIN		1853-37-8	
PODOPHYLLIC ACIDS	PRORESID	1508-45-8	
PODOPHYLLINIC 2-ETHYLHYDRAZINE	REGAMYCIN	801-52-5	
PORFIROMYCIN		29069-24-7	
PREDNIMUSTINE	MATULANE, NATULAN	366-70-1	
PROCARBAZINE HCL	TEROPTERIN, PTGA		
PTEROPTERIN		53-79-2	
PUROMYCIN	PYRAZOMYCIN	30868-30-5	
PYRAZOFURIN	CYMERINE, THYMERIN	58994-96-0	
RANIMUSTINE	RAZOXIN	21416-87-5	
RAZOXANE		7724-76-7	
RIBOPRINE		13909-09-6	
SEMUSTINE		5579-27-1	
SIMTRAZENE	SCHIZOPHYLLAN, SPG, SONIFILAN		
SIZOFIRAN		66569-27-5	
SPARFOSATE SODIUM		1404-64-4	
SPARASOMYCIN	SPIRO-32	41992-23-8	
SPIROGERMANIUM	SPIORHYDANTOIN MUSTARD	56605-16-4	
SPIROMUSTINE		74790-08-2	
SPIROPLATIN	NIGRIN	3930-19-6	
STREPTONIGRIN	ZANOSAR, STREPTOZOTOCIN	18883-66-4	U206
STREPTOZOCIN	TALLYSOMYCIN A	65057-90-1	
TALISOMYCIN		33069-62-4	
TAXOL	EXONAL, LIFRIL, SUNFURAL	17902-23-7	
TEGAFUR	VEHEM, VUMON, VM-26	29767-20-1	
TENIPOSIDE		63717-00-0	
TENUAZONIC ACID		59653-73-5	
TEROXIRONE	FLUDESTRIN, TESLAC	968-93-4	
TESTOLACTONE	GUANERAN	5581-52-2	
THIAMIPRINE	TABLOID	154-42-7	
THIOGUANINE		60084-10-8	
TIAZOFURIN		6157-87-5	
TRESTOLONE ACETATE	TRENIMON, TRIS	68-76-8	
TRIAZIQUONE	SINALOST, TRILLEKAMIN	555-77-1	
TRICHLOROTRIETHYLAMINE		61966-08-3	
TRICIRIBINE PHOSPATE			

COMPREHENSIVE LIST OF ANTINEOPLASTIC DRUGS

(NOT ALL INCLUSIVE)

SUBSTANCE	OTHER NAMES	CAS#	EPA CODE
TRIETHYLENEMELAMINE	TRIAMELIN, TRIAZINE, TEM	51-18-3	
TRIETHYLENEPHOSPHORAMIDE	TEPA	545-55-1	
TRIETHYLENETHIOPHOSPHORAMIDE	THIOTEPA, TIFOSYL, TESPAMIN	52-24-4	
TRIMETHYLOLMELAMINE	CEALYSIN, C 61, CILAG		
TRIMETREXATE		52128-35-5	
TRIPTORELLIN		57773-63-4	
TROFOSFAMIDE	IXOTEN	22089-22-1	
TUBERCIDIN	SPARSAMYCIN A. TUBERCIDINE	69-33-0	
TUBULOZOLE HYDROCHLORIDE		83529-08-2	
UBENIMEX	BESTATIN	58970-76-6	
URACIL MUSTARD	URAMUSTINE, DEMETHYLDOPAN	66-75-1	U237
UREDEPA	URETHIMINE, AVINAR, AB-100	303-49-8	
URETHANE	URETHAN, ETHYL CARBAMATE	51-79-6	
VINBLASTINE SULFATE	VELBAN, EXAL, VELBE	143-67-9	
VINCRISTINE SULFATE	VINCASAR PFS, ONCOVIN, VINCREX	2068-78-2	
VINDESINE	DESACETYLVINBLASTINE AMIDE	53643-48-4	
VINEPIDINE SULFATE		83200-11-7	
VINGLYCINATE SULFATE		7281-31-4	
VINLEUROSINE SULFATE		1404-95-1	
VINROSIDINE SULFATE		18556-44-0	
VINZOLIDINE SULFATE		67699-41-6	
ZINOSTATIN	NEOCARZINOSTATIN	9014-02-2	
ZORUBICIN HYDROCHLORIDE	RUBIDAZONE	36508-71-1	

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APPENDIX B

MEDICAL ADMINISTRATION

EXAMPLE INFECTION CONTROL PROGRAM

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Appendix B

Medical Administration

EXAMPLE INFECTION CONTROL PROGRAM

This regulation outlines and defines the functions and responsibilities of the Infection Control Program (ICP) and provides guidelines for the prevention and control of nosocomial infections and communicable diseases. It applies to all personnel assigned to and working within the facility.

Contents

1. References.

a. AFR 88-50, Facilities Design and Planning Criteria for Design and Construction of Air Force Health Facilities.

b. AFR 160-41, Infection Control Program in the Air Force Medical Service.

c. OASD (HA) Memo, 11 January 1989, HIV Testing and Look Back Guidelines for Homologous Blood Donations.

d. Employee Health Program.

e. Bloodborne Disease Prevention and Control Program.

f. Environmental Sampling.

g. Laboratory Guide.

h. Boards and Committees.

i. Isolation Procdures.

j. Central Sterile Supply.

k. Unit OIs with infection control implications.

l. OSHA Instructions CPL 2-2. 44A, Enforcement Procedures for Occupational Exposure to Hepatitis B Virus (HBV) and Human Immunodeficiency Virus (HIV), 15 August 1988

m. Accreditation Manual for Hospitals, most current.

n. Maintained by Infection Control Officer (ICO):

(1) CDC Guidelines for Prevention and Control of Nosocomial Infections.

(2) Morbidity and Mortality Week Report (MMWR)

(3) APIC Curriculum Guide for Infection Control Practice, Vols I, II, and III.

(4) EPA Guidelines for Infectious Waste Management, May 1986.

o. Applicable State Department of Health, standards for the regulation of medical waste.

2. Purpose. To prevent and control nosocomial infections; to monitor compliance with infection control standards in MTF.

3. Objectives.

a. To develop effective measures to prevent, identify, and control both nosocomial and clinic acquired infections.

b. To recommend appropriate actions based upon records and reports of identified infections and infection hazards.

c. To provide guidance and recommendations to all areas of the hospital in the development and operation of an Infection Control Program (ICP).

d. To ensure all personnel complete orientation and annual inservice training on infection control.

4. Committee Structure. The Infection Control Committee (ICC) is a multidisciplinary committee assigned to control, to discuss and to assess identified problems.

a. Members of the ICC are listed in the hospital regulation on boards and committees.

b. The ICC will meet monthly to review surveillance data, policies and procedures related to infection control, and to discuss and assess identified problems.

c. Director of Hospital Sevices.

(1) Is responsible for the ICP.

(2) Appoints a member as presiding officer.

(3) Designates administrative support for committee functions.

(4) Conducts an annual appraisal of the ICP for the committee.

d. Presiding Officer.

(1) Conducts the committee meeting.

(2) Prepares and distributes agenda three working days prior to the next scheduled meeting.

(3) Submits minutes within ten working days after each meeting.

(4) Assigns tasks and projects to members.

e. Infection Control Officer (ICO).

(1) Coordinates agenda with presiding officer.

(2) Investigates reports of infections and prepares a nosocomial infection listing for committee review and action.

(3) Institutes appropriate control measures when there is reasonable concern about dangers from infection to patients or staff.

(4) Presents or coordinates the initial infection control orientation for all new personnel and an annual inservice for all personnel.

(5) Submits a quarterly education and training report of all activities and personnel attending.

5. Committee Functions.

a. Review and evaluate the following ICC standard agenda items.

(1) Operating Instructions Subcommitte Report.

(2) Nosocomial Infection Report.

(3) Autopsy Report.

(4) Equipment Quality Control Report.

(5) Communicable Disease Report.

(6) Contractual Compliance Report.

(7) Ventilation Surveys.

(8) Bloodborne Disease Subcommitee Report.

(9) Antibiogram Report.

(10) Antibiotic Reviews.

(11) Education and Training Report.

(12) Employee Occupational Health Report.

(13) Targeted Surveillance.

(14) Process Surveillance.

b. Evaluate employee health program.

c. Conduct/review environmental surveys related to sanitation.

d. Evaluate surveillance/reporting system for identifying communicable and nosocomial infections.

e. Approve the purchase of supplies/equipment that have infection control implications.

f. Evaluate any Quality Assurace/Risk Management problems brought before the committee and recommend corrective action.

g. Establish and annually evaluate ICP clinically significant indicators.

6. Statement of Authority.

a. The ICC has the authority to institute any appropriate control measures or studies when a situation is identified as a potential danger to patients or staff. All other changes to policy are approved by the Executive Committee of the Medical Treatment Facility prior to implementation.

b. Authority is given by the medical staff to the ICO and/or the registered nurse responsible for patient care to report any actual or suspected infection, to initiate appropriate isolation precautions, and culture patients.

7. Definitions of Infections, Site Criteria, Preventable Infections.

a. Definition of Infections are stated in AFR 160-41, para 6.

b. Site criteria for determining the site of a nosocomial infection are listed in AFR 160-41, Atch 1.

c. Infections occurring in the following special situations are considered nosocomial:

(1) Infections which are acquired in the hospital and become evident within 60 days of discharge.

(2) Infections in neonates that are the result of passage through the birth canal.

d. The following conditions are not infections:

(1) Colonization which means the presence of microorganisms on/in skin, mucus membranes, open wounds, or excretions/secretions but which is not causing adverse clinical signs of infection.

(2) Inflammation which results from tissue response to injury or stimulation by noninfectious agents such as chemicals or medications.

e. The term "nosocomial infection" will include potentially preventable infections as well as those infections which may be regarded as inevitable. Nosocomial infections may be caused by organisms from both the endogenous (host's normal flora) or exogenous (outside the patient) sources. Nosocomial infections are kept to a minimal level by means of proper management, monitoring, and assessment of risk factors.

8. Surveillance Activities, Reporting Infections.

a. Physicians and section supervisors will report all suspected nosocomial (hospital/clinic acquired) infections to the ICO. Include risk factors that may have contributed to the infection.

b. Target Surveillance in Outpatient Clinics.

(1) Submit topics to be monitored/evaluated, i.e., site, service, operation, procedure, or treatment for occurrence of an infection in one service or area during a specified time periods to the ICC annually.

(2) Submit targeted surveillance findings, including conclusions, recommendations, actions and follow-up to the ICC.

c. Inpatient and outpatient process surveillance is performed by the Resource Management office (SGM) facility-wide inspections during the first month of each quarter using ICC approved criteria on established regulations, OIs, environmental cleanliness, and patient care protocols/practices. Section supervisors may supplement process surveillance (visual) using selected criteria.

9. Quality assurance indicators are monitored and evaluated IAW AFR 160-41, para 8.

10. Isolation Techniques, Universal Precautions, Patient Placement.

a. Apply universal precautions to all patients. Implement Disease-Specific isolation IAW AFR 160-41, para 9, and applicable MTF regulations.

b. Universal Precautions.

(1) Section supervisors ensure that adequate supplies such as gowns/aprons, masks, eye covers and gloves (sterile and non-sterile) are available (sizes appropriate for each staff member) and utilized for those procedures/tasks involving direct contact with blood or body fluids. Equipment required to minimize the need for emergency mouth-to-mouth resucitation, i.e., pocket masks, resuscitation bags or other ventilation devices, are in strategic locations and on each ambulance.

(2) Body fluids to which universal precautions apply.

(a) Blood and any body fluid containing VISIBLE blood.

(b) Semen, vaginal secretions and human breast milk.

(c) Tissues cerebrospinal fluid (CSF), synovial, pleural, peritoneal, pericardial, and amnionic fluids.

(3) Body fluids to which universal precautions DO NOT apply: Saliva, feces, nasal secretions, sputum, sweat, tears, urine, and vomitus UNLESS THEY CONTAIN VISIBLE BLOOD.

(4) Glove Use. Wear gloves when performing: invasive procedures; phlebotomy or other vascular access; health care worker has cuts, scratches, chaffing, dermatitis of the hands; touching mucous membranes; handling items or surfaces soiled with blood and defined body fluids and cleaning.

(5) Blood Bank personnel are not required to wear gloves when drawing from a volunteer donor IAW OASD (HA) Memo, para 6c, 11 January 1989.

(6) Gowns/plastic aprons/smocks use. These items are worn when splashes to skin or clothing with blood or defined body fluids are liklely to occur.

(7) Masks and eye covers. These items are worn when contamination of the mucosal membranes (eyes, nose or mouth) with blood or defined body fluids is likely to occur. These items are not required for routine care.

(8) Cleaning. Contract housekeeping will maintain the facility in a sanitary condition IAW the Hospital Aseptic Management Service (HAMS) contract. Blood spills are handled by housekeeping as an emergency response item, and cleaned with an approved disinfectant after the initial clean-up.

(9) Linen. Items soiled with blood or defined body fluids are not sorted or rinsed in patient care areas. They are bagged at the point of use in a clear plastic bag then placed and transported in routine canvas linen bags.

(10) Bagging of articles. Items that are contaminated with blood/defined body fluids are placed in an impervious bag. If outside bag is contaminated, torn, or leaks, add a second bag.

(11) Handwashing. Hands are washed after removing gloves. Wash skin surface immediately after contact with blood/defined body fluids.

(12) Sharp items.

(a) Needles are not recapped, purposely bent or broken by hand, removed from disposable syringes, or otherwise manipulated by hand. Only Dental Services are authorized to recap needles IAW AFR 160-41. Needles used for drawing blood cultures are not changed between venipuncture and entry into the blood culture bottle.

(b) Pipettes, scalpel blades, glass slides, cover slips, suture needles and other sharps capable of causing injury are placed in puncture-resistant containers.

(13) DO NOT eat, drink, apply cosmetics, or handle contact lenses in work areas where there is a potential for contact with blood or defined body fluids.

(14) Accidental exposure to health care worker (HCW). Percutaneous exposures such as needlesticks, mucous membrane splashes to eye, nasal mucosa or mouth, and cutaneous exposures to blood when HCW's skin is chapped,

abraded, or otherwise nonintact are reported IAW MFT Regulation, Bloodborne Disease Prevention and Control Program.

(15) Lab specimens. All specimens are placed in well-constructed containers with secure lids to prevent leakage during transport.

(16) Training/Education of HCW. Section supervisors ensure personnel are trained initially to perform tasks/procedures related to job duties, using universal precautions. IAW OSHA, annual training is required for personnel whose anticipated job duties/tasks/activities involve blood and/or defined body fluids on an average of one or more times per month. Coordinate contents of annual training with the ICO.

(17) IAW MTF Regulation, personnel at risk for Hepatitis B exposure have documented Hepatitis B vaccination/immunity.

11. Handwashing.

a. Handwashing is the single most important procedure for preventing the spread of infections. It is performed IAW AFR 160-41, paragraph 10.

b. The procedure for handwashing is performed as follows:

(1) wet hands under running water.

(2) Apply handwashing product as determined by activity.

(3) Vigorously rub all surface of fingers, palms, back of hands and wrist for at least ten seconds.

(4) Rinse under running water; keep hands lower than elbows.

(5) Dry hands.

(6) In the absence of foot/knee-operated faucets, use a dry towel to turn off faucets and discard the towel.

c. Waterless products (i.e., foams) are permitted when sinks are remotely available.

d. Housekeeping section maintains soap dispensers. Supplies of antiseptic agents are maintained and used by the using unit.

12. Cleaning, Disinfection, Sterilization.

a. Cleaning, disinfection, and sterilizing are performed IAW AFR 160-41 utilizing the approved agents.

b. Wash reusable items (wearing appropriate barriers) with soap and water immediately after use to remove blood and/or body fluids. Return items to CSS for reprocessing or sections with sterilizers will process and maintain an OI for their appropriate operation and testing.

c. Endoscopes that enter gastrointestinal, genitourinary, or respiratory systems are precleaned then disinfected with glutaraldehyde IAW section OIs.

13. Irrigation Fluids, Multi-dose Vials, Sterile Supplies.

a. Check IV solutions, multi-dose vials, culturing supplies, sterile supplies weekly for expiration dates.

b. Ensure irrigation fluids are opened, dated and used within 24 hours.

c. Multi-dose vials expire 90 days after being entered or unless specified by the pharmacy or manufacturer. Vials are marked when entered with the initials of the person who entered the vial. Unmarked vials are discarded. Multi-dose vials which do not contain preservatives (KCL and heparin flush solution) are discarded within 24 hours of opening.

d. Sterile supplies.

(1) Sterile supplies are checked weekly. Remove those which will be outdated within one week.

(2) Outdated items are reprocessed if reusable.

(3) Items which are punctured, torn, or wet are ot used.

(4) Expiration of processed items: disposable wrappers - 30 days; peel-pack and rigid container system - six months; covered supplies six months.

(5) Commercially processed items are sterile, unless package integrity is compromised or the expiration date on the package is reached.

(6) Sterile supplies are removed from cardboard boxes and stored separately from non-sterile supplies and should never be stored directly on the floor.

14. Dental Services Specific Procedures.

a. Procedures are followed IAW AFR 160-41, paragraph 13.

b. Procedures not covered in AFR 160-41, paragraph 13, are followed according to section OIs.

15. Dress Code. Clothing/attire will be IAW AFR 160-41, paragraph 14.

16. Laundry/Linen.

a. Laundry and linen handling procedures are followed IAW 160-41, paragraph 15.

b. The laundry/linen contracts are reviewed annually by the ICC.

c. A monthly contractual compliance report is submitted to the ICC by representative of the Facility Manager.

d. Linen storage.

(1) Clean Linen.

(a) Maintained in plastic wraps until use to prevent contamination.

(b) If stored in carts, flaps are kept in the down position and zipped.

(c). Never placed on floor. If it comes in contact with floor, discard in linen hamper.

(2) Soiled Linen/Isolation Linen. Refer to paragraph 10b(9).

17. Ventilation.

a. Ventilation surveys are conducted semiannually by Bioenvironmental Engineering for the MTF to include the following:

(1) Positive pressure for the Operating Rooms, Labor and Delivery (L&D), CSS and its processing areas, and Nursery.

(2) Negative pressure for isolation rooms and CSS decontamination area.

(3) Total air exchanges are IAW guidelines established by CDC and AFR 88-50.

b. Preventive maintenance of ventilation systems will include:

(1) Vacuuming of vents to remove lint and debris. Performed annually by Housekeeping IAW HAMS contract.

(2) Changing of filters is done by Civil Engineering per protocol.

18. Environmental Sampling. Environmental sampling is conducted IAW AFR 160-41, para 17.

19. Obstetrical Services.

a. Obstetrical services will follow the same standards and procedures as used by the surgical suite, IAW AFR 160-41, paragraph 18.

b. Service specific procedures are covered under section OIs.

20. Anesthesia. Guidelines will be followed IAW AFR 160-41, paragraph 19.

21. Ambulatory Care/Outpatient Services. Guidelines are followed IAW AFR 160-41, paragraph 20.

22. Employee Health. Guidelines for the employee health program are followed IAW MTF Regulations on Employee Health Program, and Bloodborne Disease and Prevention Program.

23. Guidelines for Selected Procedures.

a. Intravenous Therapy (AFR 160-41, Atch 2, paragraph 1.

b. Invasive Monitoring (AFR 160-41, Atch 2, para 2).

c. Urinary Catherization (AFR 160-41, Atch 2, paragraph 3).

d. Tracheostomy Care (AFR 160-41, Atch 2, paragraph 4).

e. Suctioning of Respiratory Tract (AFR 160-41, Atch 2, paragraph 5).

f. Respiratory Therapy (AFR 160-41, Atch 2, paragraph 6).

g. Antiseptics and Disinfectants (locally approved).

h. Disinfection and Sterilization of Flexible Fiberoptic Endoscopes (FFE) (AFR 160-41, Atch 3).

24. Housekeeping, Environmental Maintenance, Waste Management.

a. The ICC will perform an annual review of the HAMS contract IAW AFR 160-41, paragraph 23.

b. Clean and soiled utility areas will be designated.

c. All routine environmental cleaning is the responsibility of contract housekeeping personnel.

d. Separate refrigerators are maintained for food, drugs, and specimens.

e. Refrigerators used for patient food, beverage, dietary supplement, biologicals and other thermolabile medications require documented temperature control. Place thermometer in the middle section. Daily, check and record temperature on AF Form 638, Refrigeration Unit Standard Temperature Chart, and maintain the temperature between 36-46 degrees F. (Save AF Form 638 for 30 days).

f. Guidelines for cleaning specific areas by MTF personnel:

(1) Nourishment Center, Food Storage, and Consumption area.

(a) The counter top is cleaned with alcohol 70% at the end of each shift.

(b) Refrigerator maintenance:

1. Outdated beverages and food items are discarded.

2. Mild soap and water are used for weekly cleaning.

3. At least a monthly defrosting is performed.

(c) Coffee pots and microwave ovens are kept clean.

(2) Dirty utility area.

(a) Items to be cleaned are stored in this area (i.e., soiled equipment).

(b) Hampers are placed in this area for soiled linen.

(c) Lids on trash are optional.

(d) Dirty reuseable items (surgical instuments, speculums, etc.) are washed in soapy water, dried and returned to CSS. Disposable gloves are worn during cleaning.

(e) Used equipment (otoscope pieces and stethoscopes) is washed with 70% alcohol after each use.

(f) Countertops are cleaned with approved phenolic at the end of each shift.

(3) Tub Sitz Baths. Housekeeping cleans tubs and sitz baths daily. Unit personnel clean these in between patients using Microbac or Microquat.

(4) Exam/Treatment Rooms. Exam table sheets are changed between patients. Clean sufaces when visibly soiled with patient secretion/excretions.

(5) Medication Room. Includes medication carts, cabinets and refrigerators.

(a) Damp dust medication cabinet shelves and unit dose carts weekly and as necessary with 70% alcohol.

(b) Non-drug items are not stored with drug items.

(6) Staff Work Areas. Users maintain work area(s) in a clean and orderly state, i.e., nurses' station, patient reception desk, physician dictating room, report/meeting room, and designated staff lounge.

(7) Patient Rooms (In-patient).

(a) Place patients personal items (towels, wash cloths, basins, bedpans, urinals, etc.) in the bedside stand when not in use. None of these items are placed on the floor or windowsills.

(b) Do not place bedpans and urinal on the overbed table or floor.

(c) Label all measuring containers and water pitchers with the patient's name and room number immediately upon issue. Each patient is to have a separate measuring container.

(d) Discard single-use patient care items upon discharge of patient.

(e) Wipe spills from overbed table tops after AM care and meals.

(f) Empty overflowing routine waste baskets for the next shift.

g. Guidelines for Cleaning Specific Equipment.

(1) Wear gloves, eye protection, gowns/aprons as indicated.

(2) Ambu bags are cleaned and sent to Respiratory Therapy for hot water disinfection before use on other patient. They should be maintained in dust-free state.

(3) Clean laryngoscope blades with soap and water and send to CSS for stem sterilization.

(4) Clean multi-use testing equipment (specific gravity manometers) with soap and water and rinse between each use.

(5) Store nebulizers, humidifiers, and other respiratory equipment with empty water reservoirs.

(6) Thermometers.

(a) Do not place electronic units on the patient's bed, bedside stand, or exam table. If this is done inadvertently, clean the unit with 70% alcohol to prevent cross contamination. These may be used for isolation patients.

(b) Change disposable probe covers and discard after each use of the electronic thermometers.

(c) Reprocess glass thermometers in CSS.

(7) Clean endoscopes IAW section OIs and AFR 160-41.

(8) Wash reusable items (surgical instruments and speculums) with soap and water and place in a bag/container for transport to CSS.

h. Waste Management.

(1) Housekeeping Services collects and disposes of trash IAW the HAMS contract. Do not place in the linen chute.

(2) Regulated medical waste. IAW local directives.

25. Education/Training.

a. Education and training are conducted IAW AFR 160-41, paragraph 24.

b. IAW Joint Commission on Accreditation of Health Organization (JCAHO): Written policies and procedures are briefed to personnel doing patient care procedures. Personnel are competent to participate in infection monitoring, prevention, and control activities. They are provided with any necessary orientation, on-the-job and inservice training, and continuing education. This is documented in the appropriate training record(s).

c. Section supervisors must ensure annual in-service training on infection control policies and procedures. Submit a report to the ICC outlining content, presenter, number of personnel assigned and list of attendees by name, rank, and social security number within ten working days.

26. Classification of Surgical Procedures.

a. All invasive procedures are classified per CDC guidelines and IAW 160-41, paragraph 25.

b. Surgeons will ensure the classification of every invasive procedure at the time of wound closure or case termination and document on SF 516, Medical Record - Operation Report.

c. Operating Room personnel will annotate the wound classification in the departmental log and submit a monthly report to the ICO including:

(1) Numbers of operative procedures and classifications.

(2) C-section, primary or repeat, and wound classification.

d. Operating Room OI will include wound classification.

27. Disaster Casualty Control. The Medical Readiness Officer ensures established checklists include provisions for handwashing (Septisol Foam), sanitation (portable toilets), and waste disposal during a natural disaster.

28. Operating Instructions Review.

a. The ICC subcommittee will meet on a monthly basis to review and approve scheduled section OIs throughout MTF. Each section OI will be reviewed annually. Minutes of the subcommittee will be submitted to the ICC monthly.

b. The membership of the subcommittee will include a physician, the ICO, a representative from Department of Nursing, and a representative from the Operating Room.

c. Section Infection Control OIs will include AFR 160-41 items applicable to the section.

APPENDIX C

INFECTION CONTROL SELF-INSPECTION

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Appendix C

INFECTION CONTROL SELF-INSPECTION

1. Does each personnel have documented evidence of orientation to infection control standards/policies?

2. Is there documented evidence of annual Infection Control training?

3. Have section supervisors developed Infection Control written guidelines and:

   a. are they approved through proper chain of command,

   b. submitted to Infection Control Committee, and

   c. reviewed annually?

4. Are personnel aware of nosocomial infection reporting procedures?

5. Are representatives from nursing (CN or Asst CN) assigned in writing as member of the ICC?

6. Are minutes of the ICC reviewed by the hospital CA/RM?

7. Are personnel trained in culturing techniques of urine, sputum and wounds?

   a. Is training documented?

   b. Are personnel aware cultures may be obtained without physician's order?

8. Are QA indicators monitored via ICC to include at least

   a. surveillance reporting of nosocomial infections (ICO),

   b. quarterly reports on inservice attendance (ICO),

   c. quarterly reports on antimicrobial sensitivity and resistance patterns (LAB),

   d. monthly environmental samplings/score testing of sterilizers,

   e. antimicrobial drug monitoring (Pharmacy),

   f. quarterly employee occupational health report (EHO),

   g. biannual ventilation studies (plant management), and

   h. annual review of all written policies/procedures?

9. Are universal precautions coupled with catagory-specific or disease-specific isolation? (All patients are potentially infectious.)

a. Are barrier techniques used when any contacts with body fluids is made?

b. Are gloves available and worn when touching blood, body fluids?

c. Are masks, protective eye wear and aprons available for use during procedures likely to cause droplets or splashing?

10. Are puncture resistant containers located as close as practical to using areas for disposal of needles and sharps?

Are needles recapped or bent/broken prior to disposal?

11. Are mouthpieces, resuscitation bags or ventilation devices with one-way flow valves available in areas likely to perform resuscitation?

12. Are nurses aware they are responsible for and have the authority to initiate appropriate isolation precautions?

13. Are sealable plastic bags available for specimen transport to lab?

14. If glutaraldehyde disinfectant is used for instruments is:

a. the room well-ventilated,

b. are gloves and eye protection available, and

c. is eyewash available?

15. Are liquid soap dispensers filled with general purpose handwashing agent and available in each room?

a. Are the soap dispensers emptied completely prior to refilling?

b. Are bars of soap available only for patients bathing and showering and disposed of when patient is discharged?

16. Are antimicrobial chlorhexidine or povidine-iodine agents available for use:

a. prior to invasive procedures (tx rooms),

b. isolation rooms,

c. high risk areas (ICU, NICU, NN, etc.), and

d. after care of patients with highly virulent infectious organisms (hep B, Shigella, salmonella)?

17. Are personnel aware that in direct patient care artificial nails and nail polish harbor microorganisms and will not be worn?

18. Are irrigation fluids opened, dated and used for 24 hours only?

19. Are multidose vials opened, dated and disposed of in 30 days or per manufacturers/pharmacists determination?

20. Are sterile supplies checked weekly for out dates? Are written guidelines established addressing pulling of supplies that will outdate before time of check?

21. Are supplies stored as units of issue in clean storage areas (i.e., no evidence of warehouse shipping boxes)?

22. Are surgical scrub attire worn in the OR/DR/NICU and if worn out of section for an emergency, are they covered with a lab coat or cover gown?

23. Are linen storage shelves sanitized on a weekly basis with an ICC-approved environmental disinfectant?

24. Are clean linen carts covered?

25. Is linen wrapped until ready for use?

26. Are roller type linen hampers used at patient bedsides to avoid hand-carrying of linen by personnel down the corridor?

27. If linen hamper covers are in use, are they cleanable and clean?

28. Does obstetrical services have the same policies/procedures established as the surgical suite for infection?

29. Are anesthesia carts cleaned weekly?

30. Does ambulatory care have written guidelines for isolating patients suspected of having infectious disease?

31. Does the ambulatory surgical unit have the same infection control standards as the surgical suite to include:

    a. counseling patients to bathe prior to ASU?

    b. environmental cleaning between cases?

    c. dress code?

    d. traffic control?

    e. skin prep?

f. surgical scrub?

32. Does the employee health program consist of written guidelines for:

a. employment prerequisites,

b. immunizations,

c. sick call procedures,

d. work restrictions,

e. physical exams, and

f. screen protocols?

33. Are intravenous therapy standards adhered to?

a. Are plastic cannulas replaced every 72 hours and documented?

b. Are chlorhexidine, iodophor or 79% alcohol available and used for site preparations?

c. Are cannulas secured at the insertion site?

d. Are sterile dressings applied to insertion site (the dressing, not the tape should cover the wound unless the tape is sterile)?

e. Is the date of insertion recorded in the medical record AND on the dressing or tape?

f. Are daily assessments for evidence of cannula-related complications documented in the medical record?

g. Are central line dressings changed and documented every 72 hours?

h. Are all administrative tubings including piggyback tubing and hyperalimantation tubing changed every 72 hours and documented?

i. Are blood and lipid emulsion tubing changed after each administration?

j. Is the IV system maintained as a closed system?

k. Are parenteral admixtures and hyperalimentation mixed in the pharmacy?

l. Are admixtures refrigerated prior to use and started within 6 hours of mixing?

m. Are all parenterals discarded 24 hours after starting?

n. Are lipid emulsions completed within 12 hours of starting?

34. Are hospital personnel who take care of catheters periodically in-serviced on the correct techniques and potential complications of urinary catheterization to include:

    a. Insertion techniques according to AFR 160-41?

    b. Maintenance of closed sterile drainage system?

    c. Irrigation techniques?

    d. Specimen collection?

    e. Meatal care?

    f. Catheter change intervals?

    g. Spatial separation of patients?

35. Are suction containers changed every 24 hours?

36. For tracheal suctioning, is the tubing from the canister to the suction catheter changed every 24 hours?

37. Are nebulizor fluid reservoirs changed every 24 hours?

38. Are breathing circuit tubings changed every 24 hours?

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APPENDIX D

MEDICAL SERVICE

OCCUPATIONAL EXPOSURE TO BLOOD/BODY FLUIDS

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Appendix D

Hospital Regulation 160

Medical Service

OCCUPATIONAL EXPOSURE TO BLOOD/BODY FLUIDS

The purpose of this regulation is to outline the treatment protocol after an occupational exposure of a health care worker to blood or body fluids. This regulation applies to all health care workers assigned to the hospital. This protocol also applies to firefighters, rescue personnel, and law enforcement personnel who are occupationally exposed to blood/body fluids.

This regulation is affected by the Privacy Act of 1974. Each form that is subject to provisions of AFR 12-35 and required by this regulation contains a Privacy Act Statement, either incorporated into the body of the document or in a separate statement accompanying each such document. The requester will show, and upon request give, the affected individual a Privacy Act Statement for each form, format, or form letter used to collect personal data, before asking for information. The maintenance, collection, use, and dissemination of this system of record is published in AFP 4-36, under system notice: 168 AF SG C, Medical Record System. Authority: Title 10, United States Code, Chapter 55, Section 8012.

1. References:

a. Centers for Disease Control (CDC) protection against viral hepatitis: recommendations of the Immunization Practices Advisory Committee (ACIP). MWWR 1990; 39 (No. RR-2): pages 1-26.

b. CDC. Public Health Service statement on management of occupational exposure to HIV, including considerations regarding zidovudine post exposure use. MWWR 1990; 39 (No. RR-1): pages 1-14.

c. HQ USAF/SGP Ltr, 10 Nov 88, Hepatitis B Immunizations.

d. HQ USAF/SG Ltr, 27 Oct 89, Hepatitis B Immunizations of AF Health Care Personnel.

e. CDC. Recommendations for prevention of HIV transmission in health care settings. MWWR 1987; 36 (Supp. No. 25: pages 1-18).

f. Joint Advisory Notice, Department of Health and Human Services, Department of Labor. Protection against occupational exposure to HBV and HIV, 19 Oct 87.

g. CDC Update: Universal precautions for prevention of transmission of HIV, HBV and other blood-borne pathogens in health care settings. MWWR; 37, No. 24, Page 377, 24 Jun 88.

2. General:

a. Health care workers are defined as persons, including students, Red Cross, and trainees, whose activities involve contact with patients or with blood or other body fluids from patients in a health care setting. Firefighters, rescue personnel, and law enforcement personnel may also be exposed to blood/body fluids during performance of duties. Exposure to blood/body fluids places the worker at risk for infection with Human Immunodeficiency Virsus (HIV), the Hepatitis B virus (HBV), and other blood/body fluid borne pathogens.

b. Significant exposures include, but are not limited to:

(1) Penetrating injuries from contaminated needles, scalpels, or other sharp instruments.

(2) Contact with blood/body fluid to mucous membranes, eyes, or open wounds.

3. Responsibilities:

a. All Health Care Workers are responsible for:

(1) Utilizing proper techniques for prevention of blood/body fluid contact.

(2) If active duty, complete the Hepatitis B immunization series or provide serologic proof of immunity. It is highly recommended that civilians complete the Hepatitis B immunization series if not already immune.

(3) If exposure occurs, report incident to supervisor and initiate AF Form 765, Hospital Incident Statement.

(4) Report to the Emergency Room with AF Form 765.

b. Emergency Room Provider:

(1) Evaluates wound and exposure and provides care as needed.

(2) Determines status of tetanus immunization and administers tetanus booster if indicated.

(3) Determines risk of worker's exposure. High risk exposure include workers from the following sections:

(a) Emergency Room.

(b) Operating Room.

(c) Dental Clinic.

(d) Laboratory, pathology, morgue.

(e) Inpatient units.

(f) Fire departments, rescue personnel, law enforcement personnel.

(4) Follow protocol of management of blood and body fluid exposures. IAW CDC guidelines. An example ER protocol is attached.

(5) Contact the health care provider of the source patient, if known, to coordinate screening of the source.

(6) Completes AF Form 765.

(7) Refer individual to Primary Care provider via SF Form 513, Consultation Sheet, for further follow-up.

(8) Notify Environmental Health of incident no later than next duty day.

c. Health Care Providers:

(1) Follow-up referrals by emergency room for blood/body fluid exposure.

(2) Obtain appropriate screening tests from identified source of exposure.

d. Quality Assurance Coordinator:

(1) Follow-up incidents of exposure via AF Form 765.

(2) Notify Environmental Health of all incidents.

e. Chief, Environmental Health:

(1) Conducts epidemiologic investigation of all exposures.

(2) Acts as resource for current guidelines for treatment of exposures.

(3) Coordinates with Infection Control Officer and Safety Committee to educate workers exposed to blood/body fluids and recommend protective practices.

EXPOSURE TO BLOODBORNE DISEASE PROTOCOL FOR THE EMERGENCY ROOM

1. Receive exposed person in the ER.

2. Provide primary wound care.

3. Establish Tetanus immunization status and administer Tetanus prophylaxis if situation warrants.

4a. Obtain baseline laboratory studies on exposed person:

(1) Hepatitis B Surface Antigen

(2) Hepatitis B Surface Antibody

(3) Hepatitis B Core Antibody

(4) ALT (SGOT)

(5) Elisa/Western Blot for HIV

(6) RPR

(7) Comply with any required informed consent procedures for nonmilitary personnel.

4b. If the exposed person is known to be immune to Hepatitis B or completed Hepatitis B immunization, only the following laboratory studies are needed:

(1) Hepatitis B Surface Antibody

(2) Elisa/Western Blot for HIV

(3) RPR

5. Determine prophylaxis requirements. Follow the Hepatitis B Postexposure Prophylaxis Algorithm. The ER physician should only order HBIG when the source is known to be HBsAG positive.

6. Prophylactic immunizations should be given after the consulting physician has reviewed the exposure or been consulted by the attending physician, and determined that immunizations are warranted.

7. Give the exposed person an SF 513, Consultation Form, referring the person to EHS.

8. When necessary, the attending physician should initiate a "Source Testing Requested" letter requesting the status of the source from the source's physician.

9. The ER shift leader will ensure completion of all required reports documenting the exposure incident and forward as required.

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APPENDIX E

AEROSPACE MEDICINE

HOSPITAL EMPLOYEE HEALTH PROGRAM

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Appendix E

Aerospace Medicine

HOSPITAL EMPLOYEE HEALTH PROGRAM

This regulation describes and implements the Employee Health Program.

This publication is affected by the Privacy Act of 1974. A Privacy Act Statement is either incorporated in the body of each document or is in a separate statement accompanying each document. The maintenance, collection, use or dissemination of information contained in this system of records is authorized by Title 10 U.S.C. 133 and 8013.

1. GENERAL: Because hospital personnel are both potential sources of infection to patients and are at increased risk of acquiring infection from patients, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) requires an effective hospital employee health program. The goal is to maintain and promote optimum employee health, as well as protection of Medical Center patients. The requirements of this regulation are a condition of employment and apply to all military, civilian, volunteer, student, housekeeping, and maintenance personnel.

2. REFERENCES:

a. All applicable Occupational Health and Safety Administration (OSHA), JCAHO, and higher headquarters directives.

b. CDC Guidelines for Isolation Precautions in Hospitals and CDC Guidelines for Infection Control in Hospital Personnel.

c. MMWR, Supplement, Recommendations for Prevention of HIV Transmission in Health-Care Settings, August 21, 1987.

d. MMWR, Guidelines for the Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Health-Care and Public-Safety Workers, June 23, 1989.

e. AFR 160-12, Professional Policies and Procedures.

f. AFR 160-41, Infection Control Program in the Air Force Medical Service.

g. AFR 161-13, Immunizations and Chemoprophylaxis.

h. Local Regulation, Exposure to Bloodborne Diseases

i. Local Regulation, Infection Control.

j. Local Regulation, Control of Pulmonary Tuberculosis

k. Local Regulation, Human Immunodeficiency Virus Infections

l. Local Regulation, Reporting of Occupational Injuries/Illnesses

m. Local Regulation, Fetal Protection Program

n. Local Regulation, Reportable Diseases

3. RESPONSIBILITIES:

a. The Hospital Commander provides a safe working environment for all employees and implements procedures to minimize illness among all personnel.

b. All departments (Administrative Services, Medical Squadron Section, Civilian Personnel, Facilities Management, Red Cross Coordinator, and others) must ensure that all new personnel in-process through the Immunization Clinic and Environmental Health Services (EHS).

c. All departments must ensure that all personnel outprocess through EHS.

d. All personnel will:

(1) Report each injury, illness, infection, or communicable disease exposure to their immediate supervisor as soon as possible, but not later than 24 hours after incident/onset.

(2) Seek appropriate medical evaluation and treatment from a credentialed health care provider. (NOTE: When designated, care will be sought from the Employee Health Provider(s).)

(3) Comply with prescribed precautionary measures including restrictions of duty and patient contact which are directed by a health care provider and this regulation.

(4) Comply with follow-up instructions for each injury, illness, infection, or communicable disease exposure.

(5) Notify EHS of incident/onset.

(6) Notify EHS when provider gives clearance to return to normal duty.

(7) Have tuberculosis screening annually. If there is a history of a positive skin test, procedures of AFR 161-29 will be followed.

e. Supervisors will:

(1) Report each employee illness, infection, or communicable disease exposure to EHS and the Infection Control Surveillance Officer as soon as possible, but not later than 24 hours after incident/onset.

(2) Ensure employees comply with prescribed precautionary measures including restrictions of duty and patient contact which are directed by a health care provider, EHS, Infection Control Surveillance Officer, and this regulation.

(3) Ensure employees comply with follow-up instructions for each injury, illness, infection, or communicable disease exposure.

(4) Ensure personnel assigned to provide care for patients with communicable disease will, if possible, have a known immune status to that disease (e.g., chicken pox). Caregivers who have no immunity or unknown immune status should not provide care to infectious patients during the period of communicability. All persons providing care to patients with communicable diseases will use proper personal protective equipment and follow infection control guidelines.

(5) Refer pregnant employees to EHS for evaluation of job-related hazards (AFR 160-12) and health education immediately upon notification by employee.

(6) Conduct annual occupational health and safety training required by AF Occupational Safety and Health Program (AFR 127-1, para 15c; and AFOSH STD 161-12) and annotate training on employee's AF Form 55, Employee Safety and Health Record, kept in the work area. Also document training on AF Form 2767, Occupational Health Training and Protective Equipment Fit Testing, which is forwarded to EHS. Supervisors must also promote good health habits, personal hygiene, and aseptic techniques required by infection control guidelines.

f. Health Care Providers will:

(1) Examine Medical Center personnel who become ill, develop infection(s), or are injured.

(2) Manage personnel exposed to communicable disease IAW paragraph 4a.

(3) Culture infections, lesions, sore throats, boils, draining wounds and diarrhea stools when appropriate.

(4) At initial treatment, annotate each individual's medical record with necessary restrictions and precautionary measures.

(5) Report all employee injury, illness, infection, or communicable disease exposure including required duty restrictions.

(a) All reports with required precautionary measures, follow-up actions and duty restrictions will be forwarded to Environmental Health Services.

(b) Providers will complete an AF Form 422, Physical Profile Serial Report, when duty restrictions are required. All AF Forms 422 are taken by the patient or clinic personnel to the physical examination section of the Flight Surgeon's Office.

(6) Clear personnel for return to routine duty following treatment of each condition requiring work restriction. Annotate the individual's medical record of the date cleared for return to normal duty and notify EHS.

(7) Refer all personnel exposed to bloodborne diseases to the ER.

(8) Refer all personnel with chronic communicable diseases to the Infection Control Surveillance Officer and EHS for proper health and occupational counseling, record documentation, and work recommendations.

g. Environmental Health Services will:

(1) Provide epidemiology of job-related infections and exposures to communicable disease of Medical Center personnel. Identify trends and recommend appropriate preventive/corrective measures.

(2) Provide a summary of hospital personnel health surveillance to the Infection Control Committee and report job-related illnesses as required (AFR 127-12 and local regulation).

(3) Assist supervisors with in-service educations programs, when requested.

(4) Complete medical records review at time of in-processing.

(5) Arrange for additional special purpose Occupational Health Examinations when documented health hazards exist in the work area.

(6) Interview and educate pregnant employees.

(7) Communicate with the Infection Control Surveillance Officer and advise Patient Administration of reportable disease IAW local regulation.

(8) Coordinate with Red Cross coordinator to ensure that volunteers comply with the requirements of this regulation.

h. Infection Control Surveillance Officer, or designated representative, will:

(1) Accomplish surveillance and investigation of MTF acquired infections affecting patients.

(2) Assist in developing programs to prevent infections or exposure of patients to communicable disease.

(3) Assist supervisors in developing education programs.

(4) At time of in-processing, schedule personnel involved in direct patient care for mandatory infection control education to include isolation technique, handwashing technique, approved antiseptic/disinfectant, sharp object safety, universal precautions, etc.

i. Immunization Clinic will:

(1) Administer, during in-processing, Tuberculin Skin Tests (PPD) to all previously negative personnel. (NOTE: Do not administer if last negative PPD was within 6 months.) If there is a history of a positive skin test, the individual will be assessed IAW AFR 161-29, Tuberculosis Detection and Control.

(2) Review immunization records of all personnel, military and civilian, during in-processing. Required immunizations will be administered to civilians, volunteers, and housekeeping personnel at no cost to the employee/worker.

(3) Annually, at time of annual PPD, review immunization records of civilian and volunteer personnel to ensure immunizations are current.

(4) Immunizations required:

(a) Diptheria - tetanus - every ten years.

(b) Influenza - yearly (required for military; highly recommended for civilians).

(c) Polio - original series only.

(d) Rubella - all nonimmune employees who have no Rubella (HI) antibody titer or proof of vaccination.

(e) Measles - all nonimmune employees who have no measles serological proof or immunity or proof of vaccination.

(f) Mumps - all nonimmune employees.

(g) Hepatitis B Virus (HBV) - Vaccine is required for all personnel involved in direct patient contact and those whose work involves exposure or the potential for exposure one or more times per month to blood or potentially infectious body fluids. This includes all physicians, nurses, physician extenders, dentists, dental technicians/assistants, medical technicians (902X0), 901X0s, laboratory personnel, and housekeeping personnel.

(5) Military personnel immunization requirements are monitored by the Air Force computer notification system.

4. PROCEDURES:

a. Management of hospital personnel with Infectious Illnesses:

(1) To ensure limited exposure of other personnel and patients, personnel with a known or suspected communicable disease should, prior to arriving for their appointment, contact the clinic (or provider) and advise them of the suspected condition. This advance notification to the clinic will enable them to advise the patient to use alternate entrances and avoid crowded patient waiting areas. Additionally, clinic personnel will have time to prepare for the arrival of a potentially infectious person.

(2) Hospital personnel with an infectious illness that could be transmitted to patients or fellow workers may not be permitted to perform normal duties. CDC Recommended Guidelines for Infection Control in Hospital Personnel are summarized in Atch 1 and will be followed by all hospital personnel. Conditions may require precautionary measures or limitation of contact and this will be determined by health care providers. All employees living in barracks who are diagnosed as having a highly communicable disease which has a respiratory transmission route (such as chicken pox, measles, etc.) will be admitted to respiratory isolation. Caregivers who have no immunity or unknown immune status should not provide care to such infected individuals during the period of communicability.

(3) Consults regarding proper management and application of duty restriction to personnel with communicable diseases or exposures will be provided by the Chairperson, Infection Control Committee; Flight Surgeon Consultant to EHS; EHS; or Infection Control Surveillance Officer when requested.

(4) Depending on the disease or illness, the employee may return to work if proper precautionary measures are taken. For example, an employee may be detailed to another work area until the individual is no longer considered contagious. The hospital will make every effort to utilize personnel in some reasonable capacity when the health and safety of the employee and other employees or patients are not compromised. A civilian or housekeeping employee with a contagious or infectious illness may seek care from a private physician at the employee's expense and will be placed on sick leave. Civilian employees must inform their supervisor of their diagnosis and recommended treatment.

(5) All personnel returning to work after a communicable illness, regardless of the length of their absence, will report to their appropriate health care provider and be cleared for return to duty. Civilian employees may opt, at their own expense, to present a statement from their private physician to EHS informing the hospital of their communicability or infectious status. The individual's medical record or civilian health record must be annotated by EHS.

b. Hospital employee infections and injuries will be monitored by the Infection Control Surveillance Officer and Environmental Health Services personnel. EHS will review all reports, perform follow-up as indicated, and verify proper disposition of employee patients. Statistics on infections and injuries will be maintained to monitor trends, and institute preventive/corrective measures. Personnel who are linked epidemiologically to a carrier state will be cultured and, if positive, excluded from patient contact until carrier state is eliminated.

c. When post exposure treatment to communicable disease is indicated, recipients should be informed of alternative means of treatment, the degree of protection provided by the therapy, the potential side effects, and the risk of infection if treatment is not accepted.

(1) Hepatitis A: Personnel who have had direct fecal-oral exposure to excretions from a patient found to have been incubating hepatitis A should be given immune globulin (IG) (0.02 ml/kg). IG is not routinely administered to all personnel who care for patients with hepatitis A unless there has been fecal-oral exposure.

(2) Hepatitis B: Hepatitis B vaccine is required for all personnel involved in direct patient care and for those whose work involves exposure or the potential for exposure one or more times per month to blood or potentially infectious body fluids. All personnel who experience a percutaneous exposure (needle stick or mucous membrane exposure to blood or body fluid that might be infective) should be evaluated for prophylaxis against hepatitis B.

(3) Hepatitis Non-A, Non-B: IG (0.06 ml/kg) should be given following percutaneous exposure to blood from patients known to have hepatitis non-A, non-B.

(4) Meningococcal Disease: Antimicrobial prophylaxis should be offered immediately to unprotected personnel who have had intensive direct contact with an infected patient. If treated, medication should not await results of antimicrobial sensitivity testing. (See CDC Recommendations.)

(5) Pertussis: Antimicrobial prophylaxis should be offered immediately to unprotected personnel who have had intensive contact with an infected patient.

(6) Rabies: Hospital personnel who either have been bitten by a human with rabies or have scratches, abrasions, open wounds, or mucous membranes contaminated with saliva or other potentially infective material from a human with rabies should receive a full course of anti-rabies treatment.

(7) Tuberculosis:

(a) All personnel exposed to an infective case of tuberculosis, during which proper precautions were not used, will be referred to EHS.

(b) Personnel known to have significant TST reactions will be evaluated.

(8) Hospital Acquired Exposure to Bloodborne Diseases (Needle sticks): All employees with hospital acquired exposure to bloodborne disease or needle sticks will be referred to the Emergency Room. For purposes of treatment an exposure to a bloodborne disease or needle stick includes breaking of the skin by a contaminated object, a splash of blood or serum onto a mucous membrane, i.e., the eye or the mouth, or human bites from HBsAg carrier that penetrate the skin. (Reference local regulation).

(a) ER primary wound care includes assessment of tetanus immunization status. In addition, postexposure prophylaxis for Hepatitis B Virus will be administered when indicated by the guidelines in local regulation.

(b) Emergency Room personnel will ensure that all hospital acquired penetrating wounds are reported.

(9) Acquired Immune Deficiency Syndrome (AIDS): Due to extreme sensitivity and complexity of the AIDS, this subject is covered under separate regulation.

d. HBV Infection Containment Measures for Health Care Personnel:

(1) Health care personnel (employees and providers) recovering from HBV infection should have follow-up liver function tests (HBsAg, anti-HBs, and/or other pertinent tests) every three months. Personnel whose serology remains HBsAg positive and anti-HBs negative must be evaluated by the Infection Control Surveillance Officer before returning to normal duties. EHS will monitor follow-up. If the health care employee has persistent antigenemia, but otherwise is well enough to return to patient care, the following must be accomplished until the appearance of anti-HBs.

(a) The individual shall be apprised by Infection Control Surveillance Officer of the probability of HBV transmission.

(b) The individual must observe strict aseptic techniques at all times; any open lesion must be covered.

(2) HBV serological markers alone should not limit duty performance of health care employees. Instead, careful medical follow-up, appropriate precautions and monitoring should be considered on a case-by-case basis. For further inquiries, you may contact Infectious Disease Consultant, AFMSC/SGPA, Bolling AFB DC 20332-6088, DSN 297-1839; or SGPM, extension 6-4986.

SUMMARY OF WORK RESTRICTION FOR PERSONNEL WITH INFECTIOUS DISEASES

PROBLEM	RELIEVE FROM ALL DIRECT PATIENT CONTACT	PARTIAL WORK DISEASE/ RESTRICTION(S) AND DURATION
Conjunctivitis, infectious	Yes	Until discharge ceases
Cytomegalovirus infection	No	None
Diarrhea, (see CDC Guidelines)		
Acute (with other symptoms)	Yes	Until symptoms resolve and infection with Salmonella is ruled out.
Convalescent Stage	No	Salmonella (non typhoid). Do not care for high-risk patients until stool is free of salmonella on 2 consecutive cultures NLT 24 hrs apart. Enteric pathogens not Salmonella - See CDC Guidelines.
Enteroviral infection	No	Do not care for infants and newborns until symptoms resolve.
Group A Streptococcal	Yes	Until 24 hrs after adequate treatment is started.
Hepatitis, viral Hepatitis A	Yes	Until 7 days after onset of jaundice.
Hepatitis B Acute	No	Double glove for procedures involving trauma to tissues, contact with mucous membranes or broken skin, until HBsAg disappear and Anti-HBs appear in serological tests.
Chronic antigenemia	No	Same as acute illness. See MCR 161-6, para 4e.

DISEASE/ PROBLEM	RELIEVE FROM ALL DIRECT PATIENT CONTACT	PARTIAL WORK RESTRICTION(S) AND DURATION
Hepatitis non-A, non-B	No	Same as acute Hepatitis B, infectivity period not determined.
Herpes simplex		
Genital	No	None
Hands (herpetic whitlow)	Yes	Until lesions heal. (Unknown if gloves prevent transmission).
Orofacial	No	Do not care for high-risk patients until lesions heal.
Measles		
Active	Yes	Until 7 days after the rash appears.
Post exposure (susceptible personnel)	Yes Yes	5th thru 21st day after exposure or 7 days after rash appears.
Mumps		
Active	Yes	Until 9 days after onset of parotitis.
Postexposure	Yes	12th thru 26th day after exposure or until 9 days after onset of parotitis. Mumps vaccine may be offered to susceptible persons. Value questionable. (See CDC Guidelines)
Pertussis		
Active	Yes	Beginning of catarrhal stage thru 3rd week after paroxysms starts or until 7 days after start of effective therapy.

DISEASE/ PROBLEM	RELIEVE FROM ALL DIRECT PATIENT CONTACT	PARTIAL WORK RESTRICTION(S) AND DURATION
Postexposure (asymptomatic personnel)	No	Offer antimicrobial prophylaxis immediately to personnel with intensive contact.
Postexposure (symptomatic personnel)	Yes	Same as active Pertussis.
Rubella		
Active	Yes	Until 5 days after rash appears.
Postexposure (susceptible personnel)	Yes	7th thru 21st day after exposure or 5 days after rash appears.
Scabies	Yes	Until treated.
Staph aureus (skin)	Yes	Until skin lesions have resolved.
Upper respiratory infections	Yes	Do not care for high-risk patients (i.e., neonates, young infants, COPD, immune compromised) until acute symptoms resolve.
Varicella (Chicken pox)		
Active	Yes	Until all lesions dry and crust.
Postexposure	Yes	10th thru 21st day after exposure or until all lesions dry and crust.
Zoster (shingles)		
Active	No	Appropriate barrier. Do not care for high-risk patients until all lesions dry and crust.
Postexposure (susceptible personnel)	Yes	10th thru 21st day after exposure or if varicella occurs until all lesions dry and crust.

DISEASE/ PROBLEM	RELIEVE FROM ALL DIRECT PATIENT CONTACT	PARTIAL WORK RESTRICTION(S) AND DURATION
Postexposure Prophylaxis		Additional information concerning preventive measures for employee exposure to viral hepatitis A, B, non-A/ non-B, penetrating wounds/needle-stick, meningococcal disease, pertussis, and tuberculosis is contained in MCR 161-6, para 3d.

APPENDIX F

Operation/Performance Specifications Review for Hospital Incinerators Letter

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DEPARTMENT OF THE AIR FORCE
USAF OCCUPATIONAL AND ENVIRONMENTAL HEALTH LABORATORY (AFSC)
BROOKS AIR FORCE BASE, TEXAS 78235-5501

20 NOV 1990

EQE

Operation/Performance Specifications Review for Hospital Incinerators

AFMLO/FOM

1. Capts Paul Scott and Ronald Vaughn have reviewed hospital incinerator specifications for Laughlin and Altus AFBs. Their recommendations for future hospital incinerator operation and performance specifications are noted.

a. The incinerator should be of the two or more chamber design with thermocouples and temperature controls on each chamber. Good engineering practice for pathological waste incinerators are:

(1) primary chamber temperatures between 1400-1600^{o}F,

(2) secondary chamber temperatures between 1800-2000^{o}F, and

(3) minimum residence time in the secondary chamber of 2.0 seconds.

b. Performance specifications should also be included in the contract with a compliance provision to preclude contract payment until performance specifications are met (as determined by an independent source emission survey). Performance specifications should be in line with current state and federal standards to ensure permit compliance. Performance specifications should also be in the same units as those used in the standards. Below is an example of pending legislation in several states and as such will soon be pending in all states.

(1) Particulate emissions to not exceed 0.03 grains per dry standard cubic foot(gdscf).

(2) Chloride emissions to be reduced by 99% compared to uncontrolled emissions (a reduction to approximately < 0.4 mg/m^{3} total chlorides for an average incinerator).

(3) Products of Incomplete Combustion (PIC) (includes VOCs, and other Hydrocarbons such as dioxins or furans) to be reduced by 99% compared to uncontrolled emissions (this would result in a reduction to levels of Volatile organic compounds on the order of parts per billion).

(4) Opacity not to exceed 5% as averaged over a six-minute consecutive period and opacity not to exceed 20% at any time.

2. In addition to operating and performance specs, we recommend that you work with the environmental coordinator to determine if the incinerator can be permitted for all types of wastes (i.e., municipal and pathological waste). Plastics are included as municipal waste. Unfortunately, incineration of plastics produce chlorides as well as combining with products of incomplete

combustion to produce chlorinated volatile organics. Check with the state regulatory people concerning coming legislation. If chlorides or VOCs are to b regulated ,as already noted, then emission controls (e.g., wet scrubber, dry scrubber and/or carbon adsorption) may be required on the incinerator.

3. If we can be of any further assistance, please contact Capt Vaughn or Capt Scott at DSN 240-3305.

EDWIN C. BANNER III, Colonel, USAF, BSC
Chief, Environmental Engineering Division

APPENDIX G

RETURN GOOD POLICIES

Appendix G

RETURN GOOD POLICIES

To provide you with a concise reference, the editors of Drug Topics Red Book include below a summary of Manufacturers Return Good Policies. Compiled by the National Wholesale Drugists' Association, this table permits examination of return policies at a glance and is intended solely as general guide.

Column I indicates the manufacture's policy; column II advises you whom to notify for return OK; column III shows the type of adjustment offered; and column IV advises on transportation charges. For explanation or other symbols see below.

	I	II	III	IV
Abbott Hospital	2/6	R	V	P
Abbott-RX	3/6/7	H	X/V	P
Adria	2/5/7	H/R	F	P
Advanced Care Prods.	1/2/5/7	R/W	F	P
Alberto-Culver	2	R	F	D
Alcon-Ophthalmic	5	R	V	P
Alcon-Vision Care	5	R/W	F	D
Allergan	3	H	F	P
Alva-Amco	5	H	X/V	P
Anaquest	2	H	F	-
Ansell-Americas	2/5	R/W	F	-
Ascher, B.F.	2	H	X	P
Astra	2/5	B	V	P
Barnes-Hind	2	H/B/W	F	P
Barr	2/5	H	F	P
Barre-National	1/5	-	-	-
Battle Creek	2/5/7	H	X/F	P/I
Bausch & Lomb Personal Prod	5	W	F	P
Bausch & Lomb-Rx	5	H/R	F	P
Beecham Cosmetics	2/5	H	F	P
Beecham Labs	2/7	H/R	F	P
Beecham Products	2/5/8	B/R	X/V	P/L
Beiersdorf	2	H	V	P/D
Berlex	2/6	H/R	X/F	P
BIC	1/2/5	W	V	I
Block	5	W	F	P
Biocraft	2/5/8	W	X/V/F	P
Boehringer-Ingelheim Consumers	2/5	H	V	P
Boehringer-Ingelheim Rx	2	H	F	P
Bolar	2/5/8	H	F	P

	I	II	III	IV
Boots-Flint, Inc.	2/5	H/R	F/V	P
Boots Laboratories	2/5	H/R	F/V	P
Boots-Rx	2/5	H/R	F/V	P
Bristol Labs	2	R/W	F	P
Bristol-Myers	5	B	V	P
Burroughs Wellcome	2	H/R	X/V	D
Butler	2	R	V	P
Cara	2/5/8	W	F	I
Carex	2	H	V	P
Casco-Belton	1/2	H	X/F	P
Chattem	2/5	R/W	X/F/C	P
Chesebrough	2/5	B/W	F	P
Ciba-Geigy	2/7	B	X/F	P
Ciba Vision	1/2/5	R/W	X/F	P/I
Clairol	2/5	B	X	D
Colgate-Hoyt	5	H/R	F	P/D
Colgate-Palmolive	1/5	W	X/F	D
Combe	2	R/W	F	P
Commerce	5	H	V	P/D
Connaught	2/5	H	F	P
Convatec	5/7	W	X/F	P
Coopervision	5	R	-	-
Cumberland-Swan	8	W	V	-
Curtis, Helene	5	-	-	-
D&B Wholesale Cosmetic	2	H	V	P
Del Labs	2/5	W	V	P
Dep Corporation	5	W	-	-
Dermik	2	H/B	V	P
DeVilbiss	1/2	H	F	P
DuPont	2	H/B/R	X/F	P
Duracell	2/8	R	F	P
Duramed	5	W	X	P
Eveready	5	W	F	D
Faberge	5	W	V	P
Fisons	2/5	R	V	P
Fleet, C.B.	2/5	H/R	F	P
Forest	2/5/7	H	F	P
Foster Grant	2	H	F	P
Fougera	5	W	F	D
G&W Labs	2/5	R	V	P
Gar-Smith	2	H	F	D
Genentech	2/5	R	X/F	-
General Time	1/2	H	F	P

	I	II	III	IV
Geneva Generics	5	R	F	P
Gillette/Paper Mate	2/5	W	X/F	I
Gillette/Personal Care	2	B	F	I/D
Gillette Safety Razor	5	W/R	F	I
Glaxo	2/5/8	-	F	P
Glenbrook	2/5	R/W	X/F	D
Glover, Clay	2/7	H	X/F	I
Goldline	5	-	-	-
Guardian	2	H	V	P
Halsey	2	H	X	P
Healthcheck	1/2/5	H	X	P
Hoechst-Roussel	3/7	H	F	I
Home Health Prod.	5	W	X	P
Humco	2/5	H	V	P
ICI Pharma	5/8	H/R	F	-
IDE	5	W	X/F	P
Int'l. Playtex	1/2	B	F	P
Iolab	3/5	-	X/F	P
Janssen	2	H	-	-
Jergens	2/5	B	-	P/D
Johnson & Johnson/Baby	1/2/5	H/B/R	F	P/I/L/D
Johnson, S.C.	2	W	X/F	P
Kaz	2/3/5	H/R	F	L
Kendall-Futuro	2/6	R	X/F	P
Kerr Glass	5	B	F	D
Kodak	1/2	B	V	P
Knoll	2	H/R	X/V	P
Kremers Urban/Schwarz Pharma	2/5	H/R	F	I
Lactona	1/5	W	X	-
Lamaur	5	W	-	P
Lederle	6/7	B	X	P
Leeming/Pacquin	2	R	F	P
Lehn & Fink	2/5/8	-	V	P
Lemmon Co.	2	H/R	-	P
Lever Bros.	2/5	W	F	P
Lifescan	2/7	H/R	X/F/V	P/D
Lilly/Dista	6	-	-	-
Lumex	2	H	V	P
LyphoMed/Novo Pharm	2/5/8	H	V	P

	I	II	III	IV
3M-Personal Care	5/8	-	V	P
Magnivision	2	H	F	P
Mallinckrodt	2/5	-	F/V	P
Marion	2	H/R	F/V	P
McNeil Consumer	2/5	W	F	D
McNeil Rx	2/7	R	X	P
Mead Johnson Rx	2/6/7	H/B	F/V	I
Medical Disposables	5/7	W	X/F	D
Mennen	2/8	R	F	P/I
Mentholatum	2	H/R	F	P/D
Mentor	2/5/7	R/W	V	P/I
Merck Sharp & Dohme	3/6/7	-	-	P
Merrel Dow	2/7	R/W	F	P
Miles-Consumer	5	-	F	I/D
Miles-Diagnostic	5/7	H	X/F	-
Miles-Rx	2	B	F	P
Millers Forge	2	H	F	I
Mission Pharmacal	2	H	X/F	-
Mountain Medical	2	H	X	P
Muro Pharmaceutical	2/5	H	F	P
Mylan	5	W	V	P
NMC Labs	2	H	V	-
Nature's Bounty	2/5	W	X/F	D
Neutrogena	2/5/8	W	V	P
No Nonsense	5	W	V	P
Norwich Eaton	5/8	-	X/V	P/D
Northern Electric	2/5	-	-	P
Noxell	2/5	W	V	P
Numark	2	H	F	D
NutraSweet	2/5	H/W	F	D
Obergfel	2	H	-	P
Optico	2	H	F	P
Opti-Ray	2	H	F	P
Oral B	2/5	W	F	L
Organon	2/5	H/R	V	P
Ortho	2	-	F/C	P
Owen-Allercreme	2/5	W	F	P/D
PCP-Champion	1/2/5	W	V	P
Parke-Davis	2	R	X/V	P
Penwalt	6/7	R	X	P
Penox	1/2	H	X/V	I
Personal Products	2/8	R	X/F	D
Pfeiffer	2/5/8	H/R/W	F	P
Pfizer/Roerig	5	-	X	P
Pharmacia	2/5	H	X/V	P

	I	II	III	IV
Pharmacraft	2/5	-	X/F	P/D
Pharmaderm	5	W	F	D
Pharmavite	2	R	V	P
Plough	5	W	F	P
Procter & Gamble	2	B	F	P
Professional Medical Prods.	1/2/5	R	V	P
Purdue Frederick	5	W	F	-
Purepac	2/5/7	R	X	P
Putnam	2	H	X/F	P
Quad	2	H	X/V	P
Reed & Carnrick	2	H/R	F	P/D
Regency	2	H	V	P
Reid-Rowel	2/7	H	V	P
Revlon Beauty Care	1/2/5	W	V	P
Revlon Professional Prods.	2	H	F	P
Rexall	2/5/7	H/W	X/V	P
Richardson-Vicks/ Health	5	W	F	P
Riker	2/5/8	H/R/W	X/F	P/D
Roberts	2/5	R	F	P
Robins, A.H./Consumer	2/4/5	H/B/R	X/F	P/D
Robins, A.H./Rx	2/5/7	R	X	P/D
Roche	3	-	F	I
Rorer	2/7	H	F	P
Ross	-	-	F/C	P
Roxane	3	-	F	P
Rugby	5	W	-	P
Sandoz-Consumer	2/5	H/R/W	F	P
Sandoz-Rx	2	H	F	P
Savage	2/5	H/R	X/F	P/D
Schering/Key	2/7	H/R	F	P
Schmid	2/6	H/R	V	P
Searle	6	-	X	P
Serono	2/5	H/B/R/W	X/F	P
Sheftall	2/5/7	H	V	P
Sherwood-Consumer	2/5/8	W	V	P
Sherwood-RX	2	B	X/F/V	P
Shulton	2/5/8	W	V	-
Sidmark	2/5	H	F	P
Smith Kline-Consumer	5	W	F	P
Smith Kline & French	5/8	-	F	-
Squibb-Novo	2/6/7	B/R	F/C	P
Squibb-U.S.	2/7	B	F	P
SSS	2/5	H	F	P

	I	II	III	IV
Stiefel	2	H/R	X/F	P
Stuart	5/8	H/R	F	-
Syntex	2	H/B/R	F	I
Timex	1	-	X	P
Tom's of Maine	2	H/B/R	F	P
UDL	2/5	B/H/R	V	P
Upjohn-Consumer	2	B	F	P
Upjohn-Rx	2/5/7	B/R	X	P
Upsher-Smith	2/7	H	X	P
Vita Fresh	2/5	H/B	V	P/L/D
Wallace	2	R	F	P
Warner-Chilcott	3	B	X	P
Warner-Lambert	5	B	F	P
Wella	2/5/8	W	F/F	P/D
Westwood	5	W	F	D
Whitehall	5	-	F	-
Wilkinson Sword	2/5/8	W	V	P
Winthrop Consumer	5	-	-	-
Woltra	5	H	X/F	P
Wyeth-Ayerst	2/7	H	X/F	P
Yardley	2/5	H	F	P
Yound, W.F.	5	-	-	-
Zenith	5/8	W	X/F	P

SYMBOLS

I. Policy

1 - No returns except originally manufactured as defective.
2 - Returns must be authorized by manufacturer.
3 - No authorization required up to dollars indicated, simply ship to manufacturer.
4 - Certified Request honored up to dollars indicated.
5 - Contact wholesaler from whom purchased.
6 - Wholesaler prohibited from accepting pharmacy returns.
7 - Some open packages accepted for adjustment, check written policy.
8 - Wholesaler from whom merchandise was purchased is compensated for handling returns.

II. Notification

H - Notify Manufacturer Home Office.
B - Notify Manufacturer Branch or Field Office.
R - Manufacturer representative will approve or store level.
W - Notify wholesaler who maintains list for manufacturer's representative.

III. Adjustments

X - Exchange.
F - Full Credit.
V - Variable Credit.
C - Cash Refund.

IV. Transportation from Customer

P - Prepaid.
L - Collect.
I - Prepaid but included in adjustment.
D - None - destroyed on site or removed by representative.

* Per wholesaler's policy

APPENDIX H

SAFETY

HAZARDOUS MATERIALS MANAGEMENT PLAN

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Appendix H

Safety

HAZARDOUS MATERIALS MANAGEMENT PLAN

This plan establishes, implements, monitors, and documents evidence of an ongoing program for the management of hazardous materials to insure there is minimal risk to patients, personnel, visitors, and the community environment.

Attachments should include

1. Master Hospital Hazardous Chemical Listing
2. Storage Areas

1. OBJECTIVES:

a. To develop a system that addresses the identification of hazardous materials from the point of entry into the facility to the point of final disposal.

b. To develop a system for minimizing hazardous materials usage and managing the usage safely.

c. To insure the policies and procedures related to the various hazardous materials are reviewed, revised, and approved at least annually by the safety and any other appropriate committees.

d. To enhance coordination and communication among departments, services, and committees of the facility.

e. To ensure proper training for all users and handlers of hazardous materials.

2. REFERENCES:

a. AFOSH Std 161-17, Standardized Occupational Health Program.

b. AFR 127-12, Air Force Occupational Safety and Health Program.

c. AFR 127-43, Hazardous Materials and Storage.

d. Local Regulation, Hospital Safety Program.

e. 29 CFR XXXX, OSHA Standard

f. Antineoplastic, OSHA Guidance

g. HQ SAC/SGPB Letter dated 15 Jan 85, Hazard Communications Standard.

h. JCAH Monograph, Managing Hazardous Wastes and Materials.

3. GENERAL:

a. A complete list of all hazardous materials will be complied and available for reference.

b. Material Safety Data Sheets (MSDS) will be obtained from the manufacturer on all hazardous chemicals.

c. All hazardous materials will be properly labeled. (See Section 6, para 6b.)

d. Hazardous materials training will be accomplished upon initial assignment, annually, or when required. (See para 12.)

e. Work place surveys will be accomplished at least annually.

f. Operating instructions are to be established by each section, coordinated through SGL, and reviewed annually by the Safety Committee.

g. All illnesses and injuries caused by exposure to a hazardous material will be reported to and investigated by Environmental Health.

4. RESPONSIBILITIES:

a. Commander, Hospital will:

(1) Appoint the Medical Logistics Officer, in writing, as the hospital hazardous material and waste program officer.

(2) Appoint the Hazardous material and waste officer as a member of the Safety Committee.

b. Chief, Bioenvironmental Engineering Service will:

(1) Assist in identifying potentially hazardous materials.

(2) Develop and maintain a master list of potentially hazardous materials, with input from Medical Logistics and section supervisors.

(3) Provide guidance relating to substitution, waste minimization, protective measures and disposal procedures.

c. Chief, Environmental Health Services will: Provide technical guidance in the development of training programs for supervisors.

d. Chief, Medical Logistics will:

(1) Develop a system for monitoring compliance in those areas dealing with procuring and identifying potentially hazardous materials (PHM).

(2) Prepare and submit monthly to the Chief, Bioenvironmental Engineer Service a list of all PHM procured within the MTF.

(3) Establish procedures that will accommodate the health hazard control identification procedures outlined in AFM 67-1, Volume II.

(4) Report quarterly progress reports to the Safety committee.

e. Hazardous Waste Officer will: Develop a system for monitorng compliance, with this regulation, in those areas dealing with hazardous waste. He will then be responsible for monitoring compliance. This officer will also be responsible for the overall implementation of this directive through the Safety.

f. Plant Manager will: Develop a system to insure that all housekeeping personnel comply with this directive.

i. Hospital Safety Committee will: Notify the hospital commander of any safety violations dealing with the handling or disposal of hazardous wastes.

j. All Section Supervisors will:

(1) Compile a list of potentially hazardous materials used within the section.

(2) Update this list when new items or products are introduced or deleted from the section.

(3) Once compiled and updated, forward this list to the Chief, Bioenvironmental Engineering Service (SGPB).

(4) Train all personnel on the hazards associated with potentially hazardous materials used within this section.

(5) Train all personnel on the proper protective measures to be taken while handling these materials and their by-products and any special requirements in case a spill occurs.

5. COMPLIANCE: Compliance is necessary for the safe day-to-day operation, management, and coordination of a hazardous material management plan. Enforcement is not an end unto itself - rather a means to achieve a goal of lessening and/or abating the hazardous material used within the hospital. The principal ingredients of compliance of this plan will be:

a. Service/section policies and procedures will be reviewed, revised, and approved annually by the Safety Committee.

b. The appointed Hazardous Waste Officer will provide liaison between the staff, services, administration, and base agencies.

c. Coordinate the hospital emergency plans with ptjer base agencies. This includes the Emergency Water Plan, Fire Plan, Community Disaster Plan, etc.

d. Review and evaluate individual case reports of incidents and/or accidents.

e. Establish and maintain a record keeping system, including Material Safety Data Sheets (MSDS).

f. Implement all measures outlined in this plan.

g. Conduct Systematic follow-up to ensure compliance with different segments of this plan.

h. Evaluate of results of plan annually.

i. Develop goals for hazardous material reduction and waste minimization.

6. CHEMICAL MATERIALS: Chemical materials used in the hospital are numerous. All are hazardous in sufficient quantities.

a. Ordering:

(1) Identifying the potential hazards of a material and considering alternatives are the responsibilities of the service/section that originates the order. If a less hazardous substitute exists the section will use it, or give documented reasons why they can not use this substitute.

(2) The type of hazard, e.g., ignitable, corrosive, reactive, toxic, poisonous will be included in the initial paperwork so logistics personnel will be aware of the hazards and treat the material accordingly. They will be equipped to handle the hazards they could be exposed to, have access to necessary spill containment kits, and be trained to handle and contain spills that occur while the materials is stored. (Leaking packages at the time of delivery will not be accepted.)

b. Receiving: Receiving personnel will verify the containers are properly sealed, in good condition, and appropriately labeled with a description of the hazard it represents. A MSDS must be recieved with every shipment. In addition, they must verify the labeling and markings on each container are compatible with the manifests or shipping documents. A section operating instruction, in addition to the training requirements in para 12, must be developed to cover these procedures.

c. Storage:

(1) Service/section chiefs will limit purchases to the minimum practical amount. This amount should be the amount of material needed for two weeks use, if the material is easily obtainable.

(2) Regular inspections will be made of the storage site to insure the containers are not leaking. If a spill or leak is found, the Emergency Response Plan will be activated. (See para 11.) Inspections will be done quarterly by the Safety Manager and monthly by Medical Logistics. Discrepancies will be reported to the Safety Committee.

(3) The Safety Committee will identify and approve storage locations annually. A copy shall be sent to the Fire Department identifying the type of storages, ie acid, corrosive, etc.

d. Handling/Transporting:

(1) Handlers and users of a hazardous material will observe all necessary personal protection measures and environmental controls. Those who use or handle the materials on a day-to-day basis will be trained by their supervisor on what hazards exist, what personal protection measures are required, what the symptoms of exposure are, and what first-aid responses to take. Personnel using hazardous materials will know the facility's procedures concerning emergency response. (See para 11.)

(2) Excess chemicals shall be turned into Medical Logistics for reuse within the hospital.

(3) Once a material is used or contaminated, it is considered waste unless it can be recycled or reused. These hazardous chemicals will be turned into Medical Logistics. With SGPBs' guidance they will determine if these materials are a RCRA Hazardous Waste.

7. HAZARDOUS WASTE

e. Segragation of Hazardous Materials: Chemical waste will be collected at the generation point and separated into containers intended for only one kind of chemical waste. Chemical wastes should not be commingled as mixtures are not only more expensive to handle, but also can react and cause serious problems, such as explosions and/or deadly gas emissions. The following is a simple, generalized, step-by-step process to handle and transport chemical wastes:

(1) The label must indicate that the material is "hazardous waste" and list the components.

(2) Filled containers, are removed from the work area as soon as practical to reduce the hazards in that area. No work area can store more than a total of 55 gallons of hazardous waste or 1 quart of acute hazardous waste.

(3) The chemical containers must be handled properly and packaged according to Department of Transportation requirements to minimize spills.

(4) Personnel who transport chemical waste must be trained to deal with spills.

(5) Absorbent material must be available for emergency use, (i.e., diatomaceous earth, fuller earth, kitty litter).

(6) Containers boxes are not over filled and the materials stored together are chemically compatible.

f. Hazardous Waste Storage: The hospital will cordinate with the environmental coordinator to determine hazardous waste storage areas. The storage area should be designed with consideration of the hazard being stored.

APPENDIX I

MEDICAL SERVICE

SAFE HANDLING OF CYTOTOXIC AGENTS

Appendix I

Medical Service

SAFE HANDLING OF CYTOTOXIC AGENTS

This regulation established precautions to be followed in the preparation, administration and disposal of cytotoxic agents. It prescribes the proper protective equipment to be worn by personnel, designates where agents may be prepared, outlines procedures to be followed in the event of an accidental spill or individual exposure, and discusses disposition of cytotoxic and associated waste. This regulation applies to all personnel involved in the storage, preparation, administration, or disposal of cytotoxic agents and associated waste. For the purposes of this regulation, the term "cytotoxic agent" includes any item or agent labeled as chemotherapeutic or antineoplastic or mutagenic, and used in the treatment of cancer or other conditions. See paragraph X, Terms Explained.

I. General Policies and Guidelines.

A. Preparation of Cytotoxic Agents. Personnel preparing cytotoxic agents will be trained. Prepare agents in a Class II, Type A, vertical flow biological safety cabinet. Vent cabinet to the outside. All agent preparation will be done by pharmacists.

B. Storage of Cytotoxic Agents. Keep agents separate from other drugs, in an area where an accidental spill/exposure can be prevented.

C. Biological Safety Cabinet (BSC) Inspections. To insure adequate performance, Medical Equipment Repair Center (MERC) and the Bioenvironmental Engineer (BEE) will arrange an annual certification contract of all the cabinets and the exchange of HEPA filters. The inspection is to include mass particle count, air flow rate, split point determination, and a halogen light leak test. To ensure a constant flow rate, the BEE measures the air flow on a semiannual basis. The BEE also determines the split point semiannually to maintain an adequate interior work zone in the cabinet.

D. Cytotoxic Drug Documentation Binder. Each unit/function using cytotoxic drugs will establish and actively maintain a documentation binder to include any tab applicable to the unit's area of responsibility.

1. Tab A: Medical Center Regulation covering this program.

2. Tab B: Personnel Employment Roster. Include all personnel involved in preparation and administration of cytotoxic agents, and all personnel who regularly handle the excretions of patients receiving such agents. Include full name, grade, date of employment and date of termination.

3. Tab C: Unit's spill response procedures. An example is provided in Attachment 1.

4. Tab D: Education Documentation. Include documentation of annual safety training and inservice training and inservice training reports.

5. TAB E: Log of accidental exposures, to include date, location, name of agent spilled, quantity spilled, and names of personnel exposed during spill and/or cleanup.

E. Waste Disposal.

1. Keep waste materials associated with the preparation, administration, or discontinuance of cytotoxic agents separate from all other waste. Dispose of all waste before removing and disposing of protective equipment, but do not leave the area wearing the protective clothing. Clean all preparation areas thoroughly after each use and dispose of cleaning materials as cytotoxic waste.

2. Dispose of all waste in a puncture-and leak-proof container clearly marked "CYTOTOXIC WASTE" or "ANTINEOPLASTIC WASTE." Handcarry all cytotoxic waste to room _____. If the antineoplastic waste is one of the listed hazardous wastes (Atch X) and it meets the criteria for empty, less than 3 % by weight of the containers or it's an unlisted waste it may then be disposed of with the infectious waste.

F. Body Excretions. Nursing personnel must wear gloves when handling and disposing of the urine and feces of patients receiving cytotoxic agents. Dispose of excretions in the same manner as excretions of non-exposed patients; however, use extreme caution to prevent splattering.

G. Pregnant Personnel. Cytotoxic drugs are highly toxic chemicals that can adversely affect the rapidly multiplying cells of a fetus. Also, excreta from patients on cytotoxic agents contain high concentrations of agents. Therefore, females who are pregnant or nursing their children will not be involved in the preparation, handling or administration of cytotoxic agents. Replacements will handle patient excretions. All personnel, especially those actively trying to conceive, will be informed of potential risks involved in preparation, handling and administration of cytotoxic drugs.

H. Spill Response Kit. Each unit involved in the preparation, administration, or storage of cytotoxic agents will have a spill response kit available in a prominent location.

I. Spill Response Procedure. Each unit involved in the preparation, administration, or storage of cytotoxic agents must have a copy of the spill response plan (Atch 1). Supervisors will train all personnel on cleanup procedures.

J. Spill Reporting. Report immediately to Environmental Health Services any incidents where personnel are inadvertently exposed to an agent and/or where spillage of an agent occurs. (See paragraph V.)

K. Personal Protective Equipment. The purpose of personal protective equipment is to protect the individual preparing, administering, or discontinuing the drug, handling excreta, or cleaning up a spill from an accidental exposure.

1. Personal protective equipment for preparing agents or cleaning up spills consists of the following:

a. Closed front, disposable cuffed gown.

b. Latex gloves.

c. Full face organic vapor respirator with HEPA filter. A surgical mask is not considered adequate. It is necessary to wear this respirator when preparing agents outside the biological safety cabinet.

d. Goggles or faceshield (not required when using biological safety cabinet).

2. When administering an agent or handling excreta, latex gloves will be worn, as a minimum.

II. Specific Responsibilities.

A. Bioenvironmental Engineering (BEE).

1. Investigates industrial hygiene hazards and recommends preventive/corrective measures.

2. Provides consultation for spill cleanup and control procedures.

3. Provide consultation for waste management and disposal procedures.

4. Ensures protective equipment and engineering control systems are operational. Determines types of exposure, frequency, existing engineering controls, and personal protective equipment required. Briefs findings to the Aeromedical Council (AMC).

5. Schedules the annual contract inspection for all biological safety cabinets designated for the mixing of cytotoxic agents, and the replacement of HEPA filters, as necessary.

6. Semiannually monitors the air flow rate through all biological safety cabinets.

7. Semiannually determines the split point for all biological safety cabinets.

8. Approves new and additional engineering control equipment procurement.

9. Maintains documentation and references on engineering control equipment inspections and certifications.

10. Monitors compliance with this regulation in regard to engineering control systems, personal protective equipment, waste disposal and spill plans.

11. Reviews the spill response procedure annually.

B. Environmental Health (EH).

1. Maintains a listing of personnel routinely involved in the preparation and administration of cytotoxic agents. With BEE presents findings to the Aeromedical Council (AMC).

2. Notifies CBPO and CCPO to code personnel requiring occupational physicals.

3. Ensures baseline, periodic and termination occupational examinations are performed on identified personnel. Monitors the results of these examinations and identifies trends.

4. Consults with AMC to decide the medical management and follow-up of personnel involved in an accidental exposure.

5. Monitors quarterly the documentation binder maintained by the duty sections. Purges information kept in these binders at least annually and transfers the information to the unit's folder kept in the Environmental Health Office. Environmental Health maintains these folders permanently in accordance with AFR 12-50, Volume II, Table 161-5, Rule 1.

6. Conducts occupational health visits to each unit to discuss problems with supervisors, stressing re-education.

C. Plant Management.

1. Ensures that all cytotoxic waste is handled and treated in accordance with the Environmental Protection Agency (EPA) requirements.

2. Ensures that all housekeeping personnel are trained on the proper handling of both infectious and hazardous waste, and the proper procedures to be followed should an accidental exposure occur (such as bag breaking).

3. Ensures a spill response kit is readily accessible for personnel who must handle antineoplastic waste.

4. Prepares a contingency plan for cytotoxic waste disposal.

D. Pharmacy.

1. Purchases all necessary cytotoxic agents through medical material and maintains the minimally adequate supply. Stores such agents, under appropriate conditions, within the pharmacy or satellite pharmacy until the time of dispensing.

2. Prepares all antineoplastics under a BSC or wearing a full-faced organic vapor respirator with a HEPA filter, by a pharmacist or designated nurse.

3. Delivers cytotoxic agents separately from other drugs.

4. Provides information on the individual cytotoxic agents used.

5. Provides initial and annual education to employees involved in the preparation and administration of cytotoxic agents, or anyone involved in the handling of these drugs or associated waste.

E. Physical Examination and Standards Section (PES). Conducts initial, periodic, and termination occupational health examinations, as determined by the Aeromedical Council.

F. Designated Oncology Units.

1. Complies with guidelines for the storage, preparation, administration and disposal of cytotoxic agents and associated waste.

2. Establishes a method for identifying patients receiving the agents. This precaution enables personnel to protect themselves appropriately. The supervisor is responsible for establishing this method.

3. Established and actively maintains a cytotoxic documentation binder in accordance with paragraph ID.

G. Medical Material.

1. Receives cytotoxic agents from manufacturers.

2. Stores and issues agents in original packaging to the pharmacy.

3. Maintains a list of cytotoxic agents covered by this regulation. Posts list in an area accessible to all warehouse personnel.

4. Marks cytotoxic storage areas with cytotoxic warning stickers.

H. Linen. Linen contaminated with cytotoxic agents is handled the same as linen with infectious material.

I. Medical Equipment Management Office (MEMO). Ensures all new biological safety cabinet requests, respirators, and other controls are coordinated through Bioenvironmental Engineering to ensure the proper equipment is purchased.

III. Preparation of Cytotoxic Agents.

A. Cabinets. Prepare agents in an approved biological safety cabinet.

B. Personal Protective Equipment. Wear personal protective equipment consisting of the following items:

1. Closed-front, disposable cuffed gown.

2. Disposable, latex gloves. These should be changed every 30 minutes when working with cytotoxic agents. Gloves should be removed immediately after over contamination; wash hands thoroughly before regloving.

C. Handwashing. Wash hands thoroughly before and after gloving.

D. Cabinet Decontamination (Premixing). Decontaminate the interior of the safety cabinet with 70% isopropyl alcohol prior to beginning the procedure. Do not wet the HEPA filter.

E. Supplies. Arrange needed supplies in the cabinet. Place all equipment needed to complete the procedure in the cabinet prior to preparation.

F. Gloves and Hands. Change gloves and wash hands every 30 minutes or whenever gloves are contaminated.

G. Ampuls. Open ampuls with sterile gauze to prevent splashing of the agent.

H. Syringes. Use only Luer lock syringes to prevent separation of the needle and syringe.

I. Reconstitution (inside Safety Cabinet). Reconstitution of a vial inside a safety cabinet requires aspiration of air from the vial to create a slight negative pressure and to prevent spraying the agent.

J. Excess Medication. Leave excess medication in the vial.

K. Equipment Disposal. Use a small rigid container to dispose of needles, syringes, and vials inside the safety cabinet. Do not cut needles. Place the ziplock bag in a designated waste container outside the safety cabinet.

L. Gauze and Waste Disposal. Put small items, such as 2x2s used in the safety cabinet, in a ziplock bag prior to disposal in the designated waste container. Dispose of all waste prior to removing protective clothing.

M. Cabinet Cleanup. Clean the interior of the safety cabinet with soap and water and then with 70% isopropyl alcohol. Clean preparation surfaces outside the cabinet in the same manner.

N. Protective Equipment/Clothing Disposal. Remove all protective equipment and discard all disposable items in the designated waste container. Do not leave the area wearing the protective clothing.

O. Handwashing. Wash hands thoroughly after removing protective clothing.

P. Labeling of Waste Containers. Ensure that all associated waste is discarded in a container labeled "Cytotoxic Waste." See paragraph IF1.

IV. Administration of Cytotoxic Agents

All personnel will adhere to the following guidelines when administering agents.

A. Supplies. Assemble necessary supplies to include:

1. Waterproof absorbent pad.

2. Sterile gauze sponges.

3. Rigid container for disposing of sharps and glass fragments.

4. Ziplock bags for waste containment.

5. Alcohol wipes.

6. Antineoplastic warning labels.

B. Hands/gloves. Wash hands and don latex gloves.

C. Leak Pad. Put blue pad under infusion set and tubing to catch any leaks.

D. Connections. Ensure all connections are secure.

E. Priming the Tubing. Use alcohol dampened sterile gauze when priming the tubing or expelling air. Note infusion sets should be disposed of intact, without separating tubing or needles.

F. Equipment Cleansing. Use alcohol dampened gauze sponges to wipe the outside of syringes, IV bags , and pumps, after reconstitution, to remove residue.

G. Disposal of Gauzes. Dispose of contaminated gauzes in a ziplock bag and then in a container designated for cytotoxic waste.

H. Disposal of Equipment. Prior to removing gloves, dispose of all other waste materials carefully in containers designated for cytotoxic waste. See paragraph IE.

I. Gloves/Hands. Remove gloves and wash hands thoroughly.

J. IV Tubing. Use Primary Oncology IV Tubing TM.

V. Accidental Exposure

Personnel sustaining an accidental exposure to a cytotoxic drug must wash the affected area with soap and water immediately, then seek medical attention. Accidental exposure includes any contact of the agent with the skin or eyes, needlestick, or cut caused by glass or equipment contaminated with an cytotoxic agent. If a drug is splashed in the eye, flush with copious amounts of water for 15 minutes and then seek medical attention. Notify Environmental Health by phone. Document the exposure on AF Form 765, Hospital Incident Statement (see MCR 168-3, Quality Assurance/Risk Management Program). Include the date, time, location, nature of the incident, the agent involved and the amount spilled, the person or persons involved, and the cleanup action taken. Incident reports are maintained in the Quality Assurance office only. On receipt of any incident report involving cytotoxic agents, quality assurance personnel will contact Environmental Health with pertinent details.

VI. Occupational Physical Examinations

A. Scope. An examination tailored to a worker's occupational exposure; it is not a complete examination. They are given to all personnel involved in the preparation or administration of antineoplastic agents on a routine basis.

B. Frequency. Determined by the Aeromedical Council and reviewed at least annually. Examinations are based on type of exposure, frequency, engineering controls, and personal protective equipment.

C. Exam Results. Although examinations are administered by PES, Environmental Health is responsible for monitoring the results and conducting trend analysis.

VII. Contaminated Linen

Dispose of linen contaminated with cytotoxic agents in the same manner as linen contaminated with infectious material. Place linen in a water soluble bag and then in a bag with a warning label for cytotoxic agents. Dispose of disposable linen in the same manner as all other cytotoxic waste.

VIII. Deceased Patients

A. Alerting Labels. Nursing personnel place a cytotoxic sticker on both body tags. This is to alert pathology and mortuary personnel that body fluids may still contain cytotoxic agents.

B. Special Precautions. In the event an autopsy is required, the physician will notify the pathologist if it is necessary to take any special precautions.

C. Personal Protective Equipment. Pathology personnel don personal protective equipment if the body is determined to contain cytotoxic agents by the patient's physician. See paragraph IE above.

IX. Personnel Education

Supervisors/Worker Education. The pharmacist provides occupational health education to all personnel who are potentially exposured to cytotoxic drugs. Supervisors document education for military and civilian personnel in accordance with AFR 127-12. Initial and annually updated occupational health education will be provided.

X. Terms Explained.

A. Cytotoxic Agents. Drugs with mechanism of action frequently involving interaction with DNA, RNA, and protein synthesis. Many of these drugs are carcinogenic, mutagenic, and/or tetratogenic.

B. Antineoplastic Drugs. Cytotoxic drugs administered in cancer therapy to control neoplastic cells through cellular death. The mechanism of action frequently involves interaction with DNA, RNA, and protein synthesis. Many of these drugs are carcinogenic, mutagenic, and/or tetratogenic.

C. Cytotoxic Waste. Disposal items used in the preparation, administration or discontinuance of cytotoxic drugs including personal protective equipment, IV bags, tubing, needles, syringes, vials, protective barriers, and excess agent.

D. Halogen Light Leak Test. A light test on a biological safety cabinet that determines if exterior joints made by welding, gasketing, or sealing with sealants are free of leaks that might release potentially hazardous materials into the environment.

E. High Efficiency Particulate Air (HEPA) Filter. A disposable dry type filter used in a biological safety cabinet to remove airborne with a diameter of 0.3 millimeter (mm) or greater prior to discharge.

F. Mass Particle Count. A test designed to determine the integrity of supply and exhaust HEPA filters, filter housings, and filter mounting frames by measuring the concentration of airborne particle of diameters greater than 0.5 micron (um).

G. Split Point. Point inside the biological safety cabinet where the descending air flow is split such that two separate air streams occur. The location of the split point determines the interior work surface to be used.

The maximum protection is obtained in the area behind the split point. The least efficient area is three inches from the sides and the immediate front of the cabinet.

H. Split Point. Point inside the biological control device equipped with high efficiency particulate air filters. The cabinet provides a sterile environment for the preparation of sterile products in addition to protecting the individual from potentially harmful substances.

XI. References

A. "American Society of Hospital Pharmacists Technical Assistance Bulletin on Handling of Cytotoxic Drug in Hospitals," American Journal of Hospital Pharmacy, 42 (Jan 1985), 131-7.

B. Consensus Response to Unresolved Questions Concerning Cytotoxic Agents. National Study Commission on Cytotoxic Exposure, March 1984.

C. Occupational Exposure to Cancer Chemotherapeutic Drugs - A Literature Review. USAF Occupational/Environmental Health Laboratory Report 84-273EHT11GGA.

D. Procedures for Handling Cytotoxic Drugs. Bethesda Md: American Society of Hospital Pharmacists, 1983.

E. Safe Handling of Cytotoxic Drugs - Study Guide. Bethesda Md: American Society of Hospital Pharmacists, 1984.

F. Guidelines for Cytotoxic (Antineoplastic) Drugs. U.S. Department of Labor, OSHA Instruction Pub 8-1.1, Jan 1986.

SPILL RESPONSE PROCEDURE

1. Limit access to the spill.

2. Immediately don two pair latex gloves, full face organic vapor respirator with HEPA filter, and gown.

3. Limit the spread of the spill as fast as possible. Use absorbent towels for liquids. Contain powders by gently applying damp towels to the area.

4. Clean contaminated area with detergent solution and wipe clean with water.

5. If a specific chemical inactivator exists for the cytotoxic agent it may be used provided it is nontoxic and nondestructive to the surrounding area. Consult with Bioenvironmental Engineering concerning chemical inactivators.

6. Dispose of waste in container approved for cytotoxic waste. Check with BEE to determine proper disposal of waste. It may need to be disposed of as hazardous waste.

7. Decontaminate protective face shield/goggles by wiping clean with water and alcohol after the cleanup. Discard gloves, gowns, and disposable respirator masks as cytotoxic waste.

8. Contact Environmental Health at extension _____ to report all spills.

9. Contact Bioenvironmental Engineering at extension _____.

10. Prepare a report that documents the date, time, location of the spill, personnel involved, material and amount spilled, and the cleanup action taken. (see paragraph __, _____ 160-6, Safe Handling of Cytotoxic Agents, and 168-3, Quality Assurance/Risk Management Program.)

APPENDIX J

WASTE MANAGEMENT PLAN OUTLINE

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Appendix J

WASTE MANAGEMENT PLAN OUTLINE

I. **Policy and Purpose of Waste Management Program**

II. **Scope of Management Plan**

- A. Waste types
- B. Activities that generate waste
  1. Infectious
  2. Hazardous
  3. Radiologic
  4. Other medical
  5. General refuse

III. **Management Methodologies**

- A. Identification
- B. Collection
- C. Storage & Transport
- D. Treatment
- E. Disposal

IV. **Individual Responsibilities and Employee Training**

V. **Waste Minimization Efforts**

VI. **Occupational Safety**

VII. **Emergency Response**

VIII. **Quality Assurance**

IX. **Periodic Reporting**

- A. Assessment of current methods
- B. Costs of waste management
- C. Legal and other liabilities
- D. Five-year planning
- E. Operational needs

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