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AFOEHL REPORT 90-175EQ00098JHH

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**Medical Waste Technical Assistance Survey
K.I. Sawyer AFB MI**

LINDA B. ALBRECHT, Captain, USAF, BSC

October 1990

Final Report

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The author greatly appreciates the support and assistance given by K. I. Sawyer AFB. MSgt Siler and the entire staff of the Bioenvironmental Engineering Section provided essential information and assistance that was needed to accomplish this survey.



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I. INTRODUCTION

On 8 February 1990, the 410th Strategic Hospital, K. I. Sawyer Air Force Base MI requested through HQ SAC/SGPB that the Air Force Occupational and Environmental Health Laboratory (AFOEHL) perform a hazardous and medical waste survey of their hospital (see Appendix A). Base personnel were particularly concerned with medical waste disposal practices.

Capt Albrecht conducted the hazardous and medical waste survey at the 410th Strategic Hospital from 24 to 27 April 1990. The scope of this survey was to evaluate the medical facility's medical and hazardous waste management practices from the point of generation to their ultimate disposal. The survey also addressed areas of regulatory compliance, program effectiveness, and waste minimization.

II. DISCUSSION

A. Base Description

K. I. Sawyer Air Force Base, home of the 410th Bomber Wing, is located about 25 miles from the city of Marquette. The primary mission of this Strategic Air Command base is to maintain a combat ready force to support the B-52 and KC-135 bombers.

B. Current Disposal Practices and Limitations

Until a few months ago, the 410th Strategic Hospital was incinerating its medical waste on site. After receiving a Notice Of Violation from the State of Michigan, Department of Natural Resources, for burning too much plastic (above the opacity limit), the hospital had to find another method of medical waste disposal.

Housekeeping transports the majority of medical waste within the facility and stores it in the incinerator room until the facility management transports it to Marquette in a privately owned vehicle. The waste is then incinerated at a crematorium. The existing contract does not regulate the amount of medical waste, just the number of burns.

Some medical waste and hazardous waste generated in the laboratories are disposed in process to the sanitary sewer. This sewage is collected and transported by gravity and pressure lines to the K. I. Sawyer Wastewater Treatment Plant. The wastewater discharge limits are set by the Code of Federal Regulations Title 40, Sections 261.3, 403, 433, 459, and 460 and the State of Michigan Clean Water Laws.

The remainder of the hazardous waste from the 410th Strategic Hospital is collected by the laboratory personnel and turned in to Medical Supply and then to DRMO. Additionally, the x-ray department uses a silver recovery system. After the silver is recovered, the fixers are then discharged to the sanitary sewer.

III. PROCEDURES

The first step of the survey was to review the hospital's hazardous and medical waste plans, the infection control program, and the bioenvironmental engineer's hazardous chemical inventory. The team visited all sections which generate medical or hazardous waste, and observed and discussed their disposal practices. Two types of survey forms were completed by hospital personnel. The sections completed a section survey form found in Appendix B that documented packaging, transporting, and weight of infectious waste. The facility manager filled out a separate form (Appendix C) that documented final disposition and costs of infectious waste.

The survey team also visited and evaluated all hazardous waste satellite sites. The following people were contacted about their involvement and responsibilities in the hospital hazardous waste program:

MSgt Siler, NCOIC, Bioenvironmental Engineering
Mr Nutini, Facility Manager

The survey team also visited and evaluated the medical waste storage area. The following people were contacted about their involvement and responsibilities in the medical waste program:

Capt Brown-O'Keefe, Environmental Health Officer
Mr Nutini, Facility Manager
Capt Lesko, Infection Control Officer

IV. RESULTS AND DISCUSSION

A. Medical Waste Program

The current medical waste program is operating fairly well. The infection control officer is responsible for training all the hospital personnel on infection control (Appendix E), and the facility manager is responsible for medical waste disposal. The regulations on medical waste addressed all aspects of infection control and infectious waste disposal except antineoplastic drug administration and disposal.

B. Hazardous Waste Program

The facility manager also manages the hospital's hazardous waste program. Because these programs are so different, it may be better to assign responsibility to two different people. The medical logistics officer is already involved in the hazardous waste program because medical supply buys the material. Appointing him as the hazardous waste program manager will close this loop and allow the hospital more control over its hazardous waste program. Appendix F is a section-by-section summary of medical activities, chemical usage and disposal practices, and infecteous waste segregation and disposal.

V. SUMMARY OF WASTE DISPOSAL PRACTICES

A. Infectious Waste

1. Infectious waste is placed in red bags at the point of generation in all sections except flight medicine. Due to the low quantities of infectious waste in aerospace medicine, personnel place the infectious waste in their sharps container.

2. Housekeeping removes infectious waste at least once a day from all areas. Surgery and delivery have their infectious waste removed more frequently.

3. This waste is either transported in carts, which are disinfected prior to transporting other materials, or hand carried to the incinerator room.

4. The incinerator room is only used for infectious waste storage. It is disinfected twice a week.

5. The infectious waste is transported downtown by facility management personnel in a privately owned vehicle and burned by a local crematorium once a week. The hospital burns approximately 400 pounds a month, at a cost of \$150 a burn or \$600 a month.

B. Hazardous Waste

1. Medical Supply tries to keep minimal amounts of all chemicals on hand for their customers. However, some sections have large amounts of chemicals, enough to last several months, within their section.

2. Most of the hazardous waste being generated is in small quantities, 1-gallon containers. These full containers are then turned in to Medical Supply for disposal.

3. Medical Supply stores these chemicals in the acid room until DRMO can dispose of them.

VI. OBSERVATIONS

A. Personnel seem to be confused about the difference between "hazardous material" and "hazardous waste as defined by RCRA." The term "hazardous waste" has a specific legal definition which is defined in the 40 CFR Part 261. A solid waste is a hazardous waste if it is not excluded in 40 CFR 261.4(b) and it meets any of the following criteria:

1. Exhibits any of the characteristics of a hazardous waste.

2. It is listed in Subpart D and has not been excluded in any other section of the CFR. One of the more important exemptions that pertain to the hospital is 40 CFR Part 261.3(a)(E). This states that "Wastewater resulting

from laboratory operations containing toxic (T) wastes listed in Subpart D, (is exempt) provided that the annualized average flow of laboratory wastewater does not exceed one percent of total wastewater flow into the headworks of the facility's wastewater treatment or pre-treatment system, or provided the wastes, combined annualized average concentration does not exceed one part per million in the headworks of the facility's wastewater treatment or pre-treatment facility." This means that the majority of hazardous wastes that could be generated by the laboratories are not considered hazardous waste and can be discharged to the sanitary sewer as long as the chemicals are used in process.

3. It is a mixture of a listed waste and a solid waste solely because it exhibits a characteristic of a hazardous waste.

B. Although the hospital does not administer antineoplastic drugs, the pharmacy has both oral antineoplastic medications and injections. Neither pharmacy personnel nor other hospital personnel are trained in administering antineoplastic drugs. Additionally, several antineoplastic drugs are RCRA regulated hazardous wastes.

C. Sharps containers are located in each room where one is necessary. The pharmacy issues sharps containers when they issue needles to patients. These sharps containers are returned to the pharmacy.

D. The pharmacy has not been able to dispose of outdated medication since the hospital changed its infectious waste policies.

E. There is confusion over what is infectious waste and what isn't. Although most sections define infectious waste as waste saturated with blood, some sections define it as any waste which contains body fluids.

F. In the laboratory, both carbon paper and gloves were placed in the infectious waste. Both red bags and trash cans are available in the laboratory. The laboratory believes their certification requires the gloves to be red bagged.

G. The laboratory has chemicals stored which they haven't used in over a year. They are using xylene, which is a RCRA regulated hazardous waste. This chemical can easily be substituted for. Two commonly used substitutes are xyless and amiclear.

H. Currently the facility manager takes the infectious medical waste to Marquette in his car.

I. There is no spill response plan for the hospital.

J. Hazardous waste is accumulated in medical supply; however, the date accumulation began is not on the label.

VII. RECOMMENDATIONS

A. The hospital should differentiate between hazardous material and hazardous waste. Separating the hospital regulation 400-2 into two regulations, one addressing hazardous material and hazardous communication, and the other addressing hazardous waste, will help reduce the confusion.

B. The pharmacy needs to turn in all antineoplastic drugs because the hospital is not administering them. All references to administering antineoplastic drugs should be removed from the hospital regulations and Medical Supply should ensure no new antineoplastic medications are ordered. If at a later time the hospital decides to administer antineoplastics, a program that meets all the OSHA standards can then be developed.

C. The pharmacy's policy of issuing sharps containers when they issue needles to patients is an excellent method of insuring proper disposal. They should continue this policy.

D. The hospital must develop a policy on outdated medication disposal. Currently the hospital is disposing of its medical waste off-site. This causes a problem when disposing of controlled drugs, due to the requirement for the destruction to be witnessed. The hospital can flush small quantities of controlled drugs, or the medications can be ground.

E. The hospital should increase training on infectious waste. This will reduce the amount of confusion over what is infectious waste and what isn't. This training should explain WHY blood saturated waste is considered infectious while other body fluids aren't. The Dental Clinic has an excellent program and they conduct infectious waste training quarterly.

F. The infection control officer and the facility manager should randomly inspect sections. This will ensure infection control policies are being followed.

G. All excess chemicals which are not going to be used in the future should be disposed of properly. Chemicals which are RCRA hazardous waste should be packaged according to 40 CFR 264.170. An inventory containing the type and quantity of each waste put into the waste container should be maintained for each container. The waste can then be disposed of by a hazardous waste disposal contractor. Chemicals which are not RCRA hazardous waste can be either disposed of as municipal waste or discharged to the sanitary sewer system (whichever is appropriate).

H. The laboratory should stop using xylene, which is a RCRA-regulated hazardous waste. Xyless or amclear are possible substitutes. Substituting to a less hazardous material will increase workers' safety and reduce the amount of hazardous waste the hospital is disposing of.

I. The hospital must use a government vehicle to transport infectious or hazardous waste. Using a privately owned vehicle increases the Air Force's liability.

J. Infectious waste should not be stored in the dental central sterile supply room.

K. The hospital must write a spill response plan.

L. Hazardous waste can be accumulated in medical supply; however, the date accumulation began needs to be on the label. Also, once the hazardous waste is removed from the area it was generated in, the base only has 90 days to get rid of it.

M. AFOEHL/EQA should be contacted to ensure the new incinerator plans meet the requirements of the Clean Air Act.

VIII. CONCLUSIONS

The 410th Strategic Hospital, K. I. Sawyer AFB MI, has good initial infection control and hazardous waste programs. The base now needs to refine these programs. Education and training is the key to developing better programs.

REFERENCES

1. Agency For Toxic Substances and Disease Registry, "The Public Health Implications of Medical Waste: A Report to Congress," April 1990.
2. Environmental Protection Agency, "Guidelines for Infectious Waste Management," 1986.
3. 40 Code of Federal Regulations Part 261.

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APPENDIX A
Request Letter

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DEPARTMENT OF THE AIR FORCE
 410TH STRATEGIC HOSPITAL (SAC)
 K I SAWYER AIR FORCE BASE, MICHIGAN 49843-5300

1121-202-200
Cap Albrecht

REPLY TO
 ATTN. OF: SG (Capt Zigulis, AV 472-2904)

8 Feb 90

SUBJECT: Hospital Incinerator Testing and Medical Waste Survey

TO: ~~HQ SAG/SGPB~~ *We support this request. Col Schiller 16 Feb 90.*
 AFOEHL/EQE
 IN TURN

1. AFOEHL/EQE has previously agreed to support a request for air emission testing at the K. I. Sawyer AFB hospital incinerator. The survey was tentatively scheduled for April or May 1990. Since our original request, the hospital's incinerator was inspected by the Michigan Department of Natural Resources (DNR) and found to need mechanical improvements. The hospital was issued a notice of violation. Therefore, request that AFOEHL/EQE perform testing on this incinerator as soon as possible after mechanical improvements are made. Capt Zigulis (SGPB) will contact AFOEHL/EQE to discuss the estimated completion date.

2. Capt Albrecht (AFOEHL/EQE) has stated that a concurrent medical waste survey could be conducted. It would be beneficial for the 410th Strategic Hospital if such a survey could be accomplished, and we ask that this be performed concurrently if possible.

3. Please contact Capt Gregory Zigulis if you have any questions on this request, or to coordinate survey dates.

William Lundberg
 WILLIAM I. LUNDBERG, Lt Col, USAF, MC
 Commander

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APPENDIX B
Section Survey Questionnaire

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DEPARTMENTAL SURVEY FORM

PLEASE COMPLETE AND RETURN THIS FORM TO THE INFECTION CONTROL NURSE BY _____.

DEPARTMENT : _____

CONTACT : _____ AUTOVON: _____

This form will be used to compile the following:

- (1) the specific locations where wastes are generated in the medical facility
- (2) how different types of wastes are segregated
- (3) if the wastes are treated in each section
- (4) how the wastes are packaged and labeled for disposal
- (5) the disposal methods used in each section

The following pages give the EPA's statutory definitions of seven types of regulated medical wastes. Please read each of the definitions carefully, decide which ones apply to your department, and then answer the following questions as completely as possible.

If you have any questions on filling out this form, please call Captain Albrecht or Lt Hedgecock at AV 240-3306.

SIGNATURE OF PERSON FILLING OUT THIS FORM _____

TRAINING

- 1. Have you ever received training in medical waste management?
 ___ YES ___ NO
- 2. Have the other personnel in this department been trained?
 ___ YES ___ NO ___ SOME

APPROXIMATE PERCENTAGE _____

- 3. How often does training occur? _____
- 4. Describe the training you recieved. _____

- 5. Have you ever seen or read the hospital's waste management

plan? ___ YES ___ NO

Have the other personnel? ___ YES ___ NO

APPROXIMATE PERCENTAGE _____

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.

A. Describe the process(es) in which any of the above wastes are generated

B. Are the wastes treated (e.g., chemical or steam sterilization) in the area? _____

If so, describe the method of treatment? _____

C. Are the wastes segregated from other wastes generated in the area? _____

If so, describe the method of segregation. _____

D. How are the wastes packaged for disposal (What type of bags, boxes, etc.)? _____

E. Are the waste containers labeled before being removed from the area? _____

If so, describe the method of labeling. _____

F. How many times per day are wastes removed from this area? _____

G. What is the estimated daily poundage of wastes removed? _____

H. Who is responsible for removing wastes from the area, how are wastes transported from the area, and where are the wastes taken?

COMMENTS - PLEASE PROVIDE ANY ADDITIONAL INFORMATION THAT YOU FEEL MAY BE HELPFUL (USE THE BACK OF PAGE IF NECESSARY).

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.

A. Describe the process(es) in which any of the above wastes are generated. _____

B. Are the wastes treated (e.g., chemical or steam sterilization) in the area? _____

If so, describe the method of treatment? _____

C. Are the wastes segregated from other wastes generated in the area? _____

If so, describe the method of segregation. _____

D. How are the wastes packaged for disposal (What type of bags, boxes, etc.)? _____

E. Are the waste containers labeled before being removed from the area? _____

If so, describe the method of labeling. _____

F. How many times per day are wastes removed from this area? _____

G. What is the estimated daily poundage of wastes removed? _____

H. Who is responsible for removing wastes from the area, how are wastes transported from the area, and where are the wastes taken?

COMMENTS - PLEASE PROVIDE ANY ADDITIONAL INFORMATION THAT YOU FEEL MAY BE HELPFUL (Use the back of page if necessary).

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.

A. Describe the process(es) in which any of the above wastes are generated. _____

B. Are the wastes treated (e.g., chemical or steam sterilization) in the area? _____

If so, describe the method of treatment? _____

C. Are the wastes segregated from other wastes generated in the area? _____

If so, describe the method of segregation. _____

D. How are the wastes packaged for disposal (What type of bags, boxes, etc.)? _____

E. Are the waste containers labeled before being removed from the area? _____

If so, describe the method of labeling. _____

F. How many times per day are wastes removed from this area? _____

G. What is the estimated daily poundage of wastes removed? _____

H. Who is responsible for removing wastes from the area, how are wastes transported from the area, and where are the wastes taken? _____

COMMENTS - PLEASE PROVIDE ANY ADDITIONAL INFORMATION THAT YOU FEEL MAY BE HELPFUL (Use the back of page if necessary).

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.

A. Describe the process(es) in which any of the above wastes are generated

B. Are the wastes treated (e.g., chemical or steam sterilization) in the area? _____

If so, describe the method of treatment? _____

C. Are the wastes segregated from other wastes generated in the area? _____

If so, describe the method of segregation. _____

D. How are the wastes packaged for disposal (What type of bags, boxes, etc.)? _____

E. Are the waste containers labeled before being removed from the area? _____

If so, describe the method of labeling. _____

F. How many times per day are wastes removed from this area? _____

G. What is the estimated daily poundage of wastes removed? _____

H. Who is responsible for removing wastes from the area, how are wastes transported from the area, and where are the wastes taken?

COMMENTS - PLEASE PROVIDE ANY ADDITIONAL INFORMATION THAT YOU FEEL MAY BE HELPFUL (Use the back of page if necessary).

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.

A. Describe the process(es) in which any of the above wastes are generated

B. Are the wastes treated (e.g., chemical or steam sterilization) in the area? _____

If so, describe the method of treatment? _____

C. Are the wastes segregated from other wastes generated in the area? _____

If so, describe the method of segregation. _____

D. How are the wastes packaged for disposal (What type of bags, boxes, etc.)? _____

E. Are the waste containers labeled before being removed from the area? _____

If so, describe the method of labeling. _____

F. How many times per day are wastes removed from this area? _____

G. What is the estimated daily poundage of wastes removed? _____

H. Who is responsible for removing wastes from the area, how are wastes transported from the area, and where are the wastes taken?

COMMENTS - PLEASE PROVIDE ANY ADDITIONAL INFORMATION THAT YOU FEEL MAY BE HELPFUL (Use the back of page if necessary).

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.

A. Describe the process(es) in which any of the above wastes are generated

B. Are the wastes treated (e.g., chemical or steam sterilization) in the area? _____

If so, describe the method of treatment? _____

C. Are the wastes segregated from other wastes generated in the area? _____

If so, describe the method of segregation. _____

D. How are the wastes packaged for disposal (What type of bags, boxes, etc.)? _____

E. Are the waste containers labeled before being removed from the area? _____

If so, describe the method of labeling. _____

F. How many times per day are wastes removed from this area? _____

G. What is the estimated daily poundage of wastes removed? _____

H. Who is responsible for removing wastes from the area, how are wastes transported from the area, and where are the wastes taken?

COMMENTS - PLEASE PROVIDE ANY ADDITIONAL INFORMATION THAT YOU FEEL MAY BE HELPFUL (Use the back of page if necessary).

7. UNUSED SHARPS

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

A. How are the wastes packaged for disposal (What type of bags, boxes, etc.)? _____

B. Are the waste containers labeled before disposal? _____

If so, describe the method of labeling _____

COMMENTS - PLEASE PROVIDE ANY ADDITIONAL INFORMATION THAT YOU FEEL MAY BE HELPFUL.

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APPENDIX C
Facility Manager Survey

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FACILITIES MANAGEMENT SURVEY FORM

This form will be used to compile the following:

- (1) how different types of regulated medical wastes are segregated
- (2) how and where regulated medical wastes are stored before treatment and disposal
- (3) how the regulated medical wastes are packaged and labeled for disposal
- (4) how the regulated medical wastes are disposed

If you have any questions on filling out this form, please call Captain Albrecht or Lt Hedgecock at AV 240-3306.

SIGNATURE OF PERSON FILLING OUT THIS FORM _____

1. How is the medical waste treated and disposed? _____

2. Estimated pounds of medical waste produced per month _____
3. Estimated cost to dispose of medical waste per month _____
4. Is the waste disposed of _____ off-site _____ on-site
5. Are different types of medical waste segregated before treatment or disposal? _____ YES _____ NO _____ SOMETIMES

WHICH ONES? _____

6. If off-site, how is the waste transported to the site?
_____ base personnel _____ contractor

If by contractor, what is the name, address, and the telephone number of the contractor? _____

Is the contractor permitted by the EPA? _____ NO _____ YES

If yes, what is the permit number? _____

7. If the waste is treated off-site, how is it packaged before transporting off-site? _____

Are the containers

- _____ Rigid?
- _____ Leak-resistant?
- _____ Impervious to moisture?
- _____ Of sufficient strength to prevent tearing or bursting under normal conditions of use and handling?
- _____ Sealed to prevent leakage during transport?

8. Are any medical waste containers labeled?

_____ YES _____ NO _____ SOMETIMES

WHICH ONES? _____

What type of information is included on the label? _____

Are the containers marked with the biohazard symbol? _____

9. If the waste is disposed of onsite by incineration, complete the following questions.

Total number of incinerators _____

Age of each incinerator _____

Capacity of each incinerator _____

Permit Number _____

Approximate down time per month _____

Type of stack testing done and frequency _____

Type of ash testing and frequency _____

Operating Cost (including fuel consumption and maintenance) _____

10. Does the hospital have a waste management plan? YES NO

11. Are facilities management employees trained in medical waste management? YES NO SOMETIMES

WHICH ONES? _____

HOW OFTEN? _____

12. Is this medical facility subject to any regulatory requirements other than EPA requirements? YES NO

WHICH ONES? _____

13. Does this medical facility utilize any recordkeeping practices? YES NO SOME

How is this done? _____

14. Does this facility accept any regulated medical waste from sections that are not co-located with the hospital or off-site? YES NO

If yes, list below the facilities and the approximate distances to these facilities and how the waste is transported.s.

SITE

DISTANCE (miles)

TRANSPORTOR

TREATMENT AND DISPOSAL OF MEDICAL WASTES

C	P	B	S	A	I	U
U	A	L	H	N	S	N
L	T	O	A	I	O	U
T	H	O	R	M	L	S
/	O	D	P	A	A	E
S	L	/	S	L	T	D
T	O	P			I	
O	G	R			O	S
C	I	O			N	H
C	C	D				A
K	A					R
	L					P
						S

ONSITE TREATMENT

A. INCINERATION

B. AUTOCLAVING

C. CHEMICAL
TREATMENT

D. GRINDING

E. OTHER

ONSITE DISPOSAL

A. INCINERATION

B. BURNING ONSITE

C. BURIAL ONSITE

D. INTO SEWER OR
SEPTIC TANK

E. OTHER

OFFSITE TREATMENT &
DISPOSAL

A. PICKED UP WITH
OTHER SOLID
WASTE

B. UNDER CONTRACT
WITH MEDICAL
WASTE HAULER

C. TREATED OFFSITE

D. LANDFILLED OFFSITE

E. SENT TO RENDERING
PLANT

F. OTHER

APPENDIX D
Summary of Waste Training

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Training

<u>Section</u>	<u>% Trained</u>	<u>% Reviewed Hospital's Waste Plan</u>	<u>Training Frequency</u>
Aeromedical	85%	0%	Annual
Dental	100%	100%	Quarterly
Emergency	80%	0%	Annual
Lab		Survey Form not returned	
Multiservice Ward		Survey Form not returned	
Pediatrics	100%	75%	Annual
Pharmacy	0%	0%	None
Primary	100%	100%	Annual
Ob Clinic	100%	0%	Annual
Ob Ward	100%	0%	Annual
Surgery		Survey Form not returned	

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APPENDIX E

Summary of Infectious Waste Disposal by Type

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**Disposal of Blood, Pathological,
and Culture Infectious Wastes**

<u>Section</u>	<u>Quantity of Blood Waste</u>	<u>Quantity of Pathological Waste</u>	<u>Quantity of Cultures and Stocks Waste</u>
Aeromedical	None	None	None
Dental	1 lb/day	1 lb/day	None
Emergency	1 lb/day	1 lb/day	None
Lab	Survey Form not returned		
Multiservice Ward	Survey Form not returned		
Pediatrics	None	None	None
Pharmacy	None	None	None
Primary	None	None	None
Ob Clinic	None	None	None
Ob Ward	1 lb/day	1 lb/day	None
Surgery	Survey Form not returned		

**Disposal of Isolation Waste, Used and
Unused Sharps, and Who Transports It**

<u>Section</u>	<u>Quantity of Isolation Waste</u>	<u>Quantity of Used Sharps</u>	<u>Quantity of Unused Sharps</u>	<u>Removed by</u>
Aeromedical	None	1 qt/mo	None	Housekeeping
Dental	Varies	1 lb/day	Included in Sharps	Housekeeping
Emergency	None	10 lb/day	Included in Sharps	Housekeeping
Lab	Survey Form not returned			
Multiservice Ward	Survey Form not returned			
Pediatrics	None	1 qt/mo	None	Housekeeping
Pharmacy	None	1 qt/wk	Included in Sharps	Housekeeping
Primary	None	2 qt/mo	Included in Sharps	Housekeeping
Ob Clinic	None	1 lb/mo	Included in Sharps	Ob-Gyn Clinic
Ob Ward	None	1 lb/mo	Included in Sharps	Housekeeping
Surgery	Survey Form not returned			

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APPENDIX F

Section Activities And Waste Disposal Practices

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This is a section-by-section summary of medical activities, chemical usage and disposal practices, and infectious waste segregation and disposal. Housekeeping personnel transport all infectious waste to the incinerator room for storage. All hazardous material is turned in to medical supply personnel, who transfers it to the acid room for storage until the material is turned in to DRMO.

Section: Aerospace Medicine
Contact: TSgt Kurban

This clinic generates no infectious waste as the majority of their waste is paper. There are sharps containers in all the exam rooms.

Section: Bioenvironmental Engineering Section
Contact: MSgt Siler

This section does no routine water testing because the sewage plant is certified by the state to perform all the water tests. The only samples they run are proficiency samples, and these samples are thrown away. In their laboratory, they use both hydrochloric acid and nitric acid. These chemicals are disposed of in process.

Section: Dental Clinic
Contact: MSgt Mullaly and Sgt Hendrickson

The dental x-ray section takes 100 x-rays in a month. This section uses the silver recovery system in the hospital's x-ray department. Approximately five gallons of used fixer is turned in each month.

The dental laboratory's only hazardous chemical is Vapo-ster from the 15 chemoclaves, chemical sterilizers. The bioenvironmental engineering section classified this chemical as hazardous waste because of its characteristic of ignitability. The chemoclaves are drained approximately once a month producing about one pint Vapo-ster per chemoclave. This waste is then stored in the flammable storage cabinet in central sterile supply until it's turned into DRMO for disposal.

The Dental Clinic treats approximately 200 patients a day. They identify infectious patients by their health history. They should be identified prior to treatment by the hospital. All blood soaked material is red bagged. It is placed on the technicians' trays, and after the patient is treated the trays are brought into the dental clinic's central sterile supply, where they are emptied. On the average only one red bag is generated each day. There are sharps containers in all the treatment rooms. The Dental Clinic personnel wear gloves, masks, and goggles.

Section: Emergency Room
Contact: MSgt Kent

This section treats approximately 40 patients a day and generates less than one red bag a day. Only items that are saturated with blood are considered infectious waste. Personnel wear gloves for evasive procedures and use faceshields for washing instruments.

Section: Facility Management

Contact: Mr Nutini

This section is responsible for the storage, treatment, and disposal of infectious waste. All housekeeping personnel are trained on transporting infectious waste within the facility. The infectious waste is either placed by gloved housekeeping personnel in a cart or hand carried to the incinerator room, where it is stored until it is transported off base. The incinerator room is kept locked but is not posted with a biohazard sign. This room is disinfected at least twice a week. The storage area has a drain which allows any spills to enter the sanitary sewer system.

Section: Laboratory

Contact: SSgt Rebischke

This section also considers anything with body fluids to be infectious. Gloves, carbon paper, and aluminum wrappers from the alcohol swipes were found in the red bag. Approximately 7 to 10 infectious waste bags are filled a day. A 1-quart sharps container is filled every other day.

There were several old chemicals located in the laboratory. If these chemicals are not going to be used, they should be disposed of. Additionally, the laboratory is using xylene which is a listed hazardous waste. It can easily be substituted for. Xyless and amclear are two common substitutes. Ethyl acetate is also a listed hazardous waste. If possible the laboratory should substitute for this chemical. The laboratory personnel are trained on spills.

Section: Medical Supply

Contact: SSgt Flack

Medical Supply is responsible for ordering all the supplies the hospital needs. Although they try to keep minimal amounts of all chemicals available for the hospital, there is no mechanism to verify that each section of the hospital is keeping minimal amounts on hand. Medical supply also doesn't have a method to screen supply requests for hazardous material; they only order what is requested. This causes some problems when the requesters don't know a material is hazardous. For example, the Ob/Gyn Clinic ordered antineoplastic injections, although none of their personnel are trained and the hospital doesn't administer antineoplastic injections.

Medical Supply keeps the flammable and oxidizing agents separate, but they have not informed the fire department where the chemical storage areas are located. There is no spill response plan, just an OI on acid storage. There is protective equipment, gloves and an apron, available in the acid room. No in-service training has been conducted.

Hazardous waste is stored in the acid room in sealed containers. The label indicates the contents and where it was generated, but not the date accumulation began.

Section: Multiservice Ward
Contact: Maj Jardin

This is a 15-bed ward that can expand to 30 beds. The multiservice ward averages eight patients. Usually these patients are from gynecology surgery, but they also treat patients with hypertension, hernias, thyroid problems, diabetes, gallstones, and hemorrhoids. They also occasionally treat pediatric patients with gastroenteritis or pneumonia.

There are two isolation rooms used mainly for patients with respiratory illness. Infectious patients may be admitted to any room without a roommate. The ward uses the CDC guidelines and red bag any infectious waste that is saturated with blood. All IV bags are placed in the trash. There are sharps containers in the patient rooms, and any catheters are placed in them. Red bags are only placed in rooms requiring them. (When this survey was done, there were no patients requiring infectious waste bags.) This ward usually generates two red bags a month.

Section: OB/Gyn Clinic
Contact: TSgt Charpie

This clinic does not generate any infectious waste. The majority of their waste consists of spatulas and exam paper. There are sharps containers in all the treatment rooms. These containers are replaced every six months.

This clinic had ordered an antineoplastic medication, although their personnel have not been trained in administering them and there is no personal protective equipment available. They were planning to use intramuscular injections.

Section: OB Ward
Contact: TSgt Nelson

This is an 8-bed ward that normally has four patients and four babies. They consider everything except diapers to be infectious waste and place it in a red bag. There are sharps containers in all the patients' rooms and two in the nursery.

Section: Pediatrics Clinic
Contact: Mrs Johnson, RN

This clinic treats approximately 80 patients every day. They don't generate any infectious waste. The majority of their waste consists of diapers and exam papers. They give all injections in a central shot area which has a sharps container.

Section: Pharmacy
Contact: Capt Haroldson

The following antineoplastic drugs were found in the pharmacy:

Methotrexate injection	Cyclophospha
Hydroxyurea	Chlorambical
Azathioprine	

The antineoplastic drugs are counted out in a separate counting tray. After the drugs are counted, the pharmacy personnel wash their hands. No gloves are used during this process. The pharmacy was not aware that any antineoplastic drugs were considered hazardous waste. There was no spill response plan for the antineoplastics nor protective equipment available.

The pharmacy issues sharps containers whenever they issue needles to patients. These sharps containers are returned to the pharmacy before more needles are issued to the patients.

The pharmacy issues medication to 500-600 people in 700-1000 procedures each day. They dispose of an 8-gallon sharps container each week. The pharmacy identified two problems: expired medicine can't be incinerated because of the current waste disposal policy, and the pharmacy often receives medication from Medical Supply that is close to expiring.

Section: Primary Care Clinic
Contact: MSgt Schroll

This clinic treats 125-150 patients each day. They generate no infectious waste except sharps. Their waste consists mainly of exam paper, drapes, and spatulas. Sharps containers are in the exam rooms and immunization room. The container in immunization is replaced every two weeks. The other areas use an 8-gallon sharps container which is replaced every six months.

Section: Surgery
Contact: Capt Leksack

The surgery department conducts 50 surgical cases a month. These cases are mostly general surgery, such as hernias and biopsies, and ob-gyn surgery (hysterectomy, c-sections, and laproscopies). The patients should be identified as infectious in their in-patient records before the surgery starts (they don't see the outpatient records).

This department disposes of sponges and drapes as infectious waste if they are bloody. They generate 30 small red bags a month. They have a sharps container on the anesthesia cart and on the wall. They are changed when full, every two to four weeks.

The surgery section also uses formaldehyde, disposed of in process, and gluteraldehyde, disposed of into the sanitary sewer. All surgery personnel are trained on infectious waste and spill cleanup.

Section: X-Ray
Contact: TSgt Parson

The silver recovery system, IRU, has been tested by the Bioenvironmental Engineering Section, but the results are not known yet. The x-ray department uses 20-30 gallons of both fixer and developer. They have recovered 2955 grams of silver in the past six months. (The Dental Clinic turned in 25 gallons of fixer.) X-ray develops approximately 75 films each day. Over the past three months the department has developed 4,460 x-ray films.

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