Ministry of Health

Ministry of Environment

Ministry of Advanced Education, Employment and Labour

SASKATCHEWAN BIOMEDICAL WASTE MANAGEMENT GUIDELINES

February 2008

Government of
Saskatchewan

April, 2008

Dear Biomedical Waste Stakeholder:

We are pleased to advise you that the "Saskatchewan Biomedical Waste Management Guidelines, February 2008" are now available. A copy of these guidelines can be obtained at www.health.gov.sk.ca/biomedical-waste-management. Please share this information with those within your organization or business that are involved with the classifying, handling, storage, transportation or disposal of biomedical wastes.

These guidelines contain updates to various sections and revisions to address recommendations made by an external expert review that was contracted by the Saskatchewan Ministry of Health. A summary of the changes that are included in the February 2008 guidelines is available at www.health.gov.sk.ca/biomedical-waste-management-changes.

The members of the Saskatchewan Biomedical Waste Committee are found within the acknowledgement section of the guidelines and include representatives from various government ministries, Saskatchewan Association of Health Organizations and other agencies with an interest in the handling of biomedical waste. If you require further information regarding the interpretation of these guidelines, please contact an appropriate committee member or one of the agencies indicated on page 20 of the guidelines.

Our government is committed to ensuring biomedical wastes are handled in a manner that protects Saskatchewan people and the environment. We, as deputy ministers responsible for regulations and/or programs relating to the handling and disposal of biomedical waste, support the updated guidelines and encourage you to strive towards the safe management of biomedical wastes.

Sincerely,

Acting Deputy Minister
Saskatchewan Ministry of Health

Deputy Minister
Saskatchewan Ministry of Environment

Deputy Minister
Saskatchewan Ministry of Advanced Education, Employment and Labour

ACKNOWLEDGEMENT

The Saskatchewan Biomedical Waste Management Guidelines were developed under the direction of:

Saskatchewan Ministry of Health Population Health Branch	Tim Macaulay
Saskatchewan Ministry of Environment Environmental Protection Branch	Steve Arnold
Saskatchewan Ministry of Advanced Education, Employment and Labour Occupational Health and Safety Division	Rita Coshan
Saskatchewan Association of Health Organizations	Martine Legare
Regina Qu'Appelle Health Region	Dr. Maurice Hennink, Yvonne Graff, Marjorie Butler
Saskatchewan Practitioners Infection Control	Sarina Clarke
Mamawetan Churchill River, Keewatin Yatthé Health Regions and Athabasca Health Authority - Population Health Unit	Shala Ricklefs
City of Regina	John Harrison

In addition, external reviewers were most important to the process in helping to make the guidelines accurate and practical for implication throughout the province. We thank these individuals for their time and expertise.

TABLE OF CONTENTS

Acronyms - TDGR (Transportation of Dangerous Goods Regulations); WHMIS (Workplace Hazardous Materials Information System).

Agent - A pathogen that can cause human or animal disease including bacteria, mycoplasma, fungi, viruses, parasites and prions.

Biomedical Waste - For the purpose of this document means a portion of medical wastes that requires special precautions due to the waste being: infectious; sharps; cytotoxic; or especially sensitive due to the nature of the waste (i.e., human body parts).

Biomedical Waste Treatment - A process (either in-house or third party) that is capable of disinfecting biomedical waste. The process must be appropriate for the type of biomedical waste that is accepted.

Compactor - A device employed to reduce the volume of wastes both at the site of generation and during the transportation thereof (e.g., garbage compacting trucks).

Decontaminated – Been disinfected.

Disinfection - A chemical or thermal process that provides a 4 log (99.99%) or greater reduction of *Bacillus subtilis* or *Bacillus stearothermophilus.* Disinfection could involve, but is not limited to, such methods as microwaving technology, hydroclaving or autoclaving.

Generator (Consignor) - The facility that produces the waste material.

Halogenated - Refers to a type of plastic that contains halogen atoms such as chlorine or fluorine. Combustion or thermal degradation of these types of plastic materials results in the generation of toxic compounds. Examples of these types of plastic include polyvinyl chloride and fluorocarbon compounds such as Teflon.

Incinerator - An incinerator as defined by "*The Clean Air Act* meets the "Determined Efforts" for PVC and Mercury containing Products used in Saskatchewan Hospitals" (Appendix I) and incorporates the national commitments to reduce the creation of dioxins and furans.

Infectious Substance – A substance known or reasonably expected to contain viable micro-organisms that are known or reasonably expected to cause disease in human beings or animals.

Non-halogenated - Refers to a type of plastic which does not contain atoms of halogens such as chlorine or fluorine. Examples of these types of plastic include polyethylene, polycarbonate and polystyrene.

Receiver (Consignee) - The facility that receives waste material.

Sterilization - A process that kills all microorganisms, including bacteria, viruses and fungi.

Waste Disposal Ground - A waste disposal ground permitted by Saskatchewan Ministry of Environment and meeting the requirements of *The Municipal Refuse Management Regulations,* which also meets the site and requirements for acceptance of treated or untreated biomedical waste that includes dedicating a portion of the site for the disposal of biomedical waste. This does not include a transfer station.

Objective and Rationale

The objective of these guidelines is to provide an approach to the management of human/animal biomedical waste that is safe for the waste handlers, the public and the environment as well as being cost effective and practical.

For decades public health, infection control and occupational health authorities have recognized the need for personnel working in health care facilities to take proper precautions in handling any material that can cause disease or injury. Beyond the occupational risks, public health authorities do not view biomedical waste originating from health care and related facilities as being more hazardous than residential waste. While the real risk is low, it must be recognized that the general public likely perceives biomedical waste as being a serious threat. As a consequence, this set of guidelines has two primary purposes:

1) To reduce the likelihood of workers and the general public contracting a disease or injury from biomedical waste.

2) To educate the public, municipalities and other constituencies about the real and perceived health risk associated with management of biomedical waste.

These guidelines were also developed to:

- address some historical practices used by biomedical waste generators;
- reduce air emissions generated by present incineration and other treatment practices;
- minimize waste generation; and
- ease the implementation of the amended TDGR requirements.

Scope

This document replaces the Saskatchewan Biomedical Waste Mangement Guidelines –March 1998. As these guidelines may change over time, users of the document are advised to check http://www.health.gov.sk.ca/biomedical-waste-management to ensure usage of the most current version. In addition, a summary of changes that are included in the February 2008 version of the guidelines is available at: http://www.health.gov.sk.ca/biomedical-waste-management-changes

The Saskatchewan Biomedical Waste Management Guidelines- February, 2008 are intended to apply only to biomedical waste and not to all wastes generated by a health care or related facility or agency. It describes safe practices for the following processing stages of biomedical wastes: minimization; handling; segregation; containment; storage; transportation and disposal (both on and off-site).

While these guidelines are intended to address human/animal biomedical waste, associated with medical interventions, the principles and practices contained in these guidelines can apply to other facilities that generate biomedical waste. These guidelines apply, but are not limited to, the following types of facilities and operations:

- Biomedical Waste: Haulers, Receivers and Treatment Facilities;
- Blood Banks and Blood Collection Centres;
- Clinical Testing or Research Laboratories;
- Community Health Agencies; (e.g., public health offices, nursing clinics, home care);
- Dentists' Offices and Clinics;
- Emergency Measures Departments, Police, Fire, Ambulance;
- Facilities involved in the Testing or Production of Vaccines;
- Health Care Facilities (e.g., Hospitals, Special Care Homes, Personal Care Homes);
- Home Nursing Services;
- Medical Research and Medical/Health Care Teaching Facilities;
- Mortuaries and Funeral Homes;
- Pharmacies;
- Physicians' Offices and Clinics;
- Pre-hospital Medical Care; and
- Veterinary Facilities.

Regulatory Framework

The disposal of wastes, which includes biomedical wastes, is primarily subject to provincial control within Canada. As such, a number of statutes have evolved within Saskatchewan, which presently either directly or indirectly govern the treatment and disposal of these wastes in the province. These include: *The Environmental Management and Protection Act, 2002*, The Municipal Refuse Management Regulations, The Water Regulations 2002, *The Clean Air Act* and Regulations, The *Occupational Health and Safety Act* and Regulations, The *Transportation of Dangerous Goods "Clear Language Act* and Regulations" and pertinent municipal bylaws. While no direct reference to disposal of waste is made in *The Public Health Act, 1994*, it does provide power to local authorities (i.e., Regional Health Authorities) to abate health hazards, which under certain circumstances could include facility disposal practices. For more information on the legislation/regulations and respective agencies refer to Appendix A.

Municipal or other jurisdictional bylaws can also govern some aspects of the disposal of biomedical wastes at waste disposal grounds or sewer systems. Municipal requirements often vary from one jurisdiction to the next. Generators must establish mutually acceptable arrangements with the respective municipality to ensure that wastes are properly handled and that waste disposal ground operators are trained and equipped to deal with the wastes that are anticipated.

Enforcement

Non-compliance with these guidelines could result in increased liability for the facility and industry. The power to enforce the requirements of the various statutes lies with the ministry responsible for their administration. The following is an overview of each agency's statute penalties section.

Saskatchewan Ministry of Environment

- Persons found in contravention of *The Environmental Management and Protection Act, 2002* and Regulations made pursuant to that Act may be subject on conviction to a fine of not more than $1,000,000, to imprisonment for not more than 3 years, or both. Directors of corporations or organizations are not exempt from penalties under this Act.

- Persons found in contravention of *The Clean Air Act* may be subject to a control order permanently prohibiting emission of air contaminants or specifying certain conditions. Persons failing to meet the requirements of a permit or failing to comply with a control order may be subject on conviction to a fine of not more than $1,000,000, to imprisonment for not more than 3 years, or both.

Saskatchewan Ministry of Highways and Infrastructure

- Persons found in contravention of the *Dangerous Goods Transportation Act* may be subject on conviction to a fine of not more than $50,000 for a first offence and a fine of up to $100,000 for a subsequent offence, to imprisonment for not more than 2 years, or both. Provisions exist for penalties associated with certain sections of this Act as well as maximum value for the first offence. See Appendix J for a summary of these requirements.

Saskatchewan Ministry of Advanced Education, Employment and Labour

- Persons found in contravention of *The Occupational Health and Safety Act* or Regulations may be subject on conviction to a fine up to $300,000, to imprisonment for not more than 2 years, or both. See Appendix B for a summary of these requirements.

Saskatchewan Ministry of Health/Regional Health Authorities

- Persons found in contravention of *The Public Health Act, 1994* may be subject to a fine, in the case of a first offence, of up to $75,000 and to a further fine of up to $100 for each day during which the offence continues and for a second or subsequent offence, a fine of up to $100,000 and a further fine of up to $200 for each day during which the offence continues.

- In the case of a corporation found in contravention of the Act, the corporation may be subject to a fine for a first offence up to $100,000 and to a further fine of up to $1,000 per day during which the offence continues and for a second or subsequent offence, a fine of up to $250,000 and a further fine of up to $5,000 per day during which the offence continues.

Total Health Care Facility Waste

Refers to all waste, biological or non-biological, which is discarded and not intended for further use.

Industrial Waste

Refers to materials such as chemicals, radio-active substances, batteries, metal, wood, etc.

General Waste

Refers to waste that is neither medical nor industrial waste and includes such things as kitchen, ward, office, and maintenance waste.

Medical Waste

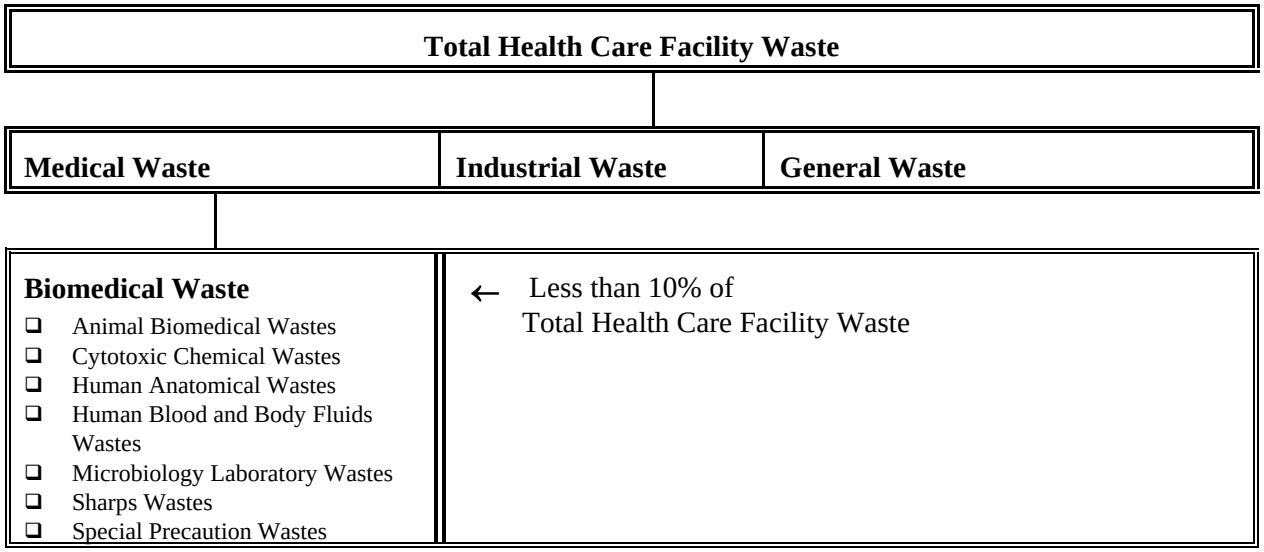
Refers to material generated as a result of the diagnosis or treatment of a patient, such as intravenous tubing or soiled dressings.

Biomedical Waste

Refers to a portion of medical wastes that require special precautions due to the waste being:

a) infectious;
b) sharps;
c) cytotoxic; or
d) especially sensitive due to the nature of the waste (i.e., human body parts).

The waste classes can be illustrated as follows:



Minimizing biomedical waste is the first step in managing wastes safely, responsibly and in a cost effective manner. This management step makes use of reducing, reusing and recycling principles. There are many possible means to minimize the amount of both general waste and biomedical wastes within the health care or related facility.

Waste Segregation

Hazardous wastes (e.g., biomedical wastes that are infectious or toxic) must be segregated from general wastes at the source. This is a regulatory requirement of The Occupational Health and Safety Regulations.

Segregation minimizes the amount of waste requiring special handling and disposal procedures and reduces the overall costs of disposal. Considerable cost offsets can be achieved if the entire waste stream does not have to be treated as biomedical waste. Only a small proportion of the wastes generated at a health care or similar facility is actually biomedical waste. Further segregation of biomedical waste into the following types allows for cost effective disposal:

- Animal Biomedical Wastes;
- Cytotoxic Chemical Wastes;
- Human Anatomical Wastes;
- Human Blood and Body Fluids Wastes;
- Microbiology Laboratory Wastes;
- Sharps Wastes; and
- Special Precaution Wastes.

Product Substitution/Process

Product substitution is another means to reduce the amount of wastes generated by a health care or related facility. Some suggestions include:

- Consider and periodically re-evaluate the potential for substitution of single use/disposable medical and surgical supplies with reusable items. Factors such as patient and worker health protection considerations, cost, convenience, labour, available space and worker acceptance should be a part of the evaluation;

- Consider using products with reduced packaging;

- Consider using suppliers/companies that have a policy of receiving/recycling used goods;

- Encourage the use of products that contain recycled materials and initiate recycling of appropriate general wastes wherever possible;

- Employ containers composed of non-halogenated plastics where incineration of the waste is necessary; and

- Encourage suppliers and manufacturers to develop or use products made from non-halogenated plastics or recycled materials.

Biomedical Waste Treatment

There are many methods available to disinfect biomedical waste that can reduce the amount of waste that is subject to more stringent and costly transportation and disposal requirements. These methods include:

- autoclaving;
- microwave treatment;
- incineration; or
- any other process that provides disinfection to the required level.

Conventional Garbage Compactors (cannot be used for compacting biomedical waste)

Compacting of biomedical waste shall not be done during handling, storage or transportation of the waste as the waste container is often destroyed when compacted, which presents a risk of potential exposure. Compactors may still be used for general wastes.

SECTION 5 - BIOMEDICAL WASTE STORAGE

The following storage requirements apply to all biomedical waste classifications. For information on the storage requirements for specific types of biomedical wastes, refer to Section 6.

The safe storage of hazardous wastes is required by the Occupational Health and Safety Regulations.

Facilities shall determine maximum storage times of refrigerated or frozen biomedical waste based on storage capacity, rate of waste generation, and applicable regulatory requirements.

Contingency plans must be prepared for storing biomedical waste if excess waste is produced, or if either refrigerator, freezer or disposal facilities become inoperative.

Compacting of biomedical waste is prohibited.

Storage Area

After biomedical waste has been collected and moved from its point of generation, it should be held in a storage area that is:

- totally enclosed and separate from supply rooms or food preparation areas;
- lockable and access restricted to authorized personnel only;
- identified as containing biomedical waste with biohazard symbol clearly displayed;
- never used for storage of materials other than waste; **Note:** In cases where the storage area is used for both general and biomedical waste storage, care shall be given to prevent contamination of general waste from biomedical waste;
- permanently marked to prevent recycling as a food storage appliance (as in the case of a domestic-type freezer or cold storage unit);
- kept at a temperature of 4 degrees C or lower for material stored for more than four (4) days; **Note:** For sharps wastes and special precaution wastes storage requirements refer to classifications in Section 6; and,
- thoroughly cleaned, including floors, walls and ceilings, in accordance with the facility's established procedures as established by Infection Control Committee, Biosafety Officer or other appointed persons.

This section describes safe practices for each of the following types of wastes:

- Animal Biomedical Wastes;
- Cytotoxic Chemical Wastes;
- Human Anatomical Wastes;
- Human Blood and Body Fluids Wastes;
- Microbiology Laboratory Wastes;
- Sharps Wastes;
- Special Precaution Wastes.

Animal Biomedical Wastes

Definition

Waste that consists of animal tissues, organs, body parts, carcasses, bedding, fluid blood and blood products, items saturated or dripping with blood, body fluids contaminated with blood and body fluids removed during surgery, treatment, autopsy or for diagnosis that contain or are suspected of containing a pathogen. (This includes agents that are capable of causing a disease listed in Appendix D).

Strategy

This strategy depends on whether these wastes are solid or liquid. Solid Animal Biomedical Wastes can be incinerated on or off-site. Liquid wastes can be disposed of into the sewer without prior disinfection.

In some cases (e.g., during an outbreak of an animal borne disease) the *Health of Animals Act* (Canada), other legislation or guidelines may require additional special disposal procedures. An inspector identified in the above Act has the authority to require disposal by means other than those outlined in these guidelines.

Handling, Packaging, Transportation and Disposal Details

Hazardous wastes (e.g., animal biomedical wastes that is infectious) must be segregated at the point of generation from non-hazardous wastes (e.g., non-pathogenic animal wastes) and should be segregated from other classes of biomedical wastes.

Infectious wastes must be handled using procedures outlined in the written exposure control plan required by The Occupational Health and Safety Regulations (Appendix B).

Animal biomedical wastes can be incinerated or treated by approved biomedical waste treatment on or off-site. Contact your local municipality to confirm that liquid waste can be disposed of into the municipal sewer without prior disinfection. Decontaminated liquid wastes that have been disinfected by an appropriate means can be disposed of into the sewer provided the local municipality approves.

If the waste is transported off-site for incineration or approved biomedical waste treatment the waste packaging should be colour coded orange and labelled with the biohazardous symbol (Appendix E) and marked in accordance with WHMIS and TDGR requirements. The wastes must be transported in accordance with the TDGR (Appendix G).

In the case where the waste is to be incinerated the waste packaging should not consist of halogenated plastics.

Cytotoxic Chemical Wastes

Definition

Wastes containing drugs that inhibit or prevent the functions of cells and are manufactured, sold or represented for use in treating neoplastic or other conditions. This type of waste includes intravenous needles, tubing, syringes used to inject cytotoxic drugs and personal protective equipment that is used when handling cytotoxic drugs.

Strategy

The handling, transportation and disposal of cytotoxic chemical wastes are of concern because of their potential mutagenic, carcinogenic or teratogenic effects.

Strategies for the management of cytotoxic chemical wastes include high temperature incineration, chemical degradation or returning the waste to the supplier.

Handling, Packaging, Transportation and Disposal Details

Cytotoxic chemical wastes must be segregated from non-hazardous wastes and should be separated from other classes of biomedical wastes. These wastes must be handled and disposed of using procedures outlined in the cytotoxic written programs required by The Occupational Health and Safety Regulations (Appendix B).

The primary method for disposing of cytotoxic chemical wastes is high temperature incineration. As there are presently no such facilities in the province, these wastes must be stored and transported to such facilities outside of the province. These wastes should be stored within sealed rigid containers made of non-halogenated materials. The containers should be colour coded red and bear a cytotoxic symbol (Appendix E) and marked in accordance with WHMIS and TDGR requirements. The wastes must ultimately be transported in accordance with the TDGR (Appendix G).

Chemical degradation is an acceptable option for the disposal of small quantities of certain cytotoxic materials. Resources such as the publication “Hazardous Laboratory Chemicals Disposal Guide - Third Edition” (Margaret-Ann Armour) can be consulted for chemical or drug specific methods.

Specific Storage Considerations

Cytotoxic chemical wastes should be stored in a dedicated storage area separate from other types of waste.

Human Anatomical Wastes

Definition

Waste that consists of human tissues, organs and body parts, including those parts that have been preserved, but excludes teeth, hair and nails.

Strategy

Incineration is generally the recommended strategy because of aesthetics and sensitivities associated with the waste, not because they necessarily pose any significant risk to human health.

Handling, Packaging, Transportation and Disposal Details

Human anatomical wastes, primarily for aesthetic reasons, should be segregated at the point of generation from other classes of biomedical and general wastes.

The disinfection of these wastes prior to disposal is not required or recommended. These wastes can be incinerated at existing crematoria or hospital incinerators or buried at a cemetery. Where the wastes are unrecognizable as human anatomical waste, provided that the local municipality approves, these wastes can be disposed at the waste disposal ground. However, prior to doing so, approval will be required from the municipality that operates the waste disposal ground.

The packaging for these wastes should bear the biohazard symbol (Appendix E) and if hazardous must be marked in accordance with WHMIS and TDGR. In cases where the waste is classified as infectious hazardous by the generator and transported off-site, the waste must be segregated from non hazardous waste. Infectious wastes must be handled using infection control procedures outlined in the written exposure control plan required by The Occupational Health and Safety Regulations (Appendix B). Containers should incorporate, where possible, recycled fibre or non-halogenated plastics. Cardboard containers shall not consist of halogenated plastics where disposal is via an incinerator within the province. Containers for human anatomical waste should be colour coded red. No other types of wastes are to be mixed or included with human anatomical wastes.

Specific Storage Considerations

Anatomical waste preserved with formalin or equivalent does not require refrigerated storage.

Human Blood and Body Fluids Wastes

Definition

Waste that consists of fluid blood, blood products and body fluids used for diagnosis or removed during surgery, treatment or autopsy and any other materials that have contacted this waste and are saturated or dripping with blood. (See Appendix J for examples of saturated or non-saturated items).

Strategy

Human blood and body fluids can usually be disposed of into the sanitary sewer. Solids that are saturated and dripping with human blood or other body fluids can be incinerated, or they can be disposed of at a waste disposal ground after biomedical waste treatment.

Handling, Packaging, Transportation and Disposal Details

Human blood and body fluids wastes must be segregated from non-hazardous wastes. In most cases they should be separated from other classes of biomedical wastes. They must be handled, transported and disposed of using the safe handling procedures outlined in the exposure control plan required by Occupational Health and Safety Regulations. They can be disposed of using one of the following methods:

- Liquids can be drained into the sanitary sewer, provided the local municipality approves. If the municipality does not approve, prior chemical disinfection is needed.

- Segregated solids that are saturated and dripping with human blood or body fluids must be labelled as hazardous. They can be incinerated, or they can undergo biomedical waste treatment followed by disposal at a waste disposal ground.

If the waste is to be treated off-site, use a biomedical waste carrier and ensure the waste is transported in accordance with TDGR.

Solid items that are saturated or dripping with blood (e.g., surgical drapes, surgical gowns, sponges, closed drainage tubes and dressings, etc.) should be packaged within yellow containers or plastic bags, which are sturdy enough to withstand the transportation processes (Appendix E). Only non-halogenated containers can be used if the waste is to be incinerated in the province. After treatment, all containers of these waste items must bear a "DECONTAMINATED" label. Despite being decontaminated, these wastes require special handling because of aesthetics and sensitivities associated with the waste. Therefore these wastes must be transported apart from general wastes but may be transported along with other classes of biomedical waste and deposited in a dedicated biomedical waste area within the waste disposal ground**.**

Items that have had contact with blood, exudates or secretions, but are not saturated or dripping with blood, do not require segregation, labelling or special transport and disposal procedures. The following items fall into this category (i.e., not considered biomedical waste) if they are dry: soiled dressings, sponges, surgery drapes, lavage tubes, casts, catheters, disposable pads, disposable gloves, specimen containers, lab coats and aprons. Appendix J provides examples of items that are considered to be human blood and body fluids wastes.

Microbiology Laboratory Wastes

Definition

Waste that consists of all microbiology laboratory cultures (whether positive or negative), stocks or specimens of microorganisms, live or attenuated vaccines, human or animal cell cultures used in research as well as laboratory material that has come into contact with such.

Strategy

Treatment and disposal procedures include incineration or biomedical waste treatment followed by disposal to sanitary sewer for liquids and disposal at a waste disposal ground for solids.

Handling, Packaging, Transportation and Disposal Details

Microbiology laboratory wastes must be segregated at the point of generation from general wastes and labelled as hazardous. Yellow containers with the biohazard symbol should be used (Appendix E). These wastes should be segregated from other classes of biomedical wastes. Infectious wastes, including items used to clean up spills and items contaminated with dried blood, must be handled, transported and disposed of using infectious control procedures outlined in the written plan required by the Occupational Health and Safety Regulations (Appendix B).

Evidence proves that once microbiology laboratory wastes have been properly disinfected they pose less of a hazard than household refuse. However, careful attention must be paid to the treatment methods to ensure that the wastes are in fact "decontaminated" by appropriate biomedical waste treatment. If the waste is disinfected, the waste can be disposed of with general waste provided it is contained in a package that is labelled as decontaminated.

Wastes classified as microbiology laboratory wastes must not include chemical substances that pose a hazard when autoclaved.

If the waste is transported off-site for appropriate biomedical waste treatment or incineration the waste should be packaged in yellow colour-coded container and labelled in accordance with WHMIS and TDGR requirements (Appendix E).

Special Storage Considerations

Microbiology laboratory wastes should be stored in rigid containers with fixed lids of a type determined by the health care facility.

Sharps Wastes

Definition

Waste that consists of any objects that can penetrate the skin or have or are likely to have come in contact with infectious agents. Sharps wastes includes more than the obvious items used in animal or human patient care: hypodermic needles, re-sheathing needles, scalpel blades, lancets, capillary tubes, broken pipettes and medical glassware, broken blood tubes, retorts, and broken culture dishes. It also includes other types of broken or unbroken items that have, or are likely to have, come in contact with infectious agents. Examples of these include slides and cover slips, tubing with the needle still attached, and wooden applicator sticks or other objects that can penetrate skin or plastic disposal bags.

Sharps wastes may also be classified as infectious wastes, regulated medical waste, solid waste, or hazardous chemical waste, depending on the regulatory or other classification system used. However, sharps wastes are universally recognized as requiring stringent regulation for several reasons. They can transmit life-threatening blood borne diseases, or they can be misused (e.g., by drug abusers), cause physical injury, or pose a risk to the environment.

Strategy

The handling and disposal of sharps wastes requires close adherence to universal/standard precautions Canadian Council of Ministers of the Environment - Biomedical Waste Guidelines and TDGR requirements for proper classification. While proper classification is important, a more common concern with sharps wastes is that of physical hazards (needle punctures) to those individuals who handle and or dispose of the sharps wastes. All sharps wastes must be handled and adequately contained to minimize the risk of infectivity. Thus, care and attention must be directed towards the proper handling and packaging of this class of waste.

Note: Appendix F outlines more general guidelines for sharps wastes generated by the general public and small institutional type facilities (e.g., personal care homes).

There are different strategies for identified infectious sharps wastes that can cause serious disease. The disposal strategy is dependant upon whether or not the sharps waste is identified as being infectious sharps wastes. For very severe and highly contagious identified infectious sharps wastes refer to the Special Precautions Wastes section.

Handling, Packaging, Transportation and Disposal Details

All identified infectious sharps wastes are to be separated from other sharps wastes. Identified infectious sharps wastes are of a type identified by a medical personnel as possibly containing a pathogen that can cause serious human disease.

Sharps contaminated with blood or body fluids must be labelled and handled in accordance with the written exposure control plan required by The Occupational Health and Safety Regulations (Appendix B). Containers should be yellow and bear the biohazard or cytotoxic symbol.

All sharps wastes shall be discarded immediately into puncture resistant containers that are located in the immediate vicinity (Appendix E). The container must have a fill line and attention should be given to ensure that the container is not over filled. Safety devices on needles must be activated before disposal. See Needle Safe Devices and Improved Exposure Control Plans at http://www.labour.gov.sk.ca/Default.aspx?DN=72196fd8-e22a-4c95-a0d0-3d4c4aa3d2b0 for more information on the requirement to use needles with safety devices in health care facilities. Needles cannot be bent, broken, cut, or separated from the syringes. Conventional needles, that lack a safety device, must not be recapped prior to disposal.

The final disposal options for sharps wastes are as follows:

Identified Infectious Sharps Wastes:

- Appropriate biomedical waste treatment and then disposal at a dedicated site at a permitted waste disposal ground; and

- Wastes may be collected at a facility (e.g., health facility or a sharps wastes recovery program drop-off site) then transported (in accordance with TDGR requirements) to a biomedical waste treatment facility that is capable of handling this material.

All Other Sharps Wastes:

- Biomedical waste treatment prior to disposal at a waste disposal ground which has a portion of the site dedicated for the disposal of biomedical waste. Care must be taken to ensure that the sharps wastes containers are not subject to direct compacting by heavy equipment;

- At a collection facility (e.g., a health facility that accepts sharps wastes from external sources or a sharps wastes recovery program drop-off site);

- At a waste disposal ground which has a portion of the site dedicated for the disposal of biomedical waste where **immediate** interment of the sharps wastes should take place. Care must be taken to ensure that the sharps wastes containers are not subject to direct compacting by heavy equipment;

- Encapsulating (Appendix C) the sharps wastes and disposal at a waste disposal ground; or

- Where none of the above is available or practical, the generator may arrange with a biomedical waste carrier for transportation in accordance with TDGR to a biomedical waste treatment facility.

Note: When the disposal of biomedical waste is to take place at a Saskatchewan Ministry of Environment permitted waste disposal ground, provided the owner of the disposal ground approves, the generator of wastes shall contact the owner or operator of the waste disposal site to advise them of the planned delivery.

Specific Storage Considerations

Refrigeration of sharps wastes is not necessary.

Special Precaution Wastes

Definition

Waste that includes body wastes, microbiology laboratory wastes, blood and body fluids, dressings, sharps and virtually all other waste types associated with patients or animals where medical personnel have identified that the waste is likely to contain a pathogen that usually produces very serious disease and may be readily transmitted from one individual to another or from animal to human directly or indirectly or by casual contact.

Strategy

Because these wastes can cause very serious and often untreatable human or animal diseases after minimal or casual exposure, it is crucial that they are to be treated in accordance with the most current version of the Laboratory Biosafety Guidelines – Public Health Agency of Canada.

Handling, Packaging and Transportation Details

Special precaution wastes shall be segregated at the point of generation from other classes of biomedical and general wastes. They must be labelled as hazardous. Containers must ensure no leakage and should be colour coded orange and labelled with the biohazard symbol (Appendix E).

Special precaution wastes must be handled using procedures outlined in the written exposure control plan required by the Occupational Health and Safety Regulations (Appendix B).

The following procedures must be followed when disposing of wastes contaminated with these agents:

- All liquid wastes, including bed bath wastes, must be treated by dilution with a sodium hypochlorite (5.25%) solution to a 1:5 ratio. Let stand 24 hours and pour into wide mouth polypropylene containers. These should then be autoclaved and carefully poured into the sanitary sewer system; and

- Needles, syringes and solid laboratory wastes shall be placed in puncture resistant containers, double bagged in autoclave bags, autoclaved and then incinerated. Bagged wastes, where necessary, shall be placed within another suitable container for transport to the approved incinerator.

Where off-site transport for the purposes of incineration is necessary, these wastes shall be packaged and transported in accordance with the TDGR. Because of the potentially serious consequences, special precaution wastes must be transported separately from all other wastes. The liners for the containers shall not consist of halogenated plastics where disposal is via an incinerator within the province.

Special Storage Considerations

Long-term storage of special precaution wastes is not advocated and the generator should arrange for transport as soon as possible to a Saskatchewan Ministry of Environment approved disposal facility for incineration. If immediate removal is not possible, special precaution wastes may be held in storage areas that are refrigerated at 4 degrees C or lower.

BIBLIOGRAPHY

Armour, Margaret-Ann. Hazardous Laboratory Chemicals Disposal – Third
Canadian Council of Ministers of the Environment, 1992, "Guidelines for the Management of Biomedical Waste in Canada", CCME-EPC-WM-42E.

Canadian Society of Hospital Pharmacists, 1991, "Guidelines for Handling and Disposal of Hazardous Pharmaceuticals (Including Cytotoxic Agents)." Toronto, Ontario.

Canadian Standards Association, 1984, "Effective Sterilization in Hospitals by the Steam Process", Rexdale, Ontario, CAN3-Z314.3-M84.

Canadian Standards Association, 1984, "Steam Sterilizers for Hospitals", Rexdale, Ontario, CAN3-Z314.7-M84.

Canadian Standards Association, 1987, "Industrial Sterilization of Medical Devices by the Steam Process", Rexdale, Ontario, CAN3-Z314.4-M87.

Health and Welfare Canada, 1992, "Infection Control Guidelines for Isolation and Precaution Techniques", Bureau of Infection Control. Ministry of Supply and Services, H30-11-6-1E.

Health and Welfare Canada, 1990, "Laboratory Biosafety Guidelines", Medical Research Council of Canada and Laboratory Centre for Disease Control, Health Protection Branch. Ministry of Supply and Services, MR 21-1/1990E.

Ontario Hospital Association, 1982, "A Guide for the Safe Preparation and Disposal of Antineoplastic Agents", Hospital Occupational Health and Safety Services, C82-095327-X.

Saskatchewan Cancer Foundation, 1991, "Guidelines for the Safe Handling and Disposal of Antineoplastic Agents", Regina, Saskatchewan.

Saskatchewan Environment and Resource Management and Saskatchewan Health, 1991, Biomedical Waste Handling and Treatment Study, Volumes 1 and 2" Regina, Saskatchewan.

Saskatchewan Ministry of Advanced Education, Employment and Labour, Occupational Health and Safety Act, 1993, Occupational Health and Safety Regulations.

Transport Canada, 1985, Transportation of Dangerous Goods Act, Chapter T-19, RSC (and the regulations thereto, including amendments).

APPENDIX A
SASKATCHEWAN BIOMEDICAL WASTE WORKING COMMITTEE

Saskatchewan Ministry of Health
Population Health Branch

Saskatchewan Ministry of Environment
Environmental Protection Branch

Saskatchewan Ministry of Advanced Education, Employment and Labour
Occupational Health and Safety Division

Saskatchewan Association of Health Organizations

Regina Qu'Appelle Health Region

Mamawetan Churchill River, Keewatin Yatthé Health Regions and Athabasca Health Authority-
Population Health Unit

Saskatchewan Practitioners Infection Control

City of Regina

For further information regarding the interpretation of these guidelines please contact:

Saskatchewan Ministry of Environment Environmental Protection Branch	(306) 787-6443
Saskatchewan Ministry of Health Population Health Branch	(306) 787-7128
Saskatchewan Ministry of Advanced Education, Employment and Labour Occupational Health and Safety Division	1-800-567-SAFE
Saskatchewan Ministry of Highways & Infrastructure	(306) 787-4801
Saskatchewan Association of Health Organizations	(306) 525-2741
Saskatchewan Practitioners Infection Control	(306) 787-3193

APPENDIX B

SASKATCHEWAN MINISTRY OF ADVANCED EDUCATION, EMPLOYMENT AND LABOUR

OCCUPATIONAL HEALTH AND SAFETY REQUIREMENTS

The following sections of the Occupational Health and Safety Regulations may pertain to biomedical wastes:

- Part XXI, Chemical and Biological Substances
- Section 85, Exposure Control Plan
- Section 471 Cytotoxic Drugs; and
- Section 472, Wastes

Note: The above regulations can be found at www.labour.gov.sk.ca

The following is a summary of the requirements:

Employers must determine and record the hazards associated with exposures of workers to biomedical wastes and provide this information to the workers. The employer should prepare generic material safety data sheets for the different types of hazardous biomedical wastes and make these available to workers and self-employed persons who collect, transport and dispose of hazardous biomedical wastes.

Each type of biomedical waste must be segregated and contained within a secure package or container that holds the contents safely. Containers must be clearly labelled. A label with the biohazard symbol should identify infectious hazardous wastes. Cytotoxic wastes should be labelled with a cytotoxic symbol Appendix E.

There is a requirement to develop and implement safe work procedures and processes for the handling, transporting, storing, and disposing of hazardous wastes. This includes procedures dealing with emergencies such as spills.

Workers who collect, transport or dispose of hazardous wastes must be trained on proper work procedures, emergency procedures (i.e., when there is an accumulation, spill, leak or exposure) and on the use of engineering controls and personal protective equipment. Workers must be familiar with the labelling system being used to distinguish hazardous wastes (Appendix G - Transport Canada, Transportation of Dangerous Goods Regulations - Overview).

Where a worker has been exposed to hazardous waste to an extent that may affect their health or safety, the employer, in consultation with the committee, shall investigate and report on the incident.

The above requirements apply to all hazardous biomedical wastes. There are additional requirements for cytotoxic and infectious wastes.

Cytotoxic Drugs

Where the hazardous waste contains cytotoxic drugs a written program that describes the procedures mentioned above must be prepared by the employer.

The program must be developed in consultation with the Occupational Health Committee or workers where there is no committee, and provided to workers who collect, transport and dispose of cytotoxic drugs.

Infectious Material or Organisms

Where workers are required to handle infectious material or organisms or are likely to have harmful exposure with an infectious material or organisms, the employer must develop and implement a written plan. The plan must identify disease characteristics of infectious material or organisms that may be encountered at work including:

- Ways in which the infectious material or organisms can enter the body and the risks associated with that entry; and
- Signs and symptoms of an infectious disease that may arise after exposure.

The plan must identify:

- workers who may be exposed to infectious material or organisms; and
- the tasks that put workers at risk.

The plan must describe procedures for:

- infection control, including the use of engineering controls and protective equipment;
- spills, leaks or possible exposures involving infectious material or organisms;
- disinfection or disposal of contaminated clothing or equipment;
- investigating and documenting exposure incidents or occurrences of occupationally transmitted infections;
- training workers;
- vaccinations; and
- post exposure follow-up.

The plans must be developed in consultation with the Occupational Health Committee or workers where there is no committee, and provided to workers who collect, transport and dispose of infectious waste. The plan must be reviewed every 2 years and amended where needed.

Autoclaving

Trained personnel using safe and effective techniques must perform Autoclaving of sharps wastes. Hospital infection control staff are generally able to provide sound advice on worker safety concerns while ensuring adequate decontamination methodologies. Careful attention must be paid to the treatment methods to ensure that the wastes are in fact "decontaminated" by the autoclave process. Records of quality assurance tests, such as steri-cheks, and biomedical waste disposal manifests, shall be retained (one year minimum retention is recommended).

Encapsulation

Encapsulation is an alternate method of preparing sharps wastes containers for disposal at a waste disposal ground where biomedical waste treatment and a dedicated biomedical waste area at a waste disposal ground is not an option. Sharps wastes that have been encapsulated can be discarded via the general waste stream at the generator's facility.

A variety of encapsulators are available, such as epoxy, grout, and concrete. However, it is imperative that the encapsulation of sharps wastes for ultimate disposal in a waste disposal ground is consistent with the following criteria, regardless of the encapsulator that is used.

1. The encapsulating mixture must be sufficiently fluid to penetrate the collected sharps to the bottom of the container.

2. The encapsulating mixture must surround ALL the collected sharps wastes.

3. The encapsulating mixture must "set" to a rigid form prior to disposal in a waste disposal ground.

4. The encapsulator must not be of an expanding nature that will burst the sharps wastes container.

Sharps wastes that are encapsulated using these criteria do not have to be specially marked and may be handled in a general waste manner. However, it is recommended that where a dedicated site is used that encapsulation be the preferred method for such sharps wastes containers.

Many waste disposal ground operators use heavy equipment to compact waste material before burial. The purpose of encapsulation is to ensure that individual sharps cannot be freed through an inadvertent bursting of the sharps wastes container through such actions.

APPENDIX D

HEALTH OF ANIMALS ACT (CANADA) - REPORTABLE DISEASES

This list is subject to change please refer to the Canadian Food Inspection Agency http://www.inspection.gc.ca/english/anima/heasan/disemala/guidee.shtml to review the current list of reportable diseases.

Item	Disease
1.	African horse sickness
2.	African swine fever
3.	Anaplasmosis
4.	Anthrax
5.	Bluetongue
6.	Bovine spongiform encephalopathy
7.	Bovine tuberculosis (M. bovis)
8.	Brucellosis
9.	Chronic wasting disease of cervids
10.	Contagious bovine pleuropneumonia
11.	Contagious equine metritis
12.	Cysticercosis
13.	Equine infectious anaemia
14.	Equine piroplasmosis (B. equi and B. caballi)
15.	Foot and mouth disease (FMD)
16.	Fowl typhoid (Salmonella gallinarum)
17.	Highly pathogenic avian influenza
18.	Hog cholera (classical swine fever)
19.	Lumpy skin disease
20.	Newcastle disease
21.	Peste des petits ruminants
22.	Pseudorabies (Aujeszky's disease)
23.	Pullorum disease (S. pullorum)
24.	Rabies
25.	Rift Valley fever
26.	Rinderpest
27.	Scrapie
28.	Sheep and goat pox
29.	Swine vesicular disease
30.	Trichinellosis
31.	Venezuelan equine encephalomyelitis
32.	Vesicular stomatitis

Reusable Containers

Reusable waste containers (e.g., plastic bins) must be made of rigid plastic and able to withstand exposure to the common cleaning agents. They should be colour-coded according to the class of waste for which they are intended and labelled with the biohazard symbol. **Note**: Containers that are designated as single use should not be reused.

Reusable waste containers should be inspected for holes or leaks each time they are emptied and their colour-coding and labelling renewed if necessary. Holes or leaks must be repaired or the waste container replaced.

Reusable waste containers must be disinfected regularly to prevent odours as soon as possible if waste materials leak or spill within the containers.

Sharps Containers

Sharps containers must be sturdy enough to be puncture resistant under normal conditions of use and handling.

The containers should be colour-coded yellow but must be labelled with the biohazard symbol and have lids that can be tightly secured. Sharps containers used for cytotoxic waste must also be properly labelled and identified. If sharps containers are to be autoclaved, they must remain functionally intact at high autoclaving temperatures.

Other useful sharps container features include:

- a fill line and must be sturdy enough to resist puncture under normal conditions of use and handling until the containers are disposed of;
- handles that permit the safe movement of the containers before disposal;
- a means by which unauthorized individuals are prevented from removing items from the container or from removing the container itself;
- a design that allows stacking; and
- a means that allows the container to be attached to medication carts, treatment carts or in ambulance or other mobile applications.

Sharps containers should be conveniently located close to the point of use to reduce the likelihood of injury. They should not be filled to more than three-quarters of their useable volume in order to prevent injuries due to overfilling. Sharps should never be forcibly pushed into the container. Sharps containers should not be filled or partially filled with a liquid disinfectant solution.

Plastic Waste - Holding Bags

The plastic waste-holding bag shall be sturdy enough to resist puncture under conditions of use and to the point of disposal. Each facility should fully test and evaluate the bags under actual conditions used.

Plastic waste-holding bags must be labelled and should be colour-coded.

Note: For the purposes of in-house collection and movement of waste, it is inappropriate to specify a minimum thickness of plastic bags or plastic sharps wastes containers as plastic materials vary extensively in their physical and mechanical properties. A 25.4 micrometer thick film of one plastic material may be more resistant to puncture, impact, and abrasion than a 50.8 micrometer thick film of a different plastic material. The properties can be further affected by the manufacturing process (i.e., extrusion versus injection moulding).

Cardboard Containers

Cardboard containers should be colour-coded and must be labelled with the biohazard symbol; rigid; closeable; leak-resistant; capable of being sealed.

Note: If cardboard containers are to be shipped off-site and are not to be supplemented with an additional outer packaging meeting the requirements of Transportation of Dangerous Goods Regulations, then the cardboard container itself must meet the requirements of the regulations.

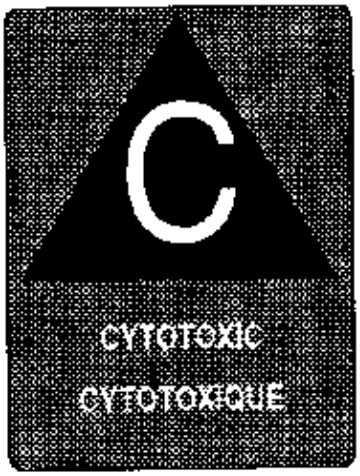
PACKAGING OF BIOMEDICAL WASTES

(Note: The following is taken from CSA Standards Z317.10-01 and CSA Z316.6-02 and is a guideline only)

Waste Class	Colour-Coding	Labelling
Animal Biomedical Wastes	Orange or Red	Biohazard Symbol
Cytotoxic Chemical Waste	Red	Biohazard and Cytotoxic Symbols
Human Anatomical Wastes	Red	Biohazard Symbol
Human Blood and Body Fluids Wastes	Yellow	Biohazard Symbol
Microbiology Laboratory Wastes	Yellow	Biohazard Symbol
Sharps Wastes	Yellow	Biohazard and Cytotoxic Symbols (when necessary)
Special Precaution Wastes	Orange	Biohazard Symbol

Labelling Symbols

Biohazard Symbol



Cytotoxic Symbol

APPENDIX F-1

GUIDELINES FOR DISPOSAL OF SHARPS WASTES FOR SMALL INSTITUTIONAL TYPE FACILITIES AND AGRICULTURAL LIVESTOCK OPERATIONS

Objective

The objective of this guideline is to provide an approach to the management of sharps wastes generated at small institutional type facilities (e.g., personal care homes) and agricultural livestock operations that will protect waste handlers and the public from exposure to infectious waste or injury caused by sharps wastes.

Handling, Packaging and Disposal Details

Sharps wastes should be properly contained in a puncture resistant container that is colour-coded yellow, and is labelled with a biohazard symbol and secured with a tightly fitted lid (Appendix E). Approved containers can be purchased through those health regions that provide sharps wastes handling and disposal programs and some local pharmacies.

Generators of sharps wastes should dispose of sharps wastes at an approved collection facility such as:

- a health facility that accepts sharps wastes from external sources (contact your local health region for information on participating facilities);

- a sharps wastes recovery program drop-off site. (Many pharmacies participate in this program. Contact the Saskatchewan Pharmaceutical Association for information on participating pharmacies). Note: Livestock operators are encouraged to collaborate with participating pharmacies to ensure proper disposal of sharps wastes.

OR

- Where neither option is available, wastes may be transported to a waste disposal ground where immediate interment of the sharps wastes should take place; if immediate interment does not take place, the sharps wastes must be encapsulated (Appendix C) prior to disposal. In both cases care must be taken to ensure that the sharps wastes containers are not subject to direct compacting by heavy equipment.

APPENDIX F-2

GUIDELINES FOR DISPOSAL OF SHARPS WASTES FOR THE GENERAL PUBLIC

Objective

The objective of this guideline is to provide an approach to the management of sharps wastes generated at private homes (e.g. diabetics) or those found within the community (e.g. on streets or within parks and playground areas), which are not specifically covered by the Saskatchewan Biomedical Waste Management Guidelines.

Handling, Packaging and Disposal Details

To prevent risk to the pubic and waste handlers two options are offered for handling, packaging and disposal of sharps wastes of this type.

Option One (Preferred Option)

Sharps wastes should be properly contained in a puncture resistant container that is colour-coded yellow, and is labelled with a biohazard symbol and secured with a tightly fitted lid (Appendix E). Approved containers can be purchased through those health regions that provide sharps wastes handling and disposal programs and some local pharmacies.

Generators of sharps wastes should dispose of sharps wastes at an approved collection facility such as:

- a health facility that accepts sharps wastes from external sources (contact your local health region for information on participating facilities);

- a sharps wastes recovery program drop-off site. (Many pharmacies participate in this program. Contact the Saskatchewan Pharmaceutical Association for information on participating pharmacies).

OR

- Where the collection facilities are not readily available, wastes may be transported to a waste disposal ground where immediate interment of the sharps wastes should take place; if immediate interment does not take place, the sharps wastes must be encapsulated (Appendix C) prior to disposal. In both cases care must be taken to ensure that the sharps wastes containers are not subject to direct compacting by heavy equipment.

Option Two

Where it is not practical to follow Option One, a non-puncture resistant container made of thick opaque plastic (e.g. bleach bottle) can be used for disposing of the sharps wastes. Only fill the container ¾ full. Screw top on tightly, secure top with tape and place into garbage bag for disposal with household garbage.

To classify waste as infectious, the consignor must reasonably believe that the waste is infectious or likely to be infectious at the time of transport.

The TDG regulations, Part 1, section 1.4 Definitions, provides the following:
Infectious substance - Means a substance known or reasonably believed to contain viable micro-organisms such as bacteria, viruses, rickettsia, parasites, fungi and other agents such as prions that are know or reasonably believed to cause disease in humans or animals and that are listed in Appendix 3 Part 2, Classification, or that exhibit characteristics similar to a substance listed in Appendix 3.

Infectious substances are separated into **infectious substance categories**.

- Category A- high risk
- Category B- low risk

The consignor must determine the category through one of the following:

- by using the classification criteria in Part 2.36 of the TDG regulations;
- by finding the name of the microorganism in Part 2, Appendix 3, Guide to Category A and B Assignment;
- by determining that the microorganism has similarities to one of those listed in Part 2, Appendix 3, Guide to Category A and B Assignment.

Further assistance may be obtained from the Director, Office of Laboratory Security, Health Canada or from the Director Biohazard Containment and Safety, Canadian Food Inspection Agency.

Please refer to the Transport Canada Website (www.tc.gc.ca) to review the current category assignment guide of infectious biological organisms.

Disposal And Management Of Biomedical Waste For Waste Disposal Grounds

This fact sheet outlines disposal methods for the portion of biomedical waste identified by the Saskatchewan Biomedical Waste Management Guidelines as acceptable for disposal, without treatment, at a waste disposal ground. Additional conditions may be specified in a facility's permit to operate issued pursuant to The Municipal Refuse Management Regulations. The Saskatchewan Biomedical Waste Management Guidelines can be found at www.environment.sk.ca under Programs and Services/Waste Management.

The guidelines identify unrecognizable human anatomical waste, dried items that have been in contact with human blood and body fluids and sharps (other than identified infectious sharps) as biomedical waste that can be disposed of at a waste disposal ground without prior treatment. Human blood, body fluids and microbiological laboratory wastes that have been treated in a waste treatment facility can also be disposed of at a waste disposal ground. This fact sheet does **not** apply to encapsulated biomedical waste.

In order to accept biomedical waste without prior treatment at a waste disposal ground the operator of the facility should meet the requirements outlined in the Saskatchewan Biomedical Waste Management Guidelines. The following procedures should also be followed:

1) The operator/owner of the waste disposal ground and the generator of the biomedical waste should enter into an agreement that outlines disposal procedures and schedules.
2) A pit should be excavated in a dedicated area of the waste disposal ground. It should be separate from the working face and inaccessible to the public.
3) The biomedical waste should be transported separately from general wastes. Segregation is needed to ensure the biomedical waste is placed in a designated area and is not directly compacted.
4) The biomedical waste should be placed in the pit and immediately covered with sufficient soil after each disposition. Compaction of the material should be minimized and conducted only after sufficient cover has been deposited.
5) A record should be kept of the biomedical waste accepted and disposed of. The record should include the type materials disposed of and its location in the waste disposal ground. Records should be maintained for the life of the facility and considered in any proposal for closure.

There are a number of requirements the operator should incorporate into the design and operation of the waste disposal ground before accepting this material. They include:

- providing an all weather access to the site and working areas for waste delivery and site vehicles.
- supervising the site to control the deposition of waste.
- providing a segregation area for biomedical waste with a record of the volumes accepted, generator names and the locations of the deposition sites.
- surface and ground water control.
- maintain a compact, but adequately sized, site to ensure the material is covered after deposition. construct a final cover after each phase of the waste disposal ground is completed to ensure the integrity of the waste disposal ground.

Contact a local Ministry of Environment Environmental Project Officer for more information.

Saskatchewan Ministry of Environment

www.environment.sk.ca

EPB 306 Feb/08

"Determined Efforts" For Polyvinyl Chloride (PVC) And Mercury Containing Products Used In Saskatchewan Hospitals

Background:

Hospital waste incinerators have been identified as a source of toxic air pollutants such as mercury, dioxins and furans. However, waste minimization and segregation, source reduction, recycling and other pollution prevention techniques can effectively reduce or eliminate the release of air pollutants.

Saskatchewan's overall approach to managing mercury, dioxin and furan emissions from existing waste incineration facilities is to incorporate the Canada-wide Standards for Dioxins and Furans into the conditions of permits to operate issued under Saskatchewan's Clean Air Act and Clean Air Regulations.

Hospital waste incinerators in Saskatchewan are small, with a capacity of less than 120 tonnes per year. The Canada-wide Standard allows small incinerators to choose between pollution control upgrading and stack testing or "determined efforts" which includes mercury diversion planning and waste audits. "Determined efforts" is the preferred choice for small facilities. This Saskatchewan Ministry of Environment fact sheet describes how small facilities can use "determined efforts" to comply with the Canada-wide Standard.

"Determined Efforts" for Mercury:
"Determined efforts" for mercury are best management practices that have been found to effectively prevent the release of mercury into the environment. By implementing "determined efforts" Saskatchewan hospitals can help to avoid the future need for increased regulations. The preferred best management practice is to replace mercury-containing products with a mercury-free product. The mercury-containing waste product would then be disposed of through recycling or through disposal at an out-of-province hazardous waste landfill. Disposal at an out-of-province landfill requires prior approval from the receiving jurisdiction. It may not be possible to replace all of the hospital's mercury products at once or there may not be a substitute that is considered reliable and cost-effective. In this case, best management practices are effective procedures for handling and recycling or disposing of the mercury-containing products. Best management practices should include:

- using Eco-procurement or Environmentally Responsible Procurement which involves adjusting purchasing actions and policies to integrate cradle-to-grave environmental factors with performance, cost, safety and other factors. This ensures that environmental impacts and legislation are considered when purchasing goods, services, construction and maintenance work.
- Extended Producer Responsibility should be considered when buying equipment and/or material that may produce mercury waste and result in dioxin or furan formation.
- access to manufacturers of hospital instruments and/or chemicals that have a collection and recycle program in place.
- access to a waste management company that recovers or disposes of mercury.

Other best management practices may include the treatment and disposal of mercury to a hazardous waste landfill.

Mercury-containing products include medical instruments, clinical laboratory chemicals, electrical equipment and cleaning solutions. Below is a list of products that should be managed according to the above practices.

- ***Fever Thermometers -*** Mercury thermometers should be replaced with mercury-free thermometers at the end of their useful lives.

- ***Gastrointestinal Tubes -*** Gastrointestinal tubes typically have expiration dates after which their use must be discontinued. Collecting, recycling or disposing of mercury-containing tubes should be considered.

Saskatchewan Ministry of Environment

www.environment.sk.ca

EPB 255 Feb/08

● ***Sphygmomanometers -*** Mercury spilled when refilling this apparatus or recovered from an instrument that is being replaced should be collected, recycled or disposed of by using best management practices. Some spills may require the services of a professional clean up firm which could prove to be expensive. Options to prevent spills, such as replacing mercury-containing equipment with a mercury-free alternative, may prove cost effective.

● ***Laboratory Chemicals -*** Whenever laboratories use mercury-containing chemicals, there is the potential for mercury to be released into the environment. There should be a phase-out of all non-essential uses of mercury in laboratories and, unless there is no alternative, mercury-containing compounds that are used in clinical, research and teaching laboratories should be eliminated. It is also recommended that all nonessential mercury devices such as thermometers and barometers be replaced. Laboratories and storage areas should be cleared of all unnecessary mercury compounds.

● ***Batteries -*** Recycling batteries is the preferred choice for managing this product. This may occur where some battery manufacturers or recycling corporations offer recycling programs for mercuric oxide batteries. The Saskatchewan Waste Reduction Council has a number of collectors listed for the management of waste batteries. This list maybe obtained at www.saskwastereduction.ca.

● ***Lamps –*** Buy fluorescent and high intensity discharge lamps and purchase that have low mercury content and a long lifespan. Lamp manufacturers have been working to reduce the amount of mercury in fluorescent lamps. Some lamps are now low enough in mercury content to be considered non-hazardous for waste recycling and disposal purposes. Use these lamps as replacement lamps for existing fluorescent lamps. Replaced lamps should be collected and forwarded to a collection depot. Avoid breaking lamps containing mercury.

● ***Electrical Equipment –*** If there is a question about the mercury content of used electrical equipment destined for recycling or disposal contact the manufacturer for more information. Mercury switches or thermostats should be removed and recycled.

● ***Thermostat Probes in Gas Appliances -*** Remove and recycle thermostat probes.

● ***Industrial Thermometers –*** During construction and renovations, consider retrofitting or replacing heating or cooling systems with mercury-free thermometers. Recycle or properly dispose of the old thermometers.

"Determined efforts" for Polyvinyl Chloride (PVC):
Polyvinyl chloride's cost effectiveness, flexibility and optical properties make it the most commonly used polymer in the production of plastic hospital products. However, incinerating waste PVC products can result in dioxins and furans being released into the environment. The following products should be diverted from the incinerator waste stream and recycled or disposed of in a municipal landfill.

Basins	Inflatable splints	Respiratory therapy products
Bedpans	IV containers	Stationery supplies
Blood bags	Lab equipment	Thermal blankets
Catheters	Medical gloves	Tubing
Drip chambers	Packaging	
Enteral feeding devices	Patient ID bracelets	Any other items which
Hemodialysis equipment		may include polyvinyl chloride

Note: Some or all of these products are considered medical and, more specifically, biomedical waste. Therefore, these products should not be incinerated. They should be segregated, handled, packaged, transported and disposed of according to the Saskatchewan Biomedical Waste Management Guidelines. These guidelines may be viewed at: www.environment.gov.sk.ca under Programs & Services/Waste Management.

References

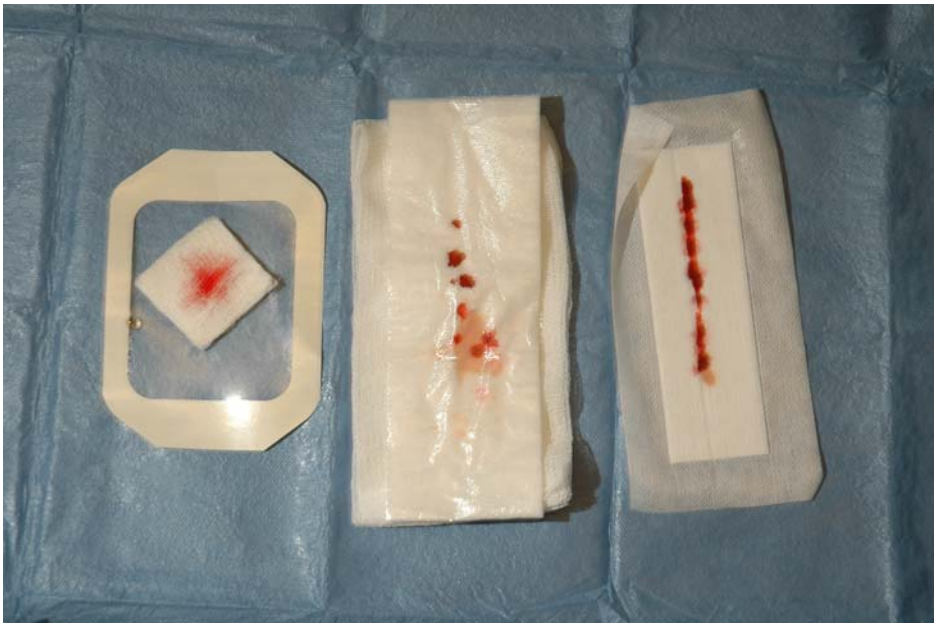
1. *Going Green: A Resource Kit for Pollution Prevention in Health Care*. Washington DC: Health Care Without Harm. Website: www.noharm.org

2. *Best Management Practices for Mercury-containing Products in the Hospital*. Lowell, Ma: Lowell Centre for Sustainable Production. Website: www.sustainablehospitals.org

APPENDIX J
EXAMPLES OF ITEMS THAT ARE SATURATED OR NON-SATURATED AND ITEMS THAT HAVE COME INTO CONTACT WITH BLOOD AND BODY FLUIDS.

NOTE: USERS OF PRINTED BLACK AND WHITE COPIES OF THIS GUIDELINE CAN VIEW THE ENTIRE GUIDELINE WITH COLOUR FIGURES AT
http://www.health.gov.sk.ca/biomedical-waste-management

FIGURE 1



Examples of dressings with minimal dried blood. This would be acceptable for general waste.

FIGURE 2

Example of sponges used for prepping a patient or surgery. The solution is a disinfectant. This would not be considered biomedical waste. The sponges do not have blood or body fluids on them.

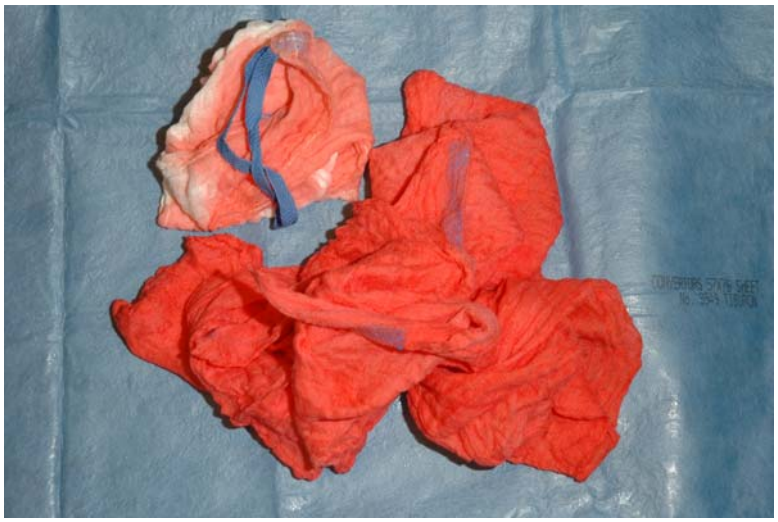
FIGURE 3 & 4

Examples of suction canisters with blood and body fluids, which are considered to be biomedical waste.

FIGURE 5

Example of gloves with minimal blood residue, which are considered to be general waste.

FIGURE 6



Items are saturated with blood and are considered biomedical waste.

Figure 7

See note below Figure 8

Figure 8

Figures 7 and 8 show canisters or similar that are considered to be non-biomedical waste when they:

- contain only a trace amount of blood in diluted form;
- are of a closed circuit type and cannot open easily; and
- do not contain a fluid that has been classified as being infectious.

However, because of aesthetic and sensitivities associated with containers that have remnants of blood, owners/operators of waste disposal grounds may require these items to be disposed in accordance with the Human Bloods and Body Fluids Wastes disposal details. Generators of these wastes should obtain the approval of the owner of the waste disposal grounds before disposing with general waste that is destined to the waste disposal grounds.

Note: When in doubt, it is recommended that waste of this type be considered to be biomedical waste.