

# **GUIDELINES FOR THE MANAGEMENT OF BIOMEDICAL WASTE IN YUKON**

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## PART 1. OBJECTIVE AND SCOPE

### 1.1 Objective

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

These guidelines were also developed to:

- address 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 federal *Transportation of Dangerous Goods Regulation* requirements.

## 1.2 Scope

This guideline is 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 stages of biomedical waste processing: minimization; handling; segregation; containment; storage; transportation and disposal (both on- and off-site).

While this guideline is intended to address human/animal biomedical waste associated with medical interventions, the principles and practices contained within can apply to other facilities that generate biomedical waste.

This guideline applies to, but is 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.

## PART 2. REGULATORY FRAMEWORK

The disposal of wastes, which includes biomedical wastes, is primarily subject to provincial/territorial control within Canada. A number of regulations under Yukon's *Environment Act* either directly or indirectly regulate the treatment and disposal of these wastes in the territory. These include the *Air Emissions Regulations*, *Special Waste Regulations*, and *Solid Waste Regulations*.

Under the *Special Waste Regulations*, a special waste permit is required to generate, handle or dispose of special wastes. However, under subsection 7(2), the requirement to obtain a special waste permit does not apply to a person who only generates biomedical waste. Under subsection 7(1), a person who releases, transports, handles or disposes of biomedical waste may establish a defence that they did so in accordance with these Guidelines.

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.

## PART 3. WASTE MINIMIZATION

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 ways to minimize the amount of both general waste and biomedical wastes within the health care or related facility.

### 3.1 Pollution Prevention

Facilities accepting and treating biomedical waste from other generators will be required to submit a pollution prevention plan to the Environmental Programs Branch for approval. This plan must include, but is not limited to:

- a) a detailed assessment of current waste disposal practices, including types of waste generated, the approximate mass of each waste type treated (by incineration, hydroclave, autoclave), and current waste handling procedures; and
- b) steps that will be taken to reduce toxic emissions from the incinerator (for example, development of a waste management strategy, installation of emissions controls, equipment upgrades, etc.).

The pollution prevention plan must be implemented within three months of approval. Following one year of the implementation date, the permittee shall conduct one of the following measures, as applicable based on waste treatment method, to demonstrate the effectiveness of the pollution prevention plan:

- a) an audit of the waste diversion program that has been implemented to reduce the amount of waste being incinerated; or
- b) pollution control upgrading; or
- c) one-time stack test to determine the level of particulate matter, dioxins/furans and mercury in the emissions from the source; or
- d) other measures as directed by an environmental protection officer from the Branch.

### 3.2 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.

### 3.3 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.

### 3.4 Conventional Garbage Compactors

Compacting of biomedical waste should 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.

## PART 4. WASTE SEGREGATION

Special (i.e. hazardous) wastes must be segregated and stored according to the requirements of permits issued under the *Special Waste Regulations* and/or these Guidelines.

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.

#### 4.1 Biomedical Waste Storage

The following storage requirements apply to all biomedical waste classifications.

Facilities should 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 refrigerator, freezer or disposal facilities become inoperative.

Compacting of biomedical waste is prohibited.

#### 4.2 Storage Areas

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 the 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 should 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.

## PART 5. BIOMEDICAL WASTE TREATMENT AND DISPOSAL BY CLASSIFICATION

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; and
- Special precaution wastes.

### 5.1 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 A).

Strategy: The management 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), or other legislation or guidelines may require additional special disposal procedures. An environmental protection officer 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 are 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 a written exposure control plan (Part 6.1).

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

biohazard symbol (Appendix B) and marked in accordance with WHMIS and TDGR requirements. The wastes must be transported in accordance with the TDGR.

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

## 5.2 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 outlined in Part 6.1.

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

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.

## 5.3 Human Anatomical Wastes

Definition: Waste that consists of human tissues, organs and body parts, including those parts that have been preserved, but excluding 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 site. However, prior to doing so, approval will be required from the municipality that operates the waste disposal site.

The packaging for these wastes should bear the biohazard symbol (Appendix B) 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 (Part 6.1). Containers should incorporate, where possible, recycled fibre or non-halogenated plastics. Cardboard containers should not consist of halogenated plastics where disposal is via an incinerator within the territory. 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.

#### 5.4 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.

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 site after biomedical waste treatment.

Handling, Packaging, Transportation and Disposal Details: Human blood and body fluid 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 below.

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 labeled as hazardous. They can be incinerated, or they can undergo biomedical waste treatment followed by disposal at a waste disposal site.

If the waste is to be treated off-site, use a permitted 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 B). Only non-halogenated containers should be used if the waste is to be incinerated. 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 site.

Items that have had contact with blood, exudates or secretions, but are not saturated or dripping with blood, do not require segregation, labeling or special transport and disposal procedures. The following items are 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.

## 5.5 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 site for solids.

Handling, Packaging, Transportation and Disposal Details: Microbiology laboratory wastes must be segregated at the point of generation from general wastes and labeled as hazardous. Yellow containers with the biohazard symbol should be used (Appendix

B). 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 (Part 6.1).

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 labeled 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 containers and labeled in accordance with WHMIS and TDGR requirements (Appendix B).

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

## 5.6 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 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.

There are different strategies for identified infectious sharps wastes that can cause serious disease. The disposal strategy is dependent upon whether or not the sharps waste is identified as being infectious sharps waste. For very severe and highly contagious identified infectious sharps waste 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 labeled and handled in accordance with the written exposure control plan (Part 6.1). Containers should be yellow and bear the biohazard or cytotoxic symbol.

All sharps wastes must be discarded immediately into puncture-resistant containers that are located in the immediate vicinity. The container must have a fill line and attention should be given to ensure that the container is not overfilled. Safety devices on needles must be activated before disposal. 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 area of a permitted waste disposal site; 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 site where an area is 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);
- Encapsulating (Part 6.3) the sharps wastes and disposal at a waste disposal site; 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 permitted waste disposal site, provided the owner of the disposal site approves, the generator of wastes shall contact the owner or operator of the waste disposal site to advise them of the planned delivery.

### 5.7 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 labeled as hazardous. Containers must ensure no leakage and should be colour-coded orange and labeled with the biohazard symbol (Appendix B).

Special precaution wastes must be handled using procedures outlined in the written exposure control plan (Part 6.1).

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 in 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 territory.

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 an 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.

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 labeled. A label with the biohazard symbol should identify infectious hazardous wastes. Cytotoxic wastes should be labeled with a cytotoxic symbol (Appendix B).

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 labeling system being used to distinguish hazardous wastes (Part 9 - 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 Occupational Health Committee at that facility, 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.

### 5.8 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 workers, and provided to all workers who collect, transport and dispose of cytotoxic drugs.

## PART 6. INFECTIOUS MATERIAL HANDLING

Where workers are required to handle infectious material or organisms or are likely to have harmful exposure to an infectious material or organisms, the employer must develop and implement a written plan.

### 6.1 Infectious Material Handling/Exposure Control Plan

The plan must include the following:

1. Identify disease characteristics of infectious material or organisms that may be encountered at work including:
  - a) ways in which the infectious material or organisms can enter the body and the risks associated with that entry; and
  - b) signs and symptoms of an infectious disease that may arise after exposure.
2. identify workers who may be exposed to infectious material or organisms, and tasks that may put workers at risk.
3. Describe procedures for:
  - a) Infection control, including the use of engineering controls and protective equipment;
  - b) Spills, leaks or possible exposures involving infectious material or organisms;

- c) Disinfection or disposal of contaminated clothing or equipment;
- d) Investigating and documenting exposure incidents or occurrences of occupationally transmitted infections;
- e) Training works;
- f) Vaccinations;
- g) 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.

## 6.2 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-checks, and biomedical waste disposal manifests, shall be retained (three year minimum retention is recommended).

## 6.3 Encapsulation

Encapsulation is an alternate method of preparing sharps wastes containers for disposal at a waste disposal site where biomedical waste treatment and a dedicated biomedical waste area at a waste disposal site 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 at a waste disposal site is consistent with the following criteria, regardless of the encapsulator that is used:

1. The encapsulating mixture must be sufficiently fluid to surround ALL the collected sharps wastes.
3. The encapsulating mixture must "set" to a rigid form prior to disposal at a waste disposal site.
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 encapsulation be the preferred method for such sharps wastes containers when a dedicated site is not available.

Many waste disposal site 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.

#### 6.4 Reusable Containers

Reusable waste containers (e.g., plastic bins) must be made of rigid plastic and able to withstand exposure to common cleaning agents. They should be colour-coded according to the class of waste for which they are intended and labeled 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 labeling 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.

#### 6.5 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 labeled with the biohazard symbol and have lids that can be tightly secured. Sharps containers used for cytotoxic waste must also be properly labeled and identified. If sharps containers are to be autoclaved, they must remain functionally intact at high autoclaving temperatures.

Other useful sharps container features include:

- 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.

#### 6.6 Plastic Waste-Holding Bags

Plastic waste-holding bags must 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.

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).

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

#### 6.7 Cardboard Containers

Cardboard containers should be colour-coded and must be labeled with the biohazard symbol; rigid; closeable; leak-resistant; and 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.

## PART 7. GUIDELINES FOR DISPOSAL OF SHARPS WASTES FOR SMALL INSTITUTIONAL TYPE FACILITIES AND AGRICULTURAL LIVESTOCK OPERATIONS

### 7.1 Objective

The objective of this section 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.

### 7.2 Handling, Packaging and Disposal Details

Sharps wastes should be properly contained in a puncture-resistant container that is colour-coded yellow, and is labeled with a biohazard symbol (Appendix B) and secured with a tightly fitted lid. Approved containers can be purchased through some health

agencies 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 the Department of Health & Social Services or your local health centre for information on participating facilities);
- a sharps wastes recovery program drop-off site. (Many pharmacies participate in this program.) 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 site where immediate interment of the sharps wastes will take place; if immediate interment does not take place, the sharps wastes must be encapsulated (Part 6) 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.

## PART 8 .GUIDELINES FOR DISPOSAL OF SHARPS WASTES FOR THE GENERAL PUBLIC

### 8.1 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 Yukon's Biomedical Waste Management Guideline.

### 8.2 Handling, Packaging and Disposal Details

To prevent risk to the public 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 labeled with a biohazard symbol and secured with a tightly fitted lid (Appendix B). Approved containers can be purchased through some health agencies 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 the Department of Health & Social Services or your local health centre for information on participating facilities);
- a sharps wastes recovery program drop-off site (e.g. participating pharmacies); or,
- where the collection facilities are not readily available, wastes may be transported to a waste disposal site where immediate interment of the sharps wastes will take place; if immediate interment does not take place, the sharps wastes must be encapsulated (Part 6) 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  $\frac{3}{4}$  full. Screw the top on tightly, secure the top with tape and transfer containers to the nearest General Hospital or healthcare facility in the Yukon.

## PART 9: REGULATIONS OVERVIEW: TRANSPORTATION OF DANGEROUS GOODS REGULATIONS

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 known 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](http://www.tc.gc.ca)) to review the current category assignment guide of infectious biological organisms.

## PART 10. GLOSSARY OF TERMS

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

Biomedical waste – the following wastes, other than those generated from building maintenance, office administration or food preparation and consumption, that are generated by human or animal health care establishments, medical, health care or veterinary teaching or research establishments, health care teaching establishments, clinical laboratories or facilities that test or produce vaccines and needle and syringe exchange programs:

- a) human tissues, organs or body parts, excluding teeth, hair or nails;
- b) human blood or blood products;
- c) human bodily fluids that are contaminated with blood;
- d) human bodily fluids removed in the course of autopsy, treatment, or surgery for diagnosis;
- e) animal tissues, organs, body parts or carcasses, excluding teeth, nails, hair, bristles, feathers, horns and hooves, resulting from the treatment of an animal for contamination or suspected contamination with one or more of the agents set out in paragraph 2.36(a) or (b) of the Transportation of Dangerous Goods Regulations;
- f) animal blood or blood products resulting from the treatment of an animal for contamination or suspected contamination with one or more of the agents set out in paragraph 2.36(a) or (b) of the Transportation of Dangerous Goods Regulations;
- g) animal body fluids that are visibly contaminated with animal blood and that result from the treatment of an animal for contamination or suspected contamination with one or more of the agents set out in paragraph 2.36(a) or (b) of the Transportation of Dangerous Goods Regulations;

- h) animal body fluids removed in the course of surgery, treatment or necropsy, and that result from the treatment of an animal for contamination or suspected contamination with one or more of the agents set out in paragraph 2.36(a) or (b) of the Transportation of Dangerous Goods Regulations;
- i) live or attenuated vaccines, human or animal cell cultures, microbiology laboratory cultures, stocks or specimens of microorganisms and any items that have come into contact with them;
- j) any items that are saturated with the blood or bodily fluids referred to in paragraphs (b) to (d) or (f) to (h), including items that were saturated but that have dried;
- k) clinical and laboratory waste sharps consisting of needles, syringes, blades or laboratory glass capable of causing punctures or cuts;
- l) cytotoxic drugs and any items, including tissues, tubing, needles or gloves, that have come into contact with a cytotoxic drug;
- m) not including:
  - i) urine or feces;
  - ii) wastes that are controlled under the *Health of Animals Act*;
  - iii) wastes that result from the breeding or raising of animals; or
  - iv) microbiology laboratory waste, human blood and body fluid waste or waste sharps after those wastes have been disinfected or decontaminated by an approved process.

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 *Air Emissions Regulations* (OIC 1998/207), as amended.

Infectious Substance – a disease listed in:

- (a) Schedule 2 of the *Health of Animals Regulations* made under the *Health of Animals Act* (Canada) as amended, or,
- (b) the *Reportable Diseases Regulations* made under the *Health of Animals Act* (Canada) as amended, or,
- (c) 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 known or reasonably believed to cause disease in humans and that are listed in Appendix 3 to Part 2 of the *Transportation of Dangerous Goods Regulations* made under the *Transportation of Dangerous Goods Act, 1992* (Canada) as amended, or,
- (d) a substance that exhibits characteristics similar to a substance described in a), b) or c).

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

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.

Special Precaution Wastes\_- 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.

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

TDGR - *Transportation of Dangerous Goods Regulations* (Federal).

Total Health Care Facility Waste - Refers to all waste, biological or non-biological, which is discarded and not intended for further use.

WHMIS - Workplace Hazardous Materials Information System.

## **Bibliography**

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Canadian Council of Ministers of the Environment, 1992, "Guidelines for the Management of Biomedical Waste in Canada", CCME-EPC-WM-42E.

Saskatchewan Biomedical Waste Management Guidelines. February 2008.

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

## Appendices

### Appendix A: HEALTH OF ANIMALS ACT (CANADA) - REPORTABLE DISEASES

This list is subject to change. Please refer to the Canadian Food Inspection Agency <http://inspection.gc.ca/english/anima/disemala/disemalae.shtml> to review the current list of reportable diseases.

### Appendix B: PACKAGING AND LABELLING OF BIOMEDICAL WASTES 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
Orange or Red	Biohazard Symbol
Red	Biohazard and Cytotoxic Symbols
Red	Biohazard Symbol
Yellow	Biohazard Symbol
Yellow	Biohazard Symbol
Yellow	Biohazard and Cytotoxic Symbols (when necessary)
Orange	Biohazard Symbol

#### Labelling Symbols

##### Biohazard Symbol



##### Cytotoxic Symbol

