STANTON TERRITORIAL HEALTH AUTHORITY

2016

STHA Biosafety Program Manual

Biosafety Advisory Committee

Stanton Territorial Health Authority

Executive Summary

STHA Biosafety Program Manual

The Biosafety Program Manual is the foundation of the STHA Biosafety and Biosecurity Program. It contains the institutional policies, programs and plans required to prevent infections and illnesses among personnel and to protect the public, the environment, and animal population from harm by preventing the inadvertent release of pathogens or toxins. This manual has been developed by the STHA Biosafety Advisory Committee to fulfill the Operational Practice Requirements outlined in Chapter 4 of the Canadian Biosafety Standard and to ensure compliance with the Human Pathogens and Toxins Act and Regulations (HPTA/R) which came into force 01-December-2015.

This manual documents the program and describes how the organization plans to achieve the goals and objectives of the program. It is also a tool to make personnel aware of the hazards, risks, mitigation strategies, emergency response, and safe work practices, and which personnel can consult as the need arises to review updates or refresh their memory on these issues.

The Biosafety Program Manual has been organized into the body and appendices. The body of the manual explains the rationale behind the program. This is WHY we do activities. The appendices are a series of standard operating procedures. This section explains HOW we perform activities.

While this manual has been developed to meet the requirements of the HPTA/R, much of the content is applicable to fulfilling other legislative requirements. Examples of related legislation:

- NWT Safety Act and General Safety Regulations
- Environmental Protection Act
- Spill Contingency Planning and Reporting Regulations
- Guidelines for the Management of Biomedical Waste in Canada
- Guidelines for the General Management of Hazardous Waste in the NWT
- Guidelines for the Management of Biomedical Waste in the Northwest Territories

As much of this manual is based on The NWT Infection Prevention and Control Manual 2012, it also helps STHA meet its requirements under the NWT Hospital and Health Care Facilities Standards Regulations (R-036-2005) to develop facility specific policies and procedures with regards to infection prevention and control.

Stanton Territorial Health Authority Biosafety Program Manual

Contents

Program Intent 6
Biosafety Policy 7
Introduction 7
Policy Statement 7
Responsibilities 7
Non-Compliance 8
Biosafety Advisory Committee 9
Biosafety Officer 10
Minimum Qualifications 10
Duties 10
Authority 11
Exclusions and Exemptions from the Human Pathogens and Toxins Act 12
Exclusions from the Human Pathogens and Toxins Act 12
Exemptions from the Human Pathogens and Toxins Act 13
Good Microbiological Laboratory Practices 14
Biosafety Program 16
Definition of Biosafety 16
Definition of a Biohazard 16
Risk Assessments 18
Biological Agent Assessment 18
Host Assessment 22
Workplace Assessment 24
Risk Assessment Documentation 28
Training Needs Assessment 30
Measuring Program Effectiveness 31

Incident Reporting and Investigation 32
Records 34
Inventories 35
Inspections and Audits 36
Reporting the Continuous Improvement of the Program 37
Physical Design of the Containment Zone and Systems 38
Physical Containment Requirements for CL – 2 Zone 39
Physical Containment Requirements for the Special Containment Zone 40
Physical Containment Requirements of the Biohazardous Waste Room 41
Biosecurity Plan 43
Physical Security 43
Personnel Suitability and Reliability 45
Accountability of Pathogens Inventory 45
Information Management and Security 46
Incident and Emergency Response 46
Medical Surveillance Program 47
Pre-Placement Evaluation 48
Vaccinations 48
Ongoing Medical Surveillance 48
Post-Exposure Response Plan 48
Emergency Medical Contact Cards 48
Training Program 50
Housekeeping Program 51
Facilities Services 51
Laboratory Personnel 51
Housekeeping Personnel 52
Disinfectants 52
Facility and Equipment Maintenance Program 53
References 54
Appendix 1 – Sharps Handling 56
Appendix 2a – Hand Hygiene Using an Alcohol Based Rub 57

Appendix 2b – Hand Hygiene Using Soap and Water 58
Appendix 3 – Biological Safety Cabinets 59
Appendix 4 – Centrifuge Safety 61
Appendix 5 – Personal Protective Equipment (PPE) Types 65
Medical Gloves 65
Eye Protection 66
Masks and N95 Respirators 67
Appendix 6 – Putting on Personal Protective Equipment (PPE) 68
Appendix 7 – Removal of Personal Protective Equipment (PPE) 69
Appendix 8 – N95 Respirator On and Off Protocol 71
Appendix 9 – Care of Reusable PPE 72
Appendix 10 – Organism Assessment 73
Appendix 11 – Organism Assessment Form 75
Appendix 12 – Activity Assessment 78
Appendix 13 – Activity Assessment Form 80
Appendix 14 – Training Needs Assessment 81
Appendix 15 – Training Needs Assessment Form 82
Appendix 16 – Containment Zone Access Log 83
Appendix 17 - Ordering and Receiving Pathogens 84
Appendix 18 – Monthly Biosafety Checklist 86
Appendix 19 – Audit Summary Form 92
Appendix 20 – Annual Containment Level 2 Safety Checklist 93
Appendix 21 – Biohazard Warning Signage 99
Appendix 22 – Chemical Spill Control 100
Appendix 23 – Biological Spill Control 107
Appendix 24 – Biological Spill Control Inside a Centrifuge 111
Appendix 25 – Biological Spill Control Inside the Special Containment Zone 114
Appendix 26 – Needle Stick, Puncture Wound or Percutaneous Injury 117
Appendix 27 – Eyes or Mucous Membrane Exposure 118
Use of the Eye Wash Station 119
Appendix 28 – Exposure by Ingestion 120

Appendix 29 – Emergency Shower Use 121
Appendix 30 – Learning Management System (LMS) 122
Appendix 31 – Routine Environmental Cleaning in a Laboratory 125
Appendix 32 – Damp Mopping of Floors 126
Appendix 33 – Damp Wiping of Surfaces 127
Appendix 34 – Routine Washroom Cleaning 128
Appendix 35 – Laundry Handling 129
Appendix 36 – Handling Garbage 130
Appendix 37 – Transport of Biohazardous Waste within the Facility 131
Shipping Biological and Medical Waste 134
Appendix 38 – Disinfectants – Advantages and Disadvantages 137
Appendix 39 – Antimicrobial Activity of Disinfectants 141
Appendix 40 – Preparing Household Bleach as a Disinfectant 142

Program Intent

The fundamental objective of the Stanton Territorial Health Authority (STHA) Biosafety Program is the containment of potentially harmful biological agents. The term **containment** is used to describe the methods, facilities and equipment used to safely manage infectious materials in the environment where they are being handled or maintained. The purpose of containment is to reduce or eliminate exposure of employees, other persons, and the environment from potentially hazardous pathogens. By successfully achieving this objective, we support the organizational vision of "*The best health care for everyone*".

Controlled activities with human pathogens conducted in Canadian facilities, such as the Diagnostic Laboratory and Biohazard Room at Stanton Territorial Hospital (STH), are regulated under the Human Pathogens and Toxins Act (HPTA) and the Human Pathogens and Toxins Regulations (HPTR). A license must be obtained from the Public Health Agency of Canada (PHAC) to authorize any of the following activities with human pathogens and toxins (Minister of Justice, Government of Canada, 2012):

- Possessing, handling or using a human pathogen or toxin;
- Producing a human pathogen or toxin;
- Storing a human pathogen or toxin;
- Permitting any person access to a human pathogen or toxin;
- Transferring a human pathogen or toxin to another facility;
- Importing or exporting a human pathogen or toxin;
- Releasing or otherwise abandoning a human pathogen or toxin; or
- Disposing of a human pathogen or toxin.

As STH is a health care facility containing a diagnostic laboratory, we routinely conduct activities involving primary specimens to assist with identifying an infection or disease. With the exception of releasing or otherwise abandoning a human pathogen or toxin, all of the activities listed above are conducted within the facility and therefore a license is required.

Further discussion of these activities will occur in the relevant sections of this manual.

This program describes how STH fulfills these requirements as well as the various other Federal, Territorial, and Municipal regulations for controlling the acquisition, use, storage, transfer and disposal of biological substances.

Biosafety Policy

Introduction

This Policy pertains to all diagnostic, storage, and disposal activities conducted by STHA that may put employees, other persons, or the environment at risk of being exposed to biologically hazardous material or organisms. Exposure to biologically hazardous substances can compromise the health and well-being of an individual and may cause disease or illness. STH is registered under the Human Pathogens and Toxins Act (HPTA) which establishes authority to govern human pathogens and toxins in Canada.

Policy Statement

STHA is committed to "*the best care for everyone*". This includes protecting the safety of all employees, other persons, and the environment from the effects of the biologically hazardous material it handles. This will be achieved by:

1. Meeting the legislative requirements for safe use, storage, transfer, and disposal of biologically hazardous material or organisms;
2. Ensuring that affected parties are aware of their responsibilities;
3. Developing and implementing written procedures to establish appropriate controls that eliminate or minimize potential exposures to infectious agents; and
4. Ensuring all participants have an informed understanding of the hazards and provide their consent to the means of eliminating or minimizing them.

Responsibilities

Administrators will:

1. Maintain the Infection Control Committee responsible for the oversite and administration of this Policy, and ensure the formulation of necessary programs and procedures.
2. Provide sufficient personnel and resources for the administration and enforcement of the requirements and procedures following this policy.
3. Require that exposures are reported and investigated and take action to prevent a recurrence where it is within their authority and in accordance with Hospital Wide Policy I-0600 Incident Reporting.

Supervisors will:

1. Ensure that individuals in their area of responsibility have been given adequate direction, training, and instruction in the safe performance of their activities concerning biological substances and that the activities are performed without undue risk. This includes the successful completion of Hospital Wide Training Module I-0710 Infection Control.

2. Require the use of appropriate safety equipment and follow appropriate safety procedures and medical precautions. These are described in Hospital Wide Policy I-0680 Standard and Additional Precautions.
3. Ensure that every employee who is at risk of exposure to biologically hazardous substances has access to the Stanton Territorial Hospital Biosafety Program Manual and any additional unit specific exposure control procedures.
4. Report substandard conditions or procedures to the Biosafety Officer as necessary and correct such conditions where it is within their authority.
5. Ensure that all exposure incidents are appropriately treated, if necessary by medical attention, reported to the Occupational Health and Safety/Infection Control Coordinator and the Biological Safety Officer, investigated and actions taken to prevent recurrence in accordance with the Hospital Wide Policy I-0600 Incident Reporting and Workers' Safety and Compensation Commission requirements.

Employees required to enter areas containing biologically hazardous substances will:

1. Know and follow all applicable procedures in the Stanton Territorial Hospital Biosafety Program.
2. Undertake any and all appropriate training as determined by their Supervisor and the Biosafety Officer.
3. Use appropriate engineering controls and/or personal protective equipment, when applicable.
4. Immediately report all hazards or unsafe conditions, procedures, or behaviors to their Supervisor.
5. Immediately report any exposures to their Supervisors and the Biosafety Officer and, if necessary, obtain medical treatment without delay.

All other individuals will:

1. Follow the directions of all biologically hazardous substance signs or instructions.
2. Respect designated restricted entry areas.

Non-Compliance

All individuals accessing the Containment Zones are subject to the responsibilities outlined above.

Violations of these responsibilities place Stanton Territorial Hospital, employees, the environment and the non-compliant individual at significant risk. Cases of suspected non-compliance will be investigated by the Biosafety Officer, Supervisor of the area, and/or the Occupational Health and Safety/Infection Control Coordinator as appropriate. Findings will be discussed during the Biosafety section of the next Infection Control Meeting and appropriate actions will be determined. These actions may include but are not limited to written recommendations that disciplinary action be taken. Non-Stanton persons may be subject to removal from the facility, medical surveillance, and depending on the actions taken in the containment zone consequences up to and including legal action.

Biosafety Advisory Committee

The Biosafety Advisory Committee reviews risk assessments, biosafety policies and procedures, and biosafety or biosecurity concerns.

This committee, referred to through the remainder of this document as the Biosafety Advisory Committee or Biosafety Committee, addresses multidisciplinary topics and concerns through the Biosafety and Biosecurity standing agenda item within the Infection Control Committee meetings. The Infection Control Committee has members from the medical field, the laboratory, occupational health and safety/infection control, management, CSR, materials management and nursing.

The Biosafety Committee generates reports as requested and indicators are reviewed, evaluated and reported to the Quality and Risk Management Committee every 6 months.

The committee reports to the Senior Management Committee (SMC) with minutes to the Clinical Practice Advisory Committee (CPAC).

Biosafety Officer

The Biosafety Officer (BSO), reporting to the Senior Management Representative (the License Holder), through the Quality and Risk Manager, is appointed by Senior Management to give professional advice and assistance in all matters related to biological material and organism safety and to co-ordinate administration of the Biosafety Program. The BSO is responsible for keeping procedures and practices for the use of biological material up to date, for identifying improvements and opportunities to keep biologically hazardous exposures minimal, and in assisting Stanton Territorial Hospital to meet regulatory compliance.

Minimum Qualifications[1]

- Knowledge of Microbiology appropriate to the risks associated with the controlled activities being conducted, attained through a combination of education, training and experience
- Knowledge of the HPTA, the HPTR, Hospital and Healthcare Facility Standards Regulation (2009), Transport of Dangerous Goods Regulations, Guidelines for the Management of Biomedical Waste in the Northwest Territories, Northwest Territories Communicable Disease Manual, The NWT Infection Prevention and Control Manual and the NWT Tuberculosis Manual. This list is not inclusive but is representative of the knowledge required.
- Knowledge of applicable biosafety and biosecurity policies, standards and practices appropriate to the risks associated with the controlled activities being conducted.

Duties[2]

- Maintaining contact, as required, with the Public Health Agency of Canada (PHAC) including verifying the accuracy and completeness of license applications
- Providing on-going advice and technical assistance to persons using biological substances at Stanton Territorial Hospital
- Reviewing biosafety aspects of plans, protocols and standard operating procedures involving biologically hazardous substances prior to the implementation of these activities. This is done in consultation with the Biosafety Committee.
- Assisting with investigations and supervising after accidents or incidents involving biologically hazardous substances
- Coordinating with medical practitioners regarding possible Laboratory Acquired Infections (LAI).
- Act as a resource to help ensure proper waste management
- Performing periodic biosafety audits on technical methods, procedures and protocols, biological agents, materials, and equipment
- Discussing violations of biosafety protocols and procedures with the appropriate persons
- Providing biosafety training for staff with access to areas of Stanton Territorial Hospital where activities requiring HPTA licensure occur.
- Providing continuing education in biosafety

[1] As found in the Implementation of the Human Pathogens and Toxins Act and Regulations, 2015.
[2] As found in University of Regina, Biosafety Program, 2012

- Monitoring the inventory of biological substances at Stanton Territorial Hospital
- Assisting with the establishment of appropriate procedures for the import/export of biologically hazardous materials or organisms to/from the laboratory, according to federal regulations
- Assisting with coordination of the receipt, shipment and transport of biologically hazardous materials or organisms according to Transport of Dangerous Goods Regulations.

Authority

- To require any person who conducts controlled activities under the license to provide them with the necessary records to assist them in carrying out their functions.
- The BSO will correct unsafe acts through the regular line of authority, although the BSO may exercise emergency authority to prevent or stop unsafe acts when immediate action is required.

Exclusions and Exemptions from the Human Pathogens and Toxins Act

Exclusions from the Human Pathogens and Toxins Act

With the exception of the Laboratory and the Biohazardous Waste Room, the majority of the activities conducted at STH are excluded from the HPTA. The following is an excerpt from the Canadian Biosafety Handbook that explains this:

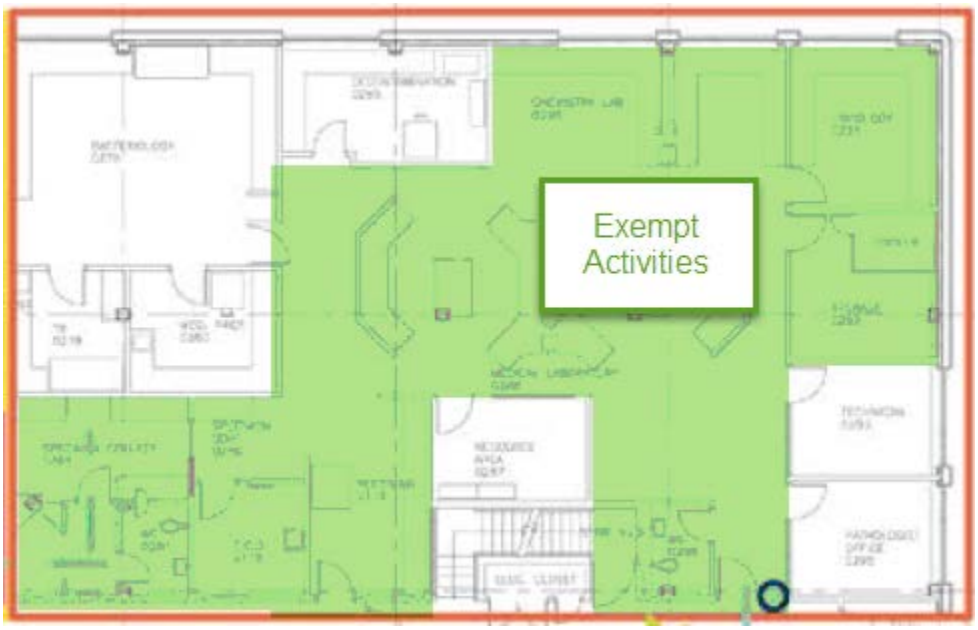
"As specified in Section 4 of the HPTA, the HPTA does not apply to a human pathogen or toxin that is in an environment in which it naturally occurs if it has not been cultivated or intentionally collected or extracted. This includes a human pathogen or toxin that:

- *Is in or on a human suffering from a disease caused by that pathogen or toxin;*
- *Has been expelled by a human suffering from a disease caused by that pathogen or toxin;*
- *Is in a cadaver, body part or other human remains; or*
- *Is in a drug in dosage form whose sale is permitted or otherwise authorized under the Food and Drugs Act or a human pathogen or toxin contained in such a drug.*

On the condition that procedures are not performed to intentionally increase the concentration or the amount (e.g., propagation or culture) of the pathogen or toxin, the natural environment of a pathogen or toxin can include blood, plasma, other bodily fluids, and tissue samples."

Exemptions from the Human Pathogens and Toxins Act

Some of the activities performed at STH with regards to the Laboratory and the disposal of Biohazardous Waste are exempt from the HPTA/R. Within the Laboratory, personnel are allowed to carry out laboratory analyses or diagnostic testing on condition that they are not cultivating or otherwise producing a human pathogen (e.g., tests such as blood counts, blood chemistry tests, centrifugation of blood specimens to separate serum or plasma).



The area shaded green in the floorplan above shows the areas of the Laboratory in which exempt activities occur.

Biohazardous Waste falls under the HPTA/R while it is within the facility, and when it moves through the facility from one containment zone to another. Once the waste is collected for transport by the disposal vendor, the waste is no longer regulated by the HPTA/R (is exempt), but then falls under the authority of the Transportation of Dangerous Goods Act and Regulations (TDGA/R).

While the activities conducted may be exempt from the HPTA/R, all reasonable precautions must be taken to protect the public from any risks posed by those activities and the facility is still subject to inspection by the Public Health Agency of Canada (PHAC).

Good Microbiological Laboratory Practices

All Laboratory work areas are expected to conduct their activities following Routine Practices and Universal Precautions. These are infection control guidelines developed for health care environments to protect individuals from exposure to potential sources of pathogens. Many of the elements of good microbiological laboratory practices are also common to Routine Practices and Universal precautions.

Good microbiological laboratory practices include the following (excerpt from Canadian Biosafety Handbook, 2015):

- Oral pipetting is strictly prohibited;
- Eating, drinking, smoking, applying cosmetics, handling contact lenses, storing food or utensils in the work area is strictly prohibited;
- Hair that may become contaminated while working should be restrained (e.g., tied back or fastened with a clip) or covered;
- Jewelry (e.g., rings or long necklaces) that may come in contact with biological material or that may puncture protective gloves should not be worn while working;
- Open wounds, cuts, scratches, and grazes should be covered with waterproof dressings;
- Work stations (e.g., benchtops) should be kept free of clutter to avoid cross-contamination and to facilitate cleaning and disinfection;
- All personnel including visitors and trainees, should wear suitable footwear (e.g., shoes that cover the entire foot with no or low heels) and Personal Protective Equipment (PPE) (e.g., lab coats, aprons, gloves, protective eyewear) appropriate to the procedure;
- Personal belongings (e.g., purses, bags) and street clothing (e.g., coats and boots) should be stored separately from PPE and from workstations where biological material is handled;
- Aseptic techniques should be used when manipulating open samples of RG1 biological material to provide basic containment and quality control;
- Work surfaces should be cleaned and decontaminated using a suitable disinfectant and an appropriate contact time after work with an RG1 biological material is complete;

Figure 1 - from the UBC Biological Safety Training Manual 2012

- All items that come into contact with biological material, including liquid or solid wastes, should be decontaminated before disposal or reuse; hands should be washed with soap and water or

otherwise disinfected (e.g., sanitized) after handling specimens that contain microorganisms (if gloves are not worn), immediately after removing gloves and before leaving the work area;

- Disposable gloves used when handling RG1 biological material should be discarded after use and never reused; all contaminated clothing and PPE should be decontaminated before laundering when a known or suspected exposure has occurred;
- PPE should be removed in a manner that minimizes the spread and contamination to the skin and hair;
- Procedures for the safe use of sharp objects should always be followed (e.g., avoid use whenever possible, use safe alternatives or safety-engineered sharps devices, avoid bending, shearing, breaking, or re-capping needles, and discard used sharps in a puncture resistant sharps container).

Biosafety Program

Human error and poor laboratory practice can compromise the best of laboratory safeguards designed specifically to protect the laboratory worker. The primary factor in prevention of laboratory accidents and laboratory associated infections is a fully trained staff. Medical Laboratory Technologists and Assistants receive specific training for biosafety prior to certification. Most other workers that perform duties within the laboratory containment zone do not. In order to accomplish the goal of a fully trained staff, it is essential that all personnel with access to the containment zones within STH receive appropriate Biosafety training.

The STHA Biosafety Program has been developed to meet this need and to ensure compliance with all federal, territorial and local standards and regulations. Its purpose is to ensure the safe handling of all biohazardous materials in all diagnostic and storage areas of the facility in order to protect the employees, other persons and the environment.

Definition of Biosafety

Biosafety, or biological safety, encompasses all aspects of containment to prevent any exposure to and accidental release of biological material.

Definition of a Biohazard

There is a distinction between biological materials and biohazardous materials.

- **Biological material** encompasses all materials containing genetic information and is capable of replication (such as viruses and prions).
- **Biohazardous materials** are defined as infectious agents or hazardous biological materials that present a risk or potential risk to the health of humans, animals, or to the environment. The risk can be direct, through infection, or indirect, through damage to the environment.[3]

Biohazardous agents can be classified into 10 categories:

1. Bacteria
2. Viruses
3. Fungi
4. Parasites
5. Zoonotic Pathogens
6. Prions
7. Toxins
8. Recombinant DNA
9. Cell Lines
10. Human Blood and Tissue

[3] Definitions from the UBC Biological Safety Training Manual, 2012

a. More information about exposure to human blood and body fluids and the associated risks see Hospital Wide Policy I-0695 Management of Health Care Workers Exposed to Blood and Body Fluids.

Risk Assessments[4]

Before starting activities with any biological agent, a proper risk assessment must be done to determine the appropriate procedures and containment level in which they can be safely completed. For this to occur, the following three factors must be assessed: Biological agent, Host (or person working with the agent), and the Workplace. The figure below summarizes how biological agents, the host and the workplace come together to form a risk (University of British Columbia Risk Management Services (Biosafety), 2012).

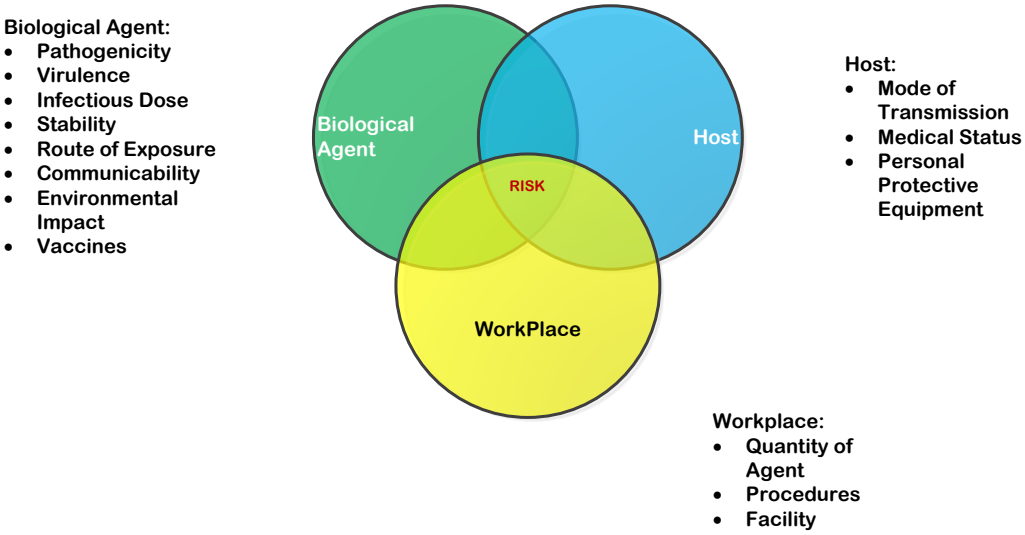


Figure 2 - Risk Assessments

Biological Agent Assessment[5]

Bacteria, viruses, fungi and other infectious agents are isolated in a diagnostic setting because they cause disease. The Public Health Agency of Canada (PHAC) has developed a number of resources to assist with assessing biological agents.

Pathogen Safety Data Sheets (PSDSs) are technical documents that describe the hazardous properties of a human pathogen and recommendations for work involving these agents in a laboratory setting. These documents have been produced by PHAC as educational and informational resources for laboratory personnel working with these infectious substances. A list of PSDSs by Pathogen Name is available online at www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/index-eng.php . The PSDS App is available as a free download for most devices. Remember, newly discovered hazards are frequent and this information may not be completely up to date.

[4] UBC Biological Safety Training Manual, 2012
[5] UBC Biological Safety Training Manual, 2012

Pathogen risks are determined by weighing a number of factors associated with the biological agent. The factors used are described below:

Factor	Description
Pathogenicity	Pathogenicity is the ability for biological material (including toxins) to infect a human, animal or plant host.
Virulence	Virulence is defined as the severity of the disease that the pathogenic biological agent causes. When examining the severity of the disease, pathogenic biological agents that will cause death are considered to be the most virulent. The duration of the disease is also a factor.
Infectious Dose	Infectious dose is defined as the amount of infectious biological material needed to cause disease. Certain biological agents will require a large amount of particles to cause disease, while others only minimal amounts.
Stability	Stability is the ability of the biological agent to remain biologically active when outside a host. Certain agents are able to remain infectious for days or weeks when left on the open bench, while other agents degrade and become inactive within minutes.
Route of Exposure	Route of exposure is defined as the way the biological agent can infect the host. Typically, biological agents can infect a host through the following routes: • Inhalation • Ingestion • Direct inoculation • Mucous membrane • Skin contact This risk factor is very important to consider as it helps determine the precautions that must be taken when the agent is being manipulated in the laboratory.
Communicability	Communicability looks at how easily a microorganism can be passed from one host to another. Knowing the communicability of the agent helps in determining the precautions required to prevent its spread not only to other lab workers, but to the general public.
Environmental Impact	Environmental impact examines how the biological agent may affect the general environment if it is released. It is important to not only look at the agents that effect humans, but those that affect plants and animals. The release of plant or animal pathogens could have both environmental and economic detrimental consequences.
Vaccines	When working in the laboratory, the risk posed by a biological agent can be alleviated by the existence of vaccines or other preventative measures, and therapies. Please consult the Occupational Health and Safety/Infection Control Coordinator at (867)669-4184 prior to performing work with biohazardous materials.

Laboratory Acquired Infections[6]

Laboratory Acquired Infections (LAIs) are described as those that result from laboratory work, whether it occurred in a laboratory worker, or in another person who happened to be exposed, as a result of work with infectious agents.

It is not always easy to define a LAI or to conclude with certainty that one has occurred. Problems occur because the diagnostic testing being performed involves microorganisms that are found in the community. There is always the possibility that the illness was contracted during the hours the individual was not at work. If it can be shown that the illness was the result of a spill or an exposure to an unusually large amount of the microorganism, then a case for LAI may be proven. Bacteriological or serological typing of the organism from the individual may also suggest that it is a current lab strain.

For this reason, it is required that all spills, possible exposures and incidents involving biohazardous materials be documented and reported to the Laboratory Supervisor, Biosafety Officer, Occupational Health and Safety/Infection Control Coordinator, the Quality and Risk Manager, and the License Holder.

Microorganisms can enter the body through accidental inoculation, ingestion, mucous membrane, direct contact or aerosols. In LAIs the route may not be the same as when the disease is acquired naturally. The dose, or number of organisms required to initiate infection is often difficult to ascertain and depends on the route of exposure.

It is not unreasonable to expect that any person who works with pathogenic microorganisms will be more likely than members of the community to become infected. There is evidence that some organisms cause more laboratory infections than others and that the incidence of infection varies according to the nature of the work and the health status of the worker. From 1979 to 1999 there were 223 reported cases of *M. tuberculosis* as compared to 2 reported cases of *Mycoplasma pneumonia*.

- **Accidental Inoculation**
  Infection may arise as the result of pricking, jabbing or cutting the skin with infected instruments or objects such as hypodermic needles, scalpels, and broken contaminated glassware. For this reason, the use of sharps and glassware is discouraged when working with Risk Group 2 and higher pathogens.

  To help minimize the exposure to sharps, individuals are required to dispose of sharps after every use. Sharps should be disposed of in a closable, puncture resistant, leak proof container.

  See Appendix 1 – Sharps Handling

[6] UBC Biological Safety Training Manual, 2012

- **Accidental Ingestion/Exposure to Mucous Membrane**
  The number one protection against accidental ingestion is washing hands thoroughly. Laboratory personnel should wash their hands every time they remove their gloves, have a potential exposure, or are about to leave the laboratory. This has been proven to be the most effective way of protecting oneself against infectious biological materials.

  See Appendix 2a – Hand Hygiene Using an Alcohol Based Rub.
  See Appendix 2b – Hand Hygiene Using Soap and Water

  It is good work practice to assume that all laboratory work surfaces and equipment may be contaminated. When material containing microorganisms is spilled, or when containers break and shed some or all of their contents, the event may pass unnoticed. The result is that the work bench or equipment may remain contaminated. The fingers may then transfer organisms to the mouth or the eyes. It must also be remembered that microorganisms may enter the blood stream through cuts and abrasions on the hands and fingers. Proper hand washing is essential to protection from exposure to microorganisms by accidental contact.

- **Infections by Aerosol**
  When a liquid is forced under pressure through a small hole the result is a cloud of very small droplets referred to as aerosols. If these droplets contain bacteria or other forms of infectious material, they are referred to as infected air-borne particles. These particles can remain suspended in the air and moved throughout the room by ventilation or movements of people. The smaller the particle, the greater the potential for travelling long distances.

  Of greatest concern is the release of infected air-borne particles that may contain organisms which cause such diseases as tuberculosis and brucellosis. Formation of aerosols can be controlled by the use of proper techniques or special equipment such as centrifuges with screw-capped safety cups. When working with biohazardous material best practice is to perform aerosol generating procedures within a certified biological safety cabinet (BSC).

  See Appendix 3 – Biological Safety Cabinets
  See Appendix 4 – Centrifuge Safety
  See Appendix 5 – Personal Protective Equipment (PPE) Types
  See Appendix 6 – Putting on Personal Protective Equipment (PPE)
  See Appendix 7 – Removal of Personal Protective Equipment (PPE)
  See Appendix 8 – N95 Respirator On and Off Protocol
  See Appendix 9 – Care of Reusable PPE

Risk Groups

A **Risk Group** is defined as the classification of biological material based on its inherent characteristics, including pathogenicity, virulence, risk of spread, and availability of effective prophylactic or therapeutic treatments, that describes the risk to the health of individuals and the public as well as the health of animals and the population.

Risk Group 1 (low individual and community risk)

- Any biological agent that is unlikely to cause disease in healthy workers or animals.

Risk Group 2 (moderate individual risk, low community risk)

- Any pathogen that can cause human disease but, under normal circumstances, is unlikely to be a serious hazard to laboratory workers, the community, livestock or the environment. Laboratory exposures rarely cause infection leading to serious disease; effective treatment and preventive measures are available, and the risk of spread is limited.

Risk Group 3 (high individual risk, low community risk)

- Any pathogen that usually causes serious human disease or can result in serious economic consequences but does not ordinarily spread by casual contact from one individual to another, or that causes diseases treatable by antimicrobial or anti-parasitic agents.

Risk Group 4 (high individual risk, high community risk)

- Any pathogen that usually produces very serious human disease, often untreatable, and may be readily transmitted from one individual to another, or from animal to human or vice-versa, directly or indirectly, or by casual contact.[7]

Stanton Territorial Hospital Laboratory routinely encounters pathogens that fall into Risk Groups 1 through 3. In the event that a Risk Group 4 pathogen is encountered at Stanton Territorial Hospital, the laboratory does not have the necessary containment facilities to perform testing safely.

> In the event that a suspected exposure to a Risk Group 4 pathogen has occurred, the Occupational Health and Safety/Infection Control Coordinator must be contacted **IMMEDIATELY**. They will contact the Office of the Chief Public Health Officer so that the Emergency Response Assistance Plan (ERAP) can be activated and the appropriate actions and notifications can be made.

Host Assessment[8]

When assessing the host, their immune status and the risks posed by the infectious biological agent to the host must be considered. For reasons of confidentiality, the worker, in consultation with the Occupational Health and Safety/Infection Control Coordinator should handle discussions and decisions regarding health status, pregnancy, and other medically related topics. Once the host factors are

[7] Risk Group definitions as found in Laboratory Biosafety Guidelines, 2004.
[8] UBC Biological Safety Training Manual, 2012

evaluated and a task-based risk analysis is completed, the Biosafety Officer (in conjunction with the Biosafety Committee) can provide advice to reduce or prevent exposure to the biohazardous agent. Further information can be found in the Hospital Wide Manual.

- O-1400 Immunizations and TB Assessment of Staff
- O-1450 Influenza Immunizations
- O-1510 Reporting Workplace Accidents, Injuries, or Illnesses
- O-1570 Duty to Accommodate/Work Accommodation
- O-1580 Right to Refuse Unsafe Work

Another factor that may be considered is the experience level of the individual for a given task. A lack of experience and training can lead to accidents that can put not only the individual at risk but also other individuals in the laboratory. In addition to this, the complacency of the individual for a given task increases the risk. It often means that steps are skipped, or there is a lack of focus on the task that can lead to incidents and accidents. Again, this puts the individual and their colleagues at an increased risk.

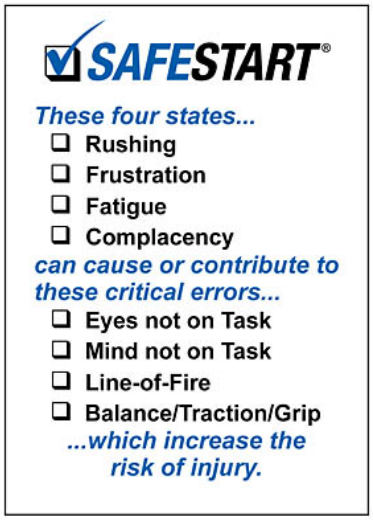


Figure 2a

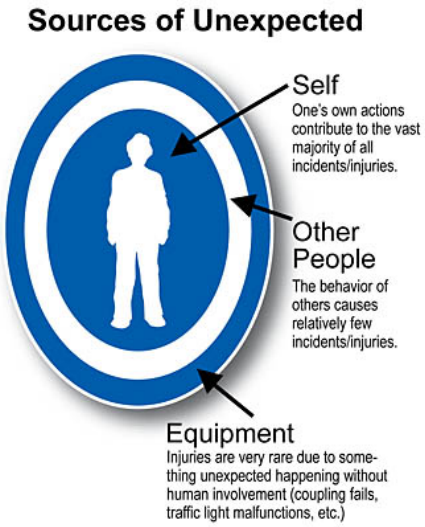


Figure 2b

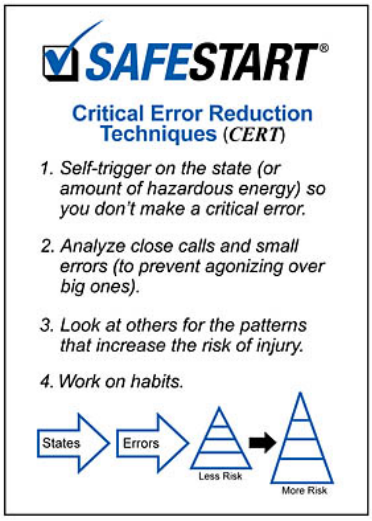


Figure 2c

Safe Start[9] Training can be scheduled through the Staff Education and Development Department.

[9] http://www.safestart.com/safestart-concepts

Workplace Assessment[10]

Working with biohazardous materials can be divided into three categories:

1. Research
2. Clinical
3. Large scale

At Stanton Territorial Hospital, only clinical activities are performed. Clinical laboratories, especially those in health care facilities, receive clinical specimens for a variety of diagnostic and clinical support services. Typically, the infectious nature of the clinical material is unknown, and specimens are often submitted with a broad request for microbiological examination for multiple agents (e.g., sputum submitted for routine, acid-fast, and fungal cultures). This is why it is important to establish standard procedures in the lab that realistically address the issue of the infective hazard.

Except in extraordinary circumstances (e.g., suspected hemorrhagic fever), the initial processing of clinical specimens and serological identification of isolates can be safely done at containment level 2. This requires the use of routine precautions and good microbiological laboratory practices with all clinical specimens of blood or other potentially infectious material. Primary barriers such as BSCs (Class I or II) should be used when performing procedures that might cause splashing, spraying or spattering of droplets. Biological safety cabinets also should be used for the initial processing of clinical specimens when the nature of the test requested or other information suggests the likely presence of an agent readily transmissible by infectious aerosols (e.g., *M. tuberculosis*), or when the use of a BSC (Class II) is indicated to protect the integrity of the specimen.

[10] Biosafety in Microbiological and Biomedical Laboratories, 2009.

Containment Levels[11]

Suppose you are a Medical Laboratory Technologist working with a potentially harmful pathogen. Precautions must be taken in the laboratory to make sure you and others are not infected.

- Where in the lab would you complete your work?
- What protective equipment and practices would you use?
- How would you contain the microbe to limit contamination or accidental infection?
- These are just a few of the questions that can be answered through an understanding of biosafety and the four containment levels.

Each containment level (CL) has its own specific controls that are required for the following:

- Laboratory practices
- Safety equipment
- Facility construction

The containment levels range from CL-1 to CL-4. Each biosafety level builds on the controls of the level before it. Every microbiology laboratory, regardless of biosafety level, follows good microbiological laboratory practices.

Containment Level – 1

If you work in a lab that is designated a CL-1, the pathogens there are not known to consistently cause disease in healthy adults and present minimal potential hazard to laboratorians and the environment.

Specific considerations for a CL-1 laboratory include the following:

Laboratory practices

- Standard microbiological practices are followed.
- Work can be performed on an open lab bench or table A.

Safety equipment

Personal protective equipment B, (lab coats, gloves, eye protection) are worn as needed.

Figure 3 – CL-1 Laboratory

Facility construction

- A sink must be available for hand washing.
- The lab should have doors to separate the working space with the rest of the facility.

[11] Recognizing the Biosafety Levels, 2015.

Containment Level – 2

CL-2 builds upon CL-1. If you work in a lab that is designated a CL-2, the pathogens there pose moderate hazards to workers and the environment. The pathogens are typically found in the local environment and associated with diseases of varying severity. An example of a pathogen that is typically worked with at a CL-2 laboratory is *Staphylococcus aureus*.

In addition to BSL-1 considerations, BSL-2 laboratories have the following containment requirements:

Laboratory practices

- Access to the laboratory is restricted when work is being conducted.

Figure 4 - CL-2 Laboratory

Safety equipment

- Appropriate personal protective equipment (PPE) (A) is worn, including lab coats and gloves. Eye protection and face shields can also be worn, as needed.
- All procedures that can cause infection from aerosols or splashes are performed within a biological safety cabinet (BSC) (B).
- An autoclave or an alternative method of decontamination is available for proper disposals.

Facility construction

- The laboratory has self-closing doors.
- A sink and an eyewash station are readily available.

Containment Level – 3

CL-3 builds upon the containment requirements of CL-2. If you work in a lab that is designated CL-3, the pathogens there can be either indigenous or exotic, and they can cause serious or potentially lethal disease through respiratory transmission. Respiratory transmission is the inhalation route of exposure. One example of a pathogen that is typically worked with in a CL-3 laboratory is *Mycobacterium tuberculosis*, the bacteria that causes tuberculosis.

In addition to BSL-2 considerations, BSL-3 laboratories have the following containment requirements:

Laboratory practices

- Laboratorians are under medical surveillance and might receive immunizations for pathogens they work with.
- Access to the laboratory is restricted and controlled at all times.

Safety equipment

- Appropriate PPE must be worn, and respirators or N-95 masks might be required A.
- All work with pathogens must be performed within an appropriate BSC B.

Figure 5 - CL-3 Laboratory

Facility construction

- A hands-free sink and eyewash are available near the exit.
- Exhaust air cannot be recirculated, and the laboratory must have sustained directional airflow by drawing air into the laboratory from clean areas towards potentially contaminated areas.
- Entrance to the lab is through two sets of self-closing and locking doors C.

Containment Level - 4

CL-4 builds upon the containment requirements of CL-3 and is the highest level of biological safety. There are a small number of CL-4 labs in Canada and around the world. The pathogens in a CL-4 lab are dangerous and exotic, posing a high risk of aerosol-transmitted infections. Infections caused by these pathogens are frequently fatal and without treatment or vaccines. Two examples of pathogens worked with in a CL-4 laboratory include Ebola and Marburg viruses.

In addition to CL-3 considerations, CL-4 laboratories have the following containment requirements:

Laboratory practices

- Change clothing before entering.
- Shower upon exiting.
- Decontaminate all materials before exiting.

Figure 6 - CL-4 Laboratory

Safety equipment

- All work with the microbe must be performed within an appropriate Class III BSC, or by wearing a full body, air-supplied, positive pressure A suit.

Facility construction

- The laboratory is in a separate building or in an isolated and restricted zone of the building.
- The laboratory has dedicated supply and exhaust air, as well as vacuum lines and decontamination systems.

Risk Assessment Documentation

Risk assessments are conducted to identify hazards and appropriate mitigation strategies, and to evaluate whether or not existing mitigation measures are commensurate with the level of risk. There are a number of different types of risk assessments that must be conducted.

Overarching Risk Assessments

Stanton Territorial Hospital has contracted the following two overarching risk assessments.

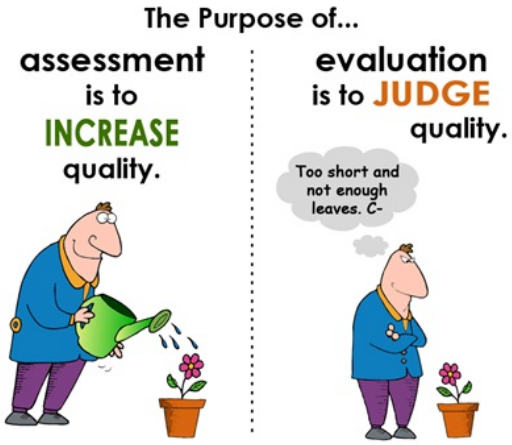


Figure 7 - http://trainingrx.org/assessment-vs-evaluation-whats-the-diff/

Marsh Risk Group Assessment

Marsh Risk Consulting was engaged in July of 2012 to complete a Clinical Risk Review. Clinical Laboratory Services were specifically discussed as a key focus area in the report sent back to internal and external stakeholders in April of 2013.

Stanton Territorial Health Authority CPTED Review

In February 2015, the Stanton Territorial Health Authority (STHA) identified the need for a security review, and Stantec Architecture Ltd. (Stantec) began the development of a Crime Prevention Through Environmental Design (CPTED) review of the STHA's existing Hospital and associated off-site clinics to provide a holistic overview of the current state and recommendations. The purpose of this review was to identify potential areas where improvements could be made on patient, visitor, and staff safety and to provide recommendations that could mitigate the identified issues. Compliant CPTED features of the Hospital and off-site clinics were also identified to ensure existing safety-favorable strategies are maintained into the future. The report was sent back to internal and external stakeholders in April of 2015.

Local Risk Assessments

The process to undertake risk assessments for infectious material and toxins follows the same principles as those found to address hazards or risks in most occupational health and safety programs. The accepted mechanisms to control an identified occupational health and safety hazard apply to biosafety and biosecurity as well. These controls are:

1. Elimination (including substitution): Is there a pathogen or process that poses less of a risk than the one selected that will provide the same result?
2. Engineering Controls: This includes the selection and use of primary containment devices (e.g., biological safety cabinets).
3. Administrative Controls: These are the controls that can alter the way in which the tasks are done and can include policies and standard operating procedures (SOPs).
4. Personal Protective Equipment (PPE): The PPE selected and worn by individuals to reduce or minimize the potential exposure to infectious material or toxins.

Safety legislation and other safety resources often refer to this list as the hierarchy of control, meaning that the controls should be considered in the order they are presented. PPE should be the last form of control considered when conducting a Local Risk Assessment.

Risk management of human and animal pathogens involves understanding the legal requirements related to performing activities with organisms, as well as the abilities of the individuals concerned and the limitations of the facilities where the material is being handled and stored. Organizations that handle or store human or animal pathogens or toxins are required to comply with the Canadian Biosafety Standard and may be subject to inspection by the Public Health Agency of Canada or the Canadian Food Inspection Agency.

As the laboratory at Stanton Territorial Hospital provides diagnostic testing, the facility cannot predict which pathogens will be present in the primary samples provided. However, as part of ongoing quality control activities, the laboratory does maintain an inventory of potential pathogens. The risks associated with these pathogens are managed through ensuring compliance with applicable legislation and periodically conducting assessments. These assessments are the responsibility of the personnel working within the containment area, although the Biosafety Officer may be consulted.

Organism Risk Assessments

Organism Assessments may be conducted for the following reasons:

1. In conjunction with a request to purchase a new organism for quality control purposes. No new organisms are to be purchased without approval of the Biosafety Committee.
2. Periodically, for risk management. The date that the next assessment is due is indicated on the current organism assessment form.
3. At the request of the Biosafety Committee. This may be the result of an occurrence, a safety concern brought to the attention of the Biosafety Committee, or a change in legislation.

The procedure for conducting an Organism Assessment at Stanton Territorial Hospital is located in Appendix 10 – Organism Assessment of this manual.

The Biosafety Risk Assessment Form – Organism Assessment is located in Appendix 11 – Organism Assessment Form of this manual.

Activity Assessments

Activity Assessments may be conducted for the following reasons:

1. In conjunction with a request to implement a new process or procedure within the containment zone. No new processes or procedures involving possible pathogens in a containment zone are to be implemented without approval of the Biosafety Committee.
2. Periodically, for quality improvement and risk management. The date that the next assessment is due is indicated on the current activity assessment form.
3. At the request of the Biosafety Committee. This may be the result of an occurrence, a safety concern brought to the attention of the Biosafety Committee, or a change in legislation.

The procedure for conducting an Activity Assessment at Stanton Territorial Hospital is located in Appendix 12 – Activity Assessment of this manual.

The Biosafety Risk Assessment Form – Activity Assessment is located in Appendix 13 – Activity Assessment Form of this manual.

Training Needs Assessment

Upon implementation of the Biological Safety Program, a comprehensive Biological Safety Training Program has been developed. This training program is conducted for all employees of Stanton Territorial Hospital and other persons (First Responders in the event of an emergency such as Fire Department/HAZMAT) that may require access to the containment zone as part of their duties. This comprehensive program will also be conducted for all new employees that will require access to the containment zone.

To ensure the ongoing safety of these individuals, annual retraining will be required.

In order to identify the current and future training needs of Stanton Territorial Hospital and to identify gaps in the current training program, an annual training needs assessment will be completed in the fall (September through November) of each year. Given the size of the organization, and the differing needs of the individuals requiring access to the containment zone, a simple training needs assessment process is employed. The procedure for conducting a simple training needs assessment is located in Appendix 14 – Training Needs Assessment of this manual.

Findings from the training needs assessment will be used in ongoing improvements to the Biological Safety Training Program.

See Appendix 15 – Training Needs Assessment Form.

Measuring Program Effectiveness

In order to ensure that the Biological Safety Program is effective, a management system following a cycle of planning, implementing, measuring and improving is in place. The following excerpt from the Deming Institute explains this process:

> The PDSA Cycle is a systematic series of steps for gaining valuable learning and knowledge for the continual improvement of a product or process. Also known as the Deming Wheel, or Deming Cycle, the concept and application was first introduced to Dr. Deming by his mentor, Walter Shewhart of the famous Bell Laboratories in New York.
>
> The cycle begins with the Plan step. This involves identifying a goal or purpose, formulating a theory, defining success metrics and putting a plan into action. These activities are followed by the Do step, in which the components of the plan are implemented, such as making a product. Next comes the Study step, where outcomes are monitored to test the validity of the plan for signs of progress and success, or problems and areas for improvement. The Act step closes the cycle, integrating the learning generated by the entire process, which can be used to adjust the goal, change methods or even reformulate a theory altogether. These four steps are repeated over and over as part of a never-ending cycle of continual improvement.

In order for the Biological Safety Plan to be effective, its performance needs to be tracked against the program's goals and objectives. This includes the following:

1. How infections and illnesses among personnel are being prevented;
2. How a release of pathogens is being prevented;
3. How compliance with legislation is being achieved; and
4. How safety is being promoted.

There are 5 different mechanisms in place to ensure the effectiveness of the Biological Safety Plan. They are:

1. Incident Reporting and Investigations
2. Records
3. Inventories
4. Internal Inspections and Audits
5. Regulatory Reporting Requirements

Incident Reporting and Investigation

The following excerpt from the Public Health Agency of Canada's website details when notifications must be made to the License Holder and Biological Safety Officer of Stanton Territorial Hospital:

"The License Holder and the Biological Safety Officer (BSO) must be notified whenever the License Holder or any person who is conducting controlled activities authorized under a license intends to increase the virulence, pathogenicity, communicability of a human pathogen, or the resistance of a human pathogen to preventive or therapeutic treatments, or to increase the toxicity of a toxin.

Every person conducting controlled activities under authority of a license must inform the License Holder and the Biological Safety Officer without delay of any inadvertent release or production of a human pathogen or toxin, of any incident involving a human pathogen or toxin that has caused, or may have caused disease, in an individual, or if a pathogen or toxin has been stolen or is otherwise missing. Records of these notifications and follow up actions must be made available if asked by an inspector."

Incident reports, subsequent investigations, and corrective actions can provide an indication of biosafety program effectiveness by identifying deficiencies and gaps in procedures or in the program itself. The following Hospital Wide Policies explain how to report an incident:

- I-0600 Incident Reporting
- I-0695 Management of Health Care Workers Exposed to Blood and Body Fluids
- O-1310 Accident Investigation
- O-1510 Reporting Workplace Accidents, Injuries or Illnesses
- O-1580 Workplace Safety: Hazard Action Form Completing

Incident reports are required in specific situations, such as, upon discovery of a Laboratory Acquired Infection (LAI), an exposure, or a failure of a containment system or device.

- Incidents involving pathogens, toxins, other regulated infectious material or involving failure of containment systems are to be reported immediately to the Laboratory Supervisor, Occupational Health and Safety/Infection Control Coordinator and the Biological Safety Officer. The resulting incident investigation is to be conducted and documented in order to determine the root cause(s).
- The Public Health Agency of Canada (PHAC) is to be informed without delay via the submission of an exposure notification report, and the NWT Office of the Chief Public Health Officer via phone call following:
    - An exposure to a human pathogen or toxin; or
    - Recognition of a disease that has or may have been caused by an exposure to a human pathogen or toxin.
- An exposure follow-up report documenting the completed investigation is to be submitted to PHAC (and the NWT Office of the Chief Public Health Officer) within:

- 15 days of the submission of an exposure notification report involving a security sensitive biological agent (SSBA).
- 30 days of the submission of an exposure notification report involving a human pathogen or toxin other than an SSBA.

The following excerpt from the Public Health Agency of Canada's website details other circumstances that require notification:

"Notification must be provided to the Public Health Agency of Canada (PHAC) without delay in the following circumstances:

- when a License Holder has reason to believe that a human pathogen or toxin has been released inadvertently from a facility;
- when a human pathogen or toxin that a person is not authorized to possess is inadvertently produced or otherwise comes into their possession;
- when an incident involving a human pathogen or toxin has caused, or may have caused, disease in an individual;
- when there is reason to believe that a human pathogen or toxin has been stolen or is otherwise missing;
- when a License Holder decides to prohibit the Holder of an HPTA Security Clearance from accessing a licensed facility, including the reasons for that decision;
- when the designated Biological Safety Officer has changed;
- where an Security Sensitive Biological Agent (SSBA) is not received within 24 hours of the date and time when it was expected to be received; and
- where the holder of an HPTA Security Clearance is convicted of a criminal offence.

Notification must be provided to the PHAC in the following circumstances:

- **before** making any of the following changes, if they could affect biocontainment, where controlled activities with **Risk Group** 3 or 4 human pathogens or SSBA toxins are conducted:
  - changes to the physical structure of their facility;
  - changes to any equipment; or
  - changes to their Standard Operating Procedures (SOPs); and
  - **within a reasonable time** of a license holder making a name change.

To facilitate notification to PHAC, an online reporting module is available for secure creation, storage and submission of laboratory incident reports through the online biosecurity portal. Incident reports can be submitted electronically to PHAC through the portal, which is accessible through the PHAC website."

The following flow chart from the Canadian Biosafety Handbook can be used to assist in the assessment of an incident to determine if an exposure has occurred and if notification to the Public Health Agency of Canada (PHAC) is required.

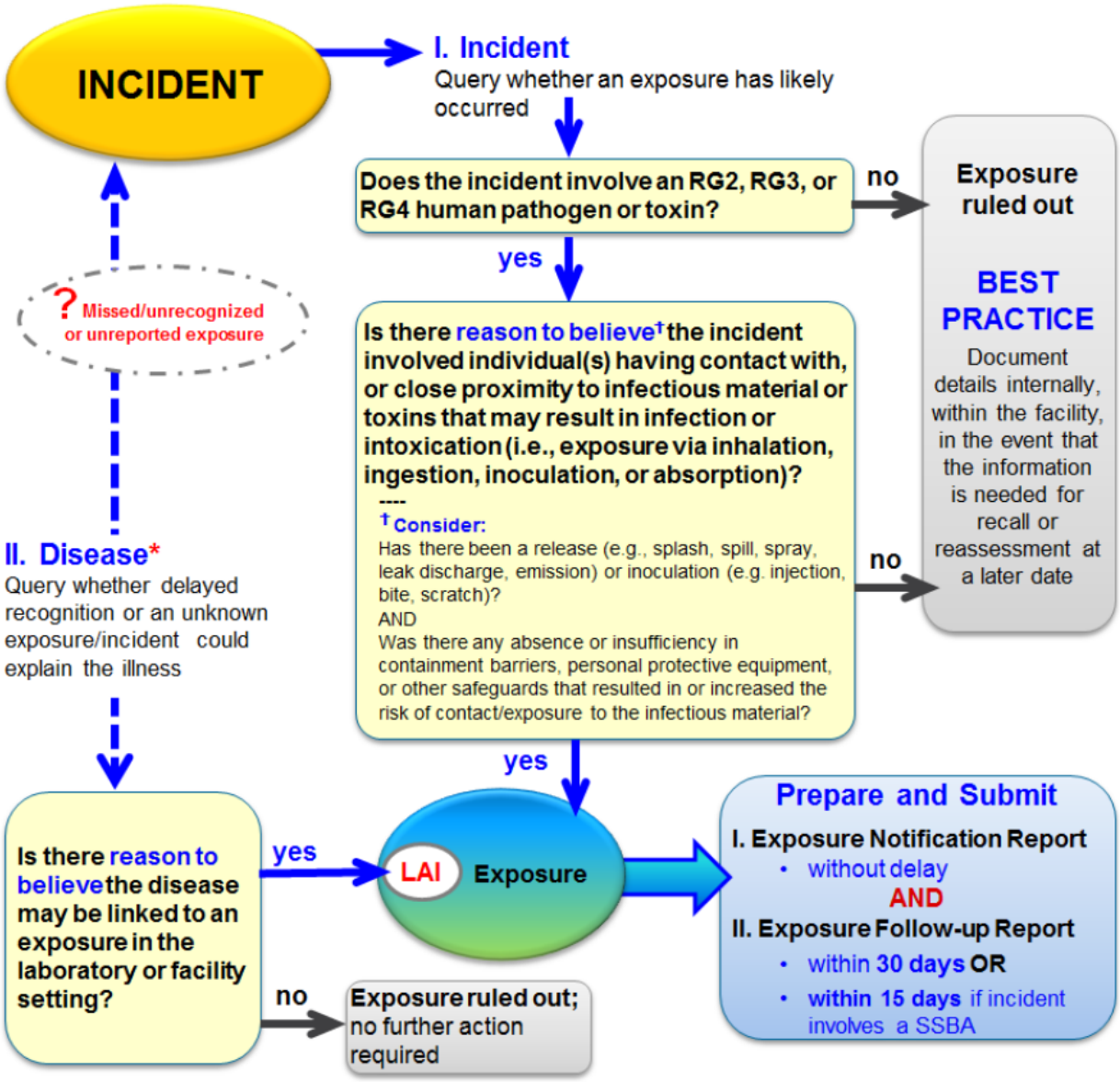


Figure 8 – Incident Reporting Flow Chart

Records

Records are documents pertaining to the Biosafety Program or to biocontainment systems that provide evidence or information accounting for something that has occurred. The following is a list of activities that are documented and used to assess whether essential biosafety elements have been met.

Training Documentation

Training documentation is located in the Hospital's Learning Management System. Successful training is a prerequisite to employees being granted swipe-card access to the laboratory.

Access Documentation

In accordance with the HPTA, License Holders are required to establish and maintain a list of all persons **authorized to access** any part of the facility to which the License applies. This list is to include, but is not limited to, personnel, students, researchers, visitors, cleaning staff, maintenance staff, and contractors, whether or not they handle pathogens or toxins. This list must be provided to the PHAC upon request. For Stanton Territorial Hospital employees, this is recorded in the Hospital's Learning Management System. All other persons are required to sign in to the Laboratory using Appendix 16 – Containment Zone Access Log. All persons entering the containment zone without prior training are required to be accompanied by successfully trained personnel.

Inventories

Pathogen accountability and inventory control processes allow pathogens and other regulated infectious material to be readily located and permit missing items to be more easily identified. Any discrepancies noted can serve to identify potential areas for improvement.

See Appendix 17 - Ordering and Receiving Pathogens for detailed instructions on ordering pathogens and safely entering them into the inventory.

The current pathogen inventory is located in an access database on the shared drive and is only accessible by select personnel. The database contains the following information:

- Type of organism (Gram Positive, Yeast, etc.)
- Organism name
- Lot Number
- Containment Level required
- ID used to enter into the TQC module of the Laboratory Information System
- Date acquired
- Date reconstituted
- Date expired
- Form of storage
- Location of storage
- Frequency of use
- Purpose of use
- Access
- Documentation (Letter of Compliance, Material Transfer Agreement, ORMED receiving report, Product Info Sheet, PSDS)
    - This documentation is maintained within the laboratory.

Inspections and Audits

The containment zones at Stanton Territorial Hospital must be regularly inspected as follows:

Daily Inspection

All individuals working within a containment zone must inspect their work area prior to conducting any work, to identify and correct hazardous conditions, or report them to their supervisor.

Monthly Inspections

A monthly inspection of the Containment Zones must be conducted using Appendix 18 – Monthly Biosafety Checklist. This internal inspection is to be assigned to rotating containment zone personnel to ensure that there are a fresh set of eyes assessing the risks each month. The completed checklist is to be submitted to the area Supervisor(s). The Supervisors and the BSO will complete an Appendix 19 – Audit Summary Form detailing any identified hazardous conditions identified and the actions required to rectify them. If no hazardous conditions are identified, this is also documented on the form. The completed checklist and summary form will be posted in the Containment Zones and an electronic copy will be forwarded to the Biosafety Committee for addition to the next agenda.

The Patient Safety Committee and Occupational Health and Safety Committee will designate representatives to perform Environment of Care Rounds at specified intervals. See Hospital Wide Procedure O-1540 Environment of Care Rounds for more information. Months in which these inspections are conducted, the internal Monthly Biosafety Checklist does not need to be completed.

Annual Inspections

An annual inspection of the containment zone must be conducted using Appendix 20 – Annual Containment Level 2 Safety Checklist. This inspection is to be conducted by members of the Biosafety Advisory Committee. The completed checklist is to be submitted to the Supervisor(s). The Supervisor(s) and the Biological Safety Officer will complete an Appendix 19 – Audit Summary Form detailing any identified hazardous conditions identified and the actions required to rectify them. If no hazardous conditions are identified, this is also documented on the form. The completed checklist and summary form will be posted in the Containment Zones and an electronic copy will be forwarded to the Biosafety Committee for addition to the next agenda.

Special Inspections

The BSO, or designate, must conduct an inspection to identify hazardous conditions arising from changes in laboratory operations or facilities, introduction of new equipment or materials, after an incident, or prior to re-start of laboratory operations after a shut down.

Other special inspections may also be conducted by other internal or external agencies. Examples of these are not limited to, but may include the following:

- Fire Inspector
- Public Health Agency of Canada
- Workers' Safety and Compensation Commission

- Occupational Health and Safety Committee

Reporting the Continuous Improvement of the Program

In order to ensure that the STHA Biosafety Program is successful, it is regularly reviewed and quarterly quality indicator reports are generated by the Biosafety Officer and submitted to the Biosafety Committee and the Quality and Risk Management Committee as a tool to compare achievements against the program's objectives and goals.

Quality Indicators are selected by the Biosafety Committee or the Quality and Risk Management Committee. The data is compiled by the Biosafety Officer and reported using the Stanton Territorial Health Authority - Indicator Template.

Senior management should also review the biosafety program at regular intervals to ensure that the program remains effective with respect to legal requirements and the long-term goals and objectives of the organization.

Physical Design of the Containment Zone and Systems

The following is a map of the Laboratory work space at Stanton Territorial Hospital. Included are the locations of the safety equipment provided in the workspace.

Figure 9 – Stanton Laboratory Safety Map

Legend:

Symbol	Description of Safety Equipment	Symbol	Description of Safety Equipment
	Location of Fire Exit		Location of Flammable Chemical Storage Cabinet
	Location of Fire Pull Station		Location of Acid and Base Chemical Storage Cabinet
	Location of Handwashing Sink		Location of Emergency Shower
	Location of Eye Wash Station		Location of Chemical Spill Kit
	Location of First Aid Kit		Location of Material Safety Data Sheets
	Location of Fire Extinguisher		Location of Biohazard Spill Kit

Within the Laboratory there are 2 containment zones other than the workspace previously discussed in the Exclusions and Exemptions from the Human Pathogens and Toxins Act previously discussed in this manual. These areas are shown on the map below.

Figure 10 – Stanton Laboratory Containment Zone Map

Physical Containment Requirements for CL – 2 Zone

- The containment zone is separated from the public and administrative areas by a door.
- Dedicated paper/computer workstations within the containment zone are segregated from the laboratory workstations. This workstation is located in the water room.
- The containment zone windows do not open.
- Doors to the containment zone are lockable.
- Biohazard warning signage (including the international biohazard warning symbol, containment level, name and telephone number(s) of the contact person(s) and entry requirement(s) are posted at the containment zone points of entry. See Appendix 21 – Biohazard Warning Signage.
- Where unique hazards exist, specific signage is posted at the point of entry.
- Space is provided for the storage of PPE in use.
- Surfaces and interior coatings are cleanable, non-absorbent, and resistant to scratches, stains, moisture, chemicals, heat, impact, repeated decontamination, and high pressure washing, in accordance with function.
- Floors are slip-resistant.
- Hands-free sink is provided and located to facilitate handwashing upon exit from the containment zone.
- Emergency eyewash and shower equipment are provided.

- Certified BSCs and other primary containment devices are provided when required by the work activities. In the event of a Code Brown or power failure in which the HVAC system is affected, the front sash is to be closed. The BSCs are located as far as possible from high traffic areas. The procedure for their use and the appropriate documentation of their use are located in the laboratory procedure LSM30200 Biological Safety Cabinets.
- An autoclave is provided within the containment zone. The procedure for the appropriate use and documentation of its use are located in laboratory procedure MIC81200 M11 Ultraclave Sterilizer.
- Communication systems in the form of telephones and computers are provided inside the CL – 2 containment area that allows for communication with individuals outside the containment area. Within the special containment zone, there is an audible alarm that can be sounded and there is a video surveillance camera with two-way audio so that individuals can be monitored from the CL – 2 zone and converse with individuals from the CL – 2 zone.

Physical Containment Requirements for the Special Containment Zone

In collaboration with a group of experts, the Public Health Agency of Canada has performed risk assessments for *Mycobacterium tuberculosis* complex (MTBC) and based on the risk factors associated with the pathogens it was determined that MTBC will remain in the RG3 category. Stanton Territorial Hospital Laboratory routinely performs diagnostic testing for MTBC. The area designated for conducting these activities is marked with a star on the map.

Based on the Biosafety Directive for Mycobacterium Complex (MTBC), the following activities are appropriate to conduct at **Containment Level 2 with additional operational requirements**. This means that Stanton Territorial Hospital must have a RG3 License (as MTBC is present in the facility), but the containment level of the facility is Containment Level 2 with additional operational requirements.

- Non-propagative clinical/diagnostic activities with primary specimens. Examples of these activities include, but are not limited to:
    - Preparing diagnostic specimens with the goal of concentrating or isolating MTBC organisms (e.g., concentration and centrifugation of sample)
- Propagative *in vitro* activities. Examples of these activities include, but are not limited to:
    - Inoculating liquid or solid culture medium such as Lowenstein-Jensen and MGIT™ with concentrated primary specimens
    - Incubating and reading initial diagnostic cultures (excluding subcultures) in tightly capped/sealed tubes such as MGIT™ and Lowenstein-Jensen, as well as non-propagative assays on initial diagnostic cultures needed to confirm AFB (e.g., preparation and reading of smears)
    - Aliquoting of diagnostic cultures for inactivation, for packaging and for shipping

Once a possible MTBC organism has been detected, the laboratory refers the specimen/culture to Alberta Health Services – The Provincial Laboratory for Public Health.

The following is the list of additional operational requirements as they appear in the Biosafety Directive for Mycobacterium Complex (MTBC).

- All activities involving open vessels of infectious material to be conducted in a certified biological safety cabinet (BSC) or other appropriate primary containment device (CBSG R4.6.24). BSCs provide effective primary containment for work with infectious material or toxins whose primary route of infection is inhalation. This operational practice is required based on the number of laboratory acquired infections (LAIs) associated with work involving MTBC and the fact that manipulations of this infectious material have the potential to generate infectious aerosols.
- Respirators to be worn where there is a risk of exposure to infectious aerosols (CBSG R4.4.8). The need for respiratory protection at CL2 is based on a local risk assessment, and can depend on specimen type and the likelihood of the specimen being positive (i.e., local MTBC prevalence, initial test versus follow up of potential positive). For example, patient specimens collected to monitor response to therapy may contain MTBC organisms for some time, and in such a case, a respirator should be worn.
- Centrifugation of infectious material to be carried out in sealed safety cups (or rotors) that are unloaded in a BSC (CBSG R4.6.27). Where this is not possible, additional precautions (e.g., PPE and/or safety equipment, splash guards) are to be in place to prevent exposure to infectious materials due to spills, splashes, or similar events.
- An additional layer of protective clothing to be donned prior to work with infectious material (CBSG R4.4.6). An additional layer of protective clothing (e.g., solid-front gown with tight fighting wrists, waterproof apron, second pair of gloves or head cover) provides additional protection and guards against exposure following a tear that may have compromised, or a spill that may have contaminated, the outer protective layer.
- Personal belongings not required for work to be left outside the containment zone or in change areas outside the containment barrier (CBSG R4.5.8).
- Personnel to doff additional layer of PPE when exiting the containment barrier (CBSG R4.5.13).

Physical Containment Requirements of the Biohazardous Waste Room

After biomedical waste has been collected and moved from its point of generation, it is stored in the Biohazardous Waste Room. This waste is stored in this room in appropriately labelled storage containers until it is removed from the facility for transport to a disposal facility outside of the Northwest Territories. Transport and disposal of the waste are contracted services.

The following is a list of containment requirements for the Biohazardous Waste Room as they appear in the Guidelines for the Management of Biomedical Waste in the Northwest Territories, 2005.

- The storage area must be totally enclosed and separate from supply rooms or food preparation areas
- Must be lockable and access must be restricted to authorized personnel

- Storage areas must be identified as containing biomedical waste with the biohazard symbol clearly displayed.
- No materials other than waste may be placed in the same storage area as biomedical waste
- Floors, walls and ceilings of storage areas must be thoroughly cleaned in accordance with the facility's established procedures.
- Anatomical waste must be stored at 4°C or lower.
- All biomedical waste must be refrigerated at 4°C or lower if stored for more than 4 days.
- Facilities refrigerating or freezing stored waste use a lockable, closed cold storage facility or a lockable, domestic type freezer unit. Either type must be used only for storing biomedical waste, visibly display the biohazard symbol, and be identified as containing biomedical waste.
- Contingency plans must be prepared for storing refrigerated biomedical waste if excess waste is produced, or if either refrigeration or disposal facilities or equipment become inoperative.
- The compaction or shredding of untreated biomedical waste is not permitted.

Figure 11 – Security Map of Stanton Biohazardous Waste Room

Biosecurity Plan

Biosecurity is defined as the security measures designed to prevent the loss, theft, misuse, diversion, or intentional release of pathogens, toxins and other related assets. The following diagram outlines the differences between biosafety and biosecurity.

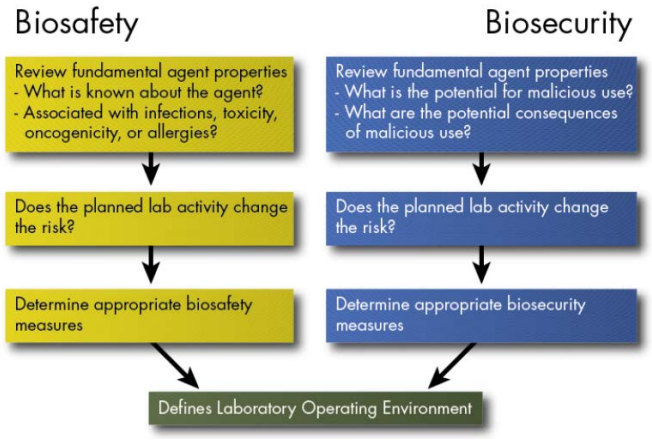


Figure 12 – Biosafety vs. Biosecurity from Sandia National Laboratories

Physical Security

Employee, patient and visitor safety are of paramount importance for Stanton Territorial Hospital. As such Stanton employs security personnel. The role of Stanton's security personnel is:

- To actively monitor their assigned and adjacent areas to offer assistance to other STHA employees;
- To proactively identify patients and visitors displaying behaviour with the potential to become aggressive or difficult to manage;
- To intervene in situations where the application of physical force is required;
- To assist STHA staff who may find themselves being assaulted; and
- To assess whether a situation is beyond intervention and assist STHA staff in clearing the area so no one is injured.

There are also a number of Hospital Wide Policies and procedures available to staff members in the event of a security concern.

- Code White
- Code Brown
- Code Black
- R-1990 Unusual Circumstances or Incidents: Communications with the RCMP
- R-1992 Theft or Missing Items
- Z-2700 Zero Tolerance Policy and Procedure

In addition to security personnel, access to the inventory of pathogens is restricted to personnel that are trained in Biosafety and Biosecurity and have a legitimate reason to use them. In order to access the laboratory, an individual must walk directly past the main security desk and down a hallway monitored by security cameras.

Doors to the laboratory are locked when the laboratory is unoccupied. A combination of key and swipe card access is required to gain access to the laboratory.

With the exception of active cultures, which would be of limited or unknown value/risk, the inventory of pathogens is stored under lock and key. The location of this storage will not be disclosed in this document.

Figure 13 – Stanton Laboratory Biosecurity Map

Personnel Suitability and Reliability

Stanton Territorial Hospital operates under the umbrella of the Government of the Northwest Territories (GNWT). The GNWT conducts criminal records checks as part of the staffing process to:

- Protect the public interest in the delivery of GNWT programs and services;
- Ensure the safety of clients and employees;
- Safeguard public funds, property and assets; and
- Ensure and maintain public confidence and trust in the public service.

The individuals that are considered for access to the containment areas at Stanton Territorial Hospital have been assessed to be in either Highly Sensitive Positions or Positions of Trust, and as such have had a criminal record check (and in some cases a vulnerable sector check) performed at time of hire.

Laboratory Technologists at Stanton require CSMLS certification and current registration. In this way, Stanton ensures that individuals working with pathogens inside the containment zone have achieved an appropriate level of training experience and competency to have access to the pathogen inventory as a function of their position.

The GNWT also provides access to the Employee Assistance Plan operated by Shepell·fgi™. This program assists employees with the following:

- Achieving well-being;
- Managing relationships and family;
- Finding child and elder care resources;
- Getting legal advice;
- Getting financial guidance;
- Dealing with workplace challenges;
- Tackling addictions;
- Improving nutrition; and
- Focussing on their health.

Figure 14 – Employee Assistance Plan Contact Information

This program assists employees in mitigating circumstances that may affect their ability to safely and securely perform their duties.

Accountability of Pathogens Inventory

As discussed earlier in the Inventories section of this manual, the Laboratory maintains a detailed inventory of the pathogens held on-site. It is the responsibility of the Microbiology Technologists to report any additions to or removals from that inventory to the Technologist II – Microbiology. The Technologist II – Microbiology is responsible for keeping the inventory up-to-date and verifying that the inventory recorded is reflective of the pathogens stored on-site. An audit may also be initiated at any time by the Biosafety Officer. The status of the inventory is an indicator that must be reported on a

quarterly basis. Missing or stolen pathogens must be reported to the Biosafety Officer immediately. Failure to comply with pathogen accountability system will result in disciplinary action.

Information Management and Security

The Code of Conduct Respecting Conflict of Interest and Oath of Office and Secrecy for the Employees of the Government of the Northwest Territories identifies standards of conduct for GNWT public service employees in the execution of their duties, and in specific areas once an employee terminates their employment.

Other Government of the Northwest Territories Legislation/Policies/Procedures (this list is not exhaustive):

- Access to Information and Protection of Privacy
- GNWT Information Technology – Electronic Information Security
- GNWT Email Use Policy
- GNWT Internet Use Policy
- Office of the Chief Information Officer's Tips on the Go – Tips for Sharing and Moving Documents

Hospital Wide Policies and Procedures:

- C-0210 Media Communication Policy
- C-0211 Communication Policy
- C-0217 Personal Electronic Devices
- C-0220 Release of Personal Information about STHA Employees
- H-0500 Facsimile Transmission of Patient Information
- H-0550 Release of Patient Information
- H-0555 Reporting Confidentiality/Privacy Breaches of Patient or Employee Information
- H-0560 Security and Storage of Patient Personal Information

Depending upon the specific situation and information, more than one of these documents may apply.

Incident and Emergency Response

Stanton Territorial Hospital has 9 different emergency response codes. The processes and procedures for handling each type of event are available as hard copies in each area in red binders called Code Binders. The electronic copies of these documents are also available on the shared drive.

The Hospital Emergency Response Codes are as follows:

- **Code Black** – Bomb Threat
- **Code Blue** – Medical Emergency
- **Code Brown** – Internal Hazardous Spill
- **Code Green** – Evacuation

- **Code Orange** – Disaster/Pandemic Plan
- **Code Pink** – Infant/Child Abduction
- **Code Red** – Fire
- **Code White** – Staff Alert/Violent Incident
- **Code Yellow** – Missing Patient

Spills are the most common incidents with the potential for exposure of personnel to pathogens or their release from containment. Spills can contaminate surfaces, equipment, samples and workers. The decontamination protocol used depends on the size of the spill and where the spill occurred.

The following procedures are to be used to contain spills and decontaminate the affected area(s):

- Appendix 22 – Chemical Spill Control
- Appendix 23 – Biological Spill Control
- Appendix 24 – Biological Spill Control Inside a Centrifuge
- Appendix 25 – Biological Spill Control Inside the Special Containment Zone

These procedures may need to be used in conjunction with the Code Brown and Code Green procedures listed above.

Aside from spills, there is also a risk that an emergency exposure or suspected exposure may occur inside the containment zone. The following procedures outline the actions to take in these circumstances:

- Appendix 26 – Needle Stick, Puncture Wound or Percutaneous Injury
- Appendix 27 – Eyes or Mucous Membrane Exposure
- Appendix 28 – Exposure by Ingestion
- Appendix 29 – Emergency Shower Use

All incidents related to biosafety and biosecurity need to be reported to the Laboratory Supervisor, the Biosafety Officer, and the Occupational Health and Safety/Infection Control Coordinator so that incidents and accidents can be appropriately documented, investigated, and reported as necessary. See the previous section of this document titled Incident Reporting and Investigation for more information.

Medical Surveillance Program

The Medical Surveillance Program at Stanton Territorial Hospital consists of 5 critical components.

1. Pre-placement evaluation
2. Vaccinations
3. Ongoing Medical Surveillance
4. Post-Exposure Response Plan
5. Emergency Medical Contact Cards

Pre-Placement Evaluation

The purpose of performing a pre-placement evaluation with employees accessing the containment zone is to ensure that personnel do not have any underlying medical conditions that may increase the likelihood of contracting a laboratory acquired infection. Other conditions such as pregnancy or allergies to antibiotics may impact the treatment of an illness if it is contracted. For confidentiality reasons, this activity is performed by the Occupational Health/Infection Control Coordinator.

Personnel may also be asked to provide baseline serum testing samples for common pathogens for comparison with samples collected following potential exposures.

Vaccinations

The Government of the NWT *Hospital and Health Care Facility Standards Regulations*, 2009 state that hospital and health care facility staff shall show proof of immunization or undertake an immunization program.

The NWT Infection Prevention and Control Manual 2012 provides a checklist and frequency for required immunizations in Section 8 – Occupational Health and Safety. Stanton Territorial Hospital also has a policy O-1400 Immunizations and TB Assessment of Staff that outlines this practice.

Ongoing Medical Surveillance

Personnel are encouraged to report any changes in their health status that may increase the risk of exposure or susceptibility to the Occupational Health/Infection Control Coordinator. Increased personal protective equipment or temporary changes in duties may be required to ensure the safety of the employee. This process is explained in Hospital Wide Policy O-1570 Duty to Accommodate/Work Accommodation.

Post-Exposure Response Plan

The NWT Infection Prevention and Control Manual outlines the Post-exposure Prophylaxis Protocol in Appendix 12. This protocol is supported with the following Stanton Hospital wide policies and procedures:

- I-0600 Incident Reporting
- I-0695 Management of Health Care Workers Exposed to Blood and Body Fluids
- O-1310 Accident Investigation
- O-1510 Reporting Workplace Accidents, Injuries or Illnesses
- O-1580 Workplace Safety: Hazard Action Form Completing

For more information see the Incident Reporting and Investigation section of this document.

Emergency Medical Contact Cards

Emergency medical contact cards will only be provided to personnel accessing the Special Containment Zone or as part of a post-exposure response. The purpose of this card is to provide a summary of

important information to medical personnel in the event of an unexplained illness so that appropriate measures can be taken. Stanton Territorial Hospital determines when emergency medical contact cards are to be carried by personnel.

Training Program

The importance of appropriate safety training for all Stanton Territorial Hospital personnel and other persons accessing the containment zone cannot be overstated. It is vital that those with access are aware of and follow appropriate processes while in the containment zone to protect themselves, others, and the environment.

The following table outlines the safety training for the containment zones within the facility:

Course	Description	Access	Frequency
Hospital Wide Orientation	This is a brief introduction to life at STHA where key speakers will present.	LMS	At hire
Laboratory Safety Orientation	Tour and training for new Laboratory personnel.	Laboratory Safety Officer	At hire
WHMIS	This training course teaches the basics of safe WHMIS practices. It describes the Workplace Hazardous Materials Information System and how Material Safety Data Sheets are used.	LMS	Annual
Workplace Safety Awareness Training	Mandatory safety training for all GNWT employees.	LMS	Once
Fire Safety	This course has been developed to educate healthcare workers about fire—how to prevent it and what to do if a fire breaks out.	LMS	Annual
Fire Extinguisher Training	This program covers how to use a fire extinguisher.	LMS	Annual
Emergency Response Training	This course reviews all Codes at STHA and the appropriate procedures to carry out during those Codes.	LMS	Annual
N-95 Fit Testing and Training	The Fit Testing incorporates the use of the Portacount Pro+ Fit Tester. To meet the Fit Testing requirements, please do not eat, drink or smoke 30 minutes prior to fit testing.	LMS	Every 2 years
Infection Control Module	This course outlines Infection Control processes and procedures.	LMS	Annual
Transport of Dangerous Goods	This course is mandatory for all persons who ship or receive dangerous goods.	LMS	Every 2 years
Privacy and Confidentiality	This is a quick review of the privacy policies at STHA.	LMS	Annual
Biosafety and Biosecurity Training	This course is mandatory for anyone required to access the laboratory or biohazardous waste room.	LMS	Annual

The Stanton Learning Management System is operated by the Staff Education and Development office. See Appendix 30 – Learning Management System (LMS) for instructions to access the system.

For individuals without access to the Learning Management System, please contact Staff Education and Development to book an appointment for Biosafety and Biosecurity Training.

Housekeeping Program

Good housekeeping practices are vital within containment zones. These practices ensure these areas remain safe and healthy places to work, increase efficiency and convey professionalism. Containment zones should be kept clean, well-organized and uncluttered.

- Unused equipment and materials should be stored or removed to avoid blocking aisles, exits and safety equipment.
- Floors need to be kept dry. Spills of ANY material need to be addressed immediately and appropriately.
- Work areas and equipment should be left in a safe condition after use. Ensure they are appropriately cleaned as per the routine maintenance schedule or immediately after a spill.
- Biohazardous waste containers and sharps containers should be conveniently located so that waste can be disposed of safely and promptly.
- Rooms and equipment may need to be decontaminated prior to service, maintenance, removal or reassignment.
- High efficiency particulate air (HEPA) filters need to be changed by appropriate personnel. This is done as part of the annual contracted service for the BSCs.
- Contact Facilities Services IMMEDIATELY if any rodents or insects are seen within the containment zone.

Housekeeping procedures within the containment zones are performed by different individuals than in other areas within the hospital.

Facilities Services

Facilities services are responsible for cleaning and maintaining the HVAC system and the plumbing system.

Laboratory Personnel

Laboratory personnel are responsible for routine cleaning and maintenance of bench tops and most equipment within the laboratory.

See Laboratory procedure LSM30300 Disposal of Biological Waste and Decontamination of Surfaces.

Laboratory personnel are also responsible for autoclaving gowns worn in the Special Containment Zone prior to placing them in the laundry. See Laboratory procedure MIC80500 Mycobacteria Room Entry and Exit and MIC81200 MII Ultra Clave Sterilizer.

Housekeeping Personnel

Housekeeping personnel are responsible for cleaning floors, walls, windows, washrooms and clean sinks within the containment zone.

- See Appendix 31 – Routine Environmental Cleaning in a Laboratory
- See Appendix 32 – Damp Mopping of Floors
- See Appendix 33 – Damp Wiping of Surfaces
- See Appendix 34 – Routine Washroom Cleaning

Housekeeping personnel remove the dirty laundry from the containment zone and replace with clean lab coats, gowns, cloths and towels.

- See Appendix 35 – Laundry Handling

The handling of hospital waste from the containment zone is also a function of the Housekeeping Department. General information is available in Hospital Wide Policy I-0692 Handling of Hospital Waste.

- See Appendix 36 – Handling Garbage
- See Appendix 37 – Transport of Biohazardous Waste within the Facility

In spite of every possible effort to avoid the escape of waste materials during movement within the health care facility, spills may occur. In most instances, minor spills involving loss or aerosolization of small volumes of material are most likely the result of faulty transfer techniques. Major spills or accidents usually involve container rupture, caused by equipment malfunction or careless handling.[12]

In the event of a spill involving biohazardous waste, please see Appendix 23 – Biological Spill Control and Code Brown.

Disinfectants

Many types of chemicals can be used as disinfectants. It is important to select the correct disinfectant for each situation. As heavy soiling can interfere with the effectiveness of most disinfectants, pre-cleaning of heavily soiled items may be required prior to disinfection.

The following appendices provide further information about disinfectants:

- See Appendix 38 – Disinfectants – Advantages and Disadvantages
- See Appendix 39 – Antimicrobial Activity of Disinfectants
- See Appendix 40 – Preparing Household Bleach as a Disinfectant

[12] As found in Guidelines for Management of Biomedical Waste in the Northwest Territories, 2005.

Facility and Equipment Maintenance Program

Maintenance of the Stanton Territorial Hospital facility is conducted by Facility Services. Any staff member that identifies the need for maintenance, repair or service on a part of the facility within the containment zones should immediately report the deficiency to their supervisor. Facilities Services also maintains the refrigerators, freezers and incubators within the containment zone. The supervisor will complete a Service Requisition and submit it to Facilities Services. Alternately, the request may be submitted via email to STH_Maintenance@gov.nt.ca.

Biological Safety Cabinet service, repair and annual recertification are contracted services. Records of these activities are kept on file by the Laboratory.

Biomedical Services performs annual centrifuge checks within the containment zone.

Most of the laboratory testing equipment is serviced and repaired under service contracts maintained by the Materials Management Department. Laboratory personnel are trained to perform basic maintenance and troubleshooting activities, but major repairs and preventative maintenance activities are performed by outside vendors.

Routine maintenance and checks of equipment performed by the laboratory are recorded on log sheets.

Contact information for service personnel are located by each piece of equipment. In the event that service personnel needs to be contacted, ensure the Laboratory Supervisor is aware. The Laboratory Supervisor will report any incidents that may result in a loss of containment to the Biosafety Officer and the Occupational Health and Safety/Infection Control Coordinator.

All relevant information concerning the equipment provided in the containment zone has been provided in the following appendices discussed earlier in this manual:

- Appendix 3 – Biological Safety Cabinets
- Appendix 4 – Centrifuge Safety
- Appendix 5 – Personal Protective Equipment (PPE) Types
- Appendix 6 – Putting on Personal Protective Equipment (PPE)
- Appendix 7 – Removal of Personal Protective Equipment (PPE)
- Appendix 8 – N95 Respirator On and Off Protocol
- Appendix 9 – Care of Reusable PPE
- Appendix 27 – Eyes or Mucous Membrane Exposure
- Appendix 29 – Emergency Shower Use

These appendices provide basic information for all individuals with access to the containment zone. Laboratory personnel will have access to more comprehensive or specific information in their departmental manuals for the routine operation and maintenance of equipment such as biological safety cabinets and autoclaves.

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Appendix 1 – Sharps Handling[13]

What are sharps?

Sharps are any object that can cut or puncture you. Examples of sharps are:

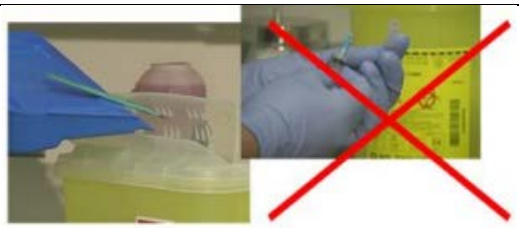
- Needles
- Blades
- Lancets
- Broken glass

What do I need?

- Gloves
- Heavy duty gloves
- Dust pan
- Broom

Do NOT pick up a discarded sharp.

Use the broom and dust pan to collect the sharp and dispose of into a sharps container. Remove gloves and do hand hygiene.



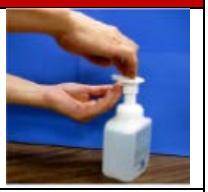
Proper Sharps Handling:

- Know where sharps containers are located.
- Do NOT shake containers.
- Do NOT recap, remove or bend sharps by hand.
- Do NOT damp wipe the top of the sharps container.
- Do NOT push in any sharps sticking out of the container.
- Do NOT fill beyond the "fill" line.
- Seal and dispose of full sharps containers.

Ensure you get your Hepatitis B vaccination!!!

[13] The NWT Infection Prevention and Control Manual 2012

Appendix 2a – Hand Hygiene Using an Alcohol Based Rub[14]

Hand Hygiene – Using an Alcohol Based Rub
Squirt product into the palm of one hand. 
Rub hands together covering all surfaces including fingernails, web spaces, thumbs and palms.   
The product will dry in 15-20 seconds; ensure hands are dry before performing another task. 

[14] The NWT Infection Prevention and Control Manual 2012

Appendix 2b – Hand Hygiene Using Soap and Water[15]

Hand Hygiene – Using Soap and Water	
Apply soap and distribute over hands.	
Wet hands under warm running water.	
Rub hands together for 15 seconds to create a good lather.	
Using friction, cover all hand surfaces including fingernails, thumbs, web spaces and palms.	  
Rinse under warm running water.	
Dry hands well with a paper towel or air dryer.	
Use paper towel to turn off tap.	

[15] The NWT Infection Prevention and Control Manual 2012

Appendix 3 – Biological Safety Cabinets[16]

Stanton Territorial Hospital uses Purifier Series Biosafety Cabinets which operate using the following principles:

- Filtration and retention of particles by High Efficiency Particulate Air (HEPA) filters
- Laminar Air Flow

Laminar air flow is defined as the movement of a body of air in a single direction, with a uniform velocity. In practice, the laminar down flow of air in the cabinet captures any aerosol generated in the work area of the cabinet, and directs it to the HEPA filters.

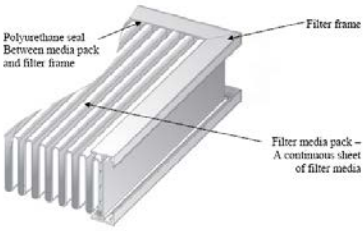
- Directional Air Flow

Directional air flow also plays a key role in biosafety cabinet performance. Air is drawn into the front of the cabinet at the front grille. This curtain of air makes it more difficult for aerosols to escape out of the work area of the cabinet and into the outside environment.

The major components in a Biosafety Cabinet are:

- The HEPA filters

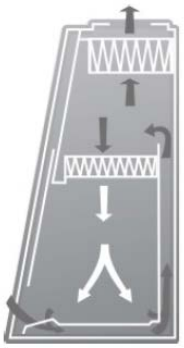
Note: The HEPA filter media is very fragile. DO NOT touch the media. If you think the media of a HEPA filter is damaged, DO NOT USE THE CABINET. Have the HEPA filter integrity tested by a certifier before using the cabinet.



HEPA filters are only effective against particulate material. Gases will pass through the filter.

- The motor/blower to force air through the Cabinet

[16] LSM30200 Biological Safety Cabinets from the Stanton Laboratory Safety Manual



The motor/blower assembly pulls room air into the front of the cabinet, and re-circulates it internally. During its recirculation, the air is split into two separate streams. One path leads through the exhaust HEPA filter and out of the unit. The second path flows through the supply HEPA filter which then flows down through the work area.

- Cabinet air intake (grilles), ductwork and air balance controls

Note: Never block or obstruct the grilles of the Biosafety Cabinet.

1. Some internal components of the Biosafety Cabinet may become contaminated during operation of the unit. Only experienced personnel competent in decontamination procedures should decontaminate the cabinet before servicing these components.
2. DO NOT load more than 50 lbs. (23Kg) in the work area. Exceeding this limit may damage the work surface and its supports.
3. Avoid the use of flammable gases or solvents in the Biosafety Cabinet. Care must be taken to ensure against the concentration of flammable or explosive gases or vapors. An open flame should NOT be used in the Biosafety Cabinet.
4. The media of HEPA filters is fragile and should not be touched.
5. When surface disinfecting the Biosafety Cabinet:
    a. Avoid splashing the disinfecting solution on skin or clothing.
    b. Ensure adequate ventilation.
    c. Always dispose of disinfecting solutions in accordance with local and national laws.
    d. DO NOT allow disinfectants with high concentrations of free chlorine to contact stainless steel components of the Biosafety Cabinet for a long period of time. Free chlorine will corrode stainless steel after extended contact.
6. Biosafety Cabinets should be decontaminated for any of the following reasons:
    a. Before maintenance work requiring entry into contaminated areas.
    b. Before HEPA filter changes.
    c. Before performing certification tests requiring entry into contaminated areas.
    d. Before relocating the cabinet.
    e. After the gross spill of biohazardous material or toxic chemicals.

Appendix 4 – Centrifuge Safety[17]

The Allegra X-15R Centrifuge is the only centrifuge located within the containment zone. Please see the appropriate laboratory manuals for complete operating instructions for this centrifuge and for other centrifuges located within the laboratory but outside of the containment zone.

SPECIAL SAFETY PRECAUTIONS:

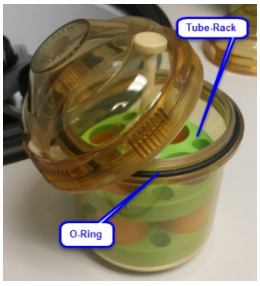
- Handle all patient samples and testing reagent using "Routine Practices"
- Please refer to the Northwest Territories Infection Prevention and Control Manual, March 2012
- Prior to testing all patient are to be identified as per I-0500 Use of Two Patient Identifiers.

CENTRIFUGE

Equipment	Information
Allegra X-15R Centrifuge	
	Manufacturer: • Beckman Coulter Model and Serial # currently unattainable (back of equipment) System ID: 1085608 Special features – Refrigeration option, making it useful for Mycobacteria and some chemistry tests.

INFORMATION ABOUT CENTRIFUGE:

Canisters:

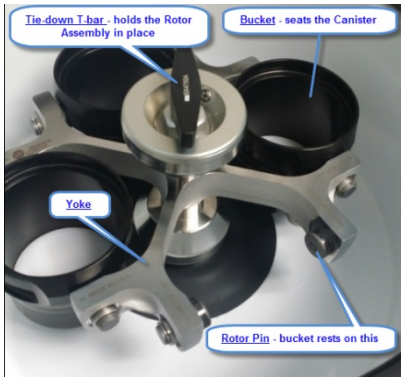


- Brand: Aerosolve™
- Manufacturer: Beckman Coulter
- Tube Racks: Lime Green, spins max 4 50mL conical Falcon tubes /canister
- O-ring: part #345366 (**cannot** substitute with any other O-ring)

[17] MIC80700 Allegra X-15R Centrifuge from the Stanton Mycobacteria Manual

- Purpose: To contain microbial aerosol leakage and liquid spills from the rotor buckets during centrifugation. The Beckman Coulter O-ring has been specifically designed to be gas-tight for maximum prevention of aerosol release.
- Design feature: Transparent so the Technologist can check for broken samples before opening the lid.
- Canisters contain the tube rack inserts that hold 50mL falcon centrifuge tubes or Vacutainer tubes for chemistry or Quantiferon Gold samples.
- Cleaning Canisters and tube racks – can be autoclaved for up to 30 minutes at 121°C or soaked in 5% bleach to disinfect. Regular maintenance: soak in warm soap water.

Swinging Bucket Rotor Assembly:



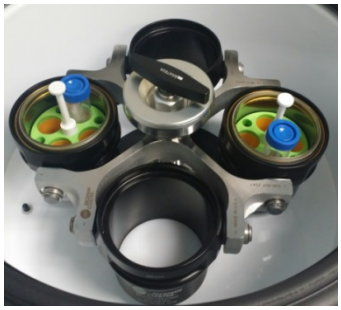
- Rotor: SX4750/4750A, made by Beckman Coulter. Equipped with ARIES technology.
- Buckets: Display the rotor specifications on the side. Must use a Beckman Coulter bucket that has been tested for the specific rotor/centrifuge combination.
- Buckets are attached to the rotor yoke (“arms” of rotor) by pivot pins.
- Only the canisters should be removed while loading/unloading samples, not the buckets.
- The centrifuge identifies the rotor during the run using a magnetic sensor and the rotor model will be displayed in the window when centrifuging.

BALANCING THE LOAD:

- Use a Cross-parallel technique, and try to load balancing samples with nearly the same volume/mass.
- Note: Rotor equipped with ARIES technology; compensates for an unbalanced load of 50 grams between samples.

Balanced load

Unbalanced load



Balanced load

OPERATION USING PROGRAMMED RUNS:

- Use the preset settings posted on the centrifuge:

Program	Sample	RPM	G	Time	Temp
1	AFB	3590	3000	15	4°C
2	Fluid	3500	2851	10	20°C
3	ACTH	3500	2851	10	4°C
4	Quantiferon	3277	2500	15	20°C

- STARTING a CYCLE: Firmly close door (hear a "click" when it latches)→ Press Program → use keypad to select Program Number (1 to 4) → press Enter/Save → Review screen and check that all parameters are correct → Press Enter/Save again → Press Start (LED by button light up) → Wait for display to read Rotor and speed before walking away (if any malfunctions occur, it'll occur before the Rotor and speed is displayed).
- Quality Control: Record RPM and Time Remaining after several minutes of spinning (after reaching full speed) on the Centrifuge Maintenance sheet.
- END of CYCLE: a quiet tone sounds when cycle is complete → Door unlatches (LED by door button lights up) → Press the Door button → chamber unlocks and opens up → lift door up. Samples are ready to unload from the buckets by removing the canisters.

- Note for unloading Mycobacteria samples**:** Allow Mycobacteria samples to "rest" for several minutes in Centrifuge in their Canisters before removing Canisters from buckets to BSC. This allows any potential aerosols on the inside of the Canisters to settle before unscrewing lid.

OPERATION USING MANUAL RUNS:

- Uncommonly done; refer to Allegra® X-15R Centrifuge Instruction Manual pg. 3-2.

NOTES ON LOADING SAMPLES FOR CENTRIFUGATION:

- Always use the screw-on lid on the canisters.
- Always balance the centrifuge load with a cross-parallel technique before closing the lid and spinning.
- Vacutainers/Quantiferon Golds: when loading Quantiferons or Chemistry tubes (i.e. For ACTH), place samples in empty screw-topped falcon centrifuge tubes and load into the tube racks inside the Canisters for centrifugation.
- Before loading Mycobacteria samples after digestion in the falcon tubes, 1st take the canisters over to the BSC and load samples into canisters. Do not take the samples to the centrifuge and load without the Canisters being sealed underneath the BSC. Always unload Mycobacteria samples from the canisters under the BSC.
- Never walk away from the centrifuge before its full RPM is reached. Watch the spinning load for unbalanced tubes before full RPM is reached (excessive vibrations and shaking will be felt). The centrifuge will often automatically detect unbalanced loads and shut down when too much vibration is felt; however a watchful eye should be kept in case this does not happen and damage may result. Correct any unbalanced loads and re-spin.

Note: the centrifuge has been mounted to the bench using the provided anti-rotation kit, to prevent an accident if an unlikely incident of a rotor mishap occurs.

Appendix 5 – Personal Protective Equipment (PPE) Types

Medical Gloves[18]

Type	Use	Advantage	Disadvantage
Vinyl	• Protection for: o Minimal exposure to blood/body fluids/infectious agents o Contact with strong acids and bases, salts alcohols o Short duration tasks o Protection for staff with documented skin breakdown	• Good level of protection but based on the quality of manufacturer • Medium chemical resistance	• Not recommended for contact with solvents, aldehydes,keytone s
Latex	• Activities that require sterility • Protection for: o Heavy exposure to blood/body fluid infectious agents o Contact with weak acids and bases, alcohols	• Good barrier qualities • Strong and durable • Has re-seal qualities • Good comfort and fit • Good protection from most caustics and detergents	• Not recommended for contact with oils, grease and organic s • Contraindicated for individuals who have allergic reactions or sensitivity to latex
Nitrile	• Protection for: o Heavy exposure to blood and body fluids/infectious agents o Tasks of longer duration o Tasks with high stress on gloves o Tasks requiring additional dexterity o Chemical and chemotherapeutic agents o Recommendation for contact with oils, grease, acids, bases o Sensitivity to latex o Preferred replacement for vinyl gloves when a documented allergy or sensitivity occurs	• Offers good dexterity • Strong and durable • Puncture resistant • Good comfort and fit • Excellent resistance to chemicals	• Not recommended for contact with solvents, keytones, esters
Neoprene	• Replacement sterile gloves for latex when a documented allergy or sensitivity occurs • Recommended for contact with acids, bases, alcohol, fats, oils, phenol, glycol, ethers	• Good barrier qualities • Strong and durable • Good comfort and fit • Good protection from caustics	• Not recommended for contact with solvents

[18] The NWT Infection Prevention and Control Manual 2012

Eye Protection[19]

Type	Use	Advantage	Disadvantage
Safety Glasses	• Protection for: ○ Exposure to infectious droplets or blood/body fluids	• Maybe cleaned and re-used until visibility is compromised • Maybe worn over prescription glasses • Good visibility	• With continued used visibility may be compromised
Goggles	• Protection for: ○ Exposure to infectious droplets or blood/body fluids	• Maybe cleaned and re-used until visibility is compromised • Maybe worn over prescription glasses	• Poor visibility
Face Shield	• Protection for: ○ Exposure to infectious droplets or blood/body fluids	• Maybe worn over prescription glasses • Good visibility	
Visor attached to mask	• Protection for ○ Minimal exposure to infectious droplets or blood/body fluids	• May be worn with prescription glasses • Quick to put on	

[19] The NWT Infection Prevention and Control Manual 2012

Masks and N95 Respirators[20]

Type	Use	Advantage	Disadvantage
Standard Face Mask (procedure mask or "isolation" mask)	• Protection For: o Minimal exposure to infectious droplets o Short duration tasks o Tasks that do not involve exposure to blood/body fluids o Protection from patient during transportation outside room	• Inexpensive	• Not fluid or water resistant
Fluid Resistant Mask	• Protection for: o Heavy exposure to infectious droplets or blood/body fluids	• Good comfort and fit • Fluid resistant	• Expensive
Surgical Mask	• Protection For: o Exposure to infectious droplets or blood/body fluids o Long duration tasks	• Good comfort and fit • Fluid resistant • Inexpensive	
NIOSH – certified N95 respirator	• Protection from airborne pathogens	• Provides protection from small particle aerosols • Better face seal prevents leakage around mask	• Required fit testing, training and seal checking • Expensive • Uncomfortable for long periods of use

[20] The NWT Infection Prevention and Control Manual 2012

Appendix 6 – Putting on Personal Protective Equipment (PPE)[21]

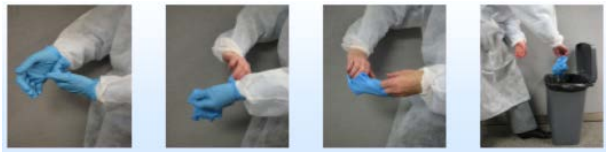
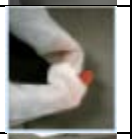
The following instructions are basic instructions for putting on PPE. See lab procedure MIC80500 Mycobacteria Room Entry and Exit for additional instructions for entering the Special Containment Zone.

Putting on Personal Protective Equipment	
Perform hand hygiene.	
Put on long sleeved gown with opening at back.	
Tie neck and waist ties.	
Apply mask (if you require an N95 mask it needs to be fit tested). Seal, check to ensure good fit. Mask should move with breath. Reapply glasses, if required.	
Apply protective eyewear, safety goggles, safety glasses or face shield.	
Apply gloves, pulling gloves up over cuffs of gown.	
You have donned your personal protective equipment.	

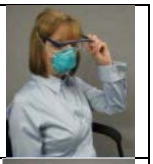
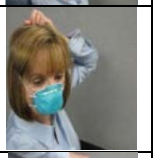
[21] The NWT Infection Prevention and Control Manual 2012

Appendix 7 – Removal of Personal Protective Equipment (PPE)[22]

The following instructions are basic instructions for removing PPE. See lab procedure MIC80500 Mycobacteria Room Entry and Exit for additional instructions for exiting the Special Containment Zone.

Removal of Personal Protective Equipment	
Remove gloves using the "glove to glove" "skin to skin" technique. 	
Perform hand hygiene.	
Untie neck ties first, and then waist ties on the gown.	
Place fingers of one hand under the opposite cuff and pull cuff over hand.	
Using the gown covered hand, pull the gown down over the other hand.	
Pull the gown down off the arms, being careful that the hands do not touch the outside of the gown.	
Hold the gown away from uniform and roll it up with the contaminated side inside, in a way that minimizes air disturbance.	
Place fabric gowns in the laundry bag and discard disposable gowns into garbage.	
Perform hand hygiene.	

[22] The NWT Infection Prevention and Control Manual 2012

Remove eye protection/face shield (See Appendix 9 – Care of Reusable PPE).	
Remove mask or N95 respirator carefully.	
Take care to prevent self-contamination.	
Discard into garbage.	
Perform hand hygiene.	

Appendix 8 – N95 Respirator On and Off Protocol[23]

N95 Respirator On and Off Protocol

Apply mask (N95-preferably fit-tested). Seal, check to ensure good fit. Mask should move with breath. Reapply glasses.

HOW TO PROPERLY PUT ON YOUR N95 MASK

- Place the N95 mask over your nose and mouth. Make sure the metal nose clip is on top.
- Pull the bottom strap over your head until it rests at the back of your neck. If you have long hair, lift your hair to make sure the mask strap is firmly against your neck.
- Pull the top strap over your head until it rests on the crown of your head, above your ears.
- Using both hands starting at the top, mold your nose clip around your nose to achieve a secure seal.
- Tighten top and bottom straps to ensure mask is snuggly fitted.

MASK FIT CHECKS

Perform both a Positive Pressure Seal Check and a Negative Pressure Seal Check

Positive Pressure Seal Check:

- With the mask securely in place, exhale greatly.
- The mask will bulge slightly.
- If air leaks between the face and the face-seal of the mask, reposition it and readjust the nose clip for a more secure seal.

Negative Pressure Seal Check:

- With the mask securely in place, inhale greatly.
- The mask will collapse slightly.
- If air leaks between the face and the face-seal of the mask, reposition it and readjust the nose clip for a more secure seal.
- If you cannot achieve a secure seal, do not enter the contaminated area.
- Fit Testing:
- Should be done prior to deciding to wear an N95 mask, which is done by a person who is certified to do N95 fit testing
- Fit-test the N95 mask on an annual basis.

Remove mask or N95 respirator carefully.

All health care staff will be required to wear a N95 mask for airborne precautions and must undergo annual respirator fit testing. AFD testing session will provide the opportunity to obtain a N95 mask of proper size and to learn the procedure of proper donning and removing a mask.

[23] The NWT Infection Prevention and Control Manual 2012

Appendix 9 – Care of Reusable PPE[24]

While most of the personal protective equipment used within the containment zone is disposable, some of the PPE is reusable. Safety glasses and housekeeping gloves are examples of reusable PPE.

Make sure you have enough PPE supplies.	
Order regularly so you don't run out. Keep in a safe dry area.	
Check PPE for rips/stains/wetness.	
If damaged, do NOT use – throw in garbage.	
Write your name on reusable equipment – do NOT share between staff, everyone should have their own.	
Wipe down PPE with disinfectant after use and hang to dry.	

[24] The NWT Infection Prevention and Control Manual 2012

Appendix 10 – Organism Assessment[25]

Organism Assessments are a critical part to the biosafety risk assessment process. The following process map outlines the basic biosafety risk assessment process:

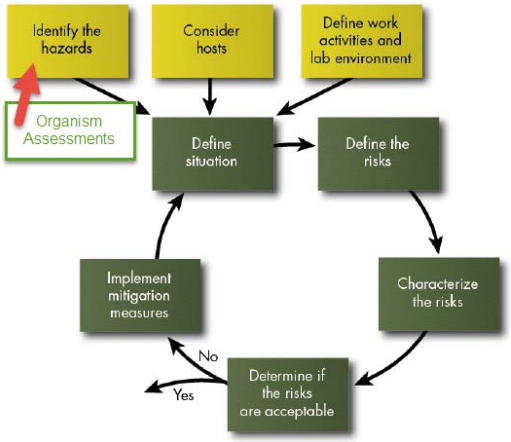


Figure 15 – Biosafety Risk Assessment Process (Sandia National Laboratories)

In an organism assessment, the biological properties of the organism that would influence its potential to cause an infection need to be considered. As the laboratory at Stanton Territorial Hospital provides diagnostic testing, the facility cannot predict which pathogens will be present in the primary samples provided. However, organisms that are purchased and held in inventory for quality control purposes are known and risk assessments need to be performed.

Follow the steps listed below to perform an organism risk assessment:

1. Determine the organism requiring a risk assessment. Any time a new organism is being requested for quality control purposes a risk assessment needs to be completed.
2. Contact the Biosafety Officer for an electronic copy of the Organism Assessment form.
3. Complete the form up until the section marked "For Biosafety Committee Use". The information required can be found on the Pathogen Safety Data Sheet (PSDS) for that organism. A list of PSDSs by pathogen name is available online at www.phac-aspc.gc/lab-bio/res/psds-ftss/index-eng.php. If there is no PSDS available for the organism contact the Medical Microbiologist for assistance.
4. Print a copy of the PSDS and place it in the PSDS binder.
5. Email the completed form to the Biosafety Officer. Include an electronic copy of the PSDS for the organism.

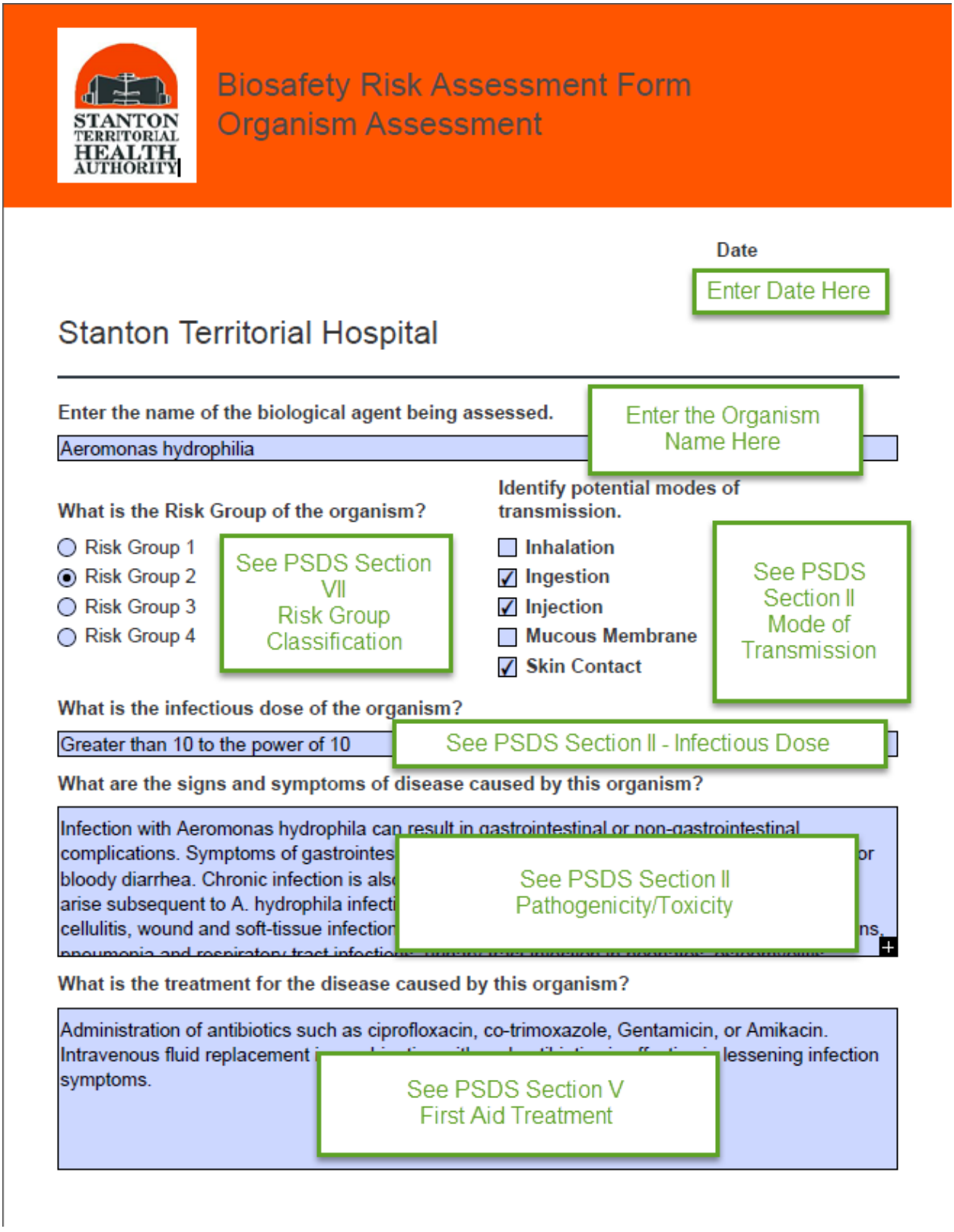
[25] Laboratory Biosafety and Biosecurity Risk Assessment Technical Guidance Document, Sandia National Laboratories

6. The Biosafety Officer will take the form to the Biosafety Committee for review at the next meeting. Advice may be requested from the Medical Microbiologist.
7. The Biosafety Committee will complete the sections marked “For Biosafety Committee Use”, “Recommendation sent to the Laboratory” and “Date of Next Assessment”.
8. A completed copy of the form will be returned to the laboratory. Recommendations that do not reflect current practice will need to be implemented prior to ordering the organism. Document these activities and submit via email to the Biosafety Officer.
9. A copy of the final form will be kept on file.
10. Note the date of next assessment and ensure that a new Organism Assessment form is submitted approximately 3 months prior to this date.

See Appendix 11 – Organism Assessment Form for assistance in completing the form.

Contact the Biosafety Officer with any questions. The Biosafety Committee may also contact the originator of the form with questions during the review process.

Appendix 11 – Organism Assessment Form



Biosafety Risk Assessment Form
Organism Assessment

Date

Enter Date Here

Stanton Territorial Hospital

Enter the name of the biological agent being assessed.

Aeromonas hydrophilia

Enter the Organism Name Here

What is the Risk Group of the organism?

- ○ Risk Group 1
- ◉ Risk Group 2
- ○ Risk Group 3
- ○ Risk Group 4

See PSDS Section VII Risk Group Classification

Identify potential modes of transmission.

- ☐ Inhalation
- ☑ Ingestion
- ☑ Injection
- ☐ Mucous Membrane
- ☑ Skin Contact

See PSDS Section II Mode of Transmission

What is the infectious dose of the organism?

Greater than 10 to the power of 10

See PSDS Section II - Infectious Dose

What are the signs and symptoms of disease caused by this organism?

Infection with Aeromonas hydrophila can result in gastrointestinal or non-gastrointestinal complications. Symptoms of gastrointes… or bloody diarrhea. Chronic infection is als… arise subsequent to A. hydrophila infecti… cellulitis, wound and soft-tissue infection… ns, pneumonia and respiratory tract infections, urinary tract infection in urinary catheterized

See PSDS Section II Pathogenicity/Toxicity

What is the treatment for the disease caused by this organism?

Administration of antibiotics such as ciprofloxacin, co-trimoxazole, Gentamicin, or Amikacin. Intravenous fluid replacement … lessening infection symptoms.

See PSDS Section V First Aid Treatment

Is there an immunization available?

○ Yes
● No

See PSDS Section V Immunization

Is this organism known to cause Laboratory Acquired Infections?

○ Yes
● No

See PSDS Section VI Laboratory Acquired Infections

List the laboratory activities that may involve this organism.

Processing primary specimens, Using needles or syringes, Bacterial suspensions, Manipulating bacterial culture plates, Using inoculation loops, Disposal of specimens and culture plates, API test strips, Gram stains, oxidase test, TSI test, etc.

List the types of laboratory activities that will be performed using this organism.

Identify the risks of these activities.

- ☑ Causes aerosols
- ☑ Potential for splashes
- ☑ Potential for Ingestion due to splashes
- ☑ Potential for skin inoculation

Check all of the risks associated with the activities listed above

What are the containment requirements for this organism?

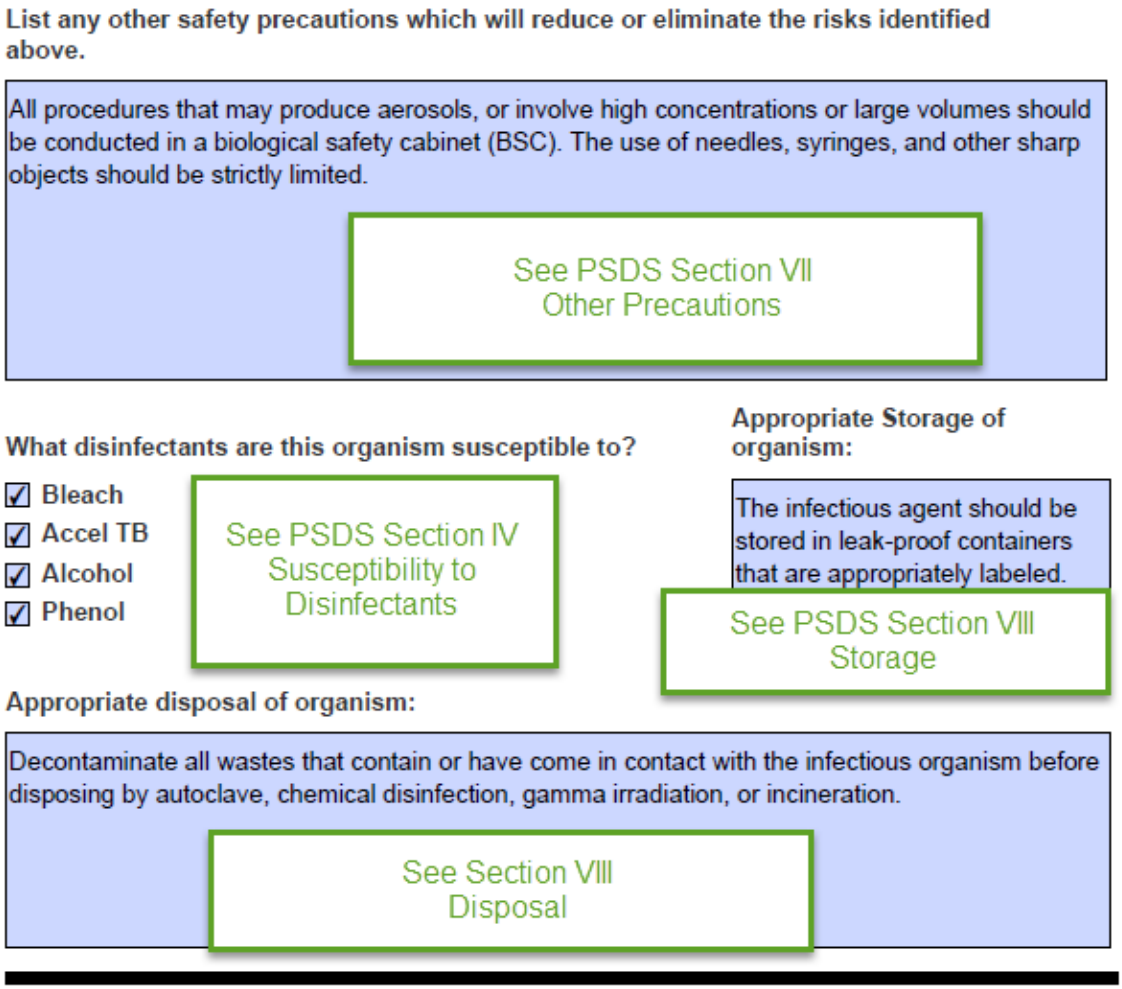
Containment Level 2 facilities, equipment, and operational practices for work involving infectious or potentially infectious materials, animals, or cultures.

See PSDS Section VII Containment Requirements

What Personal Protective Equipment is recommended?

Lab coat. Gloves when direct skin contact with infected materials or animals is unavoidable. Eye protection must be used where there is a known or potential risk of exposure to splashes.

See PSDS Section VII Protective Clothing



As the appropriate fields are completed, ensure that the procedures involving the organism reflect the current practices within the containment zone.

If procedure changes are required for the activities being planned, complete an Activity Assessment Form and submit it to the Biosafety Officer along with the related procedure for review by the Biosafety Committee.

Appendix 12 – Activity Assessment[26]

Activity assessments are a critical part to the biosafety risk assessment process. The following process map outlines the basic biosafety risk assessment process:

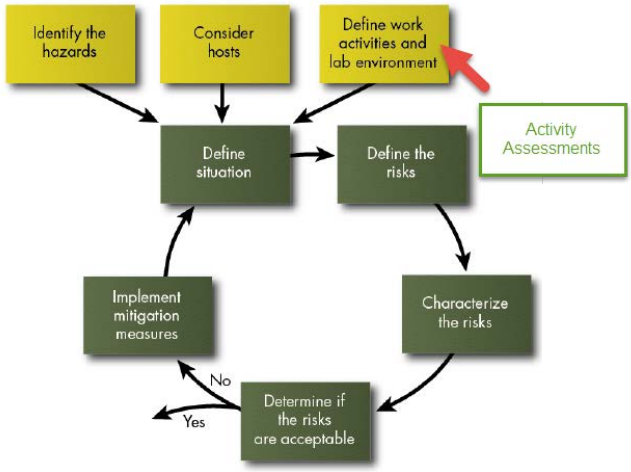


Figure 16 – Biosafety Risk Assessment Process (Sandia National Laboratories)

To assess the risks within the containment level, the types of processes perform need to be reviewed to identify potential areas where an exposure to a pathogen might occur. This is also the time to document the biosafety measures being taken to reduce the likelihood of exposure. To ensure completeness, it is recommended that the potential sources of exposure are documented separately from the safety measures being taken to reduce those risks. An activity assessment needs to be performed prior to conducting new activities within the containment zone.

Follow the steps listed below to perform an activity risk assessment:

1. Determine the activity requiring a risk assessment. Any time a new activity will be performed in the containment zone, or the steps of a current activity will change, an activity assessment will need to be performed.
2. Contact the Biosafety Officer for an electronic copy of the Activity Assessment form.
3. Complete the form up until the section marked “For Biosafety Committee Use”. The information required should be reflective of the Standard Operating Procedure (SOP) for that activity.
4. Email the completed form to the Biosafety Officer. Include an electronic copy of the SOP for the activity.

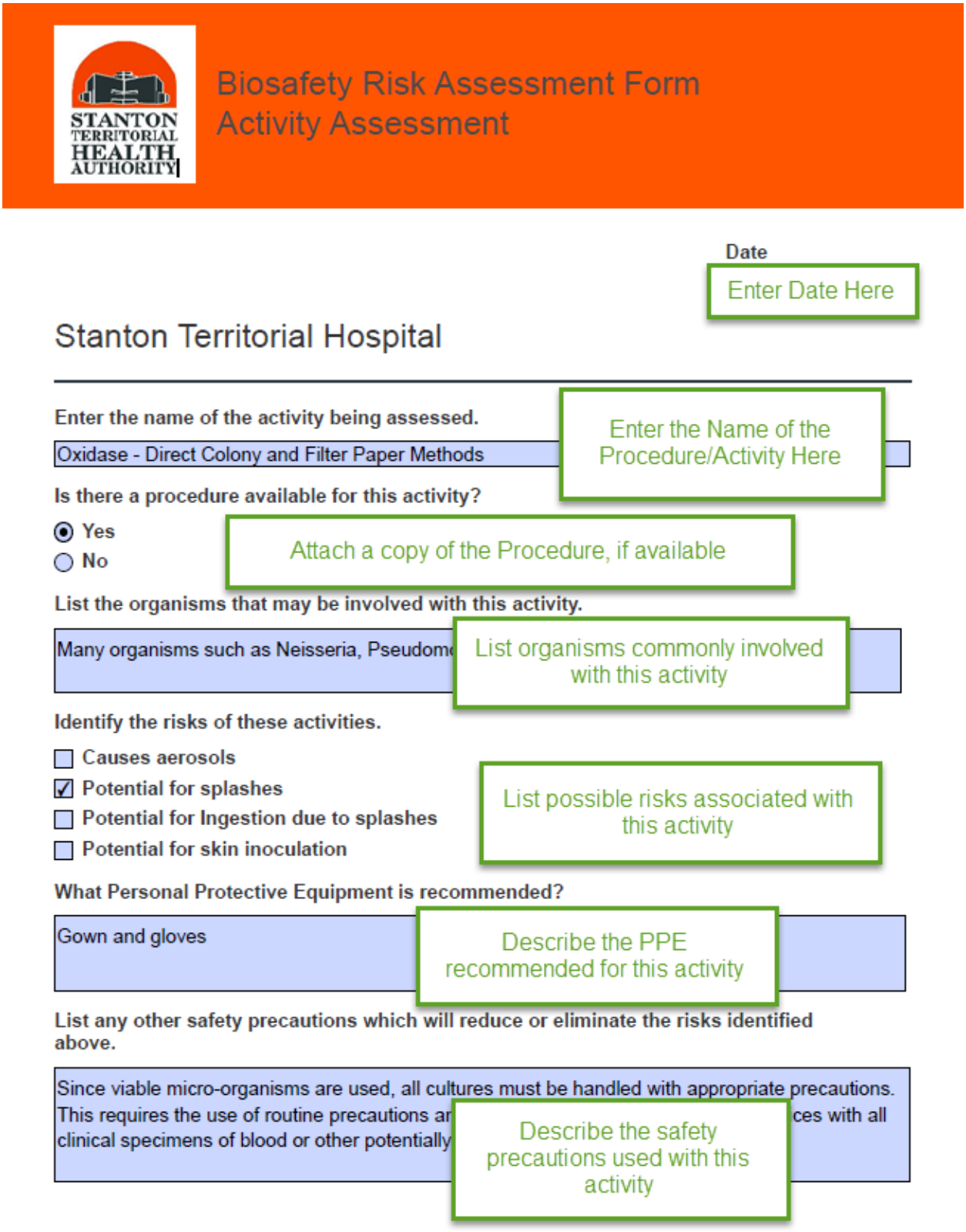
[26] Laboratory Biosafety and Biosecurity Risk Assessment Technical Guidance Document, Sandia National Laboratories

5. The Biosafety Officer will take the form to the Biosafety Committee for review at the next meeting. Advice may be requested from the Medical Microbiologist.
6. The Biosafety Committee will complete the sections marked “For Biosafety Committee Use”, “Recommendation Sent to the Laboratory” and “Date of Next Assessment”.
7. A completed copy of the form will be returned to the laboratory. Recommendations that do not reflect current practice will need to be implemented prior to performing the activity. Document these changes and submit via email to the Biosafety Officer.
8. A copy of the final form will be kept on file.
9. Note the date of next assessment and ensure that a new Activity Assessment form is submitted approximately 3 months prior to this date.

See Appendix 13 – Activity Assessment Form for assistance in completing the form.

Contact the Biosafety Officer with any questions. The Biosafety Committee may also contact the originator of the form with questions during the review process.

Appendix 13 – Activity Assessment Form



Biosafety Risk Assessment Form
Activity Assessment

STANTON TERRITORIAL HEALTH AUTHORITY

Date

Enter Date Here

Stanton Territorial Hospital

Enter the name of the activity being assessed.

Oxidase - Direct Colony and Filter Paper Methods

Enter the Name of the Procedure/Activity Here

Is there a procedure available for this activity?

- (•) Yes
- ( ) No

Attach a copy of the Procedure, if available

List the organisms that may be involved with this activity.

Many organisms such as Neisseria, Pseudom

List organisms commonly involved with this activity

Identify the risks of these activities.

- ☐ Causes aerosols
- ☑ Potential for splashes
- ☐ Potential for Ingestion due to splashes
- ☐ Potential for skin inoculation

List possible risks associated with this activity

What Personal Protective Equipment is recommended?

Gown and gloves

Describe the PPE recommended for this activity

List any other safety precautions which will reduce or eliminate the risks identified above.

Since viable micro-organisms are used, all cultures must be handled with appropriate precautions. This requires the use of routine precautions ar ces with all clinical specimens of blood or other potentially

Describe the safety precautions used with this activity

Appendix 14 – Training Needs Assessment[27]

In order to identify the current and future training needs of Stanton Territorial Hospital and to identify gaps in the current training program, an annual training needs assessment will be completed in the fall (September through November) of each year. Given the size of the organization, the differing needs of the individuals requiring access to the containment zone, a simple training needs assessment process is employed.

Training needs assessments can be performed by the Biosafety Officer, or a representative of the Staff Education and Development Department. It is best to have two people conduct the assessment, one to lead the session and one to take notes and complete Appendix 15 – Training Needs Assessment Form.

Follow the steps in the procedure below to conduct a simple training needs assessment:

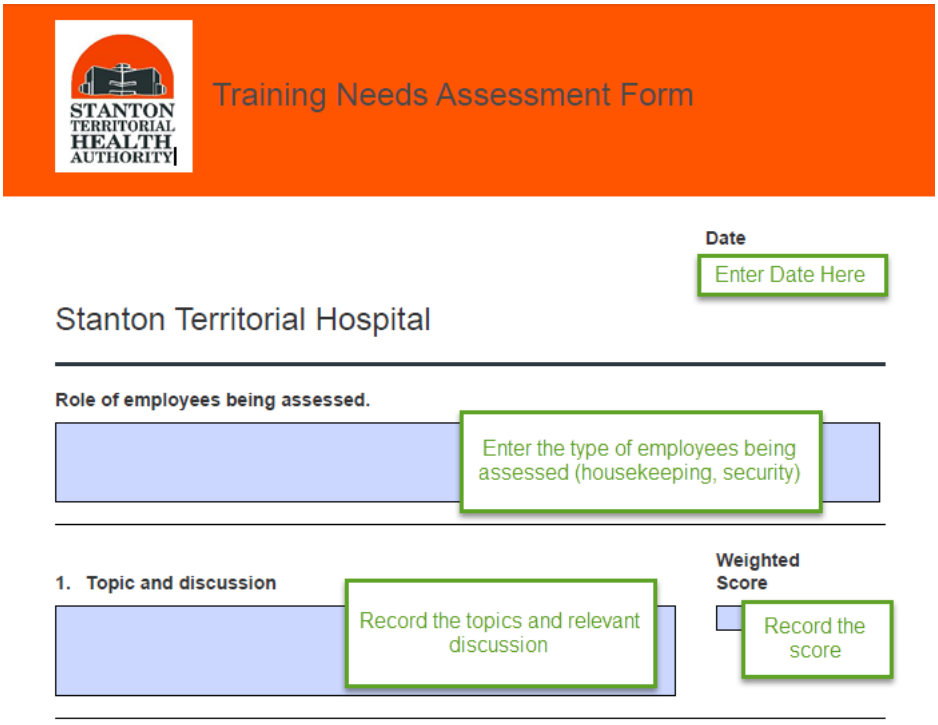
1. The facilitator gathers employees with the same role within the containment zone in a conference room with a white board or flip charts and markers.
2. Give each participant a piece of paper and a pen.
3. Ask each employee to write down their 10 most important training needs with respect to Biosafety and Biosecurity within the facility. This should take about 10 minutes.
4. The facilitator will ask the participants to share their training needs and will record the topics on the white board or flip chart. Do not record duplicates, but ensure that a topic really is a duplicate before excluding it.
5. Once the training needs have been listed, the facilitator will distribute the tokens for the weighted voting process. If the session is being conducted on a paper flip chart, this could be large and small stickers; if the session is being conducted on a white board, this could be large and small magnets or reusable vinyl stickers.
6. Large stickers or magnets are assigned 25 points and the smaller ones are assigned 5 points each. The participants place their tokens on the list to vote on their priorities.
7. Once the voting process has been completed, the facilitator will take a photo of the list. Attach a copy of the photo to the Training Needs Assessment Form.
8. The facilitators will compile the feedback and information collected during the session and findings of the session will be reported to the Biosafety Committee at the next meeting.
9. The Biosafety Committee will recommend changes to the training program based on the outcomes of the Training Needs Assessment. Employees will expect to see the key objectives outlined during this process highlighted in future versions of the training program.

[27] (Heathfield, Susan M.) How to Conduct a Simple Training Needs Assessment, 2015.

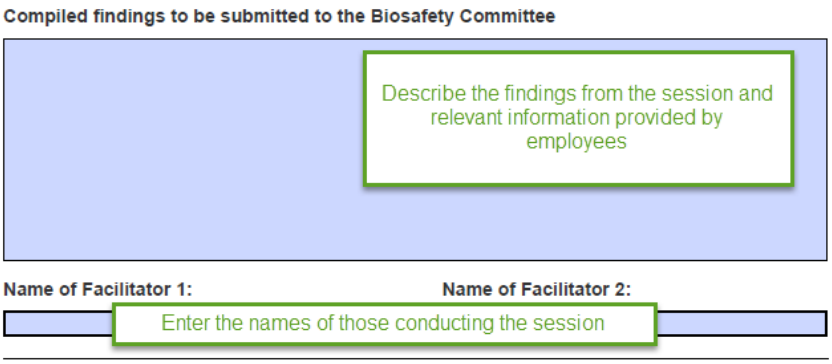
Appendix 15 – Training Needs Assessment Form

See the following for guidance on completing the Training Needs Assessment Form. Electronic copies can be obtained from the Biosafety Officer.

Complete the following areas of the form during the session.

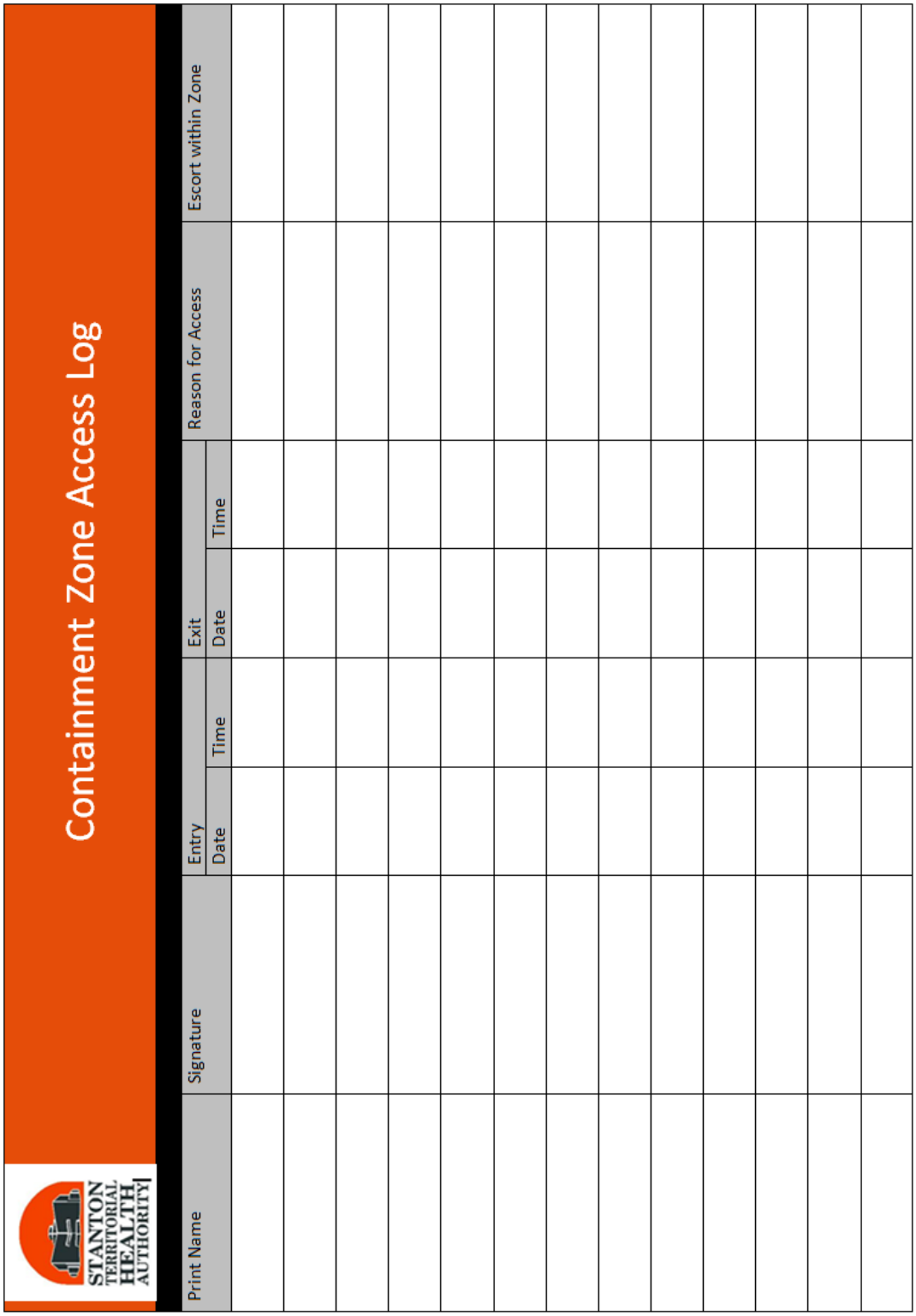


Take a photo of the list generated during the session. Use it and the part of the form completed during the session (see above) to fill in the following part of the form.



Submit the form and photo to the Biosafety Committee for review and recommendation.

Appendix 16 – Containment Zone Access Log



Appendix 17 - Ordering and Receiving Pathogens

Ordering pathogens may be required to replenish or replace the stock inventory of quality control organisms in the facility. Contact the Biosafety Officer prior to ordering any pathogens.

Stanton Territorial Hospital orders the majority of its organisms from Canadian vendors with which we have a contract or Standing Offer Agreement. As a rule of thumb, organisms that are currently in inventory and are available from our Canadian vendors are orderable under our license without requiring an import permit.

In rare instances, the Medical Microbiologist may require validation testing using an organism not available in our inventory or from our Canadian vendors. Please allocate extra time for these requests as the Biosafety Officer will need to apply for import permit(s) prior to ordering from an American vendor.

The Public Health Agency of Canada issues import permits for:

- Human pathogens and toxins; and
- Indigenous terrestrial animal pathogens and toxins.

The Canadian Food Inspection Agency issues import permits for:

- Non-indigenous terrestrial animal pathogens and toxins;
- Emerging animal disease pathogens and toxins;
- Aquatic animal pathogens in any form; and
- Bee pathogens in any form.

Stanton Territorial Hospital will not transfer purchased organisms to another organization. Movement of organisms to a location not indicated on an import permit is prohibited.

Step	Action
Ordering Pathogens	
1	Check the organism inventory to assess the organisms to be ordered. Ensure that the physical inventory matches the inventory recorded. Report any discrepancies to the Biosafety Officer immediately.
2	If any of the organisms are new to the facility or not available from our Canadian vendors, contact the Biosafety Officer as import permits may be required. No orders can be placed until the appropriate permits have been obtained.
3	Place the order in the ORMED system (for frequently used vendors and items) using

	QUA50320 Ordering Using the ORMED System. Alternately, the order may be placed on a paper requisition (for one time or sole source purchases) using QUA50330 Ordering Using a Paper Requisition.
4	In addition to approval from the appropriate signing authority, the Biosafety Officer must approve the order. Once the order receives the appropriate signatures, the order will be hand-delivered to Materials Management with the License number (or appropriate permit number(s)).
5	Materials Management will place the order and supply the vendor (and customs broker, if required) with the relevant information.
6	Materials Management will get an estimated time of delivery from the vendor and report this to the Biosafety Officer and the ordering party. Pathogens lost in transit must be reported to the appropriate authorities in a timely manner.

Step	Action
Receiving Pathogens	
1	Only personnel with current training in the Transport of Dangerous Goods may receive pathogen shipments.
2	Open the package in the Biological Safety Cabinet using appropriate personal protective equipment.
3	Compare the contents of the package with the packing slip and the original order placed. Report any damages or discrepancies to the Biosafety Officer. Verify the receipt of the shipment with Materials Management so they can receive it in the system and payment can be sent to the vendor.
4	Enter the organisms into the access database ensuring that all fields are completed. Ensure the physical inventory matches the inventory recorded in the database. Report any discrepancies to the Biosafety Officer immediately.
5	Appropriately store stock organisms.
6	Enter any organisms required for immediate use into the Laboratory Information System.

Appendix 18 – Monthly Biosafety Checklist[28]

Monthly Biosafety Checklist			
Month:	Year:		
Name:	Name:		
1. Indicate Yes, No, or N/A (Not Applicable) for each item. 2. Answer all questions. 3. List, explain and/or clarify "No" or "N/A" responses on the final page. 4. Policies and procedures will need to be updated when adding, changing or modifying tasks that affect occupational exposure.			
General	Yes	No	N/A
Has a designated Safety Officer been appointed to oversee safety issues?			
Do employees receive documented safety training at hire and annually thereafter?			
Is there a current emergency fan out list posted?			
Are all ladders and step stools maintained and in good condition?			
Are biological safety cabinets and chemical fume hoods certified annually?			
When hoods/cabinets are in use, are supplies and equipment kept at least 10 cm away from the hood face?			
Is the sash height kept at the certifier's recommended height for optimal flow and safety?			
Are chemical and biological spill kits maintained in accessible locations?			
Are noise levels below 75 dBA?			
Do employees understand what to do if they sustain an exposure to blood and body fluids?			
Housekeeping	Yes	No	N/A
Are all work areas, benches, floors, and storage areas maintained in a neat and orderly manner?			
Are all work surfaces decontaminated with an appropriate disinfectant at the end of each work shift and when grossly contaminated with blood and body fluids?			
Is broken glass picked up by tong, forceps or broom and dustpan and disposed of in an appropriate container?			
Do spill clean-up procedures include soaking up the spill with absorbent material, decontaminating the area with an appropriate disinfectant, and disposing of the materials appropriately?			

[28] Clinical Laboratory Safety; Approved Guideline Third Edition

Monthly Biosafety Checklist			
Is storage no less than 60 cm from the ceiling in a non-sprinklered area and no less than 45 cm from a sprinkler head?			
Are heavy objects stored on lower shelving?			
Are aisles free of trash and other debris?			
Are biohazard receptacles for blood or other potential infectious material separate from regular trash?			
Are these containers in good condition?			
Is trash removed at least once daily or when containers are full?			
Are main access hall corridors at least 120 cm wide?			
Are floors wet mopped daily?			
Are floors cleaned and wax stripped regularly to prevent staining and buildup?			
Is storage in chemical fume hoods and biological safety cabinets limited so that the ventilation is not obstructed?			
Have you looked in each and every cabinet for unlabeled containers and labeled them correctly?			
Are loads in centrifuges balanced?			
Are tops of centrifuges locked down when in use?			
Are aerosol containment devices used when centrifuging biological agents?			
Is chipped or cracked glassware disposed of in a rigid container?			
Are refrigerators/freezers clean and defrosted?			
Personal Protective Equipment (PPE)	Yes	No	N/A
Do employees wear safety glasses is case of splash hazards?			
Do any tasks require the use of additional face protection, suck as a mask or a chin length face shield?			
Do employees wear non-slip shoes?			
Do shoes cover the entire foot and are they made of a material impermeable to liquid?			
Do employees wear fluid resistant, full-length laboratory coats or cover gowns with long sleeves, knitted cuffs, and closed in the front while in the work area?			
If these coats/gowns are reusable, are they laundered by the hospital or an outside laundry service?			
Do employees remove their coats/gowns before leaving the containment zone?			
Do employees wear appropriate gloves when performing laboratory testing or phlebotomy?			
Are gloves available in appropriate sizes for all workers at risk for exposure?			

Monthly Biosafety Checklist			
Are gloves removed when leaving the laboratory environment?			
Documentation	Yes	No	N/A
Is the Infection Prevention and Control Manual available?			
Is the Code Binder current and available?			
Is the Communicable Disease Manual available?			
Is the Biosafety Program Manual current and available?			
Blood Borne Pathogens	Yes	No	N/A
Do employees understand what Routine Precautions mean?			
Are hands washed before leaving the work area?			
Are sharps containers available, within arm's reach and used?			
Are sharps containers disposed of when they reach the fill line?			
Is mouth pipetting prohibited?			
Do employees store food in a refrigerator specifically for food and not for specimens?			
Is this refrigerator labelled "For Food Only"?			
Do employees refrain from eating, drinking, smoking, applying cosmetics and lip balm, using electronic personal devices or manipulating contact lenses in the work area?			
Have employees responsible for shipping and receiving potentially infectious materials been trained for the Transport of Dangerous Goods?			
Chemical Safety	Yes	No	N/A
Do employees know where the MSDSs are located?			
Do employees know how to use the MSDSs to look up spills and first aid for a chemical they use?			
Are all manufactured chemical containers labeled with the appropriate identity and hazard warning information?			
Are transfer containers labeled with appropriate workplace labels?			
Are flammable or toxic chemicals kept in closed containers when not in use?			
Are incompatible chemicals stored separately?			
Are chemicals not in use stored in appropriate storage cabinets?			
Are chemical spill kits maintained and available for use?			
Are chemical spill kits identified by signage?			
Have employees been trained in spill clean-up procedures?			
Compressed Gas	Yes	No	N/A
Are all compressed gas cylinders chained to a wall or otherwise secured?			
Are cylinders legibly marked to clearly identify the gas in the cylinders?			
Are cylinders equipped with a pressure regulator designed to show both the cylinder pressure and the outlet pressure?			

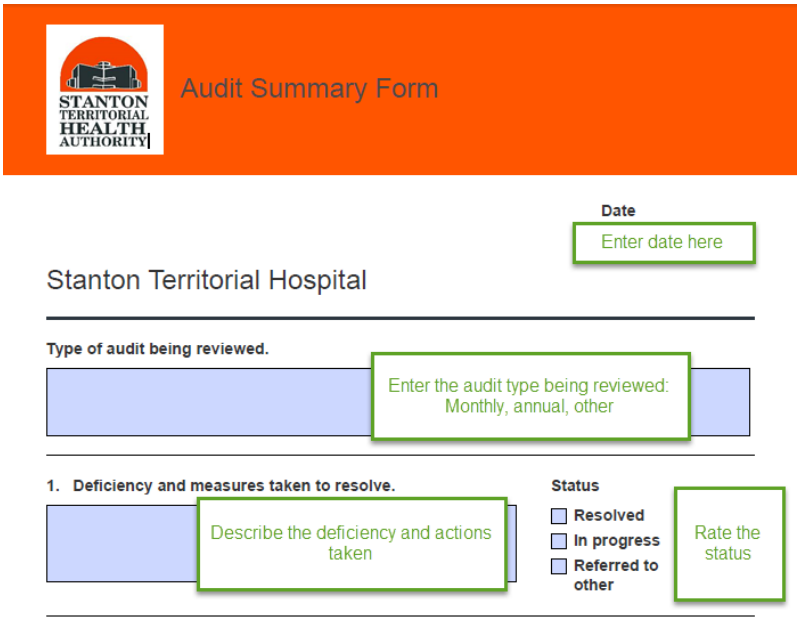
Monthly Biosafety Checklist			
Do cylinders have a manual shut off valve?			
Electrical	Yes	No	N/A
Is electrical equipment grounded with the use of three-pronged plugs?			
Are electrical cords free of any frayed edges?			
Are extension cords prohibited from use in the work area?			
Are electrical outlets located within 1.8 m of wet locations such as sinks, protected by a ground-fault circuit interrupter?			
Are light fixtures in working order?			
Are electrical panels accessible?			
Are electrical circuit breakers and panels labeled with a current listing of equipment powered by each unit?			
Eyewash/Shower	Yes	No	N/A
Are eyewash stations within a 10 second walk of where hazardous chemicals are used?			
Are there signs indicating the location of the eyewash stations?			
Are eyewash stations in good working condition?			
Is there a sign indicating the location of the safety shower?			
Are the safety shower and drain checked routinely?			
Fire Safety	Yes	No	N/A
Is there a fire alarm pull station in the containment zone?			
Can the fire alarm be heard inside the Containment zone?			
Do fire exits have an exit sign that is illuminated by a reliable light source?			
Are emergency exits accessible and free of obstruction?			
Do employees know where the fire extinguishers are located?			
Are all fire extinguishers easily accessible and not blocked?			
Have all employees received fire extinguisher training, including the opportunity to actually use the fire extinguisher in a real or simulated practice?			
Do employees understand what type of extinguisher (A, B, or C) is needed for each type of fire?			
Have extinguishers been serviced in the last year?			
Have fire drills been performed?			
Are evacuation routes posted?			
Does staff know how to respond to a fire drill and what evacuation route to use?			
Waste Management	Yes	No	N/A
Is waste disposed of properly according to Hospital Wide Policy?			
Have employees responsible for shipping hazardous waste been trained in			

Monthly Biosafety Checklist			
accordance with Transport of Dangerous Goods?			
Are waste management records retained for at least three years?			
Has the use of mercury been eliminated in the lab?			
Ergonomics	Yes	No	N/A
Do all chairs in the work area have five legs?			
Does the chair have a minimum of four-way adjustment?			
Is the seat pan the appropriate size for the user?			
Are footrests provided, if required?			
Monitor, Keyboard and Mouse	Yes	No	N/A
Are the tops of the monitors at eye level?			
Are monitors 35-76 cm from the employee's eyes?			
Is a document holder available?			
Do computer monitors face away from windows to reduce glare (or are glare screens available)?			
Does the keyboard lay flat?			
Is the mouse near the keyboard at the same level as the keyboard?			
Noise	Yes	No	N/A
Is the noise level checked annually in all areas?			
Is the noise level less than 80 dBA over an 8 hour period?			
If noise levels are between 80 and 100 dBA, are ear plugs available as an option?			
If noise levels exceed 100 dBA, are ear plugs required?			
If the noise level is 85 dBA or higher, is a hearing conservation program in place?			
Miscellaneous	Yes	No	N/A
Are centrifuges placed low enough so employees can easily see into the body of the equipment?			
Are anti-fatigue mats available at locations in which employees have to stand for long periods of time?			
Clarification of Responses			

- Submit the completed form to the Supervisor.
- The Supervisor will review the completed form with the Biosafety Officer, and record the findings on Appendix 19 – Audit Summary Form.
- Any deficiencies will be resolved or reported to the appropriate authority for resolution.
- The results will be posted in the laboratory and the Audit Summary will be sent to the Biosafety Committee for review.

Appendix 19 – Audit Summary Form

Based on the checklist or audit performed; the Supervisor(s) and Biosafety Officer will describe the findings and actions taken on the Audit Summary Form as shown below:



Once all of the relevant findings and follow up actions have been recorded, the Biosafety Officer will submit the form to the Biosafety Committee for review. Recommendations and/or feedback will be reported back to the Supervisor(s) after the next meeting.

The Biosafety Committee may also need to follow up with other departments and/or individuals when the resolution for these items has been referred to others.

Appendix 20 – Annual Containment Level 2 Safety Checklist[29]

Annual Containment Level 2 Biosafety Checklist

Date

Stanton Territorial Hospital

To be completed by the Biosafety Committee

A. Administration of Biosafety

Are the risk assessments completed for all stock organisms and procedures?

☐ Yes ☐ No ☐ N/A

Health and medical surveillance program in place

☐ Yes ☐ No ☐ N/A

Risk assessments completed to determine which organisms and/or procedures necessitate the use of a BSC.

☐ Yes ☐ No ☐ N/A

Documentation of staff training kept on file.

☐ Yes ☐ No ☐ N/A

Comments for the Administration of Biosafety

[29] University of Regina Biosafety Program, 2012

B. Biosecurity

Personnel follow the appropriate level of biosecurity, including training

☐ Yes ☐ No ☐ N/A

Biological inventory is current and correlates to actual organism in storage

☐ Yes ☐ No ☐ N/A

Comments for Biosecurity

C. Management of Biosafety

Emergency procedures are posted and legible (fire, spills, injuries, BSC failure)

☐ Yes ☐ No ☐ N/A

PSDS information is available

☐ Yes ☐ No ☐ N/A

Biosafety Program Manual available

☐ Yes ☐ No ☐ N/A

CL -2 Standard Operating Procedures available

☐ Yes ☐ No ☐ N/A

Biological Safety Cabinet Procedure available

☐ Yes ☐ No ☐ N/A

Hands-free washing sink available near the exit to the containment level

☐ Yes ☐ No ☐ N/A

Shower available and accessible

☐ Yes ☐ No ☐ N/A

Eyewash available and accessible

☐ Yes ☐ No ☐ N/A

Biological spill kit available and accessible

☐ Yes ☐ No ☐ N/A

Comments for Management of Biosafety

D. Authorized Entry

Personnel (visitors, trainees, and others) are required to wear protective laboratory clothing when entering/working in the laboratory

☐ Yes ☐ No ☐ N/A

Access to the laboratory is limited to authorized personnel

☐ Yes ☐ No ☐ N/A

Appropriate Biohazard signs are posted at access points to the containment zone(s)

☐ Yes ☐ No ☐ N/A

Containment zone doors are kept closed (and locked when not staffed)

☐ Yes ☐ No ☐ N/A

Record is made of other people (including emergency responders) entering the containment zone during an emergency

☐ Yes ☐ No ☐ N/A

Visitors, maintenance staff, custodial staff and others provided with training and/or supervision with regards to anticipated activities in laboratory

☐ Yes ☐ No ☐ N/A

Comments for Authorized Entry

E. Personal Protection

Procedures are in place to ensure that substantial footwear is worn and that legs are covered

☐ Yes ☐ No ☐ N/A

Procedures are in place outlining protective laboratory clothing requirements and decontamination procedures

☐ Yes ☐ No ☐ N/A

Laboratory coats and gloves are available

☐ Yes ☐ No ☐ N/A

Face shield and/or eye protection is available and in good condition

☐ Yes ☐ No ☐ N/A

Respirators (N95 Masks) are available in the containment zone

☐ Yes ☐ No ☐ N/A

Respirator users are trained and Fit Tested

☐ Yes ☐ No ☐ N/A

Comments for Personal Protection

F. Housekeeping

Bench tops and sink areas are tidy

☐ Yes ☐ No ☐ N/A

Food and drink are absent

☐ Yes ☐ No ☐ N/A

No eating or drinking signs are posted in the containment zone

☐ Yes ☐ No ☐ N/A

Comments for Housekeeping

G. Decontamination

Procedures are in place for the contamination of bench tops and surfaces at the end of the day

☐ Yes ☐ No ☐ N/A

Procedures are in place for decontamination of materials and equipment from the Special Containment zone before disposal or removal from the laboratory

☐ Yes ☐ No ☐ N/A

Disinfectants that are effective against pathogens in use are stored within the containment zone

☐ Yes ☐ No ☐ N/A

Comments for Decontamination

H. Waste

Biological waste containers are labeled and secure

☐ Yes ☐ No ☐ N/A

Biohazardous waste is segregated from general refuse

☐ Yes ☐ No ☐ N/A

Needles and sharps are discarded in sharps containers

☐ Yes ☐ No ☐ N/A

There are procedures in place for the appropriate use of the autoclave

☐ Yes ☐ No ☐ N/A

Comments for Waste

I. Biological Safety Cabinets

Biological safety cabinets are certified

☐ Yes ☐ No ☐ N/A

The organization can provide a copy of the current certification reports for all Biological Safety Cabinets in the containment zone

☐ Yes ☐ No ☐ N/A

Procedures are available for the appropriate use of the Biological Safety Cabinets

☐ Yes ☐ No ☐ N/A

Comments for Biological Safety Cabinets

Further action/next steps

Recommendations from the Biosafety Committee

Date to be achieved and/or reassessed

Additional notes

Appendix 21 – Biohazard Warning Signage

AUTHORIZED PERSONNEL ONLY

THIS CONTAINMENT ZONE CONTAINS INFECTIOUS MATERIAL

BIOHAZARD

CONTAINMENT LEVEL 2

PRIMARY CONTACT PERSON: _____

Phone Number:_____ Alternate:_____

SECONDARY CONTACT PERSON: _____

Phone Number:_____ Alternate:_____

ENTRY REQUIREMENTS:

No Food or Drink Permitted

Biosafety Program Training or Escort Required

Appropriate PPE Required

Appendix 22 – Chemical Spill Control

PURPOSE:

Chemical spills present a variety of hazards in the workplace. For example, corrosives such as acids and caustics can cause severe burns on contact to skin and eyes, and the presence of fumes can be damaging to the respiratory system. Also, many organic solvents are flammable and release vapors which are irritating to the eyes and respiratory system.

POLICY:

Please refer to the Code Brown Chemical Spill Procedure.

REAGENTS and/or SUPPLIES:

- Spill-X-A Agent
- Spill-X-C Agent
- Spill-X-S Agent
- Safety Gloves
- Safety Goggles
- Clean-up Pans
- Mixer/Scraper
- Chemical Spill Waste Bags
- 150 mL beaker
- Distilled Water
- pH Paper

SPECIAL SAFETY PRECAUTIONS:

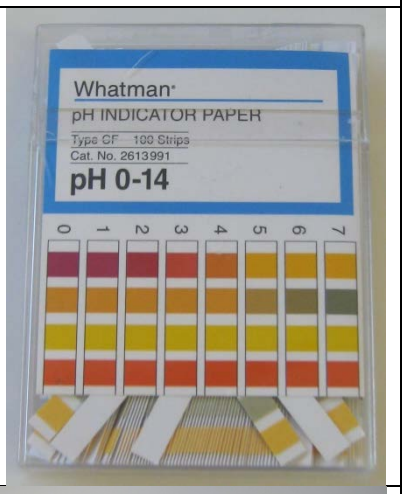
Familiarize yourself with the contents and applications of the Chemical Spill Treatment Kit prior to use.

This will help ensure safer, more effective response in the event of a chemical spill.

PROCEDURE INSTRUCTIONS:

Step	Action
Responding to Chemical Spills	
1	Taking personal protective measures is always the first step in responding to chemical spills. Isolate the spill area by clearing it of all non-essential staff and patients and close all doors. Remove all contaminated clothing immediately. If required, use the Safety Shower located by the Urinalysis bench. 
2	Call a "Code Brown". Dial "80" and state "Code Brown – Laboratory" and repeat 3 times. Facility Services will manage large spills wearing gloves, a gown, a respirator and eye shield. Small spills can be managed by Laboratory personnel using the following procedure and the Chemical Spill Treatment Kit located under the bench near the Fume Hood in Urinalysis. 
3	Personal protective clothing suitable for the hazard should be worn to prevent direct contact with the spilled substance and its vapors. The eye and hand protection in the Chemical Spill Treatment kit along with a lab gown offers minimum protection needed for spill clean-up. 
4	Identify the chemical spilled. Is the chemical an acid, caustic, a solvent, formaldehyde or other? Knowledge of a particular chemical's hazardous characteristics can be obtained from its labeling, the Material Safety Data Sheet, the manufacturer, and supervisory personnel. Review the substance's MSDS to see if additional bodily or respiratory protective measures may be required and what first aid steps should be taken in case of spill contact.

<table>
<tr><td>5</td><td>The Chemical Spill Treatment Kit contains spill control agents specially formulated to treat particular classes and sizes of chemical spills. Do not use any agent on substances other than those listed for that agent in the Chemical Spill Treatment Ratio Table. If you have a chemical which does not appear on the list, call Ansul at 1-800-346-3626 to see if testing has been performed.
<table>
<tr>
<td>For acid spills…</td>
<td> 
</td>
<td>For caustic spills…</td>
<td> 
</td>
<td>For solvent spills…</td>
<td> 
</td>
<td>For formaldehyde spills…</td>
<td> 
</td>
</tr>
</table></td></tr>
<tr><td>6</td><td>Once the correct spill control agent has been selected, discard the safety seal from inside the agent bottle cap.</td></tr>
<tr><td>7</td><td>Begin spill treatment by pouring the agent around the spill to encircle and dike its perimeter.</td></tr>
<tr><td>8</td><td>Taking care to avoid splashing, continue to apply agent evenly onto spill.</td></tr>
<tr><td rowspan="4">9</td><td>Using the scraper provided, carefully mix agent into the spill for the most complete reaction.</td></tr>
<tr><td>If:</td><td>Then:</td></tr>
<tr><td>The spill was a corrosive (acid or base)</td><td>Any neutralization reaction will subside after a few minutes leaving a paste-like residue. Samples of the spill residue must be tested for final pH. Continue with Step 10.</td></tr>
<tr><td>The spill was a formaldehyde solution</td><td>Complete solidification may not occur. For dilute solutions, see the Formaldehyde Treatment Ratio Table for solidification information. Spill-X-S may be required to solidify any remaining liquid. Continue with Step 13.</td></tr>
<tr><td></td><td>The spill was a solvent</td><td>Agent adsorption is indicated by the disappearance of free liquid. Continue with Step 13.</td></tr>
<tr><td>10</td><td>Place about 10 cubic centimeters of a representative sample of spill residue in a 150 mL beaker.</td></tr>
</table>

11	Slowly add distilled water until the mixture volume reaches 100 mL. Stir contents for about 3 minutes. NOTE: Severe foaming and high heat generation is a sign of incomplete spill neutralization.
12	Using the pH test strips provided in the Chemical Spill Treatment Kit, test the solution pH. The pH must fall between 2.0 and 12.5 in order to be safe for disposal. If the pH is unacceptable, mix more of the appropriate agent into the spill and retest for pH. Repeat this step as necessary until spill residue pH is acceptable. 
13	Record the spill type, treatment (e.g., neutralized acid/base. pH=___) and disposition (indicate disposal method) onto the label of the bags provided. 
14	After the treatment reaction cools, use the scraper and pan to pick up the residue and place in the labeled bag. 
15	Rinse and decontaminate both the utensils and the spill area.
16	Residue disposal must occur as indicated in the appropriate MSDS.
17	Report the incident to the Laboratory Supervisor and enter it into RiskPro. Provide a list of supplies that need to be replaced from the Chemical Spill Treatment Kit to the Laboratory Supervisor so they can be replaced.
18	Complete the Code Brown Evaluation Form and submit it to the Laboratory Supervisor.

FORMALDEHYDE TREATMENT RATIO TABLE:

One 0.84 kg Spill-X-FP agent container will treat the following amount of spilled formaldehyde.

Concentration (WT%)	Amount Polymerized (L)	
37	0.73	**Actual amount polymerized and solidified may vary according to application. For solution strengths less than 15, it may be necessary to solidify any remaining liquid with Spill-X-S agent.**
30	0.91	
20	1.40	
15	1.89	
10	2.89	
4	7.33	

CHEMICAL SPILL TREATMENT RATIO TABLE:

Acid Spills		Caustic Spills	
Acid	**Amount Neutralized**	**Caustic**	**Amount Neutralized**
Acetic – 99%	1.14L	Ammonium Hydroxide – 29%	1.32L
Adipic – 10%	0.93L	Aniline	0.29L
Acrylic – 99%	0.93L	Diethanolamine	0.34L
Butyric – 99%	0.93L	Diethylamine	0.35L
Chlorosulfonic – 99%	0.74L	Diethylenetriamine	0.35L
Cyanoacetic – 50%	0.93L	Dimethylformamide	0.25L
Formic – 90%	0.93L	Ethylenediamine	0.33L
Hydriodic – 50%	0.93L	Hydrazine – 64%	0.54L
Hydrochloric – 37%	1.0L	Morpholine	0.35L
Hydrofluoric – 49%	0.93L	Potassium Hydroxide – 45%	0.87L
Methacrylic – 98%	0.93L	Pyridine	0.34L
Nitric – 70%	2.08L	Sodium Hydroxide – 50%	0.54L
Proprionic – 99%	0.93L		
Perchloric – 70%	1.11L		
Phosphoric – 85%	1.14L		
Sulfuric – 93%	1.08L		

Solvent Spills			
Non-Flammable	**Amount Adsorbed**	**Non-Flammable**	**Amount Adsorbed**
1-Amino-2-Propanol	0.45L	Dimethylether	0.42L
Aniline	0.42L	Diethylene Triamine	0.57L
2-Butoxyethanol	0.39L	Ethanolamine	0.42L
Carbon Tetrachloride	0.42L	5-Ethyl-2Methylpyridine	0.42L
Chloroform	0.49L	Toluene Diisocyanate	0.42L
Diethanolamine	0.57L	1,1,1-Trichloroethane	0.30L
Solvent Spills (Continued)			
Non-Flammable	**Amount Adsorbed**	**Non-Flammable**	**Amount Adsorbed**
1,1,2-Trichloroethane	0.91L	Triethylene Tetramine	0.57L
Flammable	**Amount Adsorbed**	**Flammable**	**Amount Adsorbed**
Acetone	0.76L	Gasoline, Unleaded	0.64L
Acrylonitrile	0.57L	Heptane	0.61L
Avgas 100	0.57L	Hexane	0.45L
Benzene	0.50L	Isopropylalcohol	0.68L
Butylacetate	0.49L	Isopropylamine	0.57L
Butylether	0.45L	Jet A-1 Avtur	0.42L
Butyraldehyde	0.49L	Methanol	0.45L
Carbon Disulfide	0.42L	Methyl Ethyl Ketone	0.76L
Cumene	0.49L	Methylisobutylketone	0.72L
Cyclohexane	0.45L	Morpholine	0.45L
Decane	0.49L	Nonane	0.49L
1,2-Dichloroethane	0.34L	Octane	0.39L
Diethylamine	0.57L	Pentane	0.42L
1-Diethylamino-2-Propanol	0.57L	Petroleum Ether	0.76L
N,N-Diethyethanolamine	0.39L	Pyridine	0.76L
Dimethylformamide	0.30L	Styrene	0.49L

Ethanol	0.45L	Toluene	0.45L
Ethylenediamine	0.45L	Triethylamine	0.45L
Ethylene-Glycoldimethylether	0.49L	Vinyl Acetate	0.68L
Fuel Oil #2	0.45L	Xylene, O-	0.57L
Gasoline (50-100 Octane)	0.45L	Xylene, P-	0.45L
Gasoline (100-130 Octane)	0.64L		

REFERENCES:

- Ansul Incorporated. (2006). *Spill-X Spill Treatment Guide.* Marinette, WI: Ansul Incorporated.
- Stanton Territorial Health Authority. (2011). Code Brown - Chemical Spill. In S. T. Authority, *Code Binder.* Yellowknife, NT: Stanton Territorial Health Authority.
- Toronto Medical Laboratories. (2001). *Laboratory Safety Manual.* Toronto, ON: Toronto Medical Laboratories.

Appendix 23 – Biological Spill Control

PURPOSE:

This procedure has been developed to ensure the safety of all those who could potentially become exposed to a spill of blood and/or bodily fluids. These types of spills are to be cleaned up immediately using routine precautions and reported in RiskPro.

POLICY:

All individuals are to consider this type of spill infectious, and respond in appropriate fashion. Since the greatest risk of exposure to the individual is by direct contact with the material, personal protective equipment must be worn.

Decontamination of personnel or patients following exposure takes priority over cleanup.

If you are exposed, immediately remove contaminated clothing and other protective equipment and wash affected areas with soap and water. If medical follow up is warranted it should be sought immediately.

SUPPLIES (available in the Biological Spill Kit):

- Disinfectant solution (dilute bleach – 1 part bleach to 5 parts tap water)
- Forceps, tongs, broom, dustpan
- Personal Protective Equipment: safety glasses, gloves, lab coat, and shoe covers (optional)
- 2 yellow biohazard bags, sharps container
- Paper towels or other absorbent material

PROCEDURE INSTRUCTIONS:

Follow the steps in the table below to control a biological spill.

Step	Action
Spills within a Biological Safety Cabinet	
1	Leave the ventilation on.
2	Notify others in the laboratory not to use the Biological Safety Cabinet (include signage) and

	inform the Laboratory Supervisor.
3	Cover the spill area with paper towels or absorbent material.
4	Soak the spill area with appropriate disinfectant. Pour the disinfectant from the outside surface of the absorbent material towards the inside.
5	Leave the disinfectant on for 20 to 30 minutes.
6	Pick up the absorbent material and place in yellow biohazard bags. Pick up any broken glass or sharps as you encounter them with forceps or tongs and place them in the sharps container.
7	Once the primary spill has been controlled, all items within the cabinet should be disinfected (walls and surfaces wiped down, equipment wiped down and/or autoclaved).
8	Allow the ventilation to run for 10-15 minutes.
9	Inform other personnel and remove signage once clean-up is complete.

Step	**Action**
Spills of Blood and Bodily Fluid in Open Areas	
1	Notify personnel and area Supervisor. **If an aerosol is generated (or the risk exists), hold your breath and quickly leave the area. Close the door and post a warning sign. Evacuate the area for at least 30 minutes and allow aerosols to settle.**
2	Remove any contaminated clothing.
3	Thoroughly wash exposed skin with soap and water.
4	Cover the spill area with paper towels or absorbent material.
5	Using an appropriate disinfectant cover the spill area. Pour disinfectant from the outside, towards the inside of the spill. Allow the disinfectant to act for 20 minutes.
6	Pick up any broken glass with forceps and place in a sharps container.
7	Pick up absorbent material and place in yellow biohazard bags.
8	Once the primary spill has been contained, thoroughly wipe down the spill zone and adjacent areas with disinfectant.
9	Inform other personnel and remove signage once clean-up is complete.

Step	Action
Spills Involving CL-1 or CL-2 Containment	
1	Notify personnel and Laboratory Supervisor. **If an aerosol is generated (or the risk exists), hold your breath and quickly leave the lab. Close the door and post a warning sign. Evacuate the area for at least 30 minutes and allow aerosols to settle.**
2	Remove any contaminated clothing.
3	Thoroughly wash exposed skin with soap and water.
4	Cover an area twice the size of the spill area with paper towels or absorbent material.
5	Using an appropriate disinfectant cover the paper towels or absorbent material. Pour disinfectant from the outside, towards the inside of the spill. Allow the disinfectant to act for 20 minutes.
6	Pick up any broken glass with forceps and place in a sharps container.
7	Pick up absorbent material and place in yellow biohazard bags.
8	Once the primary spill has been contained, thoroughly wipe down the spill zone and adjacent areas with disinfectant.
9	Inform other personnel and remove signage once clean-up is complete.

DECONTAMINATION AND DISPOSAL:

- Dispose of clean-up materials in appropriate biohazard container/bags. Where required, decontaminate (autoclave) prior to disposal.
- Contaminated equipment and clothing must also be decontaminated.

REPORTING:

- Report to area Supervisor and/or Biosafety Officer.
- Complete a RiskPro Online Incident Report Form.
- If required, complete a Code Brown Evaluation Form.

- Report injuries to the Worker's Safety and Compensation Commission by completing the Worker's Report of Injury. The Supervisor will complete the Employer's Report of Injury Form.
- The spill will be reported to the Occupational Health and Safety Officer and License Holder (for CL-2 spills) by either the Biosafety Officer or the Supervisor.

RELATED DOCUMENTS:

- Code Binder
- PSDS sheets (if applicable)
- WSCC Forms (if applicable)

REFERENCES:

- Columbia University. (2008). *Biological Spills: Clean-up Procedures.* Retrieved January 30, 2012, from Environmental Health and Safety: http://www.ehs.columbia.edu/biospill.html
- Office of Risk Management. (2010, October 22). *Biological Spills.* Retrieved January 30, 2012, from Spill Response: http://www.uottawa.ca/services/ehss/biospill.htm
- Public Health Agency of Canada. (2004). *Laboratory Biosafety Guidelines.* Ottawa, Ontario: Minister of Health.
- Public Health Agency of Canada. (2011, February 18). *Mycobacterium tuberculosis, Mycobacterium bovis - MSDS.* Retrieved September 9, 2011, from Material Safety Data Sheet - Infectious Substances: http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/msds103e-eng.php

Appendix 24 – Biological Spill Control Inside a Centrifuge

PURPOSE:

This procedure has been developed to ensure the safety of all those who could potentially become exposed to a spill of blood and/or bodily fluids. These types of spills are to be cleaned up immediately using routine precautions and reported in the online RiskPro Incident Report Form.

POLICY:

All individuals are to consider this type of spill infectious, and respond in appropriate fashion. Since the greatest risk of exposure to the individual is by direct contact with the material, personal protective equipment must be worn.

Decontamination of personnel following exposure takes priority over cleanup.

If you are exposed, immediately remove contaminated clothing and other protective equipment and wash affected areas with soap and water. If medical follow up is warranted it should be sought immediately.

SUPPLIES (available in the Biological Spill Kit):

- Disinfectant solution (dilute bleach – 1 part bleach to 5 parts tap water)
- Forceps, tongs, broom, dustpan
- Personal Protective Equipment: safety glasses, gloves, lab coat, and shoe covers (optional)
- 2 yellow biohazard bags, sharps container
- Paper towels or other absorbent material

PROCEDURE INSTRUCTIONS:

Follow the steps in the table below to control a biological spill in a centrifuge.

Step	Action
Spills within a Centrifuge	
1	Shut off centrifuge. If spill has escaped the safety buckets, or the lids were not properly secured, close the lid and allow aerosols to settle for at least 1 hour.
2	Notify others in the laboratory not to use the centrifuge (include signage) and inform the

	Laboratory Supervisor or designate.
3	If possible (StatSpin), move the centrifuge to the Biological Safety Cabinet. If the spill is contained within the safety buckets, move those to the Biological Safety Cabinet.
4	Disinfect the centrifuge, rotors and buckets in an appropriate disinfectant (see procedure specific for the centrifuge affected) allowing at least 20 to 30 minutes contact time.
5	Carefully retrieve any broken glass using forceps and discard in a sharps container. Discard any absorbent material used in a yellow biohazard bag.
6	Once the primary spill has been contained, thoroughly wipe down the inside of the centrifuge and all parts including the lid with paper towels soaked in disinfectant.
7	Rinse both the rotors and the inside of the centrifuge with water if bleach was used.
8	Inform other personnel and remove signage once clean-up is complete.

DECONTAMINATION AND DISPOSAL:

- Dispose of clean-up materials in appropriate biohazard container/bags. Where required, decontaminate (autoclave) prior to disposal.
- Contaminated equipment and clothing must also be decontaminated.

REPORTING:

- Report to Laboratory Supervisor or designate and/or Biosafety Officer.
- Complete a RiskPro Online Incident Report Form.
- If required, complete a Code Brown Evaluation Form.
- Report injuries to the Worker's Safety and Compensation Commission by completing the Worker's Report of Injury. The Laboratory Supervisor will complete the Employer's Report of Injury Form.
- The spill will be reported to the Occupational Health and Safety Officer by either the Biosafety Officer or the Laboratory Supervisor.

RELATED DOCUMENTS:

- Code Binder
- PSDS sheets (if applicable)

- WSCC Forms (if applicable)

REFERENCES:

- Columbia University. (2008). *Biological Spills: Clean-up Procedures.* Retrieved January 30, 2012, from Environmental Health and Safety: http://www.ehs.columbia.edu/biospill.html
- Office of Risk Management. (2010, October 22). *Biological Spills.* Retrieved January 30, 2012, from Spill Response: http://www.uottawa.ca/services/ehss/biospill.htm
- Public Health Agency of Canada. (2004). *Laboratory Biosafety Guidelines.* Ottawa, Ontario: Minister of Health.
- Public Health Agency of Canada. (2011, February 18). *Mycobacterium tuberculosis, Mycobacterium bovis - MSDS.* Retrieved September 9, 2011, from Material Safety Data Sheet - Infectious Substances: http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/msds103e-eng.php

Appendix 25 – Biological Spill Control Inside the Special Containment Zone

PURPOSE:

This procedure has been developed to ensure the safety of all those who could potentially become exposed to a spill of a known or suspected risk group 3 pathogen. These types of spills are to be cleaned up immediately using airborne precautions and reported in RiskPro. A biological spill within the special containment zone requires a Code Brown response.

POLICY:

All individuals are to consider this type of spill infectious, and respond in appropriate fashion. Since the greatest risk of exposure to the individual is by direct contact with the material, personal protective equipment must be worn.

All personnel entering the special containment zone MUST wear a gown, double gloves and an N95 mask. Opening the door will expose personnel in the adjacent CL-2 containment zone to the aerosols generated by this spill. Do NOT open the door unless immediate medical attention is required. Activate the emergency siren located by the door. Microbiology staff will respond using the video intercom.

If you are exposed, remove contaminated clothing and other protective equipment and wash affected areas with soap and water after the aerosols have settled and spill clean-up has been completed. If medical follow up is warranted it should be sought immediately upon safely exiting the special containment zone.

SUPPLIES:

- Disinfectant solution (Accel TB or phenol)
- Forceps, tongs, broom, dustpan
- Personal Protective Equipment: safety glasses, gloves, lab coat, and shoe covers (optional)
- 2 yellow biohazard bags, sharps container
- Paper towels or other absorbent material

PROCEDURE INSTRUCTIONS:

Follow the steps in the table below to control a biological spill within the special containment zone.

Step	Action
Spills within the Special Containment Zone	
1	Activate the emergency siren by the door using a push and twist motion.
2	Staff will respond to the alarm using the video intercom. Explain the situation to the staff and they will notify the Laboratory Supervisor, Biosafety Officer, Occupational Health and Safety/Infection Control Coordinator and call a Code Brown. Microbiology staff will post signage on the door indicating that there is an active spill in the containment zone.
3	All needed spill response supplies are available within the special containment zone.
4	Cover an area twice the size of the spill area with paper towels or absorbent material.
5	Using an appropriate disinfectant (5% phenol) cover the paper towels or absorbent material. Pour disinfectant from the outside, towards the inside of the spill. Allow the disinfectant to act for 30 minutes.
6	Pick up any broken glass with forceps and place in a sharps container.
7	Pick up absorbent material and place in yellow biohazard bags.
8	Once the primary spill has been contained, thoroughly wipe down the spill zone and adjacent areas with disinfectant.
9	Autoclave contaminated materials.
10	Exit the room as directed in MIC80500 Mycobacteria Room Entry and Exit.
11	Thoroughly wash exposed skin with soap and water.
12	Seek medical attention if required or you are directed to do so.
13	Complete required incident report forms (RiskPro, Code Brown, WSCC Worker's Report of Injury).
14	Housekeeping will be called to perform a terminal clean of the special containment zone.
15	Laboratory personnel will be notified by housekeeping when the terminal clean is complete.
16	Signage will be removed and the zone will be put back into service.

DECONTAMINATION AND DISPOSAL:

- Dispose of clean-up materials in appropriate biohazard container/bags. Where required, decontaminate (autoclave) prior to disposal.
- Contaminated equipment and clothing must also be decontaminated.

REPORTING:

- Report to Laboratory Supervisor or designate and Biosafety Officer.
- Complete a RiskPro Online Incident Report Form.
- Complete a Code Brown Evaluation Form.
- Report injuries to the Worker's Safety and Compensation Commission by completing the Worker's Report of Injury. The Laboratory Supervisor will complete the Employer's Report of Injury Form.
- The spill will be reported to the Occupational Health and Safety Officer by either the Laboratory Safety Officer or the Laboratory Supervisor.

RELATED DOCUMENTS:

- Code Binder
- PSDS sheets
- WSCC Forms

REFERENCES:

- Columbia University. (2008). *Biological Spills: Clean-up Procedures.* Retrieved January 30, 2012, from Environmental Health and Safety: http://www.ehs.columbia.edu/biospill.html
- Office of Risk Management. (2010, October 22). *Biological Spills.* Retrieved January 30, 2012, from Spill Response: http://www.uottawa.ca/services/ehss/biospill.htm
- Public Health Agency of Canada. (2004). *Laboratory Biosafety Guidelines.* Ottawa, Ontario: Minister of Health.
- Public Health Agency of Canada. (2011, February 18). *Mycobacterium tuberculosis, Mycobacterium bovis - MSDS.* Retrieved September 9, 2011, from Material Safety Data Sheet - Infectious Substances: http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/msds103e-eng.php

Appendix 26 – Needle Stick, Puncture Wound or Percutaneous Injury

For exposures involving blood and body fluids, see Hospital Wide Procedure I-0695 Management of Health Care Workers Exposed to Blood/Body Fluids.

Step	Action
Staff Responsibilities for a Needle Stick, Puncture Wound or Percutaneous Injury Involving Known or Suspected Pathogens	
1	Treat the exposed area immediately by removing the gloves and allowing the wound to bleed.
2	Immediately wash the affected area for 15 minutes with soap and warm water. Do not use bleach or disinfectant solution to clean the wound.
3	Notify the Supervisor (or the Patient Care Coordinator after hours) to obtain assistance.
4	Seek medical assistance from the Occupational Health and Safety/Infection Control Coordinator or Emergency Department as appropriate. Inform the practitioner of the cause of the wound and the organisms involved. Organism specific treatment options are available in the NWT Communicable Disease Manual. The Pathogen Safety Data Sheets in the laboratory also offer this information if the organism is not listed in the Communicable Disease Manual.
5	Details of the incident must be documented in Risk Pro. Include the following details: • What was the method of contact? • How did the exposure occur? • What organisms were involved in the exposure? • What actions were taken to remove the contaminant? • What PPE was worn at the time of the injury? • What is your immune status?
6	Complete the WSCC Worker's Report of Injury form. The Supervisor will complete the Employer's Report of Injury form and submit them.
7	The Supervisor will ensure the Biosafety Officer is notified and can report the occurrence to the appropriate authorities.

Appendix 27 – Eyes or Mucous Membrane Exposure

For exposures involving blood and body fluids, see Hospital Wide Procedure I-0695 Management of Health Care Workers Exposed to Blood/Body Fluids.

Step	Action
Staff Responsibilities for Exposures to Eyes or Mucous Membranes Involving Known or Suspected Pathogens	
1	Treat the exposed area immediately.
2	Immediately flush the affected area using an eyewash station (instructions available on next page), water or normal saline for 15 minutes. Do not use bleach or disinfectant solution on eyes or mucous membranes.
3	Notify the Supervisor (or the Patient Care Coordinator after hours) to obtain assistance.
4	Seek medical assistance from the Occupational Health and Safety/Infection Control Coordinator or Emergency Department as appropriate. Inform the practitioner of the cause of the exposure and the organisms involved. Organism specific treatment options are available in the NWT Communicable Disease Manual. The Pathogen Safety Data Sheets in the laboratory also offer this information if the organism is not listed in the Communicable Disease Manual.
5	Details of the incident must be documented in Risk Pro. Include the following details: • What was the method of contact? • How did the exposure occur? • What organisms were involved in the exposure? • What actions were taken to remove the contaminant? • What PPE was worn at the time of the injury? • What is your immune status?
6	Complete the WSCC Worker's Report of Injury form. The Supervisor will complete the Employer's Report of Injury form and submit them.
7	The Supervisor will ensure the Biosafety Officer is notified and can report the occurrence to the appropriate authorities.

Use of the Eye Wash Station

Step	Action
Use of the Eye Wash Station[30]	
1	Remove the green bottle from the box. 
2	Twist the lid to open. 
3	Rinse the eye or mucous membrane until the bottle is empty. 
4	Seek medical attention.

[30] https://www.dropbox.com/s/d4c7opc7fauoxu7/Rinsing%20Guide.pdf

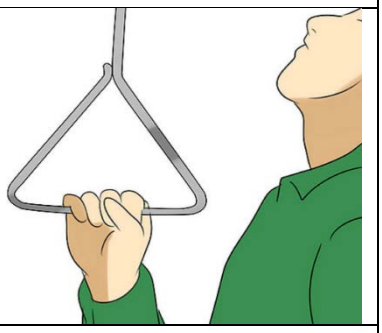
Appendix 28 – Exposure by Ingestion

For exposures involving blood and body fluids, see Hospital Wide Procedure I-0695 Management of Health Care Workers Exposed to Blood/Body Fluids.

Step	Action
Staff Responsibilities for an Exposure by Ingestion Involving Known or Suspected Pathogens	
1	Notify the Supervisor (or the Patient Care Coordinator after hours) to obtain assistance.
2	Seek medical assistance from the Occupational Health and Safety/Infection Control Coordinator or Emergency Department as appropriate. Inform the practitioner of the cause of the exposure and the organisms involved. Organism specific treatment options are available in the NWT Communicable Disease Manual. The Pathogen Safety Data Sheets in the laboratory also offer this information if the organism is not listed in the Communicable Disease Manual.
3	Details of the incident must be documented in Risk Pro. Include the following details: • What was the method of contact? • How did the exposure occur? • What organisms were involved in the exposure? • What actions were taken to remove the contaminant? • What PPE was worn at the time of the injury? • What is your immune status?
4	Complete the WSCC Worker's Report of Injury form. The Supervisor will complete the Employer's Report of Injury form and submit them.
5	The Supervisor will ensure the Biosafety Officer is notified and can report the occurrence to the appropriate authorities.

Appendix 29 – Emergency Shower Use[31]

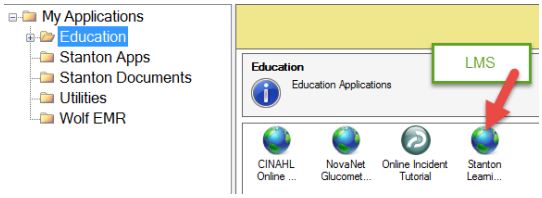
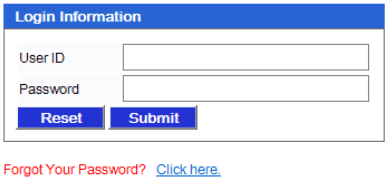
Workers in areas where biological and chemical agents are used need access to emergency shower facilities.

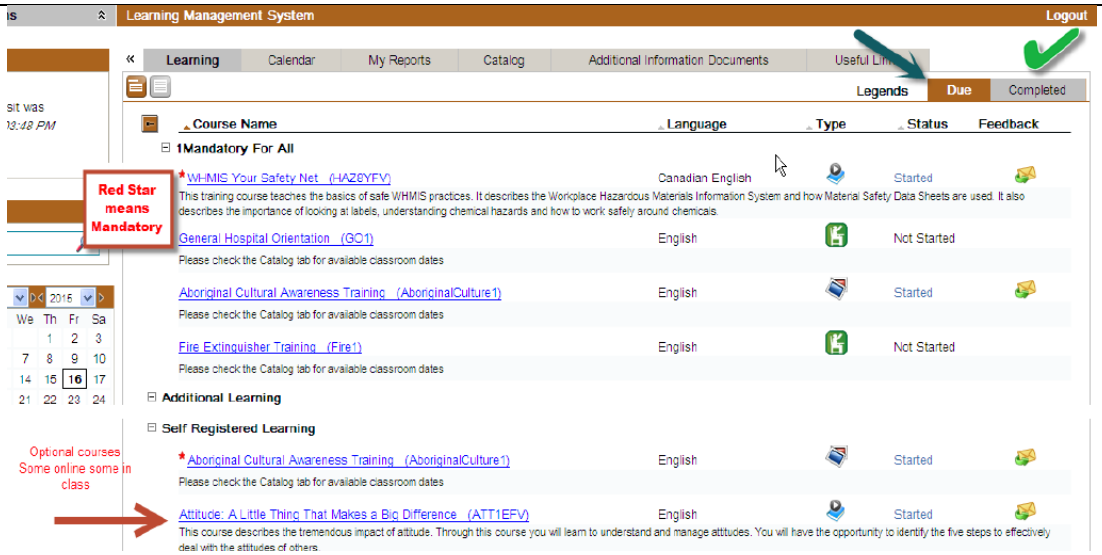
Step	Action
Emergency Shower Use	
1	Call out to co-workers for assistance immediately after a chemical or biological exposure. One of your co-workers will need to call a Code Brown.
2	Quickly go to the emergency shower. If you cannot see, co-workers may need to guide you.
3	Pull down the handle as soon as you get under the nozzle. 
4	Remove any items that may have been contaminated including clothing, shoes, glasses and jewelry. Do not let modesty slow you down. A privacy shower curtain is available.
5	Stand under the shower for at least 15 minutes, even if the water is very cold. • If your eyes were not exposed, protect them from contamination. • If your eyes were exposed, hold them open to rinse them out. If you are unable to hold your eyes open due to immense pain, your co-workers should be prepared to do it for you. They also need to be prepared to keep you under the water even if you go into shock and want to get out. A Code Blue may need to be called if immediate medical assistance is required.
6	Once the 15 minutes have elapsed, lift up the handle to shut off the shower. Facilities Services will respond to a Code Brown and deal with any water the floor drain cannot handle.
7	A co-worker will provide you with a lab gown. Proceed to the Emergency Department for treatment.

[31] http://www.wikihow.com/Use-an-Emergency-Shower

Appendix 30 – Learning Management System (LMS)

Basic information for accessing the Learning Management System is provided below. Questions and concerns can be addressed by contacting the Staff Education and Development Department.

Step	Action
Stanton Territorial Hospital Learning Management System	
1	The LMS can be accessed by: • Click on the X1A Links Button  • Highlight Education and click on the LMS icon  Or • Type the link http://stanton.claritynet.com into your web browser. • Please be sure to activate cookies in your browser to be able to see the LMS page.
2	When first logging into the LMS, your User ID is your Employee ID number (found on your Employee ID card) and your password is also your Employee ID number.  As soon as you log in, you will be prompted to change your password. If you forget your password, click on the "Forgot Password" option. Your password will be sent to your email address in seconds. You can add the LMS to your favorites in your web browser or add it as a shortcut on your desktop.
3	When you login, you will see a page like this:

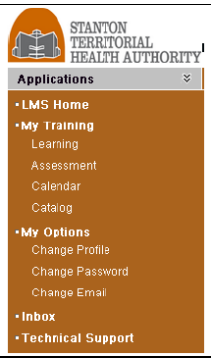


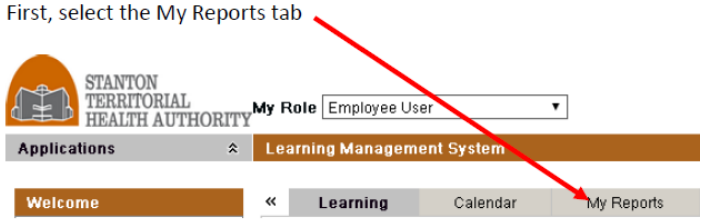
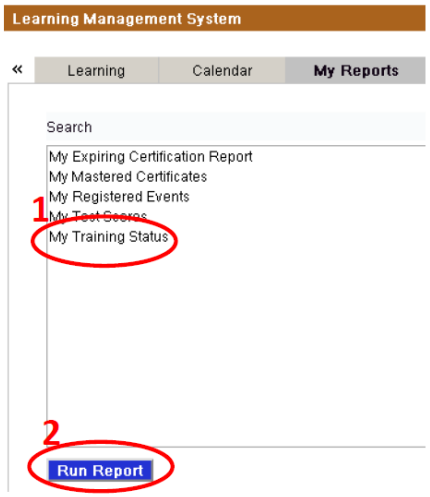
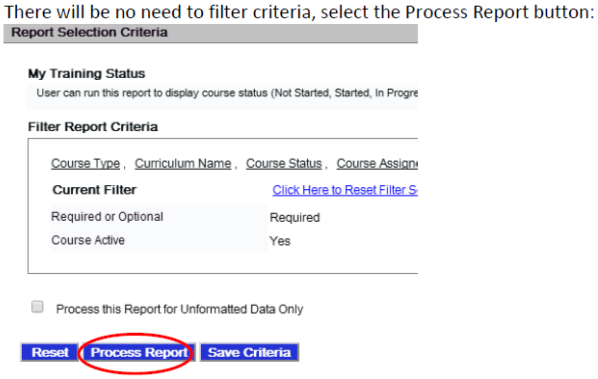
4

- The **red star** ★ means a course is mandatory for you as an employee in your area.
- The page will open to the courses that you have due, (see **the teal arrow**).
- In progress means likely there is a clinical component you need complete in order to finish the module.
- **The green checkmark** is above the box to click to see what certifications you have mastered/completed.
- To see courses available click on catalog tab.
  - ➢ This will open up to show you all courses available; online, PowerPoint, classroom and other.
- You can filter for a specific course by selecting the course name and hitting show records, you may also filter down to a course on a specific date by selecting dates. Play with the filters to see what it will show you.
- To just see classroom courses, select show only events. This will limit you to the certifications and classes we offer in our Inservice Classroom.
- Registering is as easy as the click of a button. So is cancelling, just select the course you have registered for and hit the cancel registration button.
- Once your supervisor gives you authorization you will either be registered or wait listed. Wait listed people will be emailed when/if a spot opens up in the class as soon as the spot is available.

5

You can make changes to your profile, change your email, change your password and find Technical Support by clicking on the Applications drop down menu.



6	To print of your certification report: First, select the My Reports tab  From there, select My Training Status, then Run Report:  There will be no need to filter criteria, select the Process Report button:  A report will be generated with all certifications completed/not completed, certification date and renewal date: **Course Name** | **Last Test Taken Date** | **Course Assigned Date** | **Score** | **Course Status** | **Renewal Date** Emergency Response Training | 13/01/2015 | 03/12/2014 | | Mastered | 13/01/2016 Fire Safety for Ambulatory Care: Mission Possible | 13/01/2015 | 03/12/2014 | | Mastered | 13/01/2016 Fit Testing | 09/04/2014 | 03/12/2014 | | Mastered | 09/04/2016 Privacy and Confidentiality Presentation | 19/12/2014 | 03/12/2014 | | Mastered | 19/12/2015 WHMIS Your Safety Net | | 03/12/2014 | | Started |
7	If there is any education missing from your profile, please contact the Staff Education and Development Department and they will get it entered.

Appendix 31 – Routine Environmental Cleaning in a Laboratory[32]

Laboratory Staff:

- Minimize storage of materials that are not pertinent to the work and cannot be easily decontaminated.
- Laboratory clothing, such as lab gowns and lab coats, cannot be stored with street clothing.
- Contaminated clothing must be decontaminated before laundering.
- Clean and decontaminate work surfaces with an appropriate disinfectant at the end of each shift and after spills of potentially biohazardous material.
- Replace or repair work surfaces that have become permeable to biohazardous material

Housekeeping Staff:

Daily:

- Remove waste, including biomedical waste and filled sharps containers.
- Replace soap, paper towels, and alcohol-based hand sanitizer as required.
- Clean hand washing sinks.
- Clean high touch surfaces such as door handles, wall-mounted hand sanitizer stations and light switches.
- Clean staff and patient bathrooms.
- Remove soiled linen if the bag is full.
- Mop floors.

Weekly:

- Clean eyewash station, lights, tops of shelves, file cabinets, chairs, baseboards, and telephones weekly.
- Check walls and windows for visible soiling and clean if required.

[32] http://www.publichealthontario.ca/en/eRepository/Best_Practices_Environmental_Cleaning_2012.pdf

Appendix 32 – Damp Mopping of Floors[33]

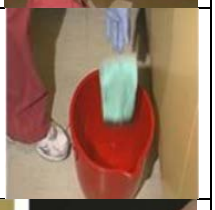
Damp mopping of floors should be performed daily in the Containment Zone.

Step	Action
Damp Mopping of Floors	
1	Perform hand hygiene and gather supplies. • Gloves • Disinfectant cleaning solution • Mop pail and mop head • Dust head • Dust pan and hand brush • Vacuum cleaner with HEPA filter 
2	Determine what PPE you will need for the cleaning job. Special PPE requirements are indicated at the entrance to the containment zones within the laboratory. 
3	Pick up larger garbage/dirt to clean the floor before mopping. 
4	Sweep or vacuum the floor. DO NOT vacuum needles, bandages, gum, large clumps, or any fluids including blood and drinks. 
5	Clear the area of chairs and other objects for cleaning. Place a wet floor sign up where you will be mopping. 
6	Damp mop all high-traffic areas – entrances, main walk ways, etc.

[33] The NWT Infection Prevention and Control Manual 2012

Appendix 33 – Damp Wiping of Surfaces[34]

Damp wiping of surfaces should be performed daily in the Containment Zone.

Step	Action
Damp Wiping of Surfaces	
1	Perform hand hygiene and gather supplies. • Gloves • Disinfectant cleaning solution in bucket • Cleaning cloths • Dirty cloth bucket 
2	Determine what PPE you will need for the cleaning job. Special PPE requirements are indicated at the entrance to the containment zones within the laboratory. 
3	Prepare fresh cleaning solution for each containment area or when visibly dirty. Wring out a fresh cloth so that it is damp but not dripping. 
4	Fold the cloth 1-2 times so you have 2 sides to use. Do NOT re-dip the cloth once used. 
5	Start from clean to dirty areas in the room. Wipe in one direction – do not go back and forth over areas. Do not bunch the cloth. Change the surface of the cloth with each major item in the room. 
6	Place dirty cloths in the dirty bucket for laundry at the end of the day. Use a FRESH CLOTH for each new area in the containment zone. 
7	Remove gloves and do hand hygiene. 

[34] The NWT Infection Prevention and Control Manual

Appendix 34 – Routine Washroom Cleaning[35]

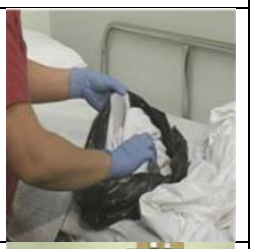
Washrooms need to be cleaned at least daily; more often if heavily used or visibly soiled.

Step	Action
Routine Washroom Cleaning	
1	Perform hand hygiene and gather supplies. • Gloves, disinfectant cleaning solution, clean cloths, mop and mop pail, dirty cloth container, glass cleaning solution, lime stain cleaning solution, wet floor sign, broom and dust pan, paper towel for cleaning, paper towel for washroom dispenser, toilet paper rolls, liquid soap for dispenser, alcohol rub for dispenser.
2	Put out the "Wet Floor" sign to alert users of the washroom. 
3	Put larger pieces into the garbage. Use a broom and dust pan to sweep up smaller pieces. 
4	Clean the washroom from TOP to BOTTOM, and from CLEAN to DIRTY. Do high dusting before damp wiping. Clean from the LEAST dirty (mirrors) to the MOST dirty (toilets). 
5	Do high dusting or ceilings weekly. 
6	Use damp wiping to clean all surfaces of the bathroom. 
7	Use scrubbers and lime stain cleaners to remove water stains or rust. 
8	Give extra attention to "High Touch" areas: light switches, soap dispensers, paper towel dispensers, door and door handles, toilet paper dispenser, sinks, etc.

[35] The NWT Infection Prevention and Control Manual 2012

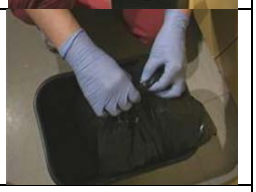
Appendix 35 – Laundry Handling[36]

Laundry is performed on an as needed basis.

Step	Action
Laundry Handling	
1	Perform hand hygiene and gather supplies. • Gloves (nitrile if routine, heavy duty if heavily soiled) • Gown and mask if splashing • Laundry bag/hamper • Garbage bags • Disinfectant wipes • Laundry detergent   
2	Roll up dirty laundry at point of use. Wrap wet laundry in a dry sheet or towel. If very wet or heavy, put laundry in a garbage bag before putting it in a laundry hamper. 
3	Bring laundry hamper to the laundry room as soon as possible. ONLY sort laundry in the laundry room. Put the garbage bag in the garbage. Do NOT put dirty laundry on the floor. 
4	If the laundry is soiled with blood or body fluids, cold soak for 30 minutes in tub.
5	Wash for a full cycle and dry thoroughly in the dryer. Laundry bags should be washed after each use.
6	Wipe heavy duty gloves with disinfectant, dispose of nitrile gloves.
7	Perform hand hygiene. 

[36] The NWT Infection Prevention and Control Manual 2012

Appendix 36 – Handling Garbage[37]

Step	Action
Handling Garbage	
1	Perform hand hygiene and gather supplies. • Gloves (nitrile or heavy duty) • Garbage bags • Sharps container     Use water-proof garbage bags that are puncture and tear resistant in all bins. Only use red or yellow biomedical waste bags for real biomedical waste.
2	Collect garbage bags when they are ¾ full so they are lighter and easier to close. 
3	Push air out the top as you close the bag. Do NOT push on the bag. Direct air away from you. Do NOT shake the bag. 
4	Double bag if it is stretched damaged or dirty on the outside. 
5	Hold the bag away from you so you do not dirty your clothes. Put in a waste transport bin for transport to the main regular waste area.
6	Remove gloves and perform hand hygiene. 
7	Report any sharps to your Supervisor and the Supervisor of the are the garbage was collected from. Complete an incident report.

[37] The NWT Infection Prevention and Control Manual 2012

Appendix 37 – Transport of Biohazardous Waste within the Facility

At Stanton Territorial Hospital, waste is handled in accordance with Hospital Wide Policy I-0692 Handling of Hospital Waste.

Currently, all biomedical waste is transported to southern facilities for incineration or other appropriate disposal methods. The biohazardous waste is stored in the biohazardous waste room until it is appropriately prepared for shipment and moved to the shipping container.

At Stanton Territorial Hospital the following single use waste containers are used for biohazardous waste:

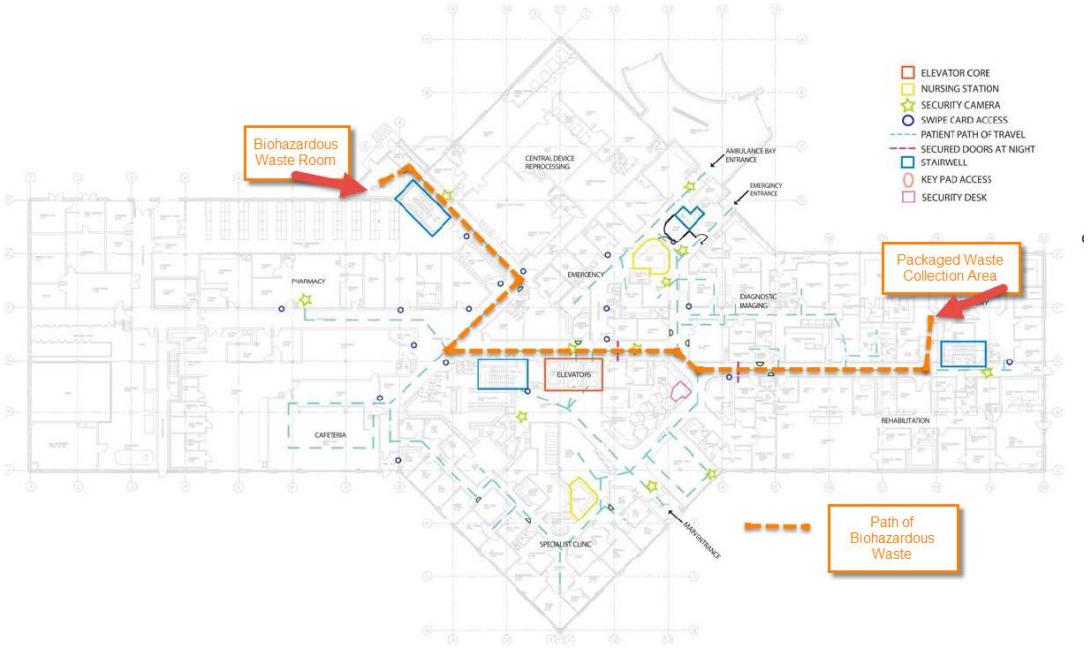
- **Sharps Containers** – These containers are color-coded yellow and labeled with the biohazard symbol, have lids that can be tightly secured, have a fill line and features that prevent unauthorized individuals from removing items from the container.
- **Plastic Waste Holding Bags** – These bags are sturdy enough to resist puncture under appropriate use to the point of storage/disposal. Bags are color-coded to correspond with the Hospital Wide Policy.
- **Cardboard Containers** – Cardboard containers must be color-coded, used in conjunction with the included plastic bag, labeled with the biohazard symbol, rigid, leak-resistant, and capable of being sealed.
    - If cardboard containers are to be shipped off-site and are not to be supplemented with an additional outer packaging meeting the Transport of Dangerous Goods Regulations, then the container itself must meet the requirements of the regulations.

All biohazardous waste containers are to be appropriately sealed within the department generating the waste.

To minimize the possibility of waste handlers incurring injuries while handling filled waste containers, no biohazardous waste containers at this facility are to exceed a weight of 12kg.

Wastes generated within the Special Containment zone are to be autoclaved prior to disposal.

While the appropriate selection and use of biohazardous waste containers greatly reduces the likelihood of breakage and leakage, it is anticipated that accidents may occur. To mitigate this risk, carts designed to prevent spills and made of materials able to withstand exposure to cleaning agents are to be used to transport biohazardous waste from the point of generation to the Biohazardous Waste Room.

Step	Action
Transporting Biohazardous Waste within the Facility	
1	Biohazardous waste containers containing appropriately segregated waste are appropriately sealed and moved to the "Packaged Waste Collection Area" within the department. 
2	Housekeeping Department personnel collect the sealed containers and place them in the spill-resistant transport cart. 
3	The biohazardous waste is transported to the Biohazardous Waste Room following the indicated route. 
4	The Biohazardous Waste Room is identified as containing biomedical waste and the biohazard symbol is clearly displayed.

Shipping Biological and Medical Waste[38]

The transport and disposal of biological and medical waste generated by Stanton Territorial Hospital are contracted services.

The following excerpt from the *Guidelines for the Management of Biomedical Waste in the Northwest Territories* outlines Stanton's responsibilities in this process:

> "The handling, offering for transport and transport of biomedical waste must comply with the requirements of the *Transport of Dangerous Goods Act and Regulations* or requirements of the Transport Authority."

The Facilities Services Department is responsible for the maintenance and operation of the Biohazardous Waste Room. Once the waste has been appropriately stored within the room, these individuals ensure that the waste is stored in the appropriate manner and is properly labeled and prepared for transport.

All medical waste is assigned to UN 3291 which encompasses 4 different proper shipping names:

- Biomedical waste, n.o.s.
- Clinical waste, unspecified, n.o.s.
- Medical waste, n.o.s.
- Regulated medical waste, n.o.s.

Any waste known or suspected to contain a Category A Infectious substance MUST be shipped as a Category A Infectious substance. Decontaminated wastes are not considered dangerous goods and are not subject to the regulations, unless they meet the requirements for another class of dangerous goods.

Medical Waste is assigned to Packing Group II, indicating it is a medium risk dangerous good.

All medical waste shipments must meet the requirements of Packing Instruction 622:

1. All packaging must be in good condition.
2. All shipments of medical waste must be packaged to ensure it arrives at the destination without presenting a hazard to anyone who might encounter the package.
3. Samples containing liquid waste must be placed in leak-proof inner packaging.
    a. The inner packaging closures must be secured with positive means (e.g., tape or paraffin), to prevent the packaging from opening due to vibrations during transport.
    b. Liquid shipments must contain sufficient absorbent material to absorb the entire contents of the waste.
    c. Inner packaging must be able to withstand an internal pressure of 95 kPa.

[38] SafTPak 2015 Compliance Training Reference Manual

4. Inner packaging must be placed in cushioning or secured inside the outer packaging so they will not break, leak their contents or be punctured during normal conditions of transport.
5. Any packages intended to contain sharp material must be puncture resistant.
6. The outer packaging must be a drum (steel, aluminum, plywood, fibre or plastic), jerrican (steel or plastic) or a box (wood, plywood, reconstituted wood or fibreboard).
7. The completed package must be able to meet the package testing requirements for Packing Group II Dangerous Goods.

The UN requires package design tests to be performed on any package design that is intended to contain medical waste. The vendor provides Stanton with packaging that meets these requirements.

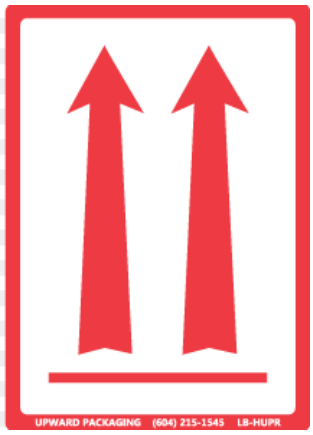
Shipping Information Required on a Medical Waste Package:

Hazard Label for Medical Waste Shipments:

The word "BIOHAZARD"

Package Orientation Label for Medical Waste:

2 required – on opposing sides



These labels are required to comply with exemption 1.42.3 of the Transport of Dangerous Goods Regulations concerning Medical or Clinical Waste.

As this facility ships multiple boxes of waste in one container, address labels are not required on each container provided they are correctly indicated on the Movement Document for the entire shipment.

Any non-emergency questions regarding the transport of medical waste can be directed to the Transport of Dangerous Goods Inquiry Hotline at 1-888-463-0521 or via email at tdg.tmdpnr@tc.gov.ca .

Documentation for Medical Waste:

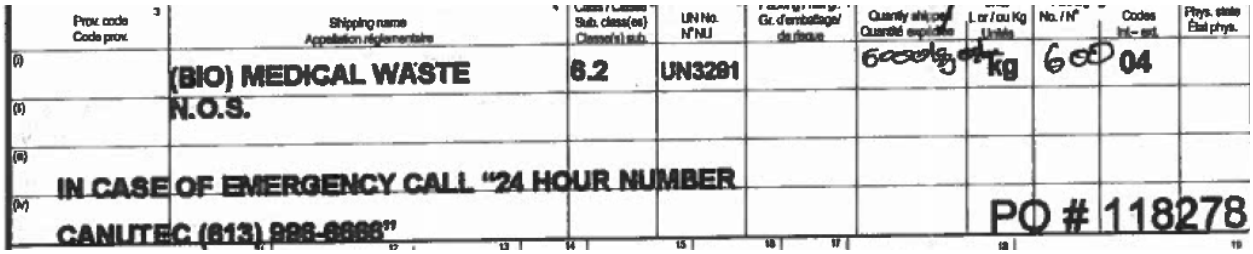
A Movement Document/Manifest is required by environmental legislation to accompany the shipment. Most of the required information is usually pre-filled on the forms provided by the carrier when they present to pick up the shipment.

Generator Information:

Enter the complete address of the facility.

Carrier and Intended Receiver Information:

Enter the complete delivery address of the carrier and the intended receiver in the appropriate areas of the form (P.O. boxes are not acceptable).



- **UN Number** – Enter the 4 digit UN number for each dangerous good in the consignment
- **Proper Shipping Name** – Enter the proper shipping name
- The **Class and Division** for medical waste is 6.2
- The **Packing Group** for medical waste is II
- Enter the total **Quantity** of the consignment.

Signature:

Once the Movement Document has been completed and checked for accuracy, the certification section at the bottom must be signed.

> "I certify that the information contained in Part A is correct and complete. I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations."

Documentation:

Once the vendor has appropriately disposed of the waste, they provide the facility with confirmation of destruction. This documentation is kept on file and managed by Facilities Services.

Appendix 38 – Disinfectants – Advantages and Disadvantages[39]

Process Option	Uses/Comments	Advantages/Comments	Disadvantages/Comments
Alcohols (70-95%)	• External surfaces of some equipment (e.g., stethoscopes) • Noncritical equipment used for home health care Disinfection is achieved after 10 minutes of contact Observe fire code restrictions for storage of alcohol	• Non-toxic • Low cost • Rapid action • Non-staining • No residue • Effective on clean equipment/devices that can be immersed	• Evaporates quickly not a good surface disinfectant • Evaporation may diminish concentration • Flammable store in a cool well ventilated area; refer to Fire Code restrictions for storage of large volumes of alcohol • Coagulates protein; a poor cleaner • May dissolve lens mountings • Hardens and swells plastic tubing • Harmful to silicone; causes brittleness • May harden rubber or cause deterioration of glues • Inactivated by organic material • Contraindicated in the O.R.
Chlorines	• Hydrotherapy tanks, exterior surfaces of dialysis equipment, cardiopulmonary training mannequin, environmental surface • Noncritical equipment used for home health care • Blood spills **Dilution of Household Bleach** Undiluted: 5.25%	• Low cost • Rapid action • Readily available in non hospital settings • Sporicidal	• Corrosive to metals • Inactivated by organic material; for blood spills, blood must be removed prior to disinfection • Irritant to skin and mucous membranes • Should be used immediately once diluted • Use in well-ventilated areas • Must be stored in closed containers away from ultraviolet light & heat to prevent deterioration • Stains clothing and carpets

[39] The NWT Infection Prevention and Control Manual 2012

Process Option	Uses/Comments	Advantages/Comments	Disadvantages/Comments
	sodium hypochlorite, 50,000 ppm available chlorine Blood spill – major: dilute 1:10 with tap water to achieve 0.5% or 5,000 ppm chlorine Blood spill – minor: dilute 1:100 with tap water to achieve 0.05% or 500 ppm chlorine Surface cleaning, soaking of items: dilute 1:50 with tap water to achieve 0.1% or 1,000 ppm chlorine REF: Health Canada/PHAC: *'Hand Washing, Cleaning Disinfection and Sterilization in Health Care'*. Table 7, page17]		
Accelerated Hydrogen Peroxide 0.5% (7% solution diluted 1:16)	• Isolation room surfaces • Clinic and procedure room surfaces • Low-level disinfection is achieved after 5 minutes of contact at 20°C • Monitoring not required, however test kits are available from the manufacturer	• Safe for environment • Non toxic • Rapid action • Available in a wipe • Active in the presence of organic materials • Excellent cleaning ability, due to detergent properties	• Contraindicated for use on copper, brass, carbon tipped devices and anodized aluminum
Accelerated Hydrogen Peroxide 4.5%	• Disinfection of toilet bowls, sinks, basins and commodes in	• Sporicidal • Available in a gel format to ensure vertical surface	• Expensive • Contraindicated for use on copper, brass, carbon tipped devices and

Process Option	Uses/Comments	Advantages/Comments	Disadvantages/Comments
	washrooms of C *.difficile* patients • Following cleaning, sterility is achieved with a 4.5% solution after 10 minutes of contact • Do not use on medical devices or equipment or as a general environmental surface cleaner or disinfectant	adhesion during required contact time • Safe for environment • Non-toxic	anodized aluminum, rubber, plastic • Do not use on monitors
Hydrogen Peroxide 3% (non-antiseptic formulations)	• Noncritical equipment used for home health care • Floors, walls, furnishings Disinfection is achieved with a 3% solution after 30 minutes of contact	• Rapid action • Safe for the environment • Non-toxic	• Contraindicated for use on copper, zinc, brass, aluminum • Store in cool place, protect from light
Iodophors (Non-antiseptic formulations)	• Hydrotherapy tanks • Thermometers • Hard surface and equipment that do not touch mucous membranes (e.g. IV poles, wheelchairs, beds, call bells) **DO NOT** use antiseptic iodophors as hard surface disinfectants	• Rapid action • Non-toxic	• Corrosive to metal unless combined with inhibitors • Inactivated by organic materials • May stain fabrics and synthetic material s

Process Option	Uses/Comments	Advantages/Comments	Disadvantages/Comments
Phenolics	• Floors, walls and furnishings • Hard surfaces and equipment that do not touch mucous membranes (e.g. IV poles, wheelchairs, beds, call bells) **DO NOT** use phenolics in nurseries	• Leaves residual film on environmental surfaces • Commercially available with added detergents to provide one-step cleaning and disinfecting • Slightly broader spectrum of activity than QUATs	• **Do not** use in nurseries or equipment contacting infant (e.g. baby scales) • Not recommended for use on food contact surfaces • May be absorbed through skin or rubber • May be toxic if inhaled • Corrosive • Some synthetic flooring may become sticky with repetitive use
Quaternary ammonium compounds (Quats) [http://www.oahpp.ca/resources/documents/pidac/Best%20Practices%20for%20Environmental%20Cleaning.pdf	• Floors, wall and furnishings • Blood spills prior to disinfection	• Non-corrosive, non-toxic, low irritant • Good cleaning ability, usually have detergent properties • May be used on food surfaces	**Do not use to disinfect instruments** • Limited use as disinfectant because of narrow microbial spectrum • Diluted solutions may support the growth of microorganisms • May be neutralized by various materials (e.g. gauze)

Appendix 39 – Antimicrobial Activity of Disinfectants[40]

Antimicrobial Activity of Disinfectants[6]

Anti-microbial activity					
Disinfectant	**Spores**	**Mycobacteria**	**Other bacteria**	**Viruses**	
				Enveloped	**Non- enveloped**
Glutaraldehyde 2% (3h-10 min)	Good 3 h	Good* 20 min	Good 10 min	Good 10 min	Good 10 min
Peracetic acid 0.2-0.35% (10 min)	Good	Good	Good	Good	Good
Alcohol 60-70% (ethanol or isopropanol) (1-10 min)	None	Moderate	Good	Good	Moderate
Peroxygen compounds 3-6% (20 min)	None	Poor	Good	Good	Moderate
Chlorine releasing agents >1000 ppm Cl2 (15-60 min)	Good	Good	Good	Good	Good
Clear soluble phenolics 1-2% **	None	Good	Good	Poor	None
Quaternary ammonia components 0.1-0.5%***	None	Variable	Moderate	Moderate	Poor

*Less active against M. avium intracellulare.

**Potentially toxic. Should not be used in neonatal wards.

***Dilute solutions may allow the growth of Gram-negative bacilli.

[6] International Federation of Infection Control

[40] The NWT Infection Prevention and Control Manual 2012

Appendix 40 – Preparing Household Bleach as a Disinfectant[41]

Preparing Household Bleach as a Disinfectant Household Bleach is 5.25% sodium hypochlorite solution (50,000 ppm)			
Level Required	**What For**	**How to make**	**Contact time**
1:10 Dilution (1 part bleach in 9 parts water) 5000 ppm	Large blood spill (after surface cleaning)	25 ml bleach in 225 ml water Same as 5 tsp bleach in 1 cup water	20 minutes
1:50 Dilution (1 part bleach in 49 parts water) 1000ppm	Surface cleaning	10 ml bleach in 490 ml water Same as 2 tsp bleach in 2 cups water	10 minutes
1:100 Dilution (1 part bleach in 99 parts water) 500ppm	Minor blood spill	5ml bleach in 495 ml water Same as 1 tsp bleach in 2 cups water	10 minutes

- Precautions for preparing and using sodium hypochlorite solutions from bleach:
- Follow the safety precautions and the manufacturer's directions when working with concentrated solutions of bleach (sodium hypochlorite). Use PPE when handling.
- Chlorine bleach can stain and damage some surfaces (e.g. metals, some plastics)
- Add bleach to water, not water to bleach
- Allow the bleach solution to sit for the full contact time to ensure it is effective.
- Don NOT mix bleach solution with ammonia products – this can produce chlorine gas which is toxic
- Check the expiry date of the concentrated solution
- Make a fresh bleach solution daily
- Pre-clean surfaces to allow bleach solution to be effective

[41] The NWT Infection Prevention and Control Manual 2012