THOMPSON RIVERS UNIVERSITY | Risk & Safety Services

Safe Work Procedure
Safety Protocol for working with Human Blood and Multi-drug Resistant Organisms

RSS 20.07.4

Program/Services Biosafety Instructors & Students	**Safe Work Procedures**		**Department:** Risk and Safety Services
Personal Protective Equipment or Devices Used • Lab coats • Full pants • Proper footwear • Safety goggles • Gloves	**Training Requirements** • In class safety training	**Applicable Documents**	**Effective Date:** May 22, 2019 Revised: August 1, 2024

Scope

- This document describes the required containment level and safe work practices when working with human blood, blood fractions, body fluids, cells, tissues, organs, and multi-drug resistant organisms (MDRO) at Thompson Rivers University.

Protocol

- Universal Precautions and Routine Practices were developed to describe safe work practices with human blood, blood products, and body fluids to protect exposed individuals from infection while performing work functions. These precautions and recommended practices were developed assuming biological hazards that are pathogenic to humans could reasonably be expected to be present in all primary human blood, tissues, and fluids. Therefore, rather than screen for all possible suspected pathogens, adoption of these precautions maximally protects exposed workers from these agents while performing vocational functions. The safe work protocols contained within this document build upon these precautions to ensure maximal safety for TRU staff and students during research and teaching operations using human derived blood, tissues and cells. Due to the nature of some of the work being conducted at Thompson Rivers University (TRU), these practices will also be applied to any laboratory work conducted with MDROs at TRU.
- As per the most recent Public Health Agency of Canada Canadian Biosafety Standard (CBS) (2016) regulations, all work with human blood and tissues require that containment level 2 requirements and practices be implemented. This is based on the assumption that no screening technique can offer complete assurance that tissues or tissue fractions are completely free from pathogens. Therefore, these biological materials should be treated as infectious and require Containment Level 2 work practices.
- Exceptions may apply to work done in clinical settings; however, this will be based on a local risk assessment (LRA). Any exceptions will require a Clinical Research Permit/Biosafety Certificate and can only be done in consultation with the TRU Biosafety Officer.

- Also, phlebotomy procedures involving human participants, will be compliant with TRU Human Ethics Research Application.

Important: If the biological material described above is known to contain a pathogen of a risk group **greater than Risk Group 2**, at present, it **CAN NOT** be worked on safely at TRU.

Responsibility

Before working with human blood, blood fractions, cells, tissues, organs, or MDROs, every employee and student must be appropriately informed and trained. Therefore, the supervisor must:

- Obtain the appropriate, approved TRU Biosafety Certificate prior to starting work.
- Inform staff of associated risks of working with human blood, blood fractions, cells, tissues, organs, or MDROs.
- Institute safe work practices when working with human blood, blood fractions, cells, tissues, organs, and MDROs.
- Ensure competent understanding and operation of containment equipment to use when working with human blood, blood fractions, cells, tissues, organs, or MDROs.
- Ensure employees are informed about and given the opportunity to protect themselves through relevant and available immunizations.

When training is completed, **it must be documented** in accordance with TRU, Canadian Food Inspection Agency, PHAC, and WorkSafeBC regulations.

Overarching Personal Protective Equipment and Safe Work Practices

- When working with human blood, blood fractions, cells, tissues, organs, or MDROs, at minimum, users must wear: a properly fastened laboratory coat, long pants/skirt, closed toed shoes, and protective disposable gloves. If potential for a splash hazard or droplet generation exists, eye protection, or ideally, a face shield should be worn. Additionally, for procedures involving human blood or tissues, double gloving is recommended.
- In addition, since human blood and tissues and MDROs are to be treated as infectious, if respiratory hazards are present or if aerosol or droplet generation is likely, work must be completed in a certified, functioning Biological Safety Cabinet (BSC). Extreme care should be taken when handling human-derived tissues or blood samples or MDROs both inside and outside BSCs.
- Also, similar to treating the biological materials as infectious, any equipment or devices that come in direct contact with human derived tissues or MDROs, should be treated as infectious and treated with the same care as if one was directly handling human tissues or infectious cultures.
- Finally, if blood or other tissues are to be centrifuged, use sealable centrifuge cups that can be removed from the apparatus and opened within a BSC after centrifugation. If such cups are not available, 30 minutes must elapse prior to opening the centrifuge after operation to allow for settling of any generated aerosols.

Hand Washing and Personal Protective Equipment

Hand Washing and Gloves

- Lab staff (including students) are required to properly wash hands prior to engaging in laboratory work.
- Disposable gloves are required PPE at Thompson Rivers University when working with all infectious or potentially infectious materials.
- Nitrile has been shown to have superior needle wiping capabilities compared to latex. Therefore, laboratory personnel are required to wear at minimum, a pair of new, disposable nitrile gloves prior to work initiation.
- Latex gloves directly on the skin should be avoided to prevent possible allergic reactions. This applies even in cases where personnel have not previously displayed an allergy to latex.
- Double gloving is recommended when working with human tissues. Outer latex gloves, if properly fitted, allow for greater dexterity when used in a double glove scenario, rather than a second pair of nitrile gloves. This second pair of gloves should overlap with the cuff of the worn laboratory coat or other PPE device covering the lower arms of the investigator.
- Immediately after handling any contaminated or potentially contaminated materials, gloves must be removed and hands must be washed properly. If work in the laboratory is to continue, new gloves are required to be worn.
- Prior to donning gloves, inspect them for thinning areas, holes, tears, and other imperfections that could impede their protective qualities. Discard gloves with any of the above imperfections and obtain new gloves. Only use gloves that are free from deficiencies that could impede their protective functions.

Laboratory coats and additional protective clothing

- Laboratory coats are to be properly sized and closed when worn.
- Long pants or a skirt and closed toed shoes are also required.
- If disposable protective shoe covers are available, it is recommended that they are used during laboratory operations with contaminated and potentially contaminated biological materials.
- While not necessary, the use of laboratory safety shoes is prudent to provide further protection from laboratory hazards.
- Prior to donning a lab coat, carefully inspect the lab coat for holes, tears, evidence of contamination, and inside the pockets for debris. If any of these are found, notify lab supervisor/staff and obtain a new lab coat, which must be inspected for holes, tears, contamination, and debris prior to use. Only use lab coats that are free from the above deficiencies.

Eye and Respiratory Protection

- Working in a properly functioning and certified BSC should be adequate eye protection for working with human tissues.
- In the instance that there may be splash or aerosol hazards, in the absence of work performed in a BSC, goggles or a full facemask are required PPE, both of these are also required when cleaning up human blood and/or tissue spills. However utilization of a functioning and certified BSC is recommended for all laboratory operations involving human tissues or infectious materials.
- If a respiratory hazard is suspected, the PI should determine if an N100 or HEPA filtered respirator is required and available. If

respiratory protection is required, proper fit testing of staff is required and can be conducted by RSS. Email safety@tru.ca to arrange fit testing.

Working with Needles and Sharps

- Always treat needles and sharps as contaminated.
- Never recap, bend, shear, or break needles.
- Always dispose of needles and sharps in a properly labelled, secure, leak-proof, and puncture resistant container. At TRU there are yellow biohazardous sharp bins available that meet all requirements above.

Waste Disposal and Decontamination Protocols

- Discard all blood/tissue contaminated waste into designated biohazard waste receptacles.
- Prior to disposal, decontaminate all waste with appropriate chemical or autoclave decontamination protocol.
- Prior to stopping work, decontaminate workstations with appropriate disinfectant for designated contact time. Most blood borne pathogens are susceptible to 70% ethanol, however, some non-lipid enveloped viruses (such as, Hepatitis Virus A [HVA]) have been observed to be only moderately susceptible to 70% ethanol.
- Application of a fresh 10% bleach solution for 5 minutes of contact followed by a 70% ethanol or water rise is a sufficient decontamination protocol in the absence of a spill.
- In the event of a spill, disinfect using a 10% solution of freshly diluted bleach as per TRU's spill clean-up protocols.

First Aid Measures

Needle stick/Sharps Injury

- Notify Paladin Security and request a First Aid Attendant
- Allow bleeding following injury and wash the wound with copious amounts of soap and water for 5 minutes.
- Seek **immediate** medical care – if possible bring a copy of the approved biosafety certificate to provide primary healthcare with relevant infectious/pathogenic information.
- Ensure to undergo appropriate medical screening.
- Report the incident to the supervisor or PI and fill out the appropriate forms.

Eye splash or other mucous membrane (nose or mouth) exposure.

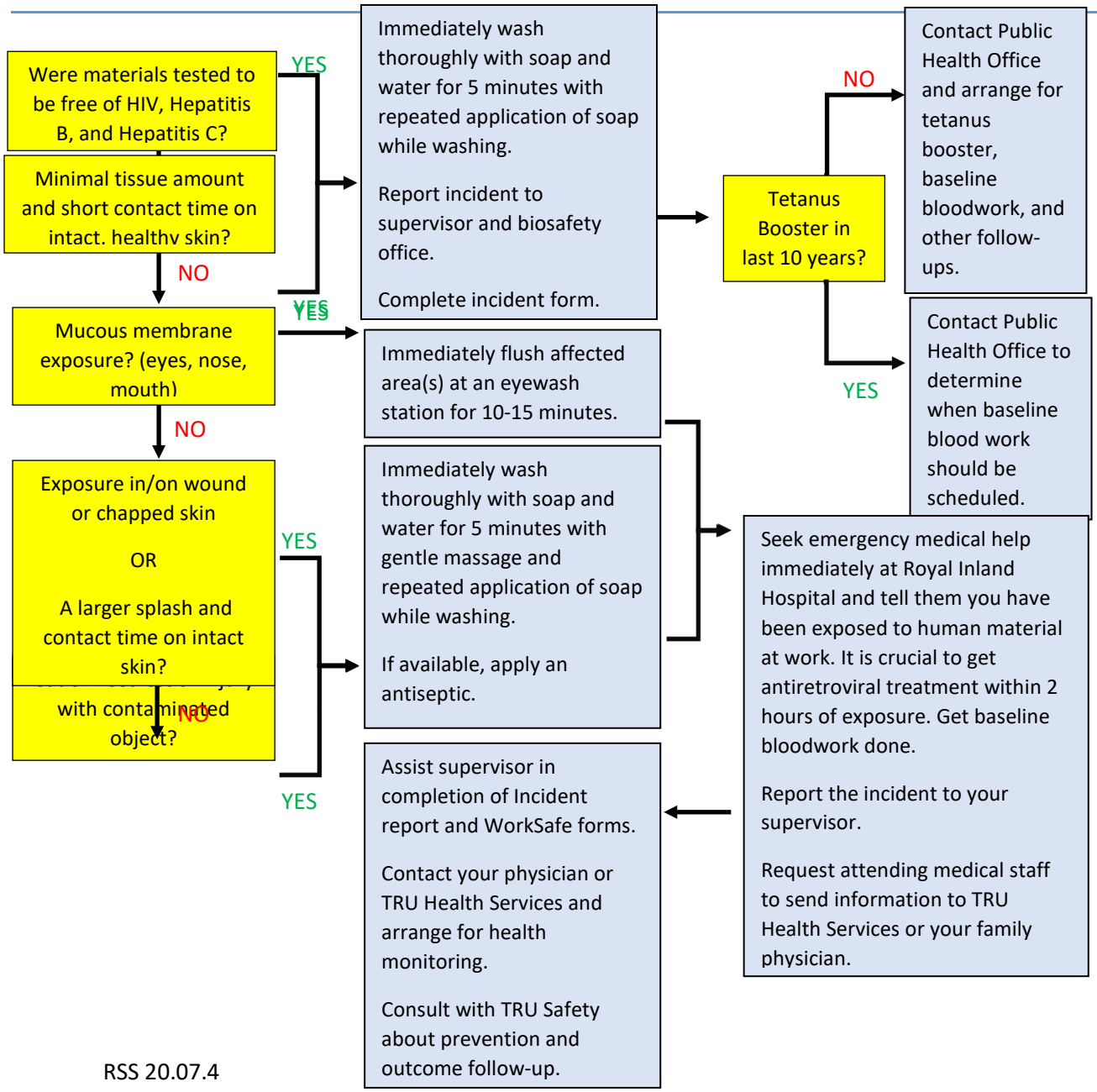
- Flush the eye(s) or other affected area at an eyewash station for 15-20 minutes.
- Seek **immediate** medical care – if possible bring a copy of the approved biosafety certificate to provide primary healthcare with relevant infectious/pathogenic information.
- Ensure to undergo appropriate medical screening.
- Report the incident to the supervisor or PI and fill out the appropriate forms.

Skin Exposure

- Wash affected area and area around affected area with copious amounts of soap and water.
- Seek **immediate** medical care – if possible bring a copy of the approved biosafety certificate to provide primary healthcare with

relevant infectious/pathogenic information.
- Ensure to undergo appropriate medical screening.
- Report the incident to the supervisor or PI and fill out the appropriate forms.

Flowchart – First Aid and Medical Response Protocol for Human Blood and/or Tissues and MDRO Incidents



IMPORTANT:
NO MATTER YOUR COURSE OF ACTION
Take the information sheets within this binder that corresponds with the organism(s) and/or material(s) to which you may have been exposed to the administering medical authorities.