

Decontamination of Equipment Prior to Inspection, Repair or Disposal

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I KNOW OUR COMPUTER HAS A **VIRUS**... BUT I PROMISE THAT YOU DIDN'T GET **THIS** VIRUS FROM THE COMPUTER!



Definitions

- Decontamination:
 - A process that removes or destroys contamination and prevents micro-organisms and other contaminants from causing harm. Renders a medical device, equipment, or environmental surface safe to handle.
 - Decontamination encompasses three processes: Cleaning, Disinfection and Sterilization.
- Decontamination agent:
 - A chemical or physical process used to decontaminate a medical device and includes detergents, disinfectants and sterilants.

More Definitions

- Cleaning
 - Removal of visible soil and organic contamination by scrubbing with a detergent and water or through another process (e.g., ultrasonic).

- Disinfection
 - Process that eliminates nearly all recognized pathogenic organisms but not necessarily all microbial forms (e.g., bacterial endospores) on inanimate objects. Three levels of disinfection:
 - High level: kills all microorganisms, except for bacterial spores.
 - Intermediate level: kills vegetative cells, most viruses, some spores.
 - Low level: kills only vegetative cells and some viruses.

- Sterilization
 - Complete elimination or destruction of all forms of microbial life.

Purpose of Decontamination

- Patient safety – to protect patients from the transmission of infection from medical equipment and devices
- Staff safety – to protect anyone who transports, inspects, maintains, repairs or handles medical, dental or laboratory equipment from the risk of infection or exposure to other hazards

Occupational Health and Safety Act

- Protect workers against workplace health and safety hazards
- Establishes framework for addressing hazards
- Outlines responsibilities for all workplace parties
- Regulations made under the Act include:
 - Regulations for Health Care and Residential Facilities
 - Regulation respecting Control of Exposure to Biological or Chemical Agents



Duties of Employer

- 25(2)(a) provide information, instruction and supervision to a worker to protect the health and safety of the worker
- 25(2)(d) acquaint a worker or a person in authority over a worker with any hazard in the work and in the handling, storage, use, disposal and transport of any article, device, equipment or a biological, chemical or physical agent
- 25(2)(h) take every precaution reasonable in the circumstances for the protection of a worker

Duties of Supervisor

The supervisor shall ensure that a worker:

27(1)(b) uses or wears the equipment, protective devices or clothing that the employer requires to be used or worn

27(2)(a) advise a worker of the existence of any potential or actual danger to the health or safety of the worker of which the supervisor is aware;

(b) where so prescribed, provide a worker with written instructions as to the measures and procedures to be taken for protection of the worker; and

(c) take every precaution reasonable in the circumstances for the protection of a worker.

Regulations for Health Care and Residential Facilities

Sections 8 and 9 require employers to establish written measures and procedures, in consultation with the Joint Health and Safety Committee (JHSC), related to:

1. Safe work practices
4. The control of infections
6. Use of appropriate antiseptics, disinfectants, and decontaminants
7. Hazards of biological, chemical, and physical agents present in the workplace, including hazards of dispensing or administering them
9. The proper use, maintenance and operation of equipment
11. Purchasing of equipment that is properly designed and constructed
12. Use, wearing, care and limitations of personal protective equipment

Regulations for Health Care and Residential Facilities

- Training on use, care and limitations of personal protective equipment
- Specific procedures for handling and disposing of equipment contaminated with antineoplastic agents, and for centrifuges, autoclaves and sterilization equipment
- No eating, drinking, smoking, applying cosmetics and storing food in area where hazardous materials are used
- Procedures for handling and disposing of sharps

Regulations for Health Care and Residential Facilities

Section 44 has provisions that machinery or equipment shall be,

- (e) inspected immediately before its use and at regular intervals as recommended by the manufacturer
- (f) serviced and maintained in accordance with the recommendations and instructions of the manufacturer

Regulation respecting Control of Exposure to Biological or Chemical Agents

- Requires employers to use engineering controls to protect workers from exposure to a hazardous biological or chemical agent without requiring use of personal protective equipment
- Except if engineering controls are:
 - Not available; not obtainable
 - Not practical
 - Temporarily broken
 - Ineffective to control exposures; or
 - In emergencies

Summary of Requirements

- Health care facilities required to develop written policies and procedures related to decontaminating equipment and environmental surfaces to protect the health and safety of workers
- Developed in consultation with the JHSC
- In accordance with manufacturer's directions and include the use of engineering controls (where feasible), safe work practices, appropriate use of decontaminants, use and care of PPE, training, and documentation

Classification of Risk (Patient Safety)

TABLE 1: Spaulding's Classification of Medical Equipment/Devices and Required Level of Processing/Reprocessing

Classification	Definition	Level of Processing/Reprocessing
Critical Equipment/device	Equipment/device that enters sterile tissues, including the vascular system.	Cleaning followed by Sterilization
Semicritical Equipment/device	Equipment/device that comes in contact with nonintact skin or mucous membranes but do not penetrate them.	Cleaning followed by High Level Disinfection (as a minimum). Sterilization is preferred.
Noncritical Equipment/device	Equipment/device that touches only intact skin and not mucous membranes, or does not directly touch the client/patient/resident.	Cleaning followed by Low Level Disinfection (in some cases, cleaning alone is acceptable)

Source: PIDAC, Best Practices for Cleaning, Disinfection and Sterilization

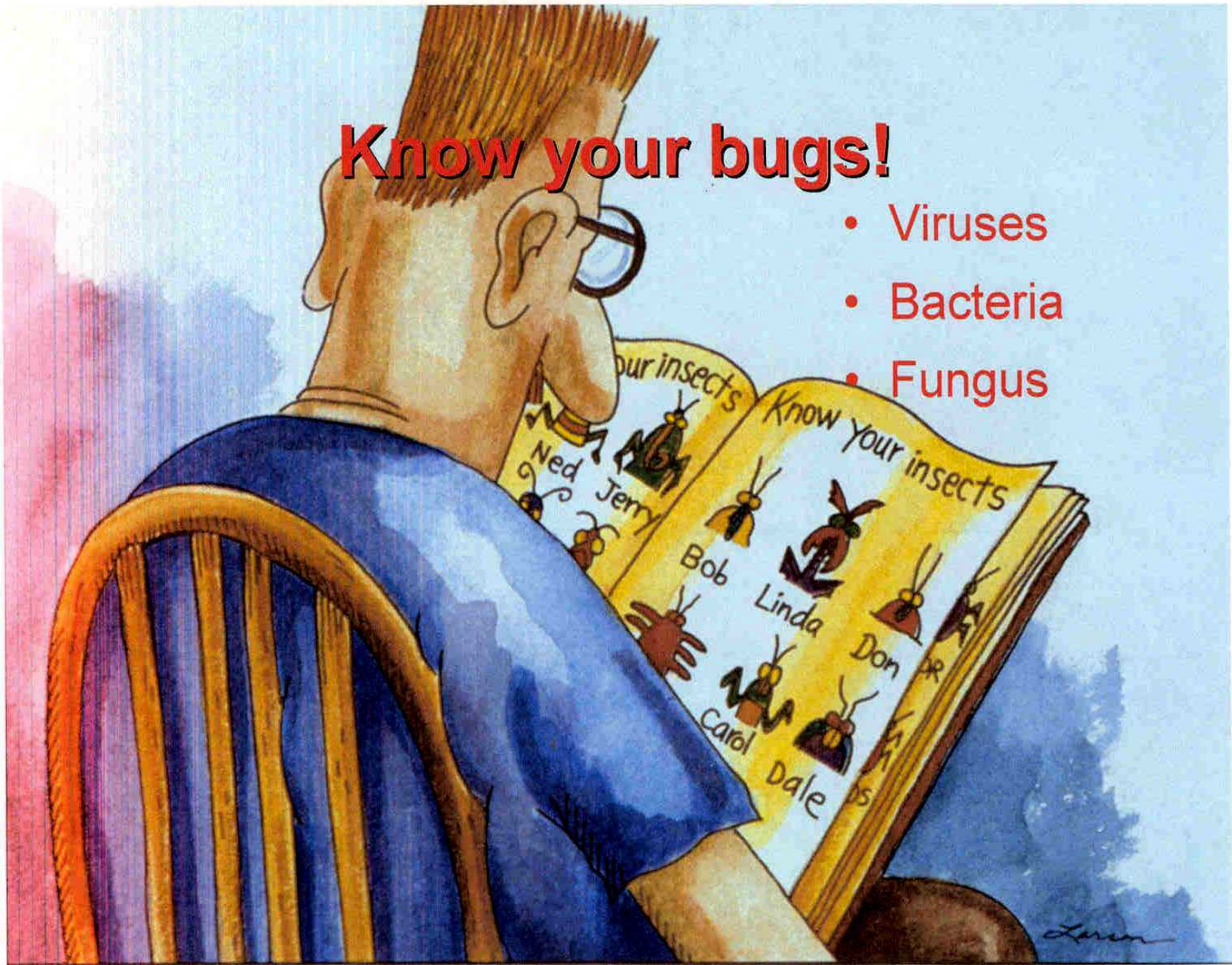
Risk Assessment (Staff Safety)

A process to:

1. Identify potential hazards to staff
(situations or things that may cause harm)
2. Evaluate the risk associated with that hazard
(how likely or severe is the harm)
3. Determine ways to eliminate or control the hazard to prevent harm

Know your bugs!

- Viruses
- Bacteria
- Fungus



Hazard Identification

Potential contaminants and workplace hazards associated with medical devices or equipment:

- Biological agents (e.g., blood and body fluids, secretions, excretions, pathological samples, etc.)
- Hazardous drugs
- Chemicals
- Radioactive materials (e.g., nuclear medicine)
- Other hazards (e.g., sharp devices, electrical hazards, compressed gases, ergonomic issues, etc.)

Hazard Evaluation

- Who may be exposed to the contaminant or hazard?
- When are they potentially exposed?
- How are they exposed? (e.g., route of exposure)
 - Inhalation
 - Skin contact/absorption
 - Injection
 - Ingestion
- What are the potential adverse effects?
- What is the likelihood that exposure would cause harm?
- How severe is the harm caused by the exposure?

Example: IV pump used to deliver chemotherapy

Nursing, Pharmacy,
Transport, Central
Services, and Medical
Engineering staff

Exposure: skin
contact and
possibly ingestion



Contamination with
blood or body fluids;
hazardous drugs

Risk of infection
or toxic effects of
the drug

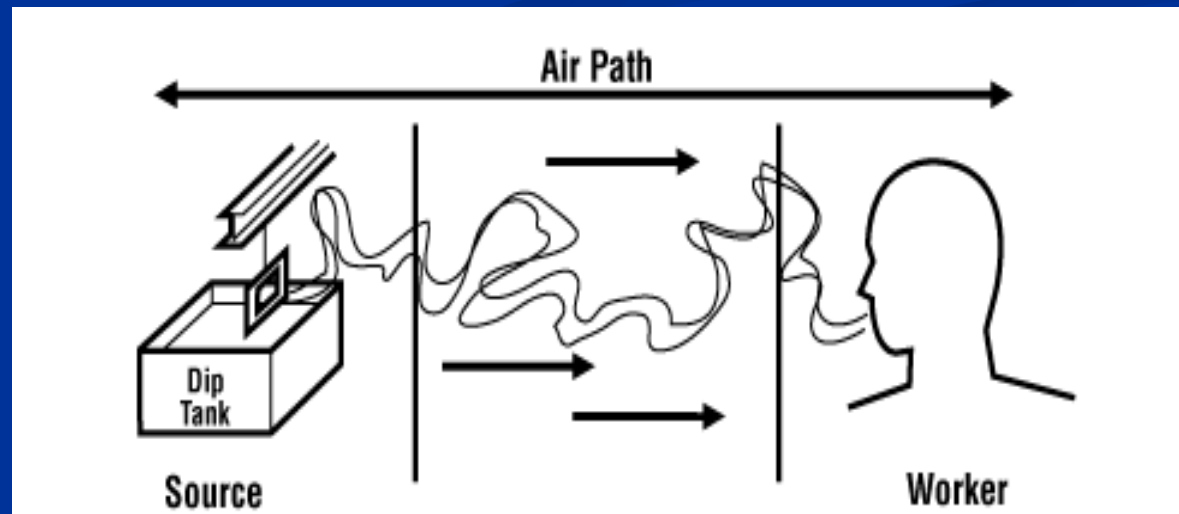
Hazard Control

The "hierarchy of control" – consider options this order

1. Elimination or substitution of the hazard
2. Engineering controls: design/modify equipment to reduce source of exposure; isolate; enclose; local exhaust ventilation
3. Administrative controls: policies, procedures, safe work practices; time of work; housekeeping; personal hygiene (e.g., hand hygiene); training
4. Personal protective equipment (PPE)

Options for Control

- At the source (where the hazard "comes from")
 - best option for control
- Along the path (where the hazard "travels")
 - next best option
- At the worker
 - the last resort



Engineering Controls

- Policies and procedures for the purchase of equipment that can be adequately cleaned and maintained
- Consider steps to reduce contamination (e.g., protective covers, placement of equipment to reduce spatter, etc.)
- Biosafety cabinets or fume hoods to dismantle or work on equipment/parts that cannot be decontaminated before handling
- Enclosed and/or automated cleaning and sterilization systems



Administrative Controls

- Policies and procedures to ensure all equipment is appropriately decontaminated before transport, inspection, repair, or disposal
- If not possible to decontaminate prior to transport, cover contaminated equipment for transport to the cleaning area
- Train staff to identify hazards
- Train staff on the appropriate decontamination procedures
- Work practices to minimize aerosolization (e.g., immerse parts in water when scrubbing)
- Procedures for proper selection and use of decontamination agents and safe work practices for handling those agents

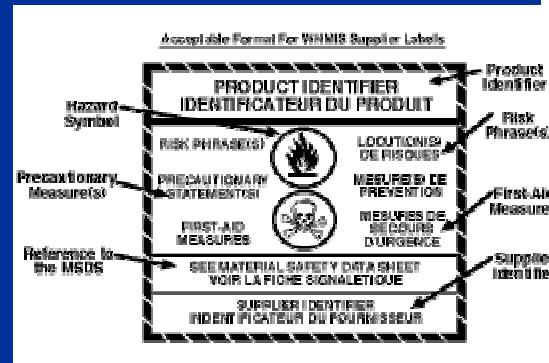
Cleaning, Disinfecting, Sterilizing

- Chlorinated products
- Iodophors/Iodine
- Peracetic Acid
- Alcohols
- Hydrogen Peroxide
- Phenolic Disinfectants
- Quaternary Ammonium Compounds
- Aldehydes
- Ethylene Oxide
- Etc.

Handling Precautions

- Obtain MSDS
- Apply safe handling precautions
- Use appropriate PPE

MATERIAL SAFETY DATA SHEET			
SECTION I - PRODUCT IDENTIFICATION			
Product Name:	Virox 5 In Use (1:16)	LEGEND	Health 7 0
Product Use:	Disinfectant Cleaner	HMS	
WHMIS Class:	Not Controlled	Severe 4	Flammability 0
TDG Classification:	Not Regulated	Serious 3	
Manufacturer:	Virox Technologies Inc. 2815 Bristol Circle, Unit 4 Oakville, ON L6H 6X5 CA Phone (905) 813-0110	Moderate 2	Physical Hazard 0
Supplier:	JohnsonDiversey Canada Inc. 2401 Bristol Circle Oakville, ON L6H 6P1 CA Phone 1-800-842-2341	Slight 1	Personal Protection 0
		Minimal 0	
SECTION II - HAZARDOUS INGREDIENTS			
None by WHMIS criteria.			
SECTION III - PHYSICAL DATA			
Boiling Point:	Not available	Specific Gravity:	1
Freezing Point:	Not available	Coefficient of Water/Oil Distribution:	Not available
Vapour Pressure:	Not available	% Volatile:	Not available
Vapour Density:	Not available	Evaporation Rate:	Not available
Solubility in Water:	Complete	pH:	2 - 3
Physical State:	Liquid	Viscosity:	Water thin
Appearance:	Clear colourless	Odour Threshold:	Not available
Odour:	Odourless.		
SECTION IV - FIRE AND EXPLOSION DATA			
Flammability:	Not flammable by WHMIS criteria.		
Flash Point:	Not available	LEL:	Not available
Hazardous Combustion Products:	May include and are not limited to: Oxides of carbon.		
Autoignition Temperature:	Not available		
Explosion Data:			
Sensitivity to Mechanical Impact:	Not available		
Sensitivity to Static Discharge:	Not available		
Means of Extinction:	Treat for surrounding material.		
Special Fire Hazards:	Firefighters should wear a self-contained breathing apparatus.		
SECTION V - REACTIVITY DATA			
Conditions for Chemical Instability:	Stable.		
Incompatible Materials:	Oxidizers, Reducing agents, Acids, Caustics.		
Reactivity:	Do not mix with chlorine bleach.		
Hazardous Decomposition Products:	May include and are not limited to: Oxides of carbon when heated to decomposition.		
SECTION VI - TOXICOLOGICAL PROPERTIES			
Route of Entry:	Eye, Skin contact, Ingestion.		
Effects of Acute Exposure:			
Eye:	Non-irritating by WHMIS criteria.		
Skin:	Non-irritating by WHMIS criteria.		
Inhalation:	Not a normal route of exposure.		
Ingestion:	This product is non-toxic by WHMIS criteria. Like any product not designed to be ingested, this product may cause stomach distress if ingested in large quantities.		
Effects of Chronic Exposure:			
Skin:	Prolonged or repeated exposure may cause skin drying in sensitive individuals.		
Irritancy:	Non-hazardous by WHMIS criteria.		
Respiratory Tract Sensitization:	Non-hazardous by WHMIS criteria.		



Personal Protective Equipment

- Gloves – when potential for contact with biological, chemical or physical agents
- Gowns or lab coats – to protect against contamination of skin and clothing
- Eye protection – to protect against splashes or impact with solid objects
- Respiratory protection – to protect against inhalation of chemical or biological aerosols



Documentation

- Written policies and procedures
- Equipment records and logs, including those related to cleaning, disinfection, sterilization
- Safe Work Permits (or “declaration of decontamination status”)

Description of equipment

Owner/user certifies that it has been decontaminated of all hazardous materials and is safe to handle, service or dispose

Safety Work Permit

To Be Completed by Plant Operations:

Date: _____ Staff assigned to the Job: _____ Job Number: _____

Description of Job:

To be completed by Department/Program:

1. Equipment repair:

Name of equipment: _____

I certify that the equipment requiring servicing:

- has been emptied of hazardous material
- has been decontaminated where applicable
- does not present any biological, chemical or radioactive risk to the person that has to transport or service it
- Wipe test for radioactive contamination have been performed on equipment that has been used with or was located in an area where open sources of radioactive material have been used.

Signature owner/user Print Name Owner/user Local

Supervisor/Principal Investigator Local
Print

2. For work to be done on equipment or in the department/ward/lab

Complete 1 and 2:

I certify that areas adjacent to the equipment or to be repaired or to where the work must be conducted are clear of any potentially hazardous materials so that the environment is safe for the worker.

Signature owner/user Print Name owner/user Local

Supervisor/Principal Investigator Local

⚠ All chemical/pharmaceutical material has been washed off.
Equipment that has been used with toxic/biological material has been first surface cleaned with a detergent then wiped down with a 1 in 10 dilution of household bleach. Wipe test done on the equipment indicate less than twice background radioactivity.

Method of Decontamination

Appendix 2 Declaration of contamination status

From:..... To.....
 Address Address.....

 Telephone number

Type of equipment..... Manufacturer.....
 Description of equipment.....

 Other identifying marks.....
 Model No. Serial No.
 Fault

Is the item contaminated? **Yes*** **No** **Don't know**
 * State type of contamination: blood, body fluids, respired gases, pathological samples, chemicals (including cytotoxic drugs), radioactive material or any other hazard.....
Has the item been decontaminated? **Yes**** **No***** **Don't know**
 ** What method of decontamination has been used? Please provide details
 Cleaning.....
 Disinfection.....
 Sterilization.....
 *** Please explain why the item has not been decontaminated?

Contaminated items should not be returned without prior agreement of the recipient

This item has been prepared to ensure safe handling and transportation:
 Name..... Position.....
 Signature.....
 Date..... Tel.....

Disposal Sticker

Occupational Health and Safety Services

Equipment has been decontaminated

	Yes	No	N/A
Radionuclides	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chemical Agents	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Biological Agents	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CFC Free	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Authorized by : Wajid

Date: Feb 4, 2008

References

- Best Practices for Cleaning, Disinfection and Sterilization in All Health Care Settings, Provincial Infectious Diseases Advisory Committee (PIDAC), March 2006
- Centres for Disease Control and Prevention: Sterilization or Disinfection of Medical Devices: General Principles
- Sterilization, Disinfection and Cleaning of Medical Equipment: Guidance on Decontamination from the Microbiology Advisory Committee to Department of Health, Parts 1, 2, and 3 (June 2006)
- National Health Service (UK) guidelines such as HSG(93)26. *Decontamination of equipment prior to inspection, service or repair*. Department of Health. 1993.
- Occupational Health and Safety Act and Regulations for Health Care and Residential Facilities

Thank you!