Biological & Clinical Waste Management Procedure

Enhancing Health & Safety in RCSI

RCSI DEVELOPING HEALTHCARE LEADERS WHO MAKE A DIFFERENCE WORLDWIDE

As a result of the variety of clinical, diagnostic, medical education and research activities in RCSI, a wide variety of biological / clinical waste and visually sensitive materials are generated in house. In addition to these materials, which contain standard biological / clinical waste hazards, a number of Departments are conducting research using genetically modified microorganisms, which includes clinical trials.

Definitions / Abbreviations

- EPA – Environmental Protection Agency
- GMO – Genetically Modified Organisms
- GMM – Genetically Modified Microorganisms

Related Documents

- RCSI Laboratory Health & Safety Rules

Responsibilities

Department Heads:

- Ensuring that all staff under their control are aware of the correct method of waste disposal.
- Ensuring that proper waste containers with proper biohazards logo are available i.e. cin bin's.
- Ensuring that all containers are properly sealed.
- Ensuring that the various wastes are placed in the appropriate containers tagged and made safe for collection.
- Ensuring that only non-domestic type waste is placed in appropriate biohazard containers.
- Ensure all your Laboratory staff complies with the above.

Lab PI's, Technicians, Users:

Principal Investigators:

- Ensure this procedure is communicated to all lab staff/students, ensuring know how to deal with biological and clinical waste.
- Ensure labs are equipped with the proper containers and or bags.

Users (students, lab personnel): *f*

- Ensure to wear the correct personal protective equipment when handling biological & clinical waste.
- Ensure familiarity with the handling, treatment and disposal procedures of the waste you generate.

Portering Staff:

Beaumont ERC:

- Zulu bins are tagged and labelled by the department staff and left out for collection by Portering Staff. Bins are placed on a trolley by Portering Staff and transferred to the large clinical waste skip.

SSG:

- Sin bins and bags are left in corridors by department staff for Portering Staff to collect each Monday & Friday.
- Portering Staff will then deliver the waste to the biohazard store.
- Porters will not remove damaged, open or untagged waste containers.
- Porters should wear suitable personnel protective clothing, when required (for lifting, handling bins):
  - Impermeable Nitrile Gloves

- Puncture and syringe proof gloves.

Note: Only staff with manual handling training should lift full biohazard bins.

Waste Disposal
The following are the nominated and licenced biological / clinical waste disposal contractors:

- St. Stephens Green Campus - Initial Medical Services (I.M.S)
- ERC Beaumont - through Beaumont Hospital by agreement.
- Mercer Medical Centre General Practice - Clinical Collections by an arrangement with South Inner City Partnership. This collection is coordinated by the ERHA who complete C1 Forms for each batch of waste.

Waste is taken away by I.M.S to the following sites:

- General categories of Healthcare Risk waste / clinical waste and sharps are disposed of at EPA licensed facility, Licence 55-1 as operated by STI Ltd, using heat disinfection.
- Certain categories of laboratory waste, pharmaceutical, medical devices, metal instruments, which require disposal by incineration are disposed of at Transfer Station, EPA licensed facility, Licence 40-1 operated by Irish Environmental Services (IES).
- Chemicals consisting of 'lab smalls' are exported to Europe for incineration from Transfer Station, EPA licensed facility, Licence 50-1 operated by AVR-Safeway.

For packaging procedures for sharps and rigid bins, go to http://www.initial.ie/medical-services/clinical-waste/index.html

Autoclaving & Disinfection Guidance
Autoclaving protocols differ depending on the origin of the waste stream. All GMO materials must be autoclaved without exception.

Non-GMO Material
Where considered necessary for the prevention of disease laboratory waste should be autoclaved prior to disposal. In any event, laboratory waste containing Category A microorganisms must be autoclaved prior to disposal. It is important that suitably qualified personnel who understand the nature of the infectious materials as well as the health and safety implications involved in the handling, packaging and treatment of the waste are involved in the assessment.
http://health.gov.ie/wp-content/uploads/2014/03/healthcare_waste_packaging2010.pdf

Liquid microbiological cultures must be autoclaved before disposal in the laboratory, drained and washed down with copious volumes of water.

GMO Material
Any material containing GMO's ***regardless of class*** must be autoclaved prior to disposal. Animals, which are carrying GMO material, must be placed in green bags for incineration. (GMO Regulations, 2001 & 2003)

Tissue Culture waste
Molecular, Cellular & Therapeutic (MCT) Department:

- Culture media used to transfer, inoculate, and prepare non-infectious cultures:
  - If waste needs to be autoclaved place solid tissue culture media waste in autoclave bags with autoclave tape and autoclave. Liquid waste is put into Pyrex bottles for autoclave. **Do not dispose of untreated materials in ordinary waste bins.**
  - Dispose of solid autoclaved waste in solid waste container, yellow cin bin.
  - Deactivate liquid tissue culture media waste with Sodium Hypochlorite (10% final concentration for at least 30 minutes) pour into liquid waste container beside the sink, the Ph of the waste is checked and the waste is disposed of down the sink with plenty of water.
- Culture material that contains chemical or bio hazardous agents will need a separate treatment and disposal procedure.

Physiology:

- Liquid waste (Tissue Culture Media Waste)
  - Tissue Culture media waste is collected in large glass aspirator bottles (autoclave suitable bottles) which do not exceed 75% of the flask's total volume.
  - The liquid waste is autoclaved at 120 C for 90 min. The time was taken from the spore test we perform once a month.
  - After autoclaving waste is filled into white drums. When white drums are full they are tagged and brought down to the basement in York House.

- Solid waste (GMO class II)
  - If solid waste needs to be autoclaved place solid tissue culture waste in autoclave bags (red Biohazard Autoclave bag) with autoclave tape and decontaminate by autoclaving @ 120 C for 90 minutes.
  - Autoclaved waste can then be placed in approved yellow bins. The waste must be tagged and recorded.

Surgery:

- Liquid waste (Tissue Culture Media Waste) is placed in drums and Virkon is added to deactivate the waste. Full drums are then tagged and brought down to the basement in York House.

Storage and Handling Precautions

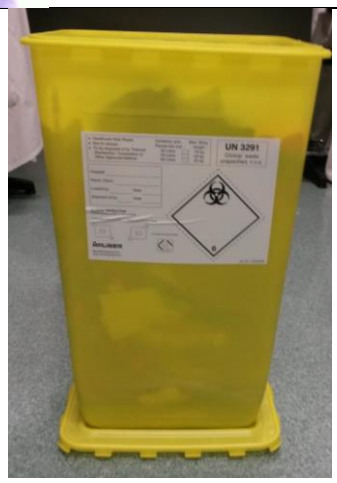
Following sealing and tagging, waste bins should be stored in a designated area at the point of origin until collection. Waste bins should not pose a fire hazard by blocking corridors or escape routes.

Persons collecting waste bins should be aware of the hazards associated with the material. The central waste store must be kept locked at all times and have a biohazard symbol on the door / gate as well as a sign restricting unauthorised entry. The storage room should be well ventilated, covered and secure.

Waste Transfer Forms are completed by Initial Medial Services.

Appendix 1 – Biological, Clinical & General Waste Bins in RCSI

A. <u>Yellow Bins</u>

LOCATION	TYPE OF WASTE	BIN
Anatomy SSG* BRF SSG Psychiatry ERC* Surgery Simulation	**Glove & tissue waste** that touch biologicals.	 Yellow bin with lid & sign
Anatomy SSG Surgery	**Plastics waste**	 Yellow bin – no lid.
Medicine ERC Psychiatry ERC Surgery SSG Simulation Pathology ERC	**Non Sharps** i.e. (General waste) Location: Lab bench Blood Tubes, Contaminated paper, Lab Gloves, Pipette Tips, Bacterial Cultures (autoclaved) , Antibody (Western blots). (Cell culture waste) Location: Cell culture room Only difference is it has Cell line culture waste too. Recorded on waste disposal log as either cell culture or general waste but both being biological waste. Histology waste and non-cultured lab waste	 Yellow Bin with label
Physiology SSG CRC* ERC Pharmacy SSG BRF* Simulation	**<u>Biological Waste (Class I)</u>:** E.g. any material (plastic, tips etc.) potentially contaminated with microorganisms, including tissues, blood; body Fluids should be placed in **approved yellow bins with a lid.** Gloves and contaminated waste papers. Yellow (30/60L) rigid bin, yellow lid --- scavenger canisters (specific for them) Waste contained blood and blood fluids	   Yellow bins / bags with signage denoting type of waste.

LOCATION	TYPE OF WASTE	BIN

B. Sharps Bins

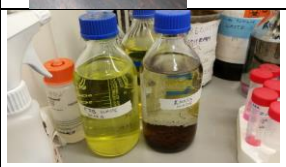
LOCATION	TYPE OF WASTE	BIN
Anatomy SSG Chemistry SSG Pharmacy SSG Surgery SSG Simulation	**Contaminated Sharps** e.g. needles	 Small yellow bin with blue lid.
Pathology ERC	Glass slides, microtome blades, disposable scalpels and syringes	
Medicine ERC Psychiatry ERC	Needles / Syringes (Blood work and non-blood work), Glassware, Scalpels, Contaminated slides.	
Physiology SSG	E.g. syringes with needles, razor-blades, scalpel blades and small bits of broken glass should be placed in approved yellow sharps container.	
BRF SSG	Needles / Syringes (Blood work and non-blood work), Glassware, Scalpels, Contaminated slides. E.g. syringes with needles, razor-blades, scalpel blades and small bits of broken glass Sharp tips of I.V. sets, blood stained or contaminated glass.	

C. Glass Bins

LOCATION	TYPE OF WASTE	BIN
Anatomy SSG Chemistry SSG Pharmacy SSG Surgery SSG	**Glass waste**	   White cardboard Box/Bin or silver bin with black lid with signage denoting broken glass.

LOCATION	TYPE OF WASTE	BIN
Chemistry SSG Surgery SSG	**Contaminated glass**	 Contaminated glass

D. <u>Liquid Waste</u>

LOCATION	TYPE OF WASTE	BIN
Anatomy SSG	**Chlorinated & non-chlorinated waste**	 Yellow & Red cans / containers
Physiology SSG Surgery SSG	**Liquid cell culture waste:** Waste must be decontaminated by autoclaving @ 121 c for 30 minutes. Autoclaved waste can then be poured in waste drums.	 Pour into white labelled container
Physiology SSG Surgery SSG	**Chemical waste:** E.g. solvents, aqueous solutions, dry powders, unwanted old chemicals. There is a designated bottle for each liquid waste in the cabinet under the hood or in the hood in the Main lab.	 Bottles are labelled for each liquid waste
Chemistry SSG	**Chlorinated waste**	 Cream Labelled container
Chemistry SSG Pharmacy SSG	**Non-chlorinated waste**	 Red labelled container

LOCATION	TYPE OF WASTE	BIN
Pharmacy SSG	**Chlorinated Polymer Waste**	 Red container labelled.
Pharmacy SSG	**Chlorinated Waste**	 Red container labelled

E. Cytotoxic Waste

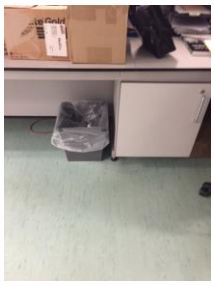
LOCATION	TYPE OF WASTE	BIN
Pharmacy SSG Molecular Medicine ERC Surgery SSG Simulation	**Cytotoxic waste** Only small quantities of residual medicines or pharmaceuticals left over after administration Non sharps cytotoxic waste	 Yellow bin with purple lid 
BRF	Contaminated cytotoxic sharps, needles, syringes, sharp instruments and broken glass	
Pathology ERC	Small quantities for chemical waste (<100mls) and non-sharps waste contaminated with chemicals/cytotoxic medicines	

F. Biological / GM Waste

LOCATION	TYPE OF WASTE	BIN
Anatomy SSG Physiology SSG BRF SSG Simulation	**Biological waste** **Animal waste:** Animal carcasses and tissue must be placed in a green waste bag and sealed. It is stored at -20 degrees. The waste must be tagged and recorded.	  Green Bag

LOCATION	TYPE OF WASTE	BIN
Physiology SSG	**GMO WASTE (Class II):** GMO Class II waste must be decontaminated by autoclaving @ 121 C for 30 minutes. Autoclaved waste can then be placed in approved yellow bins. The waste must be tagged and recorded.	 Red bag

G. General Waste

LOCATION	TYPE OF WASTE	BIN
All locations	**General waste, recyclable waste**	 Black lid – general waste Green lid – mixed recyclable waste
CRC ERC	**General Waste**	 

H. Other Waste

LOCATION	TYPE OF WASTE	BIN
BRF SSG	**Animal bedding waste** PPE (overshoes, hats, masks, gloves, coveralls), Office material General waste	 Black refuse bag

LOCATION	TYPE OF WASTE	BIN
Pathology ERC	**Wall mounted blade flask** is for the removal of scalpel blades.	 Wall mounted blade flask
CRC in ERC	**Dirty laundry**	 Laundry bins
Pharmacy SSG Chemistry SSG	**Contaminated gloves & tissue** (No biological waste, No sharps, No hard plasics, No glass)	 Red bag in red bin.

SSG = St. Stephens Green
ERC = Beaumont Education & Research Centre
CRC = Clinical Research Centre in ERC
BRF = Biomedical Research Facility

Appendix 2 – Biological Waste Colour Codes for each Dept.

Pharmacy	Black
Physiology	Purple
MCT	Green
BRF	Red
Anatomy Teaching and Research	Blue
Surgery	Orange
Chemistry	Grey
Tropical Medicine	Pink
Surgical Affairs	Browne
SARA Dept.	Silver