

Guidelines for the Management of Clinical and Related Waste

1. Introduction

The University generates clinical and related waste during its clinical, teaching and research activities and needs to manage this waste in a way that complies with legislative and regulatory obligations. As the University generates a substantial amount of clinical and related waste, efficient management of this waste is important to minimise operating costs and environmental impacts. The objectives of the clinical and related waste management systems are to minimise human and animal contact with potentially infectious waste, while also preventing unintentional release of infectious waste to the environment.

2. Scope

This document outlines the basic principles governing the management of clinical and related waste within the University. It provides guidance to operational managers and other staff to assist in the development and implementation of appropriate operating procedures in relation to the handling, storage and disposal of clinical and related waste.

3. Definitions and Terms

Clinical Waste: Waste that has the potential to cause disease in humans, including, for example, animal waste, human tissue waste, laboratory waste and discarded sharps. Clinical waste may also contain other regulated waste such as autoclaved (or appropriately treated) GMO or Quarantine material.

Animal Waste: Any discarded materials from animals contaminated with an agent that has the potential to cause disease. The material may include body parts, bedding, blood, and carcasses.

Human Tissue Waste refers to:

- Tissue, blood, blood products, other body fluids removed from a person;
- Specimens of the above and the container in which they are kept; discarded material saturated with free-flowing body fluids, including blood. This includes other body fluids such as saliva, mucus, pleural, cerebrospinal and pericardial fluids that are contaminated with blood, or have the potential to cause infection.

For the purposes of clinical waste management human tissue does not include human body parts, teeth, hair, nails, gums and bone. Contact Health and safety for further advice relating to the appropriate handling of human remains.

Laboratory Waste: Refers to a specimen or culture discarded during clinical, research, or teaching laboratory activities. It includes regulated material, e.g. genetically modified organisms (GMOs) and quarantine material, along with infectious agents. It also includes materials used to grow and maintain infectious agents, including (but not limited to) nutrient agars, gels and broths, and associated tools, e.g. loops, stirring devices, stoppers, plugs, filters and cells lines.

Discarded sharps: Devices that have sharp points, protuberances or cutting edges that can cause a penetrating injury to a human. As sharps may be contaminated by a range of substances, they should be managed according to both sharps waste management practices and the practices applicable to the contaminating agent, e.g. cytotoxic drugs or radiation.

Genetically modified organism (GMO): Waste material is the GMO itself and any material, e.g. gloves and microbial plates, that have come in direct contact with the GMO.

Biosecurity waste: Includes the biosecurity material itself (be it human, animal, plant or microbial material), any packaging that was in contact with the biosecurity material, and other waste generated while working with the biosecurity material.

Related Waste: Waste that constitutes, or is contaminated with:

- Chemicals;
- Cytotoxic drugs;
- Human remains;
- Pharmaceutical products;
- Radioactive substances.



Figure 1 The biohazard symbol and text required to label all clinical waste

Each of these waste types has its own regulations and it should not be handled as clinical waste. Refer to the specific guidelines for managing these waste types when dealing with these substances.

4. Segregation of Clinical Waste

Clinical and related waste needs to be segregated during disposal. It is a chargeable offence if segregation is inadequate or ignored. However, the ultimate method of waste disposal, e.g. landfill or incineration, influences the level of segregation required. According to the Queensland regulations waste needs to be segregated into:

- (a) the following categories of clinical waste
 - Animal waste;
 - Discarded sharps;
 - Human tissue waste;
 - Laboratory and associated waste directly resulting from the processing of specimens; and
- (b) the following categories of related waste
 - Chemical waste;
 - Waste constituted by, or contaminated with, cytotoxic drugs;
 - Human remains;
 - Pharmaceutical waste;
 - Radioactive waste; and
- (c) general waste.

Due to the method of final disposal used by the waste contractor employed by Griffith University the clinical waste categories listed above (a) can be aggregated together into one waste stream, provided certain procedures are followed when disposing of each type.

6. Clinical Waste Disposal and Storage

Clinical waste must not be disposed of in general waste. Clinical waste containers should be yellow, labelled with a black Biohazard symbol and the text “Clinical Waste” (**Figure 1**).

Clinical waste must be stored in a manner to reduce the chance of people and the environment being exposed to or affected by the waste.

Clinical and related waste must be:

- Bagged and stored in rigid-walled, leak-proof secondary containers, preferably in a bunded area with an impervious surface, e.g. concrete.
- Stored in bags and containers with the appropriate colours and labels.
- Kept so as not to cause environmental nuisance, e.g. by refrigerating potentially odorous materials.
- Kept in an area not accessible by unauthorised people or animals.

To meet these requirements Griffith University has several management practices that are common across campuses and facilities:

- Every clinical waste bin should have a liner. This liner shall be tied off prior to that bin being stored in a waste storage area
- The clinical waste bin shall be locked either by a padlock or zip tie.
- Clinical waste bins that are ready for collection by the waste disposal contractor will be placed in designated storage areas.



Figure 2 – Clinical Waste Bin

Individual research areas/groups may have their own work practices in addition to these requirements depending on the nature of the waste being generated. Laboratory waste will most commonly be disposed of as clinical waste.

GMO waste must be decontaminated before being disposed of via the clinical waste stream. Disinfection can be achieved by a variety of methods. At Griffith University the GMO waste must be effectively autoclaved prior to being sent out of the laboratory for disposal with the waste contractor. If autoclaving is not suitable, chemical disinfections can be used, e.g. 80%v/v ethanol or a sodium hypochlorite solution where the organism will be exposed to 0.5-1% available chlorine. The disinfectant must be appropriate for the organism being targeted. Spores may require the use of special disinfection methods or autoclave conditions due to their resilience.

Biosecurity waste needs to be handled according to the regulations of the Department of Agriculture and Water Resources. If you are working in an Approved Arrangement facility always ensure your waste handling is appropriate for the risk group and the type of material. You must ensure you keep accurate records for all material and waste movement and treatment.

For waste that potentially contains Risk Group 3 microorganisms, waste generated from a licenced dealing and/or quarantine waste, refer to the relevant facility manual, Licence and/or Import Permit for more specific information.

7. Sharps Waste Management

When disposing of sharps, it must be into a sharps container that cannot be re-accessed. Once inside the sharps container, the entire container can be sealed and disposed of via the clinical waste stream. Sharps should never be disposed of directly into a clinical waste bag.

If you have sharps that have been used with substances that are listed as related waste, they should still be disposed of in sharps waste containers. The sharps container should comply with the requirements of the applicable related waste category. For example, a sharps container for needles that contained cytotoxic drugs should be purple, labelled with Cytotoxic Waste and display the appropriate cell in telophase symbol (**Figure 2**) as per the regulations. The container should then be disposed of according to the procedure for that type of related waste.



Figure 3 – Cytotoxic sharps

8. Disposal of Related Waste

Chemicals

When disposing of chemical waste, the properties of the chemicals comprising the waste need to be considered. Staff should review the Chemical Waste Disposal Procedure to determine the most appropriate method for disposing of their chemical waste. To find detailed information about the chemical itself, such as the hazards it may present and/or recommended waste procedures, staff should use Chemwatch Gold FFX. A link to this program and waste disposal procedures documents can be found on the [Biosafety, Chemicals & Radiation page](#) on the Griffith Health and Safety and Wellbeing website.

Cytotoxic drugs

Cytotoxic drugs must be handled carefully to minimise any exposure of staff and students. Please refer to the [Worksafe Qld web site](#) document "[Guide for Handling Cytotoxic Drugs and Related Waste](#)" and contact the Biosafety Team directly if you are considering the use of cytotoxic substances.

Human remains

Handling of human remains must be in accordance with the Transplantation and Anatomy regulations and other relevant legislation. They should not be disposed of as clinical waste. Contact Health and Safety for further advice relating to the appropriate handling of human remains.

Pharmaceutical products

Drugs and poisons need to be managed according to the [Health \(Drugs and Poisons\) Regulation 1996](#), of Queensland. Refer to Griffith University's Scheduled Substance Management Plan (SSMP) or contact Health and Safety for further advice.

Radioactive substances

Radioactive waste must be managed according to the Radiation Safety Act 1999 and the Radiation Safety Regulation 2010. It should only be handled by staff who with the appropriate training. Procedures for managing radioactive waste should be developed on a case by case basis. Please contact the University's Chemical and Radiation Safety Officer for advice.

9. Transport within the University

Clinical waste transport practices should minimise the chance of people being exposed to the waste, be it during the transport process or during onsite storage.

When transporting clinical and related waste it must be done in rigid-walled, leak proof, puncture resistant secondary containers, for example a large wheeled garbage bin with the appropriate signage. The containers must be inaccessible to unauthorised persons. Transport of waste using only waste bags should be avoided. Double bagging of waste may be appropriate in some circumstances based on a risk assessment.

Transport of waste should be done through service areas, and where possible when there is minimal traffic. This is especially important in areas accessible by the public, e.g. dental clinics and other clinical spaces.

10. Clinical Waste Disposal

The University has a contractual arrangement with a professional waste disposal company that uses high temperature (1100°C-1150°C) incineration to dispose of the waste in line with QLD Department of Environment and Heritage Protection (DEHP) regulations.

It is important to note that from a sustainability perspective, high temperature incineration is less harmful than disposal as landfill. While CO₂ is still an important anthropogenic climate change driver, atmospheric methane (CH₄), a known by-product of landfill, is a major climate change driver and has a global warming potential 25 times that of CO₂. Due to the scale of the contractor's operation the DEHP continuously monitors the performance of the incinerator.

As discussed earlier the regulations also require clinical waste to be segregated into different types, depending on the final disposal method. The use of the incinerator as the final point of disposal allows Griffith University to reduce the degree of segregation required. Failure to comply with the level of segregation required, e.g. including cytotoxic or radioactive waste in the clinical waste stream, is a chargeable offence.

11. References

[Guideline: Clinical and Related Waste, QLD Department of Environment and Heritage Protection](#)
[Queensland Waste Reduction and Recycling Regulation 2011](#)
[Greenhouse Gases, Parliament of Australia](#)
[AS/NZS2243.2:2010 Safety in Laboratories –Microbiological Safety & Containment](#)
[Health & Safety Policy](#)
[Work Health and Safety Act 2011](#)
[Work Health and Safety Regulation 2011](#) [Environmental Protection Regulation 2008](#)