Safe Handling and Administration of Monoclonal Antibodies Guideline

1. Guiding Principles

Monoclonal antibodies (MABs) are large protein drugs that have an affinity for a specific antigen. They are used in the management of cancer and non-cancer diseases. Administration is by injection or infusion and the route is usually subcutaneous or intravenous.[1]

The action of MABs is different from traditional cytotoxic therapies and most are not inherently cytotoxic and do not need to be handled with cytotoxic precautions.[1,2,3,4,5,6]

With the continuing development of new MABs, the advent of fixed dosing and expansion of indications for existing MABS, a universal approach is required when assessing the risk to healthcare workers as well as the management of these medications within WACHS.

2. Guideline

This guideline has been developed to advise healthcare staff of the minimum level of personal protection required when preparing, handling, administering and disposing of MABs. This guideline will also provide guidance and direction on the preparation of low risk MABs on site.

2.1 Risk Assessment of MABs

All MABs need to be risk assessed. The occupational health and safety risk of handling MABs is dependent on the risk of internal exposure as well as the toxicity and immunogenicity of the MAB. Although each MAB is unique, the safe handling requirements of these agents can be considered as a class.[1,2,3]

Cytotoxic MABs are not included in the scope of this document.

- Any MAB conjugated to a cytotoxic molecule must be handled with cytotoxic precautions and should only be prepared in a manufacturing unit.[1,3,4,6]
- Current cytotoxic MABs available:
  - Brentuximab vedotin (Adcetris®)
  - Trastuzumab emtansine (Kadcyla®)

If unsure about specific handling for a MAB product please contact your pharmacist. Where the products for administration is supplied via a community pharmacy by a patient, confirmation of suitability to prepare and administer locally is required from the regional pharmacist.

2.1.1 Occupational exposure

Concerns over the handling of MABs arose due to the uncertainty over the effects of potential occupational exposure to this diverse group of drugs. Factors associated with the risk of occupational exposure include the actions of the drug, the methods used to prepare and administer the drug, staff experience, potential route of exposure and likely level of exposure.[1,4,5]

Potential Routes of Exposure	Summary of literature
Inhaled	• Animal models have shown that there can be systemic absorption of MABs through inhalation • The generation of aerosolised particles are greatest during preparation or when dis/connecting lines, although the likelihood of producing a liquid aerosol in the clinical setting is low
Mucosal	• Animal models have shown that there is the potential for local and systemic absorption from mucosal uptake (nasal and ocular) • The generation of aerosolised particles are greatest during preparation or when dis/connecting lines, although the likelihood of producing a liquid aerosol in the clinical setting is low
Dermal	• Due to the molecular size of most MABs dermal absorption is considered unlikely • Healthcare workers with exposed damaged skin may be at an increased risk
Oral	• Animal and human models have shown the oral route is a potential route of absorption • Hand to mouth contamination is the most likely cause • The level of occupational exposure is unlikely to cause toxicity

Table 1: Potential routes of occupational exposure of MABs[1,3,4,6]

2.2 Minimum personal protective equipment requirements during handling

Non-cytotoxic MABs do not need be handled with cytotoxic precautions; however, they do require greater handling precautions than other non-hazardous injectable medications.

Table 2 has the recommended safeguards to minimise the risk to healthcare workers when MABs are handled outside of an aseptic manufacturing unit.[1,2,3,4,6]

The use of appropriate PPE for preparation and administration form the safe work method statement for all non-cytotoxic MABs in accordance with the WACHS Job Hazard Analysis Procedure.

Personal Protective Equipment	Recommendations
Gloves and effective hand hygiene	• Use to minimise the risk of contamination and infection as part of good aseptic technique
Gowns	• Not warranted for preparation or administration
Mask (N95)	• Worn during dose preparation. • Not mandated during administration but may be considered when dis/connecting administration lines during intravenous administration due to potential aerolisation risk
Protective Eyewear	• Worn during dose preparation • Not mandated during administration but may be considered when dis/connecting administration lines during intravenous administration due to potential aerolisation risk

Table 2: Minimum Personal Protective Equipment[1,2,3,4,6]

2.3 Preparation of low risk MABs

There may be occasions in regional areas that MABs are required to be prepared on site. Preparation is the process of preparing or being prepared for use and is different to the process of administration. Examples of these include subcutaneous MABs or if a prepared infusion has a short expiry. These should be prepared just before administration when the patient is ready to receive treatment. They should not be prepared in advance and stored in a refrigerator. See Appendix 1 for a list of MABs suitable for Ward or Clinic preparation at a WACHS site. A job hazard analysis (JHA) risk assessment and confirmation of the suitability for local preparation is required for MABs not included in this list.

When determining the appropriate site of preparation of a MAB please refer to the occupational health and safety risk assessment in the Australian consensus guidelines for the safe handling of monoclonal antibodies for cancer treatment by healthcare professionals or regionally endorsed assessment form for non-cancer MABs. The risk assessment must be conducted with input from medical teams, nursing and regional pharmacist or WACHS cancer pharmacist.[1]

Nursing staff preparing and administering MABs should be competent in aseptic technique including completing ICATC EL2 and practical assessment (via Capabiliti LMS). Preparation should be undertaken in a dedicated area away from patients and carers. Pregnant or currently immunocompromised staff are not to be involved in the preparation of MABs for administration.[1,2,3]

For directions on preparation of a specific MAB refer to the product information, the Australian Injectable Drugs Handbook, the regional pharmacist or the WACHS cancer pharmacist.

For MABs that are not currently registered with the TGA (available through an access program) please discuss preparation with the regional pharmacist or the WACHS cancer pharmacist.

2.4 Administration of MABs

For detailed information guidance on the administration of individual MABs please refer to:

- specific treatment chart (Fiona Stanley Hospital Standard Order Set MR860 or MR170G WACHS Cancer Treatment Chart)
- WACHS specialised medicines guideline or
- product information.

2.5 Disposal of waste, patient waste and spills

MABs should be disposed of in the same manner as other non-hazardous injectable medications.[1,3,4]

Exposure to waste products including waste and /or bodily fluids of patients should not present an additional occupational health and safety risk to healthcare workers. They should be disposed of in accordance with the disposal of clinical waste. Patients do not require additional contact precautions when receiving treatment with a MAB.[1,3,4]

If a spill occurs during preparation, administration or disposal of a MAB, it is recommended that the spill clean-up procedure is managed in the same manner as other non-hazardous injectable medications.[1,3,4,]

3. Definitions

Nil

4. Roles and Responsibilities

All Staff are required to work within policies and guidelines to make sure that WACHS is a safe, equitable and positive place to be.

Staff preparing MABs are required to ensure they are competent in aseptic technique and have the relevant PPE available. They should complete the immunotherapies three part online course developed by Cancer Institute NSW, eviQED. This includes a module on the principles of safe handling and preparation of immunotherapies.

Regional Pharmacist must ensure products unsuitable to be prepared locally are not supplied from the pharmacy department.

5. Compliance

Failure to comply with this policy document may constitute a breach of the WA Health Code of Conduct (Code). The Code is part of the Integrity Policy Framework issued pursuant to section 26 of the *Health Services Act 2016* (WA) and is binding on all WACHS staff which for this purpose includes trainees, students, volunteers,

researchers, contractors for service (including all visiting health professionals and agency staff) and persons delivering training or education within WACHS.
WACHS staff are reminded that compliance with all policies is mandatory.

6. Records Management

All WACHS clinical records must be managed in accordance with Health Record Management Policy.

7. Evaluation

Compliance with this guideline will be measured by:

- Review of the incidents relating to administration of MABs reported through the Clinical Incident Monitoring system (CIMs)
- Review of incidents relating preparation or administration reported to OSH

These should be reported through the Medication Safety Governance Committee in each region.

8. Standards

National Safety and Quality Health Service Standards
Preventing and Controlling Healthcare-Associated Infection Standard: 3.9
Medication Safety Standard: 4.13 and 4.15

9. Legislation

Health Practitioner Regulation National Law (WA) Act 2010
Medicines and Poisons Act 2014 (WA)
Medicines and poisons Regulations 2016 (WA)
Occupational Health and Safety Act 1984 (WA)
Occupational Safety and Health Regulations 1996 (WA)

10. References

1. M. Alexander, J. King, A. Bajel, C. Doecke, P. Fox, S. Lingaratnam, J.D. Mellor, L. Nicholson, I. Roos, T, Saunders, J. Wilkes, R. Zielinski, J. Byrne, K. MacMillan, A. Mollo, S. Kirsa, and M. Green (2014). Australian consensus guidelines for the safe handling of monoclonal antibodies for cancer treatment by healthcare personnel.
2. S. Langford, S. Fradgley, M. Evans, C. Blanks. Assessing the risk of handling monoclonal antibodies. Hospital Pharmacist. February 2008
3. J. Siderov. Position statement: Safe handling of monoclonal antibodies in healthcare settings. Clinical Oncology Society of Australia September 2013
4. J. King, M. Alexancer, J. Byrne, K. MacMillan, A. Mollo, S. Kirsa and M. Gree. A review of the evidence for occupational exposure risks to novel anticancer agents – a focus on monoclonal antibodies. J Oncol Pharm Pract 2016,Vol 22(1) 121-134
5. T. Bauters, J. Vandenbroucke. Development of a flowchart for risk assessment and allocation of preparation of monoclonal antibodies. J Oncol Pharm Pract 2019, Vol25(1) 187-191

6. Cancer Institute NSW, eviQ Cancer Education Immunotherapies, Viewed 17 January, 2020. http://education.eviq.org.au/courses/immunotherapies

11. Related Forms

Fiona Stanley MR860 Forms
MR170G WACHS Cancer Treatment Chart

12. Related Policy Documents

WACHS Aseptic Technique Policy
WACHS Anticancer Therapy Prescribing Procedure (Using Fiona Stanley Hospital MR860 Charts)
WACHS Cancer Institute NSW- Cancer Treatments Online - EviQ - Endorsed For Use In Clinical Practice Policy
WACHS Chemotherapy Administration Clinical Practice Standard
WACHS Hazard/Incident Management Procedure
WACHS Medication Administration Policy
WACHS Occupational Safety and Health Policy
WACHS Personal Protective Equipment (PPE) Procedure
WACHS Waste Management Policy
WACHS Job Hazard Analysis Procedure

13. Related WA Health System Policies

OD 0651/16 Clinical and Related Waste Management Policy
MP 0122/19 Clinical Incident Management Policy

14. Policy Framework

Clinical Governance, Safety and Quality

15. Appendix

Appendix 1: Current MABs suitable for Ward or Clinic Preparation at a WACHS site

This document can be made available in alternative formats on request for a person with a disability

Contact:	Chief Pharmacist (M. Clay)		
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Appendix 1: Current MABs suitable for Ward or Clinic Preparation at a WACHS site:

Cancer indication MABs	Non-Cancer indication MABs	
Denosumab	Benralizumab	Ocrelizumab
Durvalumab	Bevacizumab	Palivisumab
Rituximab - subcut	Idarucizumab	Rituximab
Trastuzumab – subcut	Infliximab	Tocilizumab
	Mepolizumab	Ustekinumab
	Natalizumab	Vedolizumab

A Job Hazard Analysis (JHA) form with the risk assessment and confirmation of suitability is required before preparation of any MAB not included in this list. The JHA is available here.