Institution Name: Al Masarra Hospital

Document Title: Policy and Procedure of High Alert Medications

Approval Process

	Name	Title	Institution	Date	Signature
Written by	Policy & Procedure Team members	Pharmacy & Medical Stores	Al Masarra Hospital	26/7/2022	
Reviewed by	Najla Al Zadjali	HoD Quality Management and Patient Safety	Al Masarra Hospital	25/7/22	
Validated by	Kunooz Al Balushi	Document Manager	Al Masarra Hospital	July 2022	
Approved by	Dr. Bader Al Habsi	Hospital Director	Al Masarra Hospital	25/7/22	

Content Table:

Acronyms:

IV	Intravenous
CDC	Central Drug Committee
FDA	Food and Drug Administration
ISMP	Institute for Safe Medication Practices
SOP	Standard Operating Procedures

Policy and Procedure of High-Alert Medications

1. Introduction

Medication errors are significant and often preventable healthcare problems. Although many medication errors may not cause harm to patients, some medications are known to carry a higher risk of harm than other medications, and errors in the administration of these medications can have catastrophic clinical outcomes. It is required that to identify certain high-risk, High Alert Medications be used within the facility and further to develop specific processes for enhancing patient safety regarding their utilization.

The Pharmacy and Medical Stores services in the Al Masarra Hospital developed this document to keep up an excellence and secure dealings of High-Alert category of medications in the institution and to maintain a high quality patient care.

2. Scope

This document is applicable to all Pharmacy professionals/Staff Nurses/Doctors of Al Masarra Hospital.

3. Purpose

3.1 To establish a guideline to identify and standardize the handling and use of High Alert Medications in patient-care areas, and to outline the steps necessary in increasing awareness of these medications to prevent potential errors.

3.1 To provide and maintain a list of medication designated as high alert medications to ensure safe medication practices and eliminate medication errors that cause harm to patients.

4. Definitions

4.1 **High Alert Medications**: are medications that bear a heightened risk of causing significant patient harm when used in error. Though medication mishaps with high alert medications may or may not be more common than other drugs, the consequences following an error

with these drugs can be especially serious to the patients. These medications include the following:

4.1.1 Medications that are involve in a high percentage of errors and/or sentinelevents, such as Insulin and Heparin etc.

4.1.2 Medication whose names, packaging and labeling, or clinical use, look alikeand/or sound alike, such as Amitriptyline and Aminophylline.

5. Policy

5.1 Use of high alert medication shall be in accordance with manufacturer's instructions, Hospital Formulary, and when applicable, the Central Drug Committee (CDC) guidelines.

5.2 The pharmacy department must provide general guidelines for the proper handling of high Alert Medications including a defined list, in accordance with the FDA and ISMP Standards.

5.3 High-Alert medications must be properly labeled with RED warning sticker "High-Alert" to each designated drawer or cabinet where these medications are stored. Restrict supply of high risk medications to areas of specified use where possible.

5.4 Concentrated electrolytes (Potassium & Sodium Phosphate, Potassium Chloride, and Sodium Chloride above 0.9%) are High-Alert Medications and should **not** be stocked in patient care areas except as part of the crash cart medications.

5.5 Some critical/particular care areas may stock limited quantities of these concentrated electrolytes in a separate, locked and properly labeled cabinet away from the regular wardstock medications and closely monitored by nursing and pharmacy staff.

5.6 Ensure high risk medicines and risk awareness components for medication management are included in workforce orientation and ongoing education programs on medication safety.

5.7 Remove the need for rapid mathematical calculation and reduce options and choices by standardizing concentrations of medicines in solutions.

5.8 All incidents regarding high-risk medicines must be reported to ensure appropriate implementation of risk management or improvement strategies.

6. Procedure

6. 1 Managing High-Alert medications

6.1.1 High Alert Medications should have "**HIGH ALERT MEDICATION**" labels on storage shelves, containers, product packages and loose vials or ampoules.

6.1.2 High Alert Medications will be double checked before they are prepared, dispensed and administered to the patients. All High Alert Medications issued from the pharmacy will be counterchecked and verified by another pharmacy staffprior to dispensing for the purpose of medication safety and accuracy.

6.1.3 Any changes of brand/color/preparation of High-Alert Medications will be informed to the end users / wards / units, as soon as possible.

6.1.4 All equipment or devices used in the preparation and/or administration of medications shall be calibrated and maintained according to Standard Operating Procedure (SOP).

6.1.5 All staff involved in the handling of High Alert Medications shall be educated on management guideline.

6.2 Strategies to avoid errors involving High-Alert Medications:

6.2.1 Procurement

6.2.1.1 Limit the drug strengths available in the formulary of each health carefacility.

6.2.1.2 Avoid frequent changes of brand or color. Notify the end userswhenever there are changes.

6.2.1.3 Inform all relevant personnel regarding new High Alert Medicationslisted in the MoH formulary.

6.2.1.4 Encourage the purchase / ordering of equipment and consumables withsafety features for safe drug administration.

6.2.2 Storage

6.2.2.1 All personnel must read the High Alert Medication labels carefully before storing to ensure medications are kept at the correct place.

6.2.2.2 All High Alert Medications shall keptin individually labeled containers. Whenever possible avoid look-alike and sound-alike drugs or different strengths of the same drug from being stored side by side.

6.2.2.3 Use TALL-man lettering to emphasize differences in medication names (e.g. **DOPamine** and **DOBUTamine**).

6.2.2.4 Limit ward's floor stock drugs to standard requirement. Reduce the quantity and variation of strength/preparation stocked.

6.2.2.5 Label all containers used for storing High Alert Medications as **"HIGH ALERT MEDICATION"**.

6.2.3 Prescribing

6.2.3.1 Do not use abbreviations when prescribing High Alert Medications.

6.2.3.2 Specify the dose, route and rate of infusion for High Alert Medicationsprescribed. (e.g.: IV Dopamine 5mcg/kg over 1 minute)

6.2.3.3 Prescribe oral liquid medications with the dose specified in milligrams.

6.2.3.4 Do not use trailing zero when prescribing. (e.g. 5.0 mg can bemistaken as 50 mg)

6.2.3.5 Use computerized prescriber order entry as far as possible, to eliminateillegible handwriting and misinterpretation of verbal orders. Safety features should be incorporated in the computer system for safe medication use.

6.2.3.6 Verbal/Telephone order for high alert medication is not allowed exceptin emergency situation.

6.2.4 Dispensing / Supply

6.2.4.1 All High Alert Medication containers, product packages and loosevials or ampoules issued to wards/units shall be labeled as **"HIGHALERT MEDICATION"** except for parenteral nutrition preparations.

6.2.4.2 High Alert Medications to be dispensed to patients need not be labeledas high alert.

6.2.4.3 High Alert Medications shall be counter checked before dispensing.

6.2.4.4 High Alert Medications shall be checked upon receiving by thehealthcare providers.

6.2.5 Administration

6.2.5.1 The following particulars shall be independently double checked against the prescription or medication chart at the bedside by two appropriate persons before administration:

6.2.5.1.1 Patient's name and ID

6.2.5.1.2 Name and strength of medications

6.2.5.1.3 Dose

6.2.5.1.4 Route and rate (pump setting and line placements whennecessary).

6.2.5.1.5 Expiry date

6.2.5.2 Label the distal ends of all access lines to distinguish IV from epidurallines.

6.2.5.3 Ensure no distraction during administration of medications to patientsby implementing special measures (example: wearing special apron).

6.2.5.4 Return all unused or remaining specially formulated preparations tothe pharmacy when no longer required.

6.2.5.5 Ensure administration of cytotoxic drugs, parenteral nutrition etc. likemedicines is done by trained personnel.

6.2.5.6 Avoid ordering High Alert Medications verbally. In cases ofemergency, phone orders have to be repeated and verified.

6.2.6 Monitoring

6.2.6.1 Closely monitor vital signs, laboratory data, patient's response beforeand after administration of High Alert Medications.

6.2.6.2 Keep antidotes and resuscitation equipment in wards/ units.

6.2.7 Training

6.2.7.1 All personnel shall be trained prior to handling of High-Alert Medications and documentation kept. Staff must be trained to preventpotential errors and enable them to respond promptly when mistakes do occur.

6.2.8 Information

6.2.8.1 References or dilution guide shall be made available in the wards andpharmacy.

6.2.9 Patient Education

6.2.9.1 Educate patient and family members/caregivers on:

6.2.9.1.1 Name and purpose of medications.

6.2.9.1.2 How much and when to take the medications.

6.2.9.1.3 How to take their medications.

6.2.9.1.4 Common side effects.

6.2.9.2 Encourage patient and family involvement by:

6.2.9.2.1 Asking what medications are being given and why they arebeing given.

6.2.9.2.2 Ensuring positive identification before receivingmedications.

6.2.9.2.3 Storage of High Alert Medications.

6.2.9.2.4 Disposal of expired / unused High-Alert Medications.

6.2.10 Evaluation of Action:

6.2.10.1 Monitor adverse drug reactions and medication errors related to HighAlert Medications.

7. Responsibility

7.1 Health Care Providers - directly involved in procedures Shall:

7.1.1 Deal with prescribing, dispensing, preparing, administering, storing of high alertmedications to patients.

7.2 Admin level / Nursing / Medical Service / Pharmacy Section In-charge Shall:

7.2.1 Allocate resources in coordination with the hospital admin to support the implementation of the medication policies.

7.2.2 Deal with higher authorities of the hospital regarding any series concerns duringthe policy implementation.

7.2.3 Coordinate with the section focal points confirming all the staffs are fully informed of their role in maintaining the required standard practice.

7.2.4 Lead to strategies and innovations to improve current practice.

8. Document History and Version Control Table

Document History and Version Control			
Version	**Description of Amendment**	**Author**	**Review Date**
1	Initial Release	Policy and Procedure team (P&MS)	March 2021
2	Update and Review	Policy and Procedure team (P&MS)	July 2025
Written by	**Reviewed by**	**Approved by**	
Policy and Procedure team (P&MS)	Najla Al Zadjali	Dr. Bader Al Habsi	

9. Related Documents

9.1 Al Masarra Hospital, Nursing Department -Medication Administration Policy and Procedure. (*Hospital Local Site*).

9.2 Al Masarra Hospital, Pharmacy Department–Medication Storage Policy.

9.3 Al Masarra Hospital, Pharmacy Department - Medication Ordering Policy.

9.4 Al Masarra Hospital, Pharmacy Department - Medication Orders Review Policy.

9.5 Al Masarra Hospital, Pharmacy Department - Medication Error Reporting Policy.

9.6 Al Masarra Hospital, Pharmacy Department –Look-Alike / Sound-Alike MedicationsPolicy.

10. References:

Title of book/Journal/Website	Author	Year of publication	Page
High -Alert Medications	DGMS, MoH, Muscat	MoH – DGMS-PH-35	
High-Alert Medications Policy	Department of Health, Australia.	2014	
Management of High-Alert Medications	Albert Health Services	2015	
Guideline on Safe Use of High-Alert Medications.	MoH, Malaysia	2011	
Guidelines	FDA and ISMP	-	

Appendices

Appendix 1: Available Formulations in MoH

Classes/ Categories of Medications	Available formulations in the MOH
Adrenergic agonists, IV: Adrenaline (IV and SC)	Adrenaline 500 mcg/0.5ml 1:1000, 0.5ml inj Adrenaline (1:1000) 1 mg/ml 1 ml, (i.m. / s.c) adrenaline 1:10,000 10 ml. 1 mg/10ml, Preloaded syringe.
Noradrenaline acid Tartarate	Noradrenaline acid Tartarate 2 mg/ml (equivalent to noradrenaline base 1 mg/ml), 2 - 4 ml ampoule
Phenylephrine	Phenylepherine 1 % 1 ml inj
Isoproterenol hydrochloride	Isoproterenol hydrochloride injection 0.2 mg/ml inj
Adrenergic antagonists, IV: Labetalol hydrochloride	Labetalol hydrochloride i/v 5mg/ml 20ml. Inj
Metoprolol	Metoprolol 1mg/ml iv inj
Propranolol	Propranolol hydrochloride 1mg/ml 1ml. Inj
Phentolamine Mesilate	Phentolamine Mesilate 10mg/ml, 1ml. Inj
Antiarrhythmics, IV: Verapamil hydrochloride	Verapamil hydrochloride 2. 5 mg/ ml. 2ml. Inj
Antiretroviral agents	All formulations
Antithrombotic agents: **1.Anticoagulants:** Warfarin	Tab. Warfarin Sodium 1mg Tab Warfarin Sodium 2mg Tab Warfarin Sodium 5mg.Tab
Unfractionated Heparin	Heparin 1000 iu/ml 5ml inj Heparin 25000 iu/ml 5ml inj Heparin 5000 iu/ml 5ml,inj
LMW Heparin	Heparin LMW (enoxaparin, Dalteparin or Tinzaparin) 20,000-30,000 I.U. multidose. Heparin LMW (enoxaparin, Dalteparin or Tinzaparin) 4,000 - 5,500 I.U, 6000 IU, 8000 IU, 10,000 I.U
Factor Xa inhibitors: Fondaparinux	Fondaparinus sodium 5 mg/ml, 0.5 ml (2.5 mg) prefilled syringe

Classes/ Categories of Medications	Available formulations in the MOH
Direct thrombin inhibitors: Argatroban	Argatroban 100mg/ml, 2.5ml tab
Thrombolytics: Alteplase	Alteplase 50mg inj
Reteplase	Reteplase 10 units 1.16 gm / ml powder for reconstitution pack of 2 vials with diluent.
Cardioplegic solutions	All formulations
Chemotherapeutic agents, parenteral and oral	All formulations
Dextrose, hypertonic, 20% or greater	All formulations
Dialysis solutions (peritoneal, hemodialysis)	All formulations
Epidural or intrathecal medications	All formulations
Hypoglycemics, oral	All formulations
Immunosuppressant agents	All formulations
Inotropic medications, IV: Digoxin, oral and IV	Digoxin 0.25 mg/ml 2ml inj Digoxin 0.25mg. Tab Digoxin 0.0625mg Tab
Dobutamine	Dobutamine hydrochloride 250 mg per vial or ampoule
Dopamine	Dopamine hydrochloride 40mg/ml 5ml. Inj
Insulin, SC and IV	All formulations
Moderate sedation agents, IV: Midazolam	Midazolam 5mg/ml. 3ml
Moderate sedation agents, oral. For children: Chloral hydrate syrup	Chloral Hydrate 500 mg/5ml, 200 ml. Chloral Hydrate elixir 150 ml 143.3mg/5 ml
Midazolam	Midazolam 2.5mg/ml.100ml
Narcotics/ Opioids, oral, IV and transdermal.	Narcotics/ opioids, oral, iv and transdermal
Neuromuscular blocking agents	Rocuronium 10 mg/ ml, 5 ml Vecuronium bromide 10mg.
Parenteral nutrition preparations	Parenteral nutrition preparations

Classes/ Categories of Medications	Available formulations in the MOH
Pregnancy category X drugs	All formulations
Radiocontrast agents, IV	Radiocontrast agents, iv
Sterile water for injection, inhalation and irrigation.	Sterile water for injection, inhalation and irrigation
Sodium chloride for injection, hypertonic, greater than 0.9% concentration.	All formulations

Specific Medications	Available formulations in the MOH
Carbamazepine	Carbamazepine Controlled Release 100 Mg. Tab Carbamazepine Controlled Release 200 Mg. Tab Carbamazepine Controlled Release 400 Mg Tab Carbamazepine 100mg. Tab Carbamazepine 200mg. Tab Carbamazepine 100mg/5ml. (2%) Liquid 300ml. Carbamazepine Liquid 100 Mg/ 5 Ml. (2%) 100 Ml.
Iron Dexran, Parental	Iron Dextran Injection 20ml. Iron Dextran Injection 5ml.
Magnesium Sulphate	Magnesium Sulphate (50 %) 1 Gm - 2 Ml Inj Magnesium Sulphate (50 %) 5 Gm - 10 Ml. Inj Magnesium Sulphate (50 %) 2.5 Gm- 5 Ml. Inj
Metformin	Metformin Hcl. 500mg. Tab
Methotrxate Oral	Methotrexate 2.5mg Tab Methotrexate Suspension
Oxytocin	Oxytocin Synthetic 10 IU. Inj Oxytocin 5IU/Ml, Ergometrine Maleate 500 Micrograms/ Ml, 1 Ml. Inj
Potassium Phosphate Injection	Potassium Phosphate Usp 5 -10 Ml.
Potassium chloride for injection	Potassium Chloride 15% 10ml Potassium Chloride 2 Meq/Ml. 20 Ml
Promethazine IV	Promethazine Hydrochloride 25mg/Ml Ml. Inj Promethazine Hydrochloride 50 Mg, 1-2 Ml.Tab
Propylthiouracil	Propylthiouracil 50 Mg. Tab

Appendix 2: High-Alert Medications – Common Risk Factors

Common Risk Factors
Common risk factors associated with High Alert Medications are as follows: • Poorly written medication orders. • Incorrect dilution procedures. • Confusion between IM, IV, Intrathecal, epidural preparations. • Confusion between different strengths of the same medications. • Unclear labeling on concentration and total volume of medications. • Wrong infusion rate. • Look alike or sound alike product and similar packaging.

Appendix 3: Audit Tool

Pharmacy and Medical Stores, Al Masarra Hospital MoH
High-Alert medications - Audit Tool

S.N.	Audit Process	Standard / Criteria	Yes	Partial	No	N/A	Comment
1	Observation Document Review	Are prominent High-Alert warning labels applied on storage of shelves, containers, product packages, loose vials or ampoules?					
2	Observation Interview Document Review	Are all High-Alert medications are stored properly and restricted access to authorized/qualified staff?					
3	Observation Interview Document Review	Is the prescribing practice for High-Alert medications are appropriate and there are no prohibited abbreviations, symbols and dose designations are not used?					
4	Observation Interview	While dispensing/administering High-Alert medications, are there established check system whereby one staff prepares the dose and another staff reviews it?					
5	Observation Interview Document Review	Are all controlled Narcotic drugs separated and securely stored?					
6	Observation Interview Document Review	High – Alert medication evaluation of action are satisfactory? (Monitoring of Adverse Drug Reaction / Medication errors etc. and its documentations)					

Checked by *(Name and Signature)*: …….. **Date:** ……....

Appendix 4. Document Request Form

Document Request Form			
Section A: Completed by Document Requester			
1. Requester Details			
Name	Najla Al Zadjali	Date of Request	July 2022
Institute	Al Masarra Hospital	Mobile	95885771
Department	QMPSD	Email	—
The Purpose of Request			
☐ Develop New Document	☑ Modification of Document	☐ Cancelling of Document	
2. Document Information			
Document Title	Policy and Procedure of High Alert Medications		
Document Code	AMRH/PHARM/P&P/005/Vers.02		
Section B: Completed by Document Controller			
☑ Approved	☐ Cancelled	☐ Forward To:……..	
Comment and Recommendation:			
Name	Kunooz Al Balushi	Date	July 2022
Signature		Stamp	

Appendix 5. Document Validation Checklist

Document Validation Checklist					
Document Title: Policy and Procedure of High Alert Medications		**Document Code:** AMRH/PHARM/P&P/005/Vers.02			
No	Criteria	**Meets the Criteria**			**Comments**
		Yes	**No**	**N/A**	
1.	**Approved format used**				
1.1	Clear title – Clear Applicability	✓			
1.2	Index number stated	✓			
1.3	Header/ Footer complete	✓			
1.4	Accurate page numbering	✓			
1.5	Involved departments contributed	✓			
1.6	Involved personnel signature /approval	✓			
1.7	Clear Stamp	✓			
2.	**Document Content**				
2.1	Clear purpose and scope	✓			
2.2	Clear definitions	✓			
2.3	Clear policy statements (if any)	✓			
3.	**Well defined procedures and steps**				
3.1	Procedures in orderly manner	✓			
3.2	Procedure define personnel to carry out step	✓			
3.3	Procedures define the use of relevant forms	✓			
3.4	Procedures to define flowchart		✓		
3.5	Responsibilities are clearly defined	✓			
3.6	Necessary forms and equipment are listed	✓			
3.7	Forms are numbered	✓			
3.8	References are clearly stated	✓			
4.	**General Criteria**				
4.1	Policy is adherent to MOH rules and regulations	✓			
4.2	Policy within hospital/department scope	✓			
4.3	Relevant policies are reviewed	✓			
4.4	Items numbering is well outlined	✓			
4.5	Used of approved font type and size	✓			
4.6	Language is clear, understood and well structured	✓			
Recommendations ✓ For implementation ..... More revision ..... To be cancelled					
Reviewed by: Kunooz Al Balushi		**Reviewed by: Irwin S. Rio**			

سلطنة عمان - وزارة الصحة
مستشفى المصرة
قسم إدارة الجودة
QUALITY MANAGEMENT DEPT.
AL-MASARRA HOSPITAL
SULTANATE OF OMAN- MINISTRY OF HEALTH