Clinical

High Alert Medication Management

☒ **Hospital-wide** ☐ **Departmental (specify name):** Click or tap here to enter text.	
Policy Document Number:	2.30.017
Section:	Clinical
Sub-Section:	Medication Management
Policy Document Owner:	Manager, Pharmacy Services
Issued by:	WCH Pharmacy Services
Approved by:	Pharmacy and Therapeutics Committee Medical Advisory Committee
Original Date of Issue:	08/01/2017
Date of Last Review/Revision:	06/24/2022
Review/Revision Interval:	☐ **1 year** ☐ **2 years** ☒ **3 years**

1.0 Introduction:

The Institute for Safe Medication Practices (ISMP) defines high-alert medications as medications that "bear a heightened risk of causing significant harm when they are used in error." It is important to focus efforts on implementation of safeguards on these medications because of the higher risk of harm.

At Women's College Hospital (WCH), a number of committees are involved in supporting the safe management of medications including the Pharmacy & Therapeutics Committee which is responsible for identifying and mitigating the risk associated with the medication system while maintaining efficiency and promoting best practices.

Clinicians at Women's College Hospital share a responsibility in identifying and managing risks in the medication use system and reporting incidents through the IRIS system

2.0 Definitions

High-Risk/High-Alert Medications
Medications that have the potential to cause serious harm if administered in error. Errors may not be more common with these than other medications, but the consequences of errors may be devastating.

Independent Double-Check
A process in which a second practitioner conducts verification without any prior knowledge of the preparatory steps or calculations performed by the first practitioner.

3.0 Policy Statement:

Women's College Hospital will identify high alert medications by reviewing the ISMP list of high-alert medications and internal medication error reports to generate a list of high alert medications.

The Pharmacy and Therapeutics Committee oversees this policy. The committee will regularly review the list and implement safeguards to minimize the risk associated with these medications.

Women's College Hospital (WCH) promotes best safety practices while dispensing and administering high risk/high alert medications by requiring a series of strategies to be implemented in their management. Medications deemed to be high risk/high alert utilized at WCH are inclusive to the following table (adapted from references for WCH formulary)[1, 2]

4.0 Procedure:

Managing the policy – the chair of the Pharmacy and Therapeutics Committee along with the Pharmacy Manager and their delegates are responsible to ensure implementation and monitoring of the associated procedures. The policy is reviewed annually by the Pharmacy and Therapeutics Committee.

General Strategies for the safe use of high-alert medications include:

i. **Standardizing high-alert medication concentrations and volume options**
To prevent medication errors from occurring, it is suggested that high-alert medications be supplied in one standard concentration and volume. This reduces calculation errors and confusion that may arise when determining the appropriate concentration and volume to administer of a certain medication. Routine audits are performed to ensure that high-alert medications are available in standardized concentrations and volumes.

ii. **Using pre-mixed solutions (commercially available)**
In order to reduce errors associated with preparing solutions that have high-alert medications incorporated, WCH will use pre-mixed commercially available instead. Routine reviews are performed to ensure that solutions with high-alert medications are prepared commercially whenever possible.

iii. **Using programmable pumps with dosing limits and automated alerts**
Smart infusion pumps use drug error reduction software (DERS) to determine a dose-limit, however, the limit itself is set by WCH. A soft dose limit will alert the user when the maximum dose of the high-alert medication has been inadvertently exceeded. A hard dose limit will prevent the user from administering a dose that is beyond the pre-determined range. Programmable pumps will be subjected to routine quality control inspection to ensure continuous reliability and appropriate functionality. Pump libraries will be periodically reviewed to ensure that they are up to date and that the safety limits are appropriate.

iv. **Identifying high-alert products as soon as they are received in the pharmacy**
High alert medications will be stored in an area that identifies them as high risk as soon as they are received by the pharmacy. When high-alert medications are dispensed, they

are labeled as such. Routine audits are performed to ensure that high-alert medications have the correct warning labels.

v. Using visible warning and auxiliary labels
All high-alert medications are appropriately labeled with the correct auxiliary label. Labels on IV lines are also used to prevent mix-ups between different IV lines. Routine audits are performed to ensure that the high-alert medications are appropriately labeled.

vi. Using patient-specific labeling for unusual concentrations
High-alert medications that are being used in a concentration outside the normal range will have a specific label indicating that the dose is indicated and that there is consensual knowledge of its application for the patient. This prevents delays in the medication being administered and reduces employee confusion in dispensing the medication and monitoring the patient.

vii. Limiting access to high-alert medications in patient care areas and auditing routinely to assess for items that should be removed.
When possible high-alert medications are stored in the hospital pharmacy and are dispensed on an as-need basis. They are delivered to their appropriate destinations by trained personnel and are stored away from patients until needed. Routine audits are performed to ensure that the medications are well within the expiration date and that they are labeled appropriately and stored in a location with limited access.

viii. Standardizing the ordering, storage, preparation, administration, and dispensing of high-alert medications.
Staff involved in the ordering, storage, preparation, administration and dispensing of high-alert medications must follow a stringent set of protocols, guidelines, dosing charts and order sets. Staff credentialing is implemented and certain individuals have restricted access or rights based off of their credentialing. See Policy 2.10.001 – Professional Credentialing.

ix. Providing training about high alert medications.
All staff will be trained prior to handling of high-alert medications and documentation is kept. Staff must be trained to prevent potential errors and enable them to respond promptly when mistakes do occur.

x. Employing redundancies such as independent double checks.
Dispensing and administration of some high-alert medications requires that independent double-checks be carried out. Please see procedure under policy 2.30.007 – Independent Double-Check of High Risk/High Alert Medication. The same procedure applies for some of the medications listed in Table 1.

xi. Drug-specific strategies for the safe use of high-alert medications are included in Table 1 below.

Table 1.

High-Risk/High-Alert Medication	Route of Administration	Additional Strategies (if applicable)
Adrenergic Agonists, IV/IM/SC		Storage: -epinephrine ampoules have decision support for treatment of anaphylaxis and are stocked only on arrest carts/emergency kits Administration: -restricted administration as per IV manual
• EPINEPHrine	IV/IM/SC	
• norepinephrine	IV	
• dopamine	IV	
• ePHEDrine	IV	
• phenylephrine	IV	
Adrenergic Antagonists, IV		Storage: -metoprolol only stocked in AACU and emergency carts Administration: -restricted to trained nursing staff as per IV manual
• labetalol	IV	
• phentolamine	IV	
• esmolol	IV	
• propranolol	IV	
• metoprolol	IV	
Anesthetic agents, general, inhaled and IV		Ordering: -restricted to anesthesia Administration: -restricted administration as per IV manual
• ketamine	IV	
• Propofol	IV	
• glycopyrrolate	IV	
• sevoflurane	Inhalation	
• SUFentanil	IV	
• desflurane	Inhalation	
Antiarrhythmics, IV		Administration: -restricted administration as per IV manual -IV manual protocol (amiodarone)
• amiodarone	IV	
• lidocaine	IV	
• procainamide	IV	
Antithrombotic Agents, oral and parenteral		Ordering: -electronic order set for VTE -medical directive for warfarin management (pharmacy) within AACU Storage: -multi dose vials are not stocked in patient care areas -pre-filled syringes used for parenteral therapies -UFH is not stocked in patient care areas and is only available as patient-specific therapy -pre-filled syringes used for Low Molecular Weight Heparin Administration:
• Anticoagulants ○ dalteparin ○ enoxaparin ○ unfractionated heparin (UFH) ○ warfarin	 IV/SC IV/SC IV/SC PO	
• Factor Xa Inhibitors ○ Rivaroxaban ○ Apixaban	 PO PO	
• Direct Thrombin Inhibitor		

○ Dabigatran	PO	-independent double check of IV UFH
• Thrombolytics ○ alteplase (tPA)	IV	
Cardioplegic solutions		Storage: -only available on emergency carts and restricted area within AACU night cupboard Administration: -decision support available in the form of medication information sheets
• calcium chloride	IV	
• potassium chloride	IV	
Chemotherapeutic Agents • methotrexate (for non-chemotherapy uses)	SC/IM	Preparing/Dispensing: -patient specific labeling -pharmacist verification of dosing Administration: -restricted to trained providers in Rheumatology/Dermatology and Bay Centre for Birth Control -independent double check
Concentrated Electrolytes	IV	See Control Distribution and Administration of Concentrated Electrolytes policy
Dextrose 50%	IV	
Epidural or intrathecal medications	Epidural/ intrathecal	
Immunosuppressant Agents		Administration: -restricted as per IV manual
• methylPREDNISolone acetate	IV	
• methylPREDNISolone sodium succinate	IV	
Insulin • insulin glargine • insulin detemir • insulin lispro • insulin, human – regular • insulin, human – NPH • insulin, human – 30/70	 SC SC SC SC/IV SC SC	Storage: -minimal formats are supplied as wardstock in patient care areas -each format stored in standardized and individually labelled bin sections Ordering: -decision support available via medication information sheets posted on fridge -dangerous abbreviations policy (“u” is not approved) Administration: -infusion device -IV manual monograph available -hypoglycemia management protocol available -syringes calibrated in units -independent double check
Inotropic medications		Preparation: -independent double check of DOBUTamine Storage:
• digoxin	IV	

DOBUTamine	IV	-stocked only in AACU night cart, cardiology and emergency carts Administration: -restricted administration as per IV manual -IV manual protocol (digoxin)
Moderate sedation agents, IV		Storage: -vials standardized -treated as narcotics for storage purposes
• midazolam	IV	
• LORazepam	IV	
• diazepam	IV	
Narcotics/Opioids – all formulations • buprenorphine/naloxone • codeine • fentanyl • hydromorphone • meperidine • methadone • morphine • oxycodone • remifentanil	IM/IV/SC/PO	Storage: -revised administration record sheets and standardized requisitions are used to standardize products and limit the quantities of narcotics stored on each unit -maximum size of HYDROmorphone vials stocked in patient care areas is 2mg -maximum size of fentanyl vials supplied to patient care areas is 100mcg except Operating Room which implements storage safeguards Ordering: -standardized order sets (e.g. (WCH Anesthesia Postoperative care) Administration: -restricted administration as per IV manual -naloxone available as floorstock anywhere opioids are stored and on arrest tray
Neuromuscular blocking agents		Storage: -in sealed arrest cart medication trays and Operating Room trays only -specially labelled as “WARNING PARALYZING AGENT” Administration: -restricted to arrest situations and operating room use only
• rocuronium	IV	
• succinylcholine chloride	IV	
Oxytocin	IV	Administration: -standardized concentration -IV manual protocol
Phenytoin	IV/PO	
Pregnancy Category X drugs		Ordering: -computerized order entry system prompts for pregnancy status
• atorvastatin	PO	
• warfarin	PO	
• rosuvastatin	PO	
• pravastatin	PO	
• simvastatin	PO	
• levonorgestrel	PO	
• misoprostol	PO	
• methotrexate	IM	
dihydroergotamine (DHE)	IV/ IM/ SC	
Sterile water for injection, inhalation, and irrigation		Storage: -not stocked in patient care areas

(excluding pour bottles) in containers of 100 mL or more		-only used for compounding purposes
Sulfonylurea Hypoglycemics, Oral • glyburide • gliclazide	 PO PO	Monitoring: -diabetes monitoring protocol for patients receiving hypoglycemic agents
Vasopressin	IV	Ordering: -pharmacist order verification specific to indication

5.0 References:

- High-Alert Medications in Acute Care Settings. ISMP. Updated August 23, 2018. Accessed February 25, 2022. https://www.ismp.org/recommendations/high-alert-medications-acute-list
- High-Alert Medications in Community/ Ambulatory Settings. ISMP. Updated September 30, 2021. Accessed February 25, 2022. https://www.ismp.org/recommendations/high-alert-medications-community-ambulatory-list
- Required Organizational Practices Handbook. Accreditation Canada. 2020. Accessed February 25, 2022. https://src.healthpei.ca/sites/src.healthpei.ca/files/Accreditation/Accreditation_Canada_Required_Organizational_Practices_Handbook.pdf