North Shore University Hospital

POLICY TITLE: **High-alert medications**	**Medication Management**
Approval Date: 6/13/16 **Implementation Date:**	**Effective Date:** 7/14 **Last Revised:** 6/16, 7/14
Prepared by: System P&T	

GENERAL STATEMENT of PURPOSE

- According to the Institute for Safe Medication Practices (ISMP), high-alert medications are "drugs that bear a heightened risk of causing significant patient harm when used in error. Although mistakes may or may not be more common with these drugs, the consequences of an error are clearly more devastating to patients
- The Joint Commission (TJC) Medication Management (MM) standards require institutions to identify, in writing, their high-alert medications, develop a process for managing high-alert medications, and implement its process.

POLICY

Identify and review a list of high-alert drugs specific to Northwell Health (NWH). This list will be used to ensure that safeguards are put in place to prevent medication errors and protect the patient.

SCOPE

This policy applies to all members of the North Shore University Hospital workforce including, but not limited to employees, medical staff, volunteers, students, physician office staff, and other persons performing work for or at North Shore University Hospital.

PROCEDURE

- The NWH P&T Committee has agreed to designate the following drug pairs as high-alert medications (see *Appendix I*).
- Requests to add or remove agents from this list will be directed to the NWH P&T Committee.
- The ultimate decision to modify this policy shall lie with the NWH P&T Committee membership.
- Due to differing medication management processes at each NWH site and the implementation of various technology solutions, the exact strategies (i.e., processes) for managing high-alert medications shall be determined by local P&T Committees (see *Appendix II*). System-wide strategies may be considered upon directive from the NWH P&T Committee (see *Appendix II*). Recommended strategies may include, but are not limited to:
    - Standardizing the ordering, storage, preparation, and administration of these products
    - Improving access to information about these drugs
    - Limiting access to high-alert medications
    - Using auxiliary labels and automated alerts
    - Employing redundancies such as automated or independent double-checks
    - Administer high-alert intravenous (IV) medication infusions via a programmable infusion pump

Appendix I: Table of High-Alert Medications

<table>
<tr><th colspan="2">NORTHWELL HEALTH HIGH-ALERT MEDICATIONS</th></tr>
<tr><td colspan="2">Classes/Categories* of Medications</td></tr>
<tr><td rowspan="3">Antithrombotic agents, including:
Antiplatelets
Glycoprotein IIB/IIIA inhibitors (e.g., abciximab, eptifibatide, tirofiban)
P2Y12 platelet adenosine diphosphate (ADP) receptor antagonists (e.g., clopidogrel, prasugrel, ticagrelor)
Miscellaneous (e.g., aspirin, cilostazol, dipyridamole, ticlopidine)
Anticoagulants
Coumarin derivatives (e.g., warfarin)
Direct thrombin inhibitors (e.g., argatroban, bivalirudin, dabigatran)
Factor Xa inhibitors (e.g., apixaban, edoxaban, fondaparinux, rivaroxaban)
Heparins (e.g., dalteparin, enoxaparin, unfractionated heparin)
Heparin flushes – pediatrics only
Thrombolytics (e.g., alteplase)</td><td>Epidural medications, including:
BUpivacaine
FentaNYL
Ropivicaine
HYDROmorphone
Morphine
Combination products</td></tr>
<tr><td>Insulin, including:
All routes and formulations</td></tr>
<tr><td>Intrathecal medications, including:
Baclofen
Bleomycin
Cytarabine
Hydrocortisone
Methotrexate
NaCl 0.9%
Thiotepa
Topotecan</td></tr>
<tr><td>Antineoplastic agents, including:
Non-oncologic & oncologic use</td><td>Ketamine, including:
All routes and formulations</td></tr>
<tr><td rowspan="3">Concentrated** Electrolytes (intravenous),
including:
Magnesium sulfate
Potassium chloride
Potassium phosphate
Sodium chloride (hypertonic)</td><td>Neuromuscular blocking agents, including:
All intravenous formulations</td></tr>
<tr><td>Opioids, including:
All routes and formulations</td></tr>
<tr><td>Phytonadione (Vitamin K), including:
All parenteral formulations</td></tr>
<tr><td colspan="2">*Medications within each pharmacologic-therapeutic classification are defined as per the American Hospital Formulary Service (AHFS) unless otherwise specified
**Concentrated electrolytes are those that require dilution prior to administration and those given undiluted only in emergency situations (e.g., hypertonic saline for increase intracranial pressure)</td></tr>
</table>

High Risk Medications	Safety Strategies
Concentrated Electrolytes (intravenous), including** Magnesium sulfate Potassium chloride Potassium phosphate Sodium chloride (hypertonic)	• Pharmacy is responsible to mix all other concentrated electrolyte intravenous solutions. • Administration guidelines for potassium chloride are utilized. (See the Adult Intravenous Reference Guide.) • Concentrated electrolytes have been removed from patient care areas with the following exceptions: – Concentrated sodium chloride is kept in a locked area of the dialysis unit with a specific policy for its administration. The vial is clearly labeled with a highly visible "*Concentrated Electrolyte*" label. Access is limited to properly oriented dialysis nurses and physicians o 23.4% hypertonic saline in the SICU, CCU, MICU, NSCU, CTU, ED, PACU and Stroke Unit. The "Clinical Guidelines for the Management of Cerebral Edema and Subarachnoid Hemorrhage with Hypertonic Saline" Policy outlines the administration of this medication in these patient care areas. o When concentrated potassium chloride is clinically indicated in cardiac surgery, the pharmacy will dispense the vial, clearly labeled with a highly visible "Concentrated Electrolyte" label. The medication dispensed for single patient use will be administered by the perfusionist. The Cardiac OR has a policy defining the use of concentrated potassium • The RN must review current pertinent lab values for patients receiving electrolyte infusions.

High Risk Medications	Safety Strategies

Antithombotics
Antiplatelets
• Glycoprotein IIB/IIIA inhibitors (e.g., abciximab, eptifibatide, tirofiban)
• P2Y12 platelet adenosine diphosphate (ADP) receptor antagonists (e.g., clopidogrel, prasugrel, ticagrelor)
• Miscellaneous (e.g., aspirin, cilostazol, dipyridamole, ticlopidine)
Anticoagulants
• Coumarin derivatives (e.g., warfarin)
• Direct thrombin inhibitors (e.g., argatroban, bivalirudin, dabigatran)
• Factor Xa inhibitors (e.g., apixaban, edoxaban, fondaparinux, rivaroxaban)
• Heparins (e.g., dalteparin, enoxaparin, unfractionated heparin)
• Heparin flushes – pediatrics only
• Thrombolytics (e.g., alteplase)
	Anticoagulant Infusions (Argatroban and Heparin)
	• Prepared by the Pharmacy Department
	  o Exception: Due to the immediate nature of the initiation of Heparin, the Emergency Department will store a stock pre-made Heparin bags in a locked medication room.
	• Only one standardized concentration of each infusion is utilized when used for systemic anticoagulation
	• Flow control pumps are utilized for continual IV infusions
	• Dosing Nomograms for Heparin Infusions are available
	• The ANMs will be monitoring every patient on a Heparin nomogram All orders for Intravenous Heparin utilize a Standard Protocol (Heparin Nomogram or Patient Specific Protocol) EXCEPTION: Bone Marrow Transplant Patients
	• Initial Heparin Infusion Orders are reviewed by the Pharmacy Department to ensure appropriateness.
	• All patients on Heparin are reviewed daily to ensure therapeutic aPTTs and platelets' by the pharmacists.
	• Prior to verifying any Heparin Infusion renewal, the Pharmacist checks for appropriate protocol and rate.
	• Telephone orders cannot be taken for all anticoagulant infusions except to discontinue the infusion.
	• Intravenous Heparin infusion line should be connected directly to the patient's intravenous access point.
	• The Pharmacists monitor the aPTTs and platelets of all patients on Heparin for systemic anticoagulation daily
	• Warfarin will only be dispensed by a pharmacist when a current INR is available and is within an acceptable range
	• All patients receiving warfarin are provided education by a pharmacist and/or RN
	• Dabigatran, Apixaban, Rivaroxaban, and LMWH
	  o Pharmacists monitor the renal function to ensure dose appropriateness.
	  o Dose-rounding is performed for all doses of low molecular weight heparins that are not to the nearest 10 milligrams to ensure safe administration
	• Alerts built around anticoagulants to prevent co-administration with an epidural agent.
	• Pharmacists review patient's platelets for all anticoagulant initial orders.
	• All other antithombotic agents
	  o Pharmacists review Hemoglobin and Hematocrit to ensure appropriateness

Neuromuscular Blocking Agents:
Succinylcholine
Atracurium
Cisatracurium Rocuronium
Vecuronium Pancuronium
	• All such infusions prepared by the Pharmacy Department
	• Such agents available only in designated areas: OR, ER, ICUs, Ambulatory Surgery.
	• All agents stored in a segregated manner as follows:
	  o Non-refrigerated items: Pyxis machines. An additional warning saying "Paralyzing agent" appears when the medication is accessed
	  o Refrigerated items: Stored in a special bright orange container labeled "Paralyzing agent".
	• Patients have continuous vital signs (hemodynamic monitoring of BP, HR, and RR) and cardiac rhythm monitoring by a competent health care provider before administration, every 15 minutes throughout administration and every 15 minutes x 4 post administration

Opioids, including •All routes and formulations	• TALLman characters and bolded strengths are utilized to heighten staff awareness • Infusions are administered via specific dose calibrated pumps • Restricted override function to immediate release opioid formulations in Automated dispensing cabinets • Distribution of opioid dosing pocket guides

High Risk Medications	Safety Strategies
Insulin	• Standardized order sets are utilized for ordering correctional insulin coverage whenever appropriate • Standardized concentrations are approved for ordering insulin infusions • Pharmacy prepares all insulin infusions • Auxiliary stickers "High Alert Insulin" is affixed to the IV bag prior to dispensing. • Flow control pumps are utilized for continuous IV infusions • Lantus insulin doses drawn up in patient specific syringes • Pharmacist review of blood glucose when Lantus medication orders • Patient specific vials on all immediate acting insulin stored in Automated Dispensing cabinets • Lab values are reviewed and communicated based on protocol
Antineoplastic agents, including: Non-oncologic & oncologic use	• Only oncologists, oncology fellows are authorized to order chemotherapy agents for the treatment of the Oncologic conditions o If an oncology fellow or oncology NP orders, MUST be co-signed by Oncology attending • Oncologic agents being utilized for NON oncologic conditions can be ordered by other clinicians • Specific dosing criteria (e.g. mg/m2, dose/wt.) must be written on the order • Min-max dosing alerts are built in Sunrise Clinical Manager order system to heighten pharmacy awareness • Only specially trained pharmacists are allowed to prepare, check and dispense these agents • All chemo preparations are doubled checked by two staff (1 pharmacist and 1 nurse) prior to patient administration • Only trained nurses can administer chemo agents • Critical lab values are reviewed and monitored as per protocol • Vincristine & Vinblastine parenteral products are dispensed with auxiliary labels stating "NOT FOR INTRATHECAL USE" • Vincristine prepared as an IVBP
Vitamin K, injectable	• Undiluted phytonadione will not be routinely stored in patient care areas. • When storage is necessary in patient care areas, specific directions for infusion preparation will be provided with the product: • Dilute with 50 mL of 0.9% NaCl or 5% Dextroseand Administer via IV Infusion over 20 – 30 minutes using a smart pump • When prepared by pharmacy, orders for intravenous phytonadione will be dispensed as a diluted and ready to use product in a 50 milliliter bag for infusion. • Intravenous phytonadione will be administered slowly as an intermittent infusion, using an infusion pump, over at least 20 minutes duration. • Phytonadione will not be administered as an intravenous push.
Ketamine	• Ketamine infusions are prepared by pharmacy and replaced daily. • Guidelines for non-infusion use ni the ED developed
Epidural medications BUpivacaine FentaNYL Ropivicaine HYDROmorphone Morphine	• May only be ordered by the Anesthesia Department • Standardized protocols are built in Sunrise Clinical Manager • PCEA pump settings must be reviewed and cosigned upon initiation and all prescription changes by a second nurse. • CAUTION: EPIDURAL NARCOTIC label affixed to narcotic epidural to prevent confusion with plain epidural infusions
Intrathecal medications Baclofen Bleomycin Cytarabine Hydrocortisone Methotrexate NaCl 0.9% Thiotepa Topotecan	• Prepared by the pharmacy department • Shortened expiration