Medication Management
Policy / Procedure

<table>
<thead>
<tr>
<th>TITLE:</th>
<th>HIGH ALERT MEDICATIONS</th>
<th>NUMBER:</th>
<th>25.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sponsor:</td>
<td>Drugs &amp; Therapeutics Committee</td>
<td></td>
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<tr>
<td>Approved by:</td>
<td>Medical Advisory Committee</td>
<td>Approval Date:</td>
<td>April 2, 2019</td>
</tr>
<tr>
<td>Effective Date:</td>
<td>April 17, 2019 (minor revision)</td>
<td></td>
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<tr>
<td>Applies To:</td>
<td>Pharmacy, Programs, Medical Dental Staff</td>
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POLICY
To help prevent or reduce the number of medication errors and adverse drug events related to high alert medication, the IWK has identified and implemented a list of high alert medications (and electrolytes) adapted from the Institute of Safe Medication Practices (ISMP) Canada. (see Appendix B). This policy outlines the management of high alert medications and actions required to promote the safe storage, labeling, handling, prescribing, preparation, dispensing, administration and documentation of high alert medications.

This policy is applicable to all IWK staff. Individual care teams may have specific policies and protocols that extend beyond limitations set by this policy.

This policy is NOT applicable to the administration of anesthetic, analgesic, sedative and ancillary drugs by anesthesiologists, anesthesia residents, anesthesia support staff, and personnel acting under an anesthetist’s direct supervision (present) in the Operating Room and Recovery Room. It is also not applicable to anesthesiologists delivering anesthetic drugs under appropriate monitoring at remote sites of the Health Centre.

This policy is NOT applicable to medications given during emergency situations (e.g. cardiac respiratory arrest). However, there is a minimum expectation that the nurse verifies the medication with the authorized prescriber present at the event.

Students (excluding medical/dental residents) may NOT double check high alert medications. If the student participates in the medication administration process, they will be the third person performing the checks and calculations. Note that this does NOT prohibit students/learners from administering high alert medications under appropriate supervision.

The Drugs and Therapeutics Committee shall review and approve the policy and list of high alert medications as required and at least every 3 years following IWK approval processes. Drugs and Therapeutics Committee shall also review and approve the rational for availability and the safeguards put in place to minimize the risk of error for high dose formats of concentrated electrolytes, narcotics and heparin.

PROTOCOL
The IWK will identify and compile a list of medications (and electrolytes) that are considered to be high alert. (see Appendix A).

For look alike/read alike medications, including those that are high alert, TALLman lettering will be used to amend drug descriptions to help distinguish medications per Medication Management Policy 1.43 “TALLman Lettering”

The computer generated medication administration record (cMAR) and preprinted MARs will include messaging that identifies items as high alert medications.

The number of strengths, concentrations and volumes available for high alert medications will be limited.

High alert auxiliary labels are affixed to high alert medications where defined by this policy. Automated dispensing cabinets (ADCs) (e.g. Pyxis) will provide a clinical alert, “high alert-independently double check and sign MAR” when a high alert medication is removed.

High alert IV intermittent infusions and IV continuous medications, epidural or PCAs will be administered via programmable IV (smart) pumps using standard concentrations and drug library with soft and hard dosing limits (per policy 1140 “Administration of Intravenous Medication”)
If unable to use the defined standard concentration for an IV high alert medication, the medication will be prepared by pharmacy with patient-specific labeling and instructions whenever possible.

Patient monitoring for parenteral high alert medication will follow those outlined in the IWK online parenteral manual for pediatric patients. For adults, Ottawa General or the online Central Zone IV Manual will be followed (or approved evidence-based reference).

Education will be provided to patients, prescribers, nurses, and pharmacy staff in the form of memos, newsletters and in-services in order to increase awareness of high alert medications and decrease potential for errors.

Any medication incidents involving high alert medications will be reviewed quarterly to look for trends, with appropriate follow-up, including any change in process being communicated appropriately. The results will be presented to the D&T Committee.

Audits of client services areas will be conducted at least annually by pharmacy.

**PROCEDURE**

The following strategies will be used to reduce errors involving high alert medications:

1. The IWK will standardize the storage, labeling, handling, prescribing, preparation, dispensing, administration and documentation of high alert medications through the use of protocols, guidelines, dosing charts, and orders sets (pre-printed or electronic).

2. The IWK High Alert Medication list (Appendix A) and corresponding safety controls (Appendix B) will be used by all healthcare providers when dealing with high alert medications.

3. **Storage/Labeling/Handling High Alert Medications (see Appendix I):**

   3.1 **Pharmacy**
   
   - High alert medications such as narcotics/opioids, ketamine, propofol and midazolam will be stored in the Pyxis CII Safe as per federal and provincial regulations.
   - Where possible, two strengths or dosing formats of the same medication will not be stored within the same CII Safe compartment or refrigerator shelf.
   - High alert medication stored in the sterile room pass through and refrigerator will be stored in clear bins that include a red stripe high alert stickers. If medication is to be only used in pharmacy, labeling on the bin will indicate “Pharmacy Use Only, Do Not Dispense to Care Areas”.
   - Epidural solutions will be stored in the refrigerator in clear bins labelled with high alert stickers and a yellow stripe.

   3.1.1 Insulin (refrigerated) will be stored with brands and concentrations segregated in bins.
   3.1.2 All unfractionated and low molecular weight heparins will be stored segregated within their own storage area in separate bins.
   3.1.3 All pre-mixed epidural solutions will be clearly labeled and stored in labelled high alert bins that include a yellow stripe, separated from intravenous solutions.
   3.1.4 Pharmacy will provide concentrated electrolytes in a dilute ready-to-administer format whenever possible. If not possible, restricted concentrated electrolyte products will be provided on a patient-specific basis.
   3.1.5 Dilute formats of concentrated electrolyte products may be stocked in patient care areas.
   3.1.6 Sodium chloride 4 mmol/mL, when required for oral feeds, will be transferred into an oral container and labelled “For Oral Use only” Pharmacy may provide this product as a patient-specific load into Pyxis.
3.1.7 A restricted concentrated electrolyte product may only be stocked in a patient care area contrary to a Required Organizational Practice (ROP) if approved by the Drugs and Therapeutics Committee.

3.2 Patient care areas

- The following select concentrated electrolytes, narcotic (opioid) products (high dose, high potency formats) and heparin products are restricted and shall NOT be stored in patient care areas as wardstock. Under exceptional circumstances Drugs and Therapeutics Committee shall approve availability when specific safeguards are put in place to minimize risk of error:
  - Calcium (all salts): concentrations greater than or equal to 10%
  - Magnesium sulfate: concentrations greater than 20%
  - Potassium (all salts): concentrations greater than or equal to 2 mmol/mL (2 mEq/mL)
  - Sodium acetate and phosphate: concentrations greater than or equal to 4 mmol/mL
  - Sodium chloride: concentrations greater than 0.9%
  - fentaNYL: ampoules or vials with total dose greater than 100 micrograms per container
  - HYDROmorphone: ampoules or vials with total dose greater than 2 mg
  - Morphine: ampoules or vials with total dose greater than 15 mg in adult care areas and 2 mg in pediatric care areas.
  - Low molecular weight heparin: use of multi-dose vials is limited to critical care areas for treatment doses
  - Unfractionated heparin (high dose): greater than or equal to 10,000 units total per container (e.g. 10,000 units/1 mL; 10,000 units/10 mL; 30,000 units/30 mL) is provided on a client-specific basis when required
  - Unfractionated heparin for intravenous use: E.g. 25,000 units/500 mL; 20,000 units/500 mL is provided on a client-specific basis when required.
- Where automated dispensing cabinets (ADC) (Pyxis) exist, high alert medications will be stored within.
- All high alert medications in ADC’s will be assigned a clinical data category of “high alert”. This will provide a prompt “high alert-independently double check and sign MAR” warning message when the medication is removed. Exception: PICU, ER Trauma and Operating Rooms where high alerts medications represent a significant portion of the total stock and double checking is standard practice for all medications.
- High alert medications will be stored in individual pockets with labeling indicating high alert. If stored in an open bin (e.g. Pyxis refrigerator or tower), a red stripe and high alert stickers will be applied to the bin.
- The availability of concentrated electrolytes on patient care areas is limited (see Appendices C to G)
- In Women’s Health, epidural solutions will be stored in ADCs in bins labelled with high alert stickers and a yellow stripe. In Children’s Health, epidurals will be stored in Pyxis in separate PCA/epidural drawers that are labelled high alert.
- Quarterly audits will be conducted by pharmacy to:
  - Ensure clinical data categories are assigned
  - Bins/pockets are labelled according to policy
  - Identify which high alert medications should be removed based on utilization

4. Ordering/Prescribing High Alert Medications:

4.1 Orders will be written according to prescribing practices outlined in Medication Management Policy 3.07 “Medication Orders: Writing and Verification”. and per Administrative Policy 123.1
“Do Not Use” Dangerous Abbreviations, Symbols and Dose Designations”.

4.2 Clinical Order sets (COS) Pre-printed orders will be developed whenever possible for ordering high alert medications, to standardize practice and reduce the risk of errors. When high alert medications are included in pre-printed orders, the text for high alert medications will be **bolded**.

4.3 Verbal or telephone orders for high alert medication will only to be permitted when the prescriber is unable to attend to the patient and write the order, or a delay in ordering the medication will compromise patient safety and care.

4.4 Telephone orders are not acceptable for parenteral cytotoxic agents, except to change or confirm the start of a written cycle. (see Policy 10.05)

5. **Preparing and Dispensing High Alert Medications (see Appendix C and I):**

5.1 Commercially available or pharmacy-prepared ready to administer high alert medications will be used when available. The number of concentrations and volumes available for all high alert medications in patient care areas is limited.

5.2 High alert auxiliary labels will be affixed by pharmacy where appropriate.

5.3 Epidural solutions will be provided by pharmacy in ready-to-administer format and clearly labeled “FOR EPIDURAL USE ONLY”

6. **Administering High Alert Medications**

6.1 Conduct an independent double check of all high alert medications prior to administration

6.2. Check the initial preparation of medication against the order and/or MAR including:
- Patient name and second identifier
- Medication name
- Dose
- Route
- Administration date and time
- Appropriate laboratory test results / assessment

6.3. A second health care provider performs an independent double check by:
- Reviewing the order and/or MAR and doing any calculations independently (without any cues from the person who carried out the initial work).

6.4 Independently double check the preparation/dilution of high alert IV medications requiring dilution prior to administration.

6.5 Administer intravenous (IV) intermittent or continuous infusions, epidural or PCA administration of high alert medications via a smart pump using standard concentrations. Overriding the drug library is not acceptable except under unavoidable conditions such as fluid restrictions, new drugs not in library.

6.8 Verify that the intended medication is in the right channel by physically tracing the line from the solution, through the pump and to the patient.

6.9 Use the pump display as the label for infusions for medications contained in the smart pump date set (drug library).
6.10 As per Medication Management Policy 10.15 label:
- each infusion line at distal end of the tubing with name of the medication being infused.
- epidurals or PCAs with additional labeling

A second care provider confirms accuracy.

6.12 Independently double check pump settings and document same.

6.13. Verify with a second care provider at shift change and/or at transfer of care (i.e. visual check that the correct medication, dose, rate and route is being administered according to the current medication order and into the intended channel).

6.14 Follow patient monitoring parameters for high alert IV medications included in all protocols and pre-printed orders or as included in the:
- IWK online parenteral manual (for pediatric patients) or
- Central Zone NSHA/Ottawa IV manuals (for adults)

7. Independent Double Check of a High Alert Medication

7.1 Health care provider completing the double check co-signs on the MAR/infusion flow sheet or other appropriate record.

7.1.1 The second practitioner’s initials indicate medication, dose, frequency, time of administration is correct, preparation of the medication is accurate and smart pump is programmed correctly. This second signature is confirming that all steps outlined above have been followed.

Intravenous (IV) intermittent or continuous infusions, epidural or PCA administration of high alert medications, require the following additional independent double checks of the smart pump/set-up, to verify:

- Correct drug and concentration, expiry date
- Dose calculation
- Dose programmed into the pump
  - Dose, dose units – have second person check
  - Time – have second person check
- Patient weight
- Rate if appropriate
- Total volume if appropriate
- Correct site. Trace the line from the solution, through the pump to the patient (this includes roller clamp).
- Each infusion line is labeled with the name of the medication at the distal end of tubing.

7.2. Selected care teams may be challenged to have qualified individuals available to conduct double checks. These teams shall develop a suitable process to meet the standard.

7.3 Independent double checks are not required for 2 Liter bags of sterile water labeled for inhalation or irrigation.
REFERENCES


Accreditation Canada, Qmentum Program, Medication Management Standards for Surveys Starting After: January 1, 2019


RELATED DOCUMENTS
Policies
Applicable policies: See Clinical Policies 705 and 706 and document on the Cardiac Respiratory Arrest Record – Form 4425.

Policy 3.07 Medication Order Requirements

Administrative Policy 123.1 “Do Not Use” Dangerous Abbreviations, Symbols and Dose Designations.

Policy 1.43 Tall Man Lettering

Policy 10.15 Labeling of Medications Outside of Pharmacy

Policy 25.15 Potassium Chloride Concentrate – Fetal Assessment Treatment Centre
## APPENDIX A

### DEFINITIONS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>High Alert Medications</td>
<td>Drugs that bear a heightened risk of causing significant patient harm when used in error.</td>
</tr>
<tr>
<td>Independent double check of a high alert medication</td>
<td>A procedure in which two health care providers separately check a high-alert medication (alone and apart from each other, then compare results), each component of prescribing, dispensing, and verifying the high alert medication before administering it to the patient.</td>
</tr>
<tr>
<td>Health care provider</td>
<td>Staff who provide care within scope of practice/employment – including but not limited to nurse, nurse practitioner, licensed practical nurse, midwife, youth care worker, child care worker, physician, dentist, pharmacist, pharmacy practice assistant, pharmacy clinical support pharmacy practice assistant, respiratory therapist (during Transport), anesthesia assistant.</td>
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# Appendix B - High Alert Drug List

<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
<th>EXAMPLE MEDICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ANESTHETIC AGENTS</strong>&lt;br&gt;GENERAL, INHALED AND IV</td>
<td>example: propofol, ketamine</td>
</tr>
<tr>
<td><strong>CARDIOPLEGIC SOLUTIONS</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CARDIOVASCULAR AGENTS</strong></td>
<td>adrenergic agonists, IV (e.g. EPINEPHrine, norepinephrine, DOPamine DOBUTamine, phenylePHrine, ePHEDrine, isoproterenol)</td>
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<td></td>
<td>adrenergic antagonists, IV (e.g. labetalol, phentolamine, propranolol, metoprolol, esmolol)</td>
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<td></td>
<td>anti-arrhythmics, IV (e.g. adenosine, amiodarone, bretylium, procainamide lidocaine, verapamil, esmolol, metoprolol)</td>
</tr>
<tr>
<td></td>
<td>anti-thrombotic agents (e.g. warfarin, therapeutic heparin (unfractionated), low molecular weight heparins: dalteparin, tinzaparin, enoxaparin; fondaparinux; alteplase, dabigatran, rivaroxaban, apixaban)</td>
</tr>
<tr>
<td></td>
<td>inotropic agents, IV (e.g. digoxin, milrinone)</td>
</tr>
<tr>
<td><strong>CHEMOTHERAPEUTIC AGENTS, ALL ROUTES, ALL INDICATIONS</strong></td>
<td></td>
</tr>
<tr>
<td><strong>ELECTROLYTES</strong> for Injection</td>
<td>calcium chloride</td>
</tr>
<tr>
<td></td>
<td>calcium gluconate</td>
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<tr>
<td></td>
<td>magnesium sulfate</td>
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<tr>
<td></td>
<td>potassium chloride for injection (concentrate)</td>
</tr>
<tr>
<td></td>
<td>potassium chloride 1 mmol/mL - 50 mL syringes</td>
</tr>
<tr>
<td></td>
<td>potassium phosphates</td>
</tr>
<tr>
<td></td>
<td>sodium acetate</td>
</tr>
<tr>
<td></td>
<td>sodium chloride solutions (hypertonic) greater than 0.9%</td>
</tr>
<tr>
<td></td>
<td>sodium chloride solutions (hypotonic) less than 0.45%</td>
</tr>
<tr>
<td></td>
<td>sodium phosphate</td>
</tr>
<tr>
<td></td>
<td>total parenteral nutrition [TPN]</td>
</tr>
<tr>
<td><strong>DEXTROSE, HYPERTONIC, (20% or greater)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>DIALYSIS SOLUTIONS, PERITONEAL AND HEMODIALYSIS</strong></td>
<td></td>
</tr>
<tr>
<td><strong>EPIDURAL AND INTRATEHICAL AGENTS</strong></td>
<td></td>
</tr>
<tr>
<td><strong>INSULIN</strong>, all routes and types where dose is withdrawn from vials. Penfills require double check for dose changes and if patient is on more than one pen.</td>
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</tr>
<tr>
<td><strong>EPOPROSTENOL (Flolan® or equivalent) IV</strong></td>
<td></td>
</tr>
<tr>
<td><strong>FAT EMULSION, FISH OIL EMULSION</strong></td>
<td></td>
</tr>
<tr>
<td><strong>HYPOTONIC SOLUTIONS for pediatric patients</strong> (see Clinical Practice Guidelines 80.30)</td>
<td>D5W, D10W, D5W + 0.2% NaCl (+ any additives) and Dextrose 3.3% + 0.3% NaCl (+ any additives). (see ELECTROLYTES above)</td>
</tr>
<tr>
<td><strong>LIPOSOMAL FORMS OF MEDICATIONS &amp; THEIR CONVENTIONAL EQUIVALENTS</strong> (example amphotericin B liposomal &amp; conventional)</td>
<td></td>
</tr>
<tr>
<td><strong>MODERATE SEDATION AGENTS, IV</strong></td>
<td>Midazolam, dexmedetomidine</td>
</tr>
<tr>
<td><strong>MODERATE SEDATION AGENTS, Buccal, Intranasal, Oral FOR Neonates, Infants &amp; Children</strong></td>
<td>chloral hydrate, midazolam</td>
</tr>
<tr>
<td><strong>NARCOTICS/OPIOID AGENTS</strong> all routes</td>
<td></td>
</tr>
<tr>
<td><strong>NEUROMUSCULAR BLOCKING AGENTS</strong></td>
<td>cisatracurium, rocuronium, succinylcholine</td>
</tr>
<tr>
<td><strong>NITROPRUSSIDE</strong></td>
<td></td>
</tr>
<tr>
<td><strong>OXYTOCIN IV for intrapartum use</strong> (induction and/or augmentation of labor)</td>
<td></td>
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<tr>
<td><strong>RADIOCONTRAST AGENTS</strong> (not considered medications at IWK, but deemed high alert)</td>
<td></td>
</tr>
<tr>
<td><strong>STERILE WATER FOR INJECTION, INHALATION OR IRRIGATION</strong> - all routes in containers of 100 mL or more (excluding pour bottles)</td>
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<tr>
<td><strong>VASOPRESSIN</strong>, Intravenous or Intrathecal</td>
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Appendix C – Additional Safety Controls for High Alert Medication

1. Insulin
   - Multidose vials of insulin will be used for a single patient only. Upon opening, nurse will affix a patient label with two unique identifiers and a date opened sticker. Once opened, vials of insulin will be moved to patient specific bin and stored at room temperature.
   - ED and ambulatory clinics will use insulin vials for a single patient only, then discard.

2. Antithrombotic agents
   - Low Molecular Weight Heparin (LMWH)
     - Pre-filled syringes of low-molecular weight heparin will be used wherever possible. Initial orders for LMWH will only be accepted on approved clinical order sets (pre-printed orders).
     - Clinical data settings will be used in Pyxis to provide warning message to user when LMWH is removed.
     - LMWH will not be on override in Pyxis during pharmacy hours.
     - Quarterly audit check list used to audit client service areas for multidose vials of LMWH that are on an unapproved client service area.
     - Drugs & Therapeutics Committee (reaffirmed Oct 2017 approved stock locations for multidose vials of enoxaparin - PICU – MAIN)
       - When removed, nursing will affix a patient specific label with two unique patient identifiers and a date opened sticker.
       - Block feature will be used in ADCs to restrict pharmacy staff from loading multidose vials of low molecular weight into non-approved client service area Medstations.
   - Unfractionated Heparin
     - High dose unfractionated heparin (50,000 units total per container) is not stocked anywhere in the health centre.
     - The IWK limits the availability of unfractionated heparin greater than or equal to 10,000 units total per container and unfractionated heparin for IV use (25000 units/500 mL) to select care areas approved by D&T Committee.
       - Additional labelling will be applied to vial as per Appendix l.
       - If stored in ADC, clinical data settings will be used in Pyxis to provide warning to user when removed. (reaffirmed by D&T Oct 3, 2017)
       - Block feature will be used in ADCs to restrict loading unfractionated heparin greater than or equal to 10,000 units total per container and unfractionated heparin 25,000 units/500 mL into non-approved Medstations.
       - Quarterly audit check list used to audit client service areas (Pharmacy Policy 2.91 Pharmacy Practice Assistant Unit Audit) to ensure that unfractionated heparin greater than or equal to 10,000 units total per container and unfractionated heparin for IV use (25000 units/500 mL) are not in unapproved client service areas.
     - Initial orders for therapeutic or post op cardiac catheter heparin infusions will only be accepted on approved pre-printed orders.
     - Drugs & Therapeutics approved patient care stock areas for restricted heparin products (reaffirmed October 2017):
       - Heparin 30,000 units/30 mL = Card Cath, WH OR-15, OR-18 & OR-22, Peds OR, 6 LINK (Dialysis), PICU
       - Heparin 25,000 units/500 mL = PICU-MAIN, Cardiac Cath, Peds Recovery, 7A-Adult Surgery

3. Sterile Water for Injection, Irrigation, Inhalation
   - 1 Liter bags of sterile water (labeled for injection, irrigation or inhalation) shall NOT be stocked in IWK areas outside Pharmacy.
   - 2 Liter bags of sterile water for irrigation or inhalation have been replaced with 2 Liter bags, bottles of sterile water for irrigation or vials.
   - 1 Liter bags of sterile water for injection may only be ordered by Pharmacy.
   - Sterile water for inj. for reconstitution of dantrolene shall be labeled (bag and overwrap) by Pharmacy with high alert stickers and stored within the Malignant Hyperthermia kit(s).
Appendix C – Additional Safety Controls for High Alert Medication (Continued)

3. Concentrated Electrolytes
   - Concentrated electrolytes will not be available outside pharmacy except as outlined in Appendix C-G.
     - Additional labelling will be applied as per Appendix I.
   - When removed from ADCs, a prompt “do not leave item unattended. Discard or return to Pyxis if not needed” warning message will appear when concentrated electrolytes are removed.
   - The prompt for NaCl 3% 250 mL injection when removing from ADCs will appear as “If not immediately administered to patient, I will ensure bag is returned to Pyxis or discarded”.
   - Block feature will be used in ADCs to restrict pharmacy staff from loading concentrated electrolytes into non-approved client service area Medstations.
   - Quarterly audit check list used to audit client service areas (Pharmacy Policy 2.91 Pharmacy Practice Unit Audit) to ensure that concentrated electrolytes are not in unapproved client service areas.
   - Drugs & Therapeutics approved stock areas for concentrated electrolytes (reaffirmed by D&T October 3, 2017):
     - Sodium Chloride 3% Injection – PICU, Emergency, EHS Life Flight
     - Sodium Chloride 4 mEq/mL (4 mmol/mL) – PICU, EHS Life Flight
     - Sodium Acetate 4 mEq/mL (4 mmol/mL) – NICU1
     - Sodium Phosphate 0.05 mmol/mL - PICU
     - Sodium Phosphate 3 mmol/mL - PICU
     - Potassium Chloride 1 mEq/mL (1 mmol/mL) syringes – NICU1, PICU, Ped OR
     - Potassium Chloride 2 mEq/mL (2 mmol/mL) – EHS Life Flight
     - Calcium Chloride 10% prefilled syringe – Emergency Tray, ED Emergency Cart (see Policy 3.28)
     - Calcium gluconate 10% (10 mL vials) – Obs-Gyne Emergency Kit, NICU Neonatal Resuscitation Tray, PICU, EHS Life Flight, Ped OR
     - Calcium gluconate 10% (100 mL vials) – PICU for CRRT solutions (approved April 2019)

4. Oral Methotrexate
   - To prevent errors with weekly oral methotrexate being inadvertently ordered daily and for the potential of significant patient harm if even small doses are involved:
   - Pharmacy has a default flag in Meditech which appears during medication order entry: “If DAILY dosing, verify indication and frequency before entering/dispensing.”

5. High Potency Narcotics
   - fentaNYL ampoules or vials with a total dose greater than 100 micrograms per container will not be stocked in patient care areas.
   - HYDROmorphine injection ampoules of vials with total dose greater than 2 mg/mL will not be routinely stocked in any patient care areas.
   - Morphine injection greater than 10 mg/mL will not be stocked in any patient care areas. Pediatric care areas will be restricted to a concentration of 2 mg/mL. Pediatric automated dispensing cabinets have a no load feature set up so that 10 mg/mL morphine cannot be inadvertently loaded on a pediatric care area.
   - Drugs & Therapeutics approved stock areas - NONE

6. Neuromuscular Blocking Agents
   - Additional labelling for neuromuscular blockers as outlined in Appendix I and J when paralytic warning not included on cap.
Appendix D – Concentrated Sodium Chloride

IV SODIUM CHLORIDE PRODUCTS GREATER THAN 0.9%

Products:
NaCl 3% Hypertonic 250 mL injection
NaCl 4 mEq/mL (4 mmol/mL) 30 mL vials
NaCl 4 mEq/mL (4 mmol/mL) 200 mL vials

NaCl 3% 250 mL Hypertonic Injection
Stocked:
- Pharmacy
- PICU
- Emergency
- EHS Lifeflight

Used for:
- Severe Hyponatremia
- Increased intracranial pressure

NaCl 4 mmol/mL 30 mL vials
Stocked:
- Pharmacy
- PICU
- EHS Lifeflight

Used for:
- Preparation of electrolyte solution requiring NaCl after hours.

NaCl 4 mmol/mL 200 mL vials
Stocked:
- Pharmacy Sterile Room

Used for:
- Preparation of parenteral nutrition
- Other electrolyte solutions in pharmacy.
## Appendix E – Sodium Acetate & Sodium Phosphate

### IV SODIUM ACETATE

**Products:**

*Sodium Acetate 4 mEq/mL*

50 mL vials

**Stocked:**

- Pharmacy
- NICU-1

**Used for:**

- Preparation of electrolyte solutions requiring sodium acetate after hours.
- Preparation of parenteral nutrition and electrolyte solutions in pharmacy.

### IV SODIUM PHOSPHATE

**Products:**

*Sodium Phosphate 0.05 mmol (phosphate)/mL*

280 mL bags in D5W

*Sodium Phosphate 3 mmol (phosphate)/mL*

10 mL vials

**Stocked:**

- PICU

**Used for:**

- Preparation of parenteral nutrition and sodium phosphate infusions in pharmacy.
Appendix F – Magnesium Sulfate Products

IV MAGNESIUM PRODUCTS

**Products:**
- 40 mg/mL 100 mL premixed bags in 0.9% NaCl
- 40 mg/mL 500 mL premixed bags in 0.9% NaCl
- 20% (200 mg/mL) 10 mL vials
- 50% (500 mg/mL) 50 mL vials

**Magnesium Sulfate 40 mg/mL 100 mL bag**
- Stocked: Pharmacy, PICU, NICU-1, 6Link, PMU, 5A, 5B, 7A, Birth Unit, Emergency, EHS Lifeflight
- Used for:
  - Persistent pulmonary hypertension of newborns
  - Hypomagnesemia
  - Asthma

**Magnesium Sulfate 40 mg/mL 500 mL bag**
- Stocked: Pharmacy, Birth Unit, EHS Lifeflight
- Used for:
  - Hypertension in pregnancy.
  - Neuroprotection of neonate during labour.

**Magnesium Sulfate 20% (200 mg/mL) 10 mL vials**
- Stocked: Pharmacy, Cath Lab, MRI, Emergency (blue cart), Peds OR, EHS Lifeflight, Obs/Gyn Emergency kits, Adult Emergency Trays
- Used for:
  - Hypomagnesemia

**Magnesium Sulfate 50% (500 mg/mL) 50 mL vials**
- Stocked: Pharmacy, Sterile Room
- Used for:
  - Preparation of magnesium sulfate 40 mg/mL bags when unavailable from supplier.

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Appendix G – Potassium Chloride, Potassium Phosphate & Potassium Acetate Products

**IV POTASSIUM CHLORIDE PRODUCTS**

**Products:**
- Potassium Chloride 1 mEq/mL 10 mL syringes
- Potassium Chloride 1 mEq/mL 50 mL syringes
- Potassium Chloride 2 mEq/mL 10 & 20 mL vials

**Stocked:**
- Pharmacy
- NICU
- PICU
- Peds OR

**Used for:**
- High dose potassium chloride infusions.
- Preparation of electrolyte solutions requiring KCl after hours.
- Addition to dialysis.
- Severe hypokalemia or hypokalemia in patients unable to take oral potassium.

**IV POTASSIUM PHOSPHATE PRODUCTS**

**Products:**
- Potassium Phosphate 0.05 mmol (phosphate)/mL 280 mL bags in D5W
- Potassium Phosphate 3 mmol/mL 10 & 50 mL vials

**Stocked:**
- Pharmacy Sterile Room
- PICU

**Used for:**
- Preparation of parenteral nutrition and potassium phosphate infusions.
- Preparation of parenteral nutrition and other electrolyte solutions in pharmacy.
Appendix G – Potassium Chloride, Potassium Phosphate & Potassium Acetate Products (continued)

IV POTASSIUM ACETATE PRODUCTS

**Products:**
Potassium Acetate 4 mEq/mL

**Stocked:**
- Pharmacy Sterile Room

**Used for:**
- Preparation of parenteral Nutrition in pharmacy.
### Appendix H – Calcium Chloride and Calcium Gluconate Products

#### IV CALCIUM CHLORIDE PRODUCTS

**Products:**
- Calcium Chloride 100 mg/mL 10 mL vials
- Calcium Chloride 100 mg/mL prefilled syringes

**Stocked:**
- Pharmacy
- PICU

**Used for:**
- calcium chloride infusions in fluid restricted patients.

#### IV CALCIUM GLUCONATE PRODUCTS

**Products:**
- Calcium Gluconate 100 mg/mL 10 mL vials
- Calcium Gluconate 100 mg/mL 100 mL vials

**Stocked:**
- Pharmacy
- NICU emergency trays
- Obs/Gyne emergency kits
- PICU
- Antidote Kit-ED
- Peds OR
- EHS Lifeflight

**Used for:**
- calcium gluconate infusions in PICU and Peds OR
- fluid restricted patients
- neonatal hypocalcemia
- resuscitation,
- magnesium toxicity in pregnancy
- hydrofluoric acid burns.

**Stocked:**
- Pharmacy Sterile Room
- PICU (over labelled by pharmacy for CRRT)

**Used for:**
- preparation of parenteral nutrition
- stock electrolyte solutions in pharmacy.
- Preparation of CRRT solution in PICU
Appendix I – Heparin High Dose, High Potency (unfractionated and LMWH)

HEPARIN

**Product:**
30,000 units/
30 mL vials

Stocked:
- Pharmacy
- 6L Dialysis unit
- Pediatric OR
- Cardiac Cath Lab
- Women’s OR-15, OR-18 & OR-22
- PICU
- Lab

HEPARIN

**Product:**
25,000 unit/
500 mL bags

Stocked:
- Pharmacy
- Cardiac Cath Lab
- PICU
- Pediatric Recovery room
- 7A

ENOXAPARIN

**Product:**
300 mg/3 mL
Multidose vials

Stocked:
- Pharmacy
- PICU
Appendix J - ADDITIONAL HIGH ALERT LABELLING/PACKAGING PROCEDURES FOR RECEIVERS

**Cisatracurium**
Warning label placed on bag *(please include Nimbex label in baggie)* if paralyzing agent included on cap, no need to repackage in bag.

**EPINEPHrine Chloride Topical (30mL)**
“Topical-Pour Only” labels (found in bin with vials in Topical Bay) placed over top of blue cap.

**Heparin 1000 units/mL (30 mL vial)**
“HIGH ALERT-discard after use” label placed on side (Do not cover front label or Lot/Expiry).

**EPINEPHrine HCl**
administer via 3-way stop cock with NaCl 0.9% flush

**Adenosine**
Adenosine administration label placed on box.

**DOPamine 1600 microgram/mL & DOPamine 3200 microgram/mL**
“HIGH ALERT” label placed on front.

**NaCl 3% 250 mL Bag**
“Caution-Hypertonic Solution” label and Red “HIGH ALERT” labels on bag itself.

**Heparin 25,000 units/500 mL**
“HIGH ALERT” label placed on front.

**Heparin 1000 units/mL (30 mL vial)**
“HIGH ALERT-discard after use” label placed on side (Do not cover front label or Lot/Expiry).
Appendix J - ADDITIONAL LABELLING/PACKAGING PROCEDURES (cont’d)

**NaCl 4 mEq/mL (30 mL vial)**
“Concentrated NaCl” label on front, White “HIGH ALERT” on side (do not cover Lot/Expiry)

**Succinylcholine**
Warning label placed on bag if paralytic warning not on cap

**Calcium Gluconate 100 mg/mL**
(10 mL & 100 mL)
“High Alert” Concentrated Calcium. Do not leave unattended. If UNUSED, discard vial in sharps bucket.” label on vial.

**Sodium Acetate 4 mEq/mL (50 mL)**
“Concentrated Sodium Acetate” label on side, White “HIGH ALERT” on side (do not cover Lot/Expiry/Bar Code)

**Rocuronium**
Warning label placed on bag if paralytic warning not on cap

**Calcium Chloride 100 mg/mL (10 mL)**
“High Alert – Concentrated Calcium. Do not leave unattended. If UNUSED, discard vial in sharps bucket.” label on vial.
Appendix K

ADDITIONAL LABELING/PACKAGING PROCEDURES

For Pyxis Anesthesia Carts

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**Rocuronium**

- Expiry: 60 days from today
- **Extend date beyond weekend/holiday**
- “Do not Use After” Label: Place next to existing expiry date – DO NOT COVER

**Succinylcholine**

- Expiry: 30 days from today
- **Extend date beyond weekend/holiday**
- “Do Not Use After” Label: Place next to existing expiry date – DO NOT COVER

***

**IWK Policies Being Replaced**

(Please List)

**Version History**

<table>
<thead>
<tr>
<th>Major Revisions (e.g. Standard 4 year review)</th>
<th>Minor Revisions (e.g. spelling correction, wording changes, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>April 2019 – wording changes, addition of Calcium Gluc100 mL vials to PICU wardstock for addition to CRRT Solutions; minor wording change to Appendix B</td>
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</tbody>
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