PURPOSE:

1. To standardize and ensure the safe use of Concentrated Electrolytes by evaluating and limiting its availability. These include, but are not limited to:
   - 1.1. Calcium (all salts): concentrations greater than or equal to 10%
   - 1.2. Magnesium sulfate: concentrations greater than 20%
   - 1.3. Potassium (all salts): concentrations greater than or equal to 2 mmol/mL (2 mEq/mL)
   - 1.4. Sodium (acetate and phosphate): concentrations greater than or equal to 4 mmol/mL
   - 1.5. Sodium chloride: concentrations greater than 0.9%
2. To provide guidance in the management of Concentrated Electrolytes in the clinical units to prevent fatal medication adverse event.
3. To eliminate harm to the patient from the use of concentrated electrolyte solutions.
4. To develop standardized medication handling processes for concentrated electrolyte solutions.
5. To monitor and continually improve the standardized delivery process for concentrated electrolyte solutions.

LEVEL:

Physicians, Nurse, Pharmacists and other Healthcare Professionals

DEFINITION OF TERMS:

Concentrated Electrolytes – these are solutions which contain a high concentration of ions such as Potassium chloride at the concentration ≥ 2 mEq/mL.

Medication Management (MM) – a partnership of the pharmacist, the patient or their caregiver, and other health professionals that promote the safe and effective use of medications and help patients achieve the targeted outcomes from medication therapy. MM includes the analytical, consultative, educational, and monitoring

services provided by pharmacists to help patients get the best results from medications through enhancing patient understanding of medication therapy, increasing patient adherence to medications, controlling costs, and preventing drug complications, conflicts, and interactions.

High-Alert Medications (HAM) – are medications that have a heightened risk of causing significant patient harm when they are 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. High-alert medications such as concentrated electrolytes have a higher risk of causing injury, either as a result of a narrow therapeutic range or due to a high incidence of reported serious errors.

Independent Double-check - it is a procedure in which two authorized, qualified practitioners shall separately check each component of the work process.

POLICY:

1. DPOTMH shall ensure that best practice systems and processes are in place:
   - 1.1. A strict maintenance of supplies of Concentrated Electrolytes including, but not limited to Potassium chloride shall be stored in the Main Pharmacy and E-kit **ONLY.**
   - 1.2. Concentrated Electrolytes shall not be available in stock supply in patient care areas to avoid inadvertent use in undiluted form.
   - 1.3. A number of drug concentrations available in the hospital shall be standardized and limited to the minimum requirement to meet patient care needs.
   - 1.4. The Pharmacy Department shall maintain and review a list of Concentrated Electrolytes in the hospital.
   - 1.5. The promotion of safe practices with Potassium chloride and other Concetrated Electrolyte solutions shall be a priority and that effective organizational risk assessments should address these solutions.

1.6. Concentrated Electrolytes including, but not limited to Potassium chloride shall be treated as controlled substances, including requirements that restrict ordering and establish storage and documentation requirements.

1.7. Strict implementation of the removal of Concentrated Electrolyte solutions from all nursing units, which shall only be stored in specialized pharmacy preparation areas or in a locked area. Concentrated Electrolytes vials, if stored in a specialized patient care area (Operating Room, Delivery Room, ER, E-cart & Intensive care area ICU/NICU) must be labeled individually with a visible florescent warning label that states "MUST BE DILUTED".

1.8. Only trained and qualified individuals (physician, nurse, and pharmacist) shall prepare the Concentrated Electrolytes solutions.

1.9. After the preparation of the Concentrated Electrolytes solution, there shall be an independent verification of the electrolyte solution by a second trained and qualified individual. The Pharmacy Division shall establish a checklist that is used for the independent verification. Checklist items shall include concentration calculations, infusion pump rates, and correct line attachments.

1.10. The infusion pump shall be used to administer Concentrated Electrolytes solutions. If an infusion pump is not available, other infusion devices, such as Buretrol administration tubing (tubing with an inline receptacle that limits the volume that will flow into the patient), may be considered for use, but infusions of concentrated solutions must be monitored frequently.

1.11. The pharmacy, nursing and other medical departments shall ensure the training of their qualified staff through policies, procedures, best practices, and annual re-certification.

1.12. The physician's orders shall include the rates of infusion for Concentrated Electrolyte solutions.

2. The following Concentrated Electrolyte solutions shall be stored by and mixed in the Main Pharmacy, excluding emergency situations:
   2.1. Potassium chloride (conc. ≥ 2 mEq/mL)
   2.2. Potassium phosphate (conc. ≥ 2 mEq/mL)
   2.3. Sodium chloride greater than 0.9% (as 3%, 5% & 14.61%)
   2.4. Magnesium sulfate concentrations greater than 20% (as Magnesium sulfate 50 %)
   2.5. Calcium chloride ≥ 10%
   2.6. Calcium gluconate ≥ 10%
   2.7. Sodium acetate (conc. ≥ 4 mmol/mL)
   2.8. Sodium phosphate (conc. ≥ 4 mmol/mL)

3. When infusions of Concentrated Electrolyte injection are required for patient use, only commercially prepared products (when possible), with patient-specific labeling, shall be dispensed. All Concentrated Electrolyte infusions shall be affixed a "High Alert Medication (HAM)" label.

High Alert Medication

4. Two qualified pharmacy staff, one of whom must be a pharmacist, shall independently double-check the accuracy of the product in the pharmacy department using the method as specified in this document, at the point of completion of compounding sterile dosage forms of concentrated electrolytes.

5. If two qualified healthcare professionals are not available in the pharmacy, the checks may be accomplished with a pharmacist and a registered nurse or physician at the location of administration using the documentation of the compound-

ing activities. This check shall be documented in the pharmacy records (e.g., IV compounding profile, record or IV room logbook) by both parties.

6. Selection and Procurement

6.1. Pre-mixed solutions or commercially outsourced admixtures shall be used when possible.

6.2. The range of Concentrated Electrolytes dilutions available shall be standardized and limited.

6.3. Concentrated Electrolyte solutions shall be purchased from different vendors, if possible, to avoid packaging similarities.

6.4. An inventory audit of all Concentrated Electrolytes shall be conducted in the organization and an evaluation of look-alike potential of product containers should be performed.

APPROVAL:

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	HENRY F. ALAVAREN, MD, FPSMID, FPSQua Total Quality Division Officer		1/11/2022
Approved:	**GENESIS GOLDI D. GOLINGAN** President and CEO		2/12/22

DOCUMENTATION:

New Policy

DISSEMINATION:

1. RMCI Hospital Communicator
2. Policies and Procedure Manual
3. Conducting hospital wide continuing education to all healthcare professionals.

REFERENCES:

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Reducing the Risk of Errors Associated with Concentrated Electrolyte Solutions, High-Risk, High-Alert Drugs and Complying with Standard MM.7.10, The Joint Commission Web site (http://www.jointcommission.org) and the NQF Web site

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Effective Date:	06-01-2022
Document Type:	Standard Operating Procedure
Page Number:	1 of 5
Department/Section:	Pharmacy Division
Document Title:	**CONCENTRATED ELECTROLYTES MEDICATION MANAGEMENT**

PURPOSE:

To discuss the organizational-wide risk reduction strategies to prevent errors in handling concentrated electrolytes.

SCOPE:

Applies to all Pharmacy Division staff of Dr. Pablo O. Torre Memorial Hospital

PERSON RESPONSIBLE:

Pharmacists, Staff Nurses, Procurement Section/ Logistics Personnel

PROCEDURE:

1. **Selection and Procurement**
   - 1.1. Pre-mixed solutions or commercially outsourced admixtures should be used when possible.
   - 1.2. The range of Concentrated Electrolytes dilutions available should be standardized and limited.
   - 1.3. The purchase of Concentrated Electrolyte solutions should be from different vendors, if possible, to avoid packaging similarities.
   - 1.4. An inventory audit of all Concentrated Electrolytes in the organization should be conducted and an evaluation of look-alike potential of product containers should be performed.

2. **Storage**
   - 2.1. Concentrated Electrolyte solutions should be removed from all nursing units and should be stored in specialized pharmacy storage areas.
   - 2.2. Labels with a visible Red warning that states HIGH ALERT: MUST DOUBLE CHECK or other fluorescent colored labels stating High-alert Medication (HAM) should be used.

2.3. In the pharmacy, bulk supplies of Concentrated Electrolytes in an area segregated from other drugs should be stored and be distinctly separated by product type.

3. **Ordering and Transcribing**

3.1. Prescribe Potassium solutions for intravenous administration in those concentrations that are available as commercially prepared ready-to-use diluted solutions.

3.2. Include the rate of infusion in all orders.

3.3. Use pre-printed order forms.

3.4. Standardize terminology for prescribing; the term bolus should not be used in reference to Potassium chloride (Kcl).

3.5. Physician orders include the rates of infusion for these solutions.

3.6. Prescribing Concentrated Electrolytes such as Potassium chloride (Kcl) the physician will fill-in completely the e-Potassium pre-printed form.

3.7. All physicians must write daily orders for Concentrated Electrolytes.

4. **Preparation and Dispensing**

4.1. If there is a need for a Potassium solution in a dilution that is not commercially prepared in ready-to use diluted form, prepare the solution in the pharmacy.

4.2. Label the prepared solution with a HIGH-RISK WARNING: DOUBLE CHECK label prior to administration.

4.3. Require a pharmacist to perform a formal, independent check of all products used for IV admixtures of electrolyte solutions.

4.4. Vials should not be dispensed for individual patients. The pharmacy should dispense premixed solutions or prepare patient-specific admixtures as needed.

4.5. After Concentrated Electrolytes solution preparation, there is independent verification of the electrolyte solution by a second qualified and trained individual using a standardized checklist. Checklist items should include

concentration calculations, infusion pump rates, and correct line attachments.

4.6. When infusion of Concentrated Electrolyte injection is required for patient use, only commercially prepared products (when possible), with patient-specific labeling, shall be dispensed. All Concentrated Electrolyte infusions shall be affixed with a "High Alert Double Check" label.

4.7. Two qualified pharmacy staff, one of whom must be a Registered Pharmacist (RPh), shall independently double-check the accuracy of the product in the pharmacy department using the method as specified in this document, at the point of completion of compounding sterile dosage forms of Concentrated Electrolytes.

4.8. All IV fluids in which concentrated Potassium chloride is added required thorough mixing via vigorous inversion and agitation of the IV bag.

5. **Administration**

5.1. Infusion pumps should be used to administer Potassium riders.

5.2. An independent double-check should be required for correct product, dosage, method of delivery, dilution, and patient prior to IV administration of Concentrated Electrolyte solutions.

5.3. No Potassium chloride should be administered by Intramuscular or Intravenous PUSH. See Potassium protocol.

5.4. No other IV push medications should be administered via IV lines through which a large concentration of Potassium is on-going.

6. **Monitoring**

6.1. The patients' electrolytes should be monitored before, during, and after replacement therapy; Electrocardiograph should be performed as indicated.

6.2. A standard protocol should be established for frequency of laboratory studies and monitoring of electrolyte levels.

6.3. Patients taking any Concentrated Electrolytes infusions shall be documented on the e-Medication Administration Record (e-MAR) of the medical record by Nurses and Physician.

APPROVAL:

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Approved:	**GENESIS GOLDI D. GOLINGAN** President and CEO		7/1/22

KEY TASKS	PERSON RESPONSIBLE
1. Does not store concentrated electrolyte solutions except for emergency situations.	Inpatient Pharmacy
2. Does independent double checking of the accuracy of the product in the Pharmacy Division for concentrated electrolytes and at the location of administration using the documentation of the compounding activities.	Inpatient Pharmacist/ Staff Nurse
3. Documents double checking on the MAR of the medical record by both parties.	Staff Nurse
4. Labels the prepared solution with a **HIGH-RISK WARNING.**	Clinical Pharmacist / Staff Nurse
5. Double checks label prior to administration.	
6. Establishes a standard protocol for frequency of laboratory studies and monitoring of electrolyte levels.	Pharmacy Division
7. Standardizes and limits the range of concentrated electrolytes dilutions available.	
8. Purchases concentrated electrolyte solutions from different vendors, if possible, to avoid packaging similarities.	Procurement Section (Logistics Division)
9. Audits all concentrated electrolytes in the organization and performs an evaluation of look-alike potential of product containers.	Inpatient Pharmacy
10. Removes concentrated electrolyte solutions from all nursing units.	

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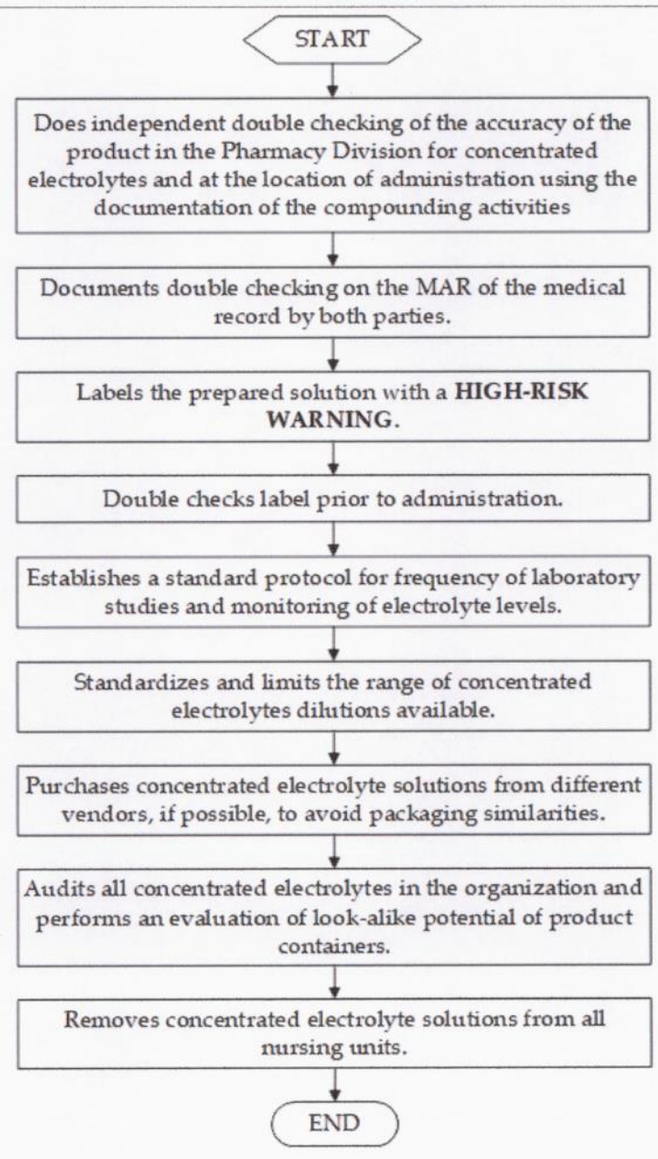
FLOWCHART



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