

Standard Protocol for Electrolyte Replacement Therapy in Adults

Electrolyte	Concentration	Treatment	Comments
Potassium (normal range: 3.5-5.1 mEq/L)	3.0-3.5 mEq/L	Oral KCl 60-80 mEq/day if no sign or symptoms (dose greater than 60 mEq should be divided to avoid GI adverse effects)	1. If CrCl < 30 mL/min, reduce dose by 50%
	2.5-3.0 mEq/L	Oral KCl 120 mEq/day or IV 60-80 mEq administered at 10-20 mEq/hour if signs or symptoms	2. Maximum intravenous infusion rate: - Peripheral line: 10 mEq/hour - Central line: 20 mEq/hour
	2.0-2.5 mEq/L	IV KCl 10-20 mEq/hour (Consider continuous ECG monitoring)	3. Maximum concentration: - Peripheral line: 60 mEq/L - Central line: 100 mEq/L
	Less than 2.0 mEq/L	IV KCl 20-40 mEq/hour (Requires continuous ECG monitoring)	
Magnesium (normal range: 1.7-2.3 mg/dL)	1.5 – 1.8 mg/dL	Consider no replacement, except in patients admitted on cardiac units, who have had recent cardiac surgery, or who have cardiac disorders, including arrhythmias, or in patients with eclampsia or pre-eclampsia In these patient populations: 0.05 g/kg IV	1. If CrCl < 30 mL/min, reduce dose by 50%
	1 -1.4 mg/dL	Oral: Milk of magnesia (MOM) 5mL QID IV: Magnesium Sulfate Injection 0.05-0.1a g/kg	2. If CrCl < 30 mL/min and using magnesium sulfate solution: - Magnesium 1.5-1.8 mg/dL: Magnesium sulfate solution 2000 mg (dilute in 50 mL) x 1 dose - Magnesium 1.1-1.4 mg/dL: Magnesium sulfate solution 2000 mg (dilute in 50 mL) every 4 hours x 3 doses
	Less than 1 mg/dL	IV: Magnesium Sulfate Injection 0.1-0.15a g/kg	3. For IV dosing, use actual body weight unless actual is >130% ideal body weight; in these cases, use ideal body weight 4. Maximum IV dose is 8g/day 5. Intravenous infusion rate Infuse doses of ≤ 0.05 g/kg over 12 hours or over 24 hours for supplements >0.05 g/kg Maximum infusion rate is 0.5 to 1 g/hr
Phosphate (normal range: 2.3-4.7 mg/dL)	2.4-3.0 mg/dL	Consider no replacement, except in patient with active alcoholism, malnourished, liver cirrhosis, critical status, hepatectomy, parenteral nutrition, or burn injury if benefit outweighs risk.	1. If CrCl <30 mL/min, reduce IV dose by 50%
			2. If CrCl <30 mL/min, use of phosphorus tablet preferred due to lower potassium content:

Please mark "N/A" under the item that is not applicable.

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เอกสารฉบับนี้เป็นเอกสารภายในของโรงพยาบาลในกลุ่ม PMC เท่านั้น ห้ามทำสำเนาหรือพิมพ์เผยแพร่ก่อนได้รับอนุมัติ และห้ามบันทึก / แก้ไขข้อความใดๆ บนเอกสารควบคุม

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		In these patient populations: oral/enteral supplementation	
	1.6-2.3 mg/dL	Oral/enteral: 0.16 mmol/kg or 0.32 mmol/kg ^a	- Phosphate 2.4-3.0 mg/dL: 1 tablet every 4 hours while awake x 2 doses
	1.0-1.5 mg/dL	Oral/enteral: 0.32 mmol/kg IV ^a : 15 mmol once over 2 hr, then 0.32 mmol/kg	- Phosphate 1.6-2.3 mg/dL: 1 tablet every 4 hours while awake x 3 doses
	Less than 1 mg/dL	IV: 0.64 mmol/kg IV ^a : 15 mmol once over 2 hr, then 0.64 mmol/kg	- Phosphate 1.0-1.5 mg/dL: 1 tablet every 4 hours while awake x 4 doses 3. For IV dosing, use actual body weight unless actual is >130% ideal body weight; in these cases, use ideal body weight 4. Maximum IV dose is 45 mmol; recheck phosphate level 6 to 12 hours after dose to determine if further supplementation is necessary 5. Administer IV dose over 2 to 3 hours for mild or moderate hypophosphatemia and over 6 to 8 hours for severe hypophosphatemia 6. Round IV supplementation to the nearest 7.5 or 15 mmol increment
Sodium (normal 135-145 mEq/L)	Hyponatremia (Na < 135 mEq/L)	Euvolemic or edematous fluid status <ul style="list-style-type: none"> ● Fluid restriction < 800 mL/day ● Vasopressin antagonist <ul style="list-style-type: none"> ○ Tolvaptan Hypovolemic fluid status <ul style="list-style-type: none"> ● Fluid replacement <ul style="list-style-type: none"> ○ 3% NaCl ○ 0.9% NaCl 	1. Tolvaptan cannot be used more than 30 consecutive days it may cause liver injury 2. Avoid rise > 12 mEq/L in 24 hr (0.5 mEq/L/hr) 3. Symptomatic patients with seizure and coma <ul style="list-style-type: none"> ● 0.75-1 mEq/L/hr until serum Na = 120 mEq/L then decrease to 0.5 mEq/L/hr 4. Corrected hypokalemia in hyponatremia

^a: High-risk: clinically malnourished, active alcoholism, recent surgery, admitted for cardiac disease, graft-versus-host disease, diabetic ketoacidosis, or undergoing diuresis

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Standard Protocol for Electrolyte Replacement Therapy in Adults

Available oral, enteral, and intravenous electrolyte products at Phyathai 2 hospital

	Oral		Intravenous	
	Product	Elemental content	Product	Elemental content
Potassium	Enpott [®] Tablet	6.7 mEq/Tab (500 mg)	Potassium chloride high concentration Injection	K ⁺ = 2 mEq/mL
	Potassium Chloride oral solution (Kaylyte [®])	20 mEq/15 mL	Dipotassium phosphate Injection	K ⁺ = 1 mEq/mL HPO ₄ ²⁻ = 1 mEq/mL (0.5 mmol/mL)
Magnesium	Magnesium chloride 10% solution	1 mEq/mL	Magnesium sulfate 10, 50% Injection	8.1 mEq/Amp (2 mL, 10 mL)
	Chelated Mg Tablet	100 mg		
	MOM Suspension (400 mg/5 mL)	13.7 mEq/5 mL		
	MOM Tablet	10.3 mEq/Tab		
Phosphate	ACIDIC Phosphate solution	18.91 mmol/15 mL	Dipotassium phosphate Injection	K ⁺ = 1 mEq/mL HPO ₄ ²⁻ = 1 mEq/mL (0.5 mmol/mL)
	Unima solution	20 mEq/5 mL	Glycophos for Infusion (20 mL)	PO ₄ ³⁻ = 2 mEq/mL Na ⁺ = 2 mEq/mL
Sodium	Tolvaptan (samSCA [®]) 15 mg tablet	-	3% NaCl infusion 500 mL	Na = 513 mEq/L
	NaCl (Salt Tab) 600mg tablet	Na = 236 mg/tab	0.9% NaCl infusion 500 mL, 1000 mL	Na = 154 mEq/L

Reference

1. Electrolytes: Enteral and Intravenous – Adult – Inpatient Clinical Practice Guideline 2017
2. Pharmacotherapy A pathophysiologic Approach 9th
3. Dickerson RN. Fluids, Electrolytes, Acid-Base Disorders, and Nutrition Support . ACCP Updates in Therapeutics® 2015;59-62.

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