



Basics of Electrolyte Management

Adam Pate, PharmD, Last updated: April 2011
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Why is it important to replace electrolytes?

Patients may be rejected for procedures, side effects, and mortality.

What things should I consider when replacing patients electrolytes?

Renal function	Diarrhea, nausea/vomiting
Salt form- acid/base status	Time of lab draw
Route of administration	Absorption issues

Potassium

Severity	Serum K ⁺ concentration (mEq/L)	Initial I.V. K ⁺ replacement dose
Mild/Moderate	2.5-3.4	20-40 mEq
Severe	<2.5	40-80 mEq

- Every 1 mEq/L below 3.5 represents a 100-200 mEq deficit
- One time dose of 40 mEq is not adequate replacement
- Oral replacement if asymptomatic and K⁺ is 2.5-3.5 mEq/L
- Oral = IV K⁺ at same doses
- Liquid has unpleasant taste
- Avoid dextrose vehicles- may stimulate insulin release and ↓ K⁺

Magnesium

Serum Mg ²⁺ concentration (mEq/L)	Oral	Intravenous
1.0-1.5 (mild/moderate)	Magnesium oxide 400 mg 1-2 tablets TID	8-32 mEq
<1.0 (severe)	N/A	32-64 mEq

- 1 g IV Mg²⁺ = 8 mEq
- MgSO₄ is an unapproved abbreviation
- Normal serum levels needed for potassium and calcium replacement
- Approximately 50% of the dose given is renally eliminated
- Replace P.O. if patient can tolerate (diarrhea - rate limiting side effect)
- Takes 3 to 5 days for total repletion
- Max IV rate = 1 g per hour

Phosphate

PO ₄ Concentration (mg/dL)	IV replacement dose
2.3-2.7	0.08-0.16 mmol/kg
1.5-2.2	0.16-0.32 mmol/kg
<1.5	0.32-0.64 mmol/kg

- Role in several important body functions
- KPO₄ (1.5 mEq of K⁺/mmol of PO₄)
- NaPO₄ (1.3 mEq Na/ mmol PO₄)
- Adding NaPO₄ to Normal Saline will make it hypertonic and should be avoided
- Total dose infused over 4-6 hrs to reduce risk of hypocalcemia and soft tissue calcification
- Oral PO₄ should be used if asymptomatic/mild hypophosphatemia (can cause diarrhea)

Calcium

Total Ca ²⁺ (mg/dL)	Dosing	Continuous IV dose
≥ 8	Give PO replacement	
Mild/moderate and asymptomatic	1-2 g Calcium gluconate over 30-60 minutes repeat q 6 hrs PRN	4.56-9.12 mEq Ca over 30-60 minutes
<7.5 (Severe) or symptomatic	3 g calcium gluconate over 10 minutes repeat PRN	13.6 mEq Ca over 10 min. repeat PRN

- Highly protein bound so always calculate corrected calcium
- Corrected calcium = [(4-albumin) x 0.8] + serum calcium
- Ionized calcium remains normal in low albumin states
- Calcium chloride only used in severe situations typically codes

Sodium

- May reflect increased, decreased, or normal total body sodium
- Must assess osmolality to treat
- Various causes (SIADH, CHF, Ascites)
- Max rate of increase in serum sodium is 8-12 mEq/L in 24 hrs
- Assess underlying cause and treat first

** All replacement doses reflect dosing for patients with **normal** renal function**

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