

Electrolyte Replacement

SODIUM (Na⁺)

Name	Common dose	Elemental Na ⁺ equivalence (mmol=mEq)
Sodium chloride capsule	1 g	17.1 mmol
Sodium phosphate IV	NaPhos 20/15 mmol in 250 mL NS IV over 2.5 hrs	
Various NaCl concentration IV bags	Intermittent/continuous IV infusions	

POTASSIUM (K⁺)

Name	Common dose	Elemental K ⁺ equivalence (mmol=mEq)
Micro-K, Slow-K, Apo-K capsules	600 mg	8 mmol
K-Dur tablet	1500 mg	20 mmol
K-elixir, potassium liquid	15 mL	20 mmol
KCl peripheral IV bolus	KCl 10 mmol in 100 mL SWI IV over 1 hr	
Potassium phosphate IV	KPhos 22/15 mmol in 250 mL NS IV over 2.5 hrs	
KCl continuous IV infusions	KCl 20 or 40 mmol in 1L of NS, 2/3-1/3, D5W, D5NS, D5-½NS, LR	

MAGNESIUM (Mg²⁺)

Generic name (Brand name)	Common dose	Elemental Mg ²⁺ equivalence
Magnesium gluconate tablet	500 mg	29.3 mg
Magnesium glucoheptonate (Rougier) liquid	30 mL	150 mg
Magnesium elemental tablet	50 & 250 mg	50 & 250 mg
Magnesium hydroxide (MOM) liquid	15 mL	495 mg
Magnesium sulfate IV bolus in NS/D5W	2 g or 4g	196 mg or 392 mg

PHOSPHATE (PO₄⁻)

Generic name (Brand name)	Common dose	Elemental PO ₄ ⁻ equivalence
Phosphate effervescent (Novartis) tablet	500 mg	16.1 mmol
Potassium phosphate IV (use if K<3.5)	KPhos 22/15 mmol in 250mL NS IV over 2.5 hrs	
Sodium phosphate IV (use if K>4.5)	NaPhos 20/15 mmol in 250mL NS IV over 2.5 hrs	

CALCIUM (Ca²⁺)

Generic name (Brand name)	Common dose	Elemental Ca ²⁺ equivalence
Calcium carbonate (Tums) chew tablet	500 mg	200 mg
Calcium carbonate (Oscal) tablet	1250 mg	500 mg
Calcium liquid	order as elemental mg	
Calcium gluconate IV bolus (peripheral)	1 g	93 mg
Calcium chloride IV bolus (central)	1 g	272 mg

IRON (Fe²⁺ ferrous [po] and Fe³⁺ ferric [IV])

Generic name (Brand name)	Common dose	Elemental Fe equivalence
Ferrous gluconate tablet	300 mg	35 mg
Ferrous sulfate tablet	300 mg	60 mg
Ferrous fumarate (Palafer) tablet	300 mg	100 mg
Heme iron polypeptide (Proferrin) tablet	1 tablet (nonformulary)	11 mg
Polysaccharide iron complex (FeraMAX) capsule	150 mg (anemia of CKD)	150 mg
Ferrous sulfate liquid (Fer-In-Sol)	300 mg	60 mg
Iron Sucrose (Venofer) IV infusion	300 mg	300 mg
Sodium Ferric Gluconate (Ferrlecit) IV bolus during hemodialysis	125 mg	125 mg

Note: this table provides examples of commonly used products in UAH, but is not a comprehensive table.

Reference: AHS Parenteral Manual

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HYPOKALEMIA

- Asymptomatic: PO preferred (oral bioavailability 100%, can give up to 80mmol at once if tolerated)
- IV for NPO, and consider in addition to PO if severe or symptomatic (limited to 10mmol/hr peripheral IV)
- Generally 20mmol \uparrow K^+ by \sim 0.1mmol (response depends on many factors, e.g. GI and renal K^+ losses)
- K^+ replacement is refractory if concurrent hypoMg or hypoCa

HYPERKALEMIA

- Asymptomatic: kayexalate 15-60g PO/PR, onset 1hr, 60-100g decreases K^+ by 0.5-1mmol
- Symptomatic: kayexalate as above and consider:
 - calcium gluconate (if EKG changes, stabilize cell membrane) 1amp (1g) peripheral IV over 1-2min OR calcium chloride 1amp (1g) central IV over 1-5min
 - sodium bicarbonate (if acidemic, shifts K^+ intracellularly, effect transient 60 mins), 50mEq IV over 5min
 - D50W 1amp IV (dextrose 25g) first, then Humulin R insulin 10units IV push (shifts K^+ intracellularly, effect transient 30 – 60 mins)
 - Furosemide (if volume overloaded, decrease total body K^+) 20 – 40 mg IV (dose variable depending on patient)
 - Hemodialysis (decrease total body K^+)
 - Salbutamol generally not used

HYPOMAGNESEMIA

- Mild (>0.5) and asymptomatic: Mg Rougier 30-60mL po TID-QID (oral bioavailability 33%)
- $Mg < 0.5$ or symptomatic:
 - 0.5-0.7: $MgSO_4$ 2g IV over 2hr
 - <0.5 : $MgSO_4$ 4-5g IV over 2hr
 - 2g increases Mg by 0.2-0.4mmol
 - can recheck labs after 4h

HYPERMAGNESEMIA

- If renal function adequate: NS and furosemide IV
- Ca gluconate 1-2g peripheral IV until response occurs

HYPOPHOSPHATEMIA

- Phosphate Novartis 500mg po TID (oral bioavailability 66%)
- NaPhos or KPhos IV bag over 2.5hr, recheck labs 6hr after dose
- Max 80mmol $PO_4/24hr$ (less if in renal failure)

HYPERPHOSPHATEMIA

- Phosphate binders
 - calcium carbonate 500mg po TID with meals
 - sevelamer 800-1600mg po TID with meals

HYPOCALCEMIA

- Mild-moderate and asymptomatic:
 - calcium elemental 500mg po Daily-TID (calcium carbonate better absorbed with meals)
- Severe or symptomatic:
 - Ca gluconate 1-3g peripheral IV q1-3d prn
 - Ca chloride 0.5-1g central IV q1-3d prn
 - recheck labs after 4h

HYPERCALCEMIA

- Volume expansion with NS, then can give loop diuretic after hydration
- Calcitonin 4u/kg sc q12h x 48h, onset 2h, may have tachyphylaxis after 48h
- Bisphosphonates:
 - pamidronate 30-90mg IV x1
 - zoledronate 4mg IV x1
 - slow onset of 48h, duration of action 1-4 weeks up to 3 months

IRON DEFICIENCY ANEMIA

- PO: ferrous gluconate/sulfate/fumarate 300mg po Daily-TID (takes months to replete iron store)
- IV: iron sucrose 300 or 500mg IV daily x 3d

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