

Adult Electrolyte Replacement Protocol

SPECIFIC REQUIREMENTS:

- Intravenous piggyback infusions of electrolytes must be administered with free-flow protected infusion devices (i.e. Alaris infusion pump). Patients **should meet** the following criteria prior to initiation of the Potassium, Magnesium, or Phosphorus:
 - $SCr < 2 \text{ mg/dL}$
 - $\text{Weight} > 40 \text{ kg}$
- Electrolyte replacements, Calcium chloride (Level I areas only) or Calcium gluconate (all levels of care), Magnesium sulfate, Potassium chloride, or Potassium Phosphate, may be ordered individually or in combination.

INTRAVENOUS POTASSIUM REPLACEMENT

- Recommended rate of infusion is 10 mEq/h
- Maximum rate of intravenous replacement is 20 mEq/h with continuous ECG monitoring (the maximum rate may be increased to 40 mEq/h in emergency situations)

Standard Concentrations: 10 mEq/50 mL, 10 mEq/100mL, 20 mEq/50 mL and 20 mEq/100 mL

- **Maximum Concentration for Central IV administration** = 20 mEq/50 mL
- **Maximum Concentration for Peripheral IV administration** = 10 mEq/50 mL

If Potassium Level is 3.6-3.9 mEq/L:

- **Central IV:** 20 mEq IV over 2 HR x 1 dose
- **Peripheral IV:** 10 mEq IV over 1 HR x 2 doses
- **Follow-Up/Monitoring:** No additional follow-up/monitoring until repeat AM labs or the patient declines.

If Potassium Level is 3.4 – 3.5 mEq/L:

- **Central IV:** 20 mEq IV over 2 HR x 1 dose **AND** 10 mEq IV over 1 HR x 1 dose
- **Peripheral IV:** 10 mEq IV over 1 HR x 3 doses
- **Follow-Up/Monitoring:** No additional follow-up/monitoring until repeat AM labs or the patient declines.

If Potassium Level is 3.1-3.3 mEq/L:

- **Central IV:** 20 mEq IV over 2 HR x 2 doses
- **Peripheral IV:** 10 mEq IV over 1 HR x 4 doses
- **Follow-Up/Monitoring:** Recheck serum potassium level 2 hours after the infusion is complete.

If Potassium Level is 2.6 – 3 mEq/L:

- **Central IV:** 20 mEq IV over 2 HR x 2 doses AND 10 mEq IV over 1 HR x 1 dose
- **Peripheral IV:** 10 mEq IV over 1 HR x 5 doses
- **Follow-Up/Monitoring:** Recheck serum potassium level 2 hours after the infusion is complete.

If Potassium Level is 2.3 – 2.5 mEq/L:

- **Central IV:** 20 mEq IV over 2 HR x 3 doses
- **Peripheral IV:** 10 mEq IV over 1 HR x 6 doses
- **Follow-Up/Monitoring:** Recheck serum potassium level 2 hours after the infusion is complete

If Potassium Level is < 2.3 mEq/L:

- **Central IV:** 20 mEq IV over 2 HR x 3 doses AND call PA/NP
- **Peripheral IV:** 10 mEq IV over 1 HR x 6 doses and call PA/NP
- **Follow-Up/Monitoring:** Recheck serum potassium level 2 hours after the infusion is complete.

NOTE: If both potassium and phosphorus replacement required, subtract the mEq of potassium given as potassium phosphate from total amount of potassium

ORAL or ENTERAL POTASSIUM REPLACEMENT

Standard dosage forms: KCl 20mEq tablet or KCl 10% solution (20 mEq/15 mL)

If Potassium Level is 3.7 – 3.9 mEq/L: 20 mEq KCl PO/Per feeding tube x 1 dose.

Follow-Up/Monitoring: No additional follow-up/monitoring until repeat AM labs or the patient declines.

If Potassium Level is 3.5 – 3.6 mEq/L: 20 mEq KCl PO/Per feeding tube Q2H x 2 doses.

Follow-Up/Monitoring: No additional follow-up/monitoring until repeat AM labs or the patient declines.

If Potassium Level is 3.3 – 3.4 mEq/L: 20 mEq KCl PO/Per feeding tube Q2H x 3 doses

Follow-Up/Monitoring: Recheck serum potassium level 4 hours after the last oral dose

If Potassium Level is 3.1 – 3.2 mEq/L: 20 mEq KCl PO/Per feeding tube Q2H x 4 doses

Follow-Up/Monitoring: Recheck serum potassium level 4 hours after the last oral dose.

If Potassium Level is < 3.1 mEq/L: 20 mEq KCl PO/Per feeding tube Q2H x 4 doses AND Call PA/NP

Follow-Up/Monitoring: Recheck serum potassium level 4 hours after the last oral dose

MAGNESIUM REPLACEMENT

- Infusions should be no faster than 1gm of magnesium sulfate every 30 minutes.
- Standard Concentrations: 1 gm/100 mL and 2 gm/50 mL

If Magnesium Level is 1.5 – 2 mEq/L: 2 grams Magnesium Sulfate IV over 1 HR

Follow-Up/Monitoring: No additional follow-up/monitoring until repeat AM labs or the patient declines.

If Magnesium Level is 0.9 – 1.4 mEq/L: 2 grams Magnesium Sulfate IV over 1 HR x 2 doses

Follow-Up/Monitoring: Recheck serum magnesium level 2 hours after the infusion is complete

If Magnesium Level is < 0.9 mEq/L: 2 grams IV Magnesium Sulfate over 1 hour x 2 dose AND Call PA/NP

Follow-Up/Monitoring: Recheck serum magnesium level 2 hours after the infusion is complete

PHOSPHORUS REPLACEMENT

- Replacement must be ordered in mmol of phosphorus.
- Recommended rate = 3mmol/hr (= 4.4 mEq/h of K)
- Maximum rate = 10 mmol/hr (= 15 mEq/h of K)
- Use SODIUM phosphate for patients with serum potassium > 4.5 mEq/L and serum sodium < 145mEq/L

Standard Concentrations:

- o Potassium Phosphate: 15 mmol/250 mL and 21 mmol/250 mL
- o Sodium Phosphate: 15 mmol/250 mL, 21 mmol/250 mL, and 30 mmol/250 mL

If Phosphorus Level is 2 – 2.5 mg/dL: 15 mmol Potassium Phosphate IV over 4 HR.

Follow-Up/Monitoring: No additional follow-up/monitoring until repeat AM labs or the patient declines.

If Phosphorus Level is 1 – 1.9 mg/dL: 21 mmol Potassium Phosphate IV over 4 HR.

Follow-Up/Monitoring: Recheck serum Phosphorus level 2 hours after infusion complete.

If Phosphorus Level is < 1 mg/dL: 30 mmol Potassium Phosphate IV over 4 HR (Administered as: 15 mmol Potassium Phosphate IV Q2H x 2 doses).

Follow-Up/Monitoring: Recheck serum Phosphorus level 2 hours after infusion complete.

NOTE: If both potassium and phosphorus replacement required, subtract the mEq of potassium given as potassium phosphate from total amount of potassium required. (Conversion: 3 mmols KPO₄ = 4.4 mEq K⁺)

- Call pharmacy for assistance if needed.

CALCIUM REPLACEMENT

You must specify the salt form (gluconate or chloride)

Calcium chloride:

- Reserved for Level I areas only
- Must be administered via a central line
- Maximum rate = 1 gm IV over 10 minutes

Calcium gluconate:

- May be used in all levels of care
- Administration via a central line is *preferred*; however, it may be given peripherally with adequate IV access.
- Maximum rate = 3 gm IV over 10 minutes

Standard concentrations:

- Calcium *chloride*: 1 gm/50 mL, 2 gm/100 mL, 3 gm/150 mL
- Calcium *gluconate*: 1 gm/50 mL, 2 gm/100 mL

If Ionized Calcium Level is 1 – 1.1 mmol/L:

- Total **Calcium Gluconate** Replacement: 1 gram IV over 1 HR.
- Total **Calcium Chloride** Replacement: 1 gram IV over 1 HR.

Follow-Up/Monitoring: No additional follow-up/monitoring until repeat AM labs or the patient declines.

If Ionized Calcium Level is 0.85 – 0.99 mmol/L:

- Total **Calcium Gluconate** Replacement: 2 grams IV over 1 HR.
- Total **Calcium Chloride** Replacement: 2 grams IV over 1 HR

-Follow-Up/Monitoring: Recheck serum ionized calcium 2 hours after infusion complete.

If Ionized calcium Level is <0.85mmol/L:

- Total **Calcium Gluconate** Replacement: 2 grams IV over 1 HR AND call PA/NP
- Total **Calcium Chloride** Replacement: 3 grams IV over 1 HR

Follow-Up/Monitoring: Recheck serum ionized calcium 2 hours after infusion complete.