POTASSIUM SUPPLEMENTS (parenteral) (po-tas-ee-um)

potassium acetate
potassium chloride

Classification: mineral and electrolyte replacements/supplements

Pregnancy Category C

Indications
Treatment/prevention of potassium depletion. Arrhythmias due to digoxin toxicity.

Action
Maintain acid-base balance, isotonicity, and electrophysiologic balance of the cell. Activates many enzymatic reactions, essential to transmission of nerve impulses; contraction of cardiac, skeletal, and smooth muscle; gastric secretion; renal function; tissue synthesis; and carbohydrate metabolism. Therapeutic Effects: Replacement. Prevention of deficiency.

Pharmacokinetics

TIME/ACTION PROFILE (increase in serum potassium levels)

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
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<tbody>
<tr>
<td>IV</td>
<td>Rapid</td>
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Contraindications/Precautions
Contraindicated in: Hyperkalemia; Severe renal impairment; Untreated Addison’s disease; Severe tissue trauma; Hyperkalemic familial periodic paralysis. Potassium acetate injection contains aluminum, which may become toxic with prolonged use in high risk groups (renal impairment, premature neonates).

Use Cautiously in: Cardiac disease; Renal impairment; Hypokalemia (renal failure correction of hypokalemia more difficult). Patients receiving potassium-sparing drugs.

Adverse Reactions/Side Effects

Interactions
Drug-Drug: Use with potassium-sparing diuretics or ACE inhibitors or angiotensin II receptor antagonists may lead to hyperkalemia. Anticholinergics may cause GI mucosal lesions in patients taking wax-matrix potassium chloride preparations.

Route/Dosage
Expressed as mEq of potassium. Potassium acetate contains 10.2 mEq/g; potassium chloride contains 13.4 mEq/g.

Normal Daily Requirements

| IV (Adults) | 40–80 mEq/day |
| IV (Children) | 2–3 mEq/kg/day |
| IV (Neonates) | 2–4 mEq/kg/day |

Treatment of Hypokalemia

| IV (Adults) | 10–20 mEq/dose (maximum: 40 mEq/dose) to infuse over 2–3 hr (maximum infusion rate: 40 mEq/hr) |
| IV (Children) | 0.5–1 mEq/kg/dose as an infusion to infuse at 0.3–0.5 mEq/kg/hr (maximum infusion rate 1 mEq/kg/hr) |

NURSING IMPLICATIONS

Assessment
- Assess for signs and symptoms of hypokalemia (weakness, fatigue; U wave on ECG, arrhythmia, polyuria, polydipsia) and hyperkalemia (see Toxicity and Overdose).
- Monitor pulse, BP, and ECG periodically during IV therapy.

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Lab Test Considerations: Monitor serum potassium before and periodically during therapy. Monitor renal function, serum bicarbonate, and pHi. Determine serum magnesium levels if patient has refractory hypokalemia. Hypomagnesemia should be corrected to facilitate effectiveness of potassium replacement. Monitor serum chloride because hypochloremia may occur if replacing potassium without concurrent chloride.

Toxicity and Overdose: Symptoms of toxicity are those of hyperkalemia (slow, irregular heartbeat; fatigue; muscle weakness; paresthesia; confusion; dyspnea; peaked T waves; depressed ST segments; prolonged QT segments; loss of P waves; and cardiac arrhythmias).

Treatment includes discontinuation of potassium, administration of sodium bicarbonate to correct acidosis, dextrose and insulin to facilitate passage of potassium into cells, calcium salts to reverse ECG effects (in patients who are not receiving digoxin), sodium polystyrene used as an exchange resin, and/or dialysis for patient with impaired renal function.

Potential Nursing Diagnoses

Imbalanced nutrition: less than body requirements (Indications)

Implementation

High Alert: Medication errors involving too rapid infusion or bolus IV administration of potassium chloride have resulted in fatalities. See IV administration guidelines below.

IV:

Assess for extravasation; severe pain and tissue necrosis may occur. High Alert: Never administer potassium IV push or bolus.

Potassium Acetate

pH: 5.5–8.0.

Continuous Infusion: High Alert: Do not administer undiluted. Each single dose must be diluted and thoroughly mixed in 100–1000 mL of IV solution. Usually limited to 80 mEq/L via peripheral line (200 mEq/L via central line).

Rate: High Alert: Infuse slowly, at a rate up to 10 mEq/hr in adults or 0.5 mEq/kg/hr in children on general care areas. Check hospital policy for maximum infusion rates (maximum rate in monitored setting 40 mEq/hr in adults or 1 mEq/kg/hr in children).

Solution Compatibility:

May be diluted in dextrose, saline, LR, dextrose/saline, dextrose/Ringer's solution, dextrose/LR combinations. Commercially available premixed with many other IV solutions.

Y-Site Compatibility:

Acyclovir, albendazole, allopurinol, amiodarone, amphotericin B, ampicillin, atropine, aztreonam, calcium gluconate, chlordiazepoxide, chlorpromazine, ciprofloxacin, cisatracurium, cladribine, cyanocobalamin, digoxin, diltiazem, diphenhydramine, doxorubicin, doxepin, dopamine, doxorubicin liposome, droperidol, edrophonium, edetate disodium, epinephrine, esmolol, famotidine, fentanyl, filgrastim, fludarabine, fluorouracil, furosemide, gemcitabine, granisetron, heparin, hydralazine, idarubicin, indomethacin, insulin, isoproterenol, labetalol, lidocaine, linezolid, lorazepam, magnesium sulfate, menadione, mesna, methotrexate, metoclopramide, methylprednisolone, methylergonovine, minocycline, morphine, nafcillin, nadroparin calcium, neostigmine, nevirapine, neomycin, norepinephrine, ondansetron, oxaliplatin, oxaprin, paclitaxel, penicillin G potassium, pentazocine, phytonadione, procainamide, propofol, propranolol, povidone-iodine, prothrombin, pyridostigmine, quinidine, ranitidine, remifentanil, sargramostim, sodium bicarbonate, succinylcholine, tacrolimus, teniposide, theophylline, thiotepa, tirofiban, trimethaphan, vinorelbine, warfarin, zidovudine.

Y-Site Incompatibility:

Amphotericin B cholesteryl sulfate complex, diazepam, ergotamine tartrate, phenytoin.

Additive Compatibility:

Calcium gluconate, cimetidine, lidocaine, ranitidine, sodium bicarbonate, vitamin B complex with C.

Potassium Chloride

pH: 4.5–8.0.

Continuous Infusion: High Alert: Do not administer concentrations of >1.5 mEq/mL undiluted; fatalities have occurred. Concentrated products have black caps or black stripes above constriction on ampules and are labeled with a warning about dilution requirement. Each single dose must be diluted and thoroughly mixed in 100–1000 mL of IV solution. Usually limited to 80 mEq/L via peripheral line (200 mEq/L via central line).

Concentrations of 0.5 and 0.6 mEq/mL are intended for administration on calcareous infusion devices and do not require dilution.

Rate: High Alert: Bolus: at a rate up to 10 mEq/hr in adults or 0.5 mEq/hr in children on general care areas. Check hospital policy for maximum infusion rates (maximum rate in monitored setting 40 mEq/hr in adults or 1 mEq/kg/hr in children).

Use an infusion pump.

Solution Compatibility:

May be diluted in dextrose, saline, LR, dextrose/saline, dextrose/Ringer's solution, dextrose/LR combinations. Commercially available premixed with many other IV solutions.

Y-Site Compatibility:

Acyclovir, albendazole, allopurinol, amiodarone, amphotericin B, ampicillin, atropine, aztreonam, calcium gluconate, chlordiazepoxide, chlorpromazine, ciprofloxacin, cisatracurium, cladribine, cyanocobalamin, digoxin, diltiazem, diphenhydramine, doxorubicin, doxepin, dopamine, doxorubicin liposome, droperidol, edrophonium, edetate disodium, epinephrine, esmolol, famotidine, fentanyl, filgrastim, fludarabine, fluorouracil, furosemide, gemcitabine, granisetron, heparin, hydralazine, idarubicin, indomethacin, insulin, isoproterenol, labetalol, lidocaine, linezolid, lorazepam, magnesium sulfate, menadione, mesna, methotrexate, metoclopramide, methylprednisolone, methylergonovine, minocycline, morphine, nafcillin, nadroparin calcium, neostigmine, nevirapine, neomycin, norepinephrine, ondansetron, oxaliplatin, oxaprin, paclitaxel, penicillin G potassium, pentazocine, phytonadione, procainamide, propofol, propranolol, povidone-iodine, prothrombin, pyridostigmine, quinidine, ranitidine, remifentanil, sargramostim, sodium bicarbonate, succinylcholine, tacrolimus, teniposide, theophylline, thiotepa, tirofiban, trimethaphan, vinorelbine, warfarin, zidovudine.

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POTASSIUM SUPPLEMENTS (parenteral)

Patient/Family Teaching

- Advise patient regarding sources of dietary potassium. Encourage compliance with recommended diet.
- Instruct patient to report dark, tarry, or bloody stools; weakness; unusual fatigue; or ringing of ears. Notify health care professional if nausea, vomiting, diarrhea, or stomach discomfort persists. Dosage may require adjustment.
- Emphasize the importance of regular follow-up exams to monitor serum levels and progress.

Evaluation/Desired Outcomes

- Prevention and correction of serum potassium depletion.
- Cessation of arrhythmias caused by digoxin toxicity.

Why was this drug prescribed for your patient?