

Alert	<p>Most often given in conjunction with calcium for the prevention and treatment of metabolic bone disease in preterm infants.</p> <p>1 mmol phosphorus/phosphate (P) = 31 mg elemental phosphorus. 1 mmol elemental calcium (Ca) = 40 mg elemental calcium.</p> <p>Separate oral doses from calcium supplements by at least 1 hour.</p> <p>When using IV preparation, always check plasma sodium and potassium concentrations to assist in choosing the right phosphate preparation (e.g. sodium or potassium phosphate preparation).</p>
Indication	<p>Treatment of Metabolic Bone Disease.</p> <p>Treatment of hypophosphataemia.</p> <p>Supplementation to meet the recommended daily intakes.</p>
Action	<p>Phosphorus is a major intracellular mineral and is important in bone mineralisation and energy production.</p>
Drug Type	<p>Mineral</p>
Trade Name	<p>Phosphate-Sandoz® oral effervescent tablets Each tablet contains: 16.1 mmol phosphate (equivalent to 500 mg elemental phosphorus); 20.4 mmol sodium; 3.1 mmol potassium</p> <p>Sodium dihydrogen phosphate Phebra IV (preferred IV preparation) Each 10 mL vial (sodium dihydrogen phosphate 1.56 g) contains: 10 mmol phosphate; 10 mmol sodium; 20 mmol hydrogen</p> <p>Potassium dihydrogen phosphate concentrated injection DBL IV Potassium dihydrogen phosphate concentrated injection Phebra IV Each 10 mL ampoule (potassium dihydrogen phosphate 1.361 g) contains: 10 mmol phosphate; 10 mmol potassium; 20 mmol hydrogen</p>
Presentation	<p>Oral: 500 mg effervescent tablets; IV preparation (e.g. sodium or potassium dihydrogen phosphate) can be given orally.</p> <p>IV: Sodium dihydrogen phosphate 10 mL vial; Potassium dihydrogen phosphate concentrated injection 10 mL ampoule.</p>
Dosage/Interval	<p>Treatment of metabolic bone disease (MBD)</p> <p>PO: 1 to 3 mmol/kg/day in 2-4 divided doses as an addition to intake from milk and other sources to a maximum intake of 4.5 mmol/kg/day.</p> <p>Use either Sodium dihydrogen phosphate Phebra IV preparation or Phosphate-Sandoz tablets.</p> <p>General principles of treatment of MBD:</p> <ol style="list-style-type: none"> Commence at low dose (e.g. 1 mmol/kg/day) and titrate the dose up as tolerated. Given in conjunction with calcium supplementation (but not together - example: Calcium 8 AM, 2 PM, 8 PM and Phosphorus 6 AM, 12 MD, 6 PM) Aim to reach the upper end of the recommended intake: Ca 5 mmol/kg/day and P 4.5 mmol/kg/day.⁸ Dose can be adjusted with a goal of slight excess supply aiming for urinary calcium ≥ 1.2 mmol/L and phosphate ≥ 0.4 mmol/L. <p>Treatment of acute hypophosphataemia</p> <p>IV: 0.2 mmol/kg/dose [range 0.15–0.33 mmol/kg/dose] over 6 hours. Repeat as necessary. Aim to maintain normophosphataemia of 1.8–2.6 mmol/L (5.6–8.1 mg/dl).</p> <p>Daily Supplementation to meet the recommended daily intakes (RDI)</p> <p>Parenteral:¹²</p>

	<p>Preterm – First days of life: 1.0-2.0 mmol/kg/day (31-62 mg/kg/day) Growing preterm – 1.6-3.5 mmol/kg/day (77-108 mg/kg/day) Term neonates – 0.7-1.3 mmol/kg/day (20-40 mg/kg/day)</p> <p style="text-align: center;">Enteral: 2–4.5 mmol/kg/day (62–140 mg/kg/day of phosphorous)^{7,8}</p> <p>1. Calculate intake from parenteral and enteral sources 2. Supplement the difference via IV or oral route.</p>
Route	PO IV
Maximum Daily Dose	
Preparation/Dilution	<p>Oral Option 1 (preferred option for infants going home or when a long storage time is required in the NICU): Disperse 500 mg (16.1 mmol) Phosphate-Sandoz in 16 mL of water for injection to make a solution with a concentration of 1 mmol/mL.</p> <p>Option 2 (can be used where preparation with low osmolality is preferred e.g. infants with history of feed intolerance): IV sodium dihydrogen phosphate decanted into a bottle and given orally undiluted (expiry time: 7 days).</p> <p>IV infusion for treatment of acute hypophosphataemia: IV infusion (sodium dihydrogen phosphate): Draw up 1 mL (1 mmol phosphate) and add 19 mL sodium chloride 0.9% or glucose 5% to make a final volume of 20 mL with a concentration of 0.05 mmol/mL. Draw up 3 mL/kg (0.15 mmol/kg).</p> <p>IV infusion (potassium dihydrogen phosphate): Draw up 1 mL (1 mmol phosphate) and add 24 mL sodium chloride 0.9% or glucose 5% to make a final volume of 25 mL with a concentration of 0.04 mmol/mL. Draw up 3.75 mL/kg (0.15 mmol/kg).</p>
Administration	<p>Oral Can be administered with feeds (refer to evidence summary section). Separate calcium supplements by at least 2 hours.</p> <p>IV As part of parenteral nutrition fluid – refer to individual parenteral nutrition formulations.</p> <p>IV infusion for treatment of acute hypophosphataemia: IV sodium dihydrogen phosphate or IV potassium dihydrogen phosphate: Infuse over at least 6 hours. For severe hypophosphataemia infuse over 8–12 hours. Maximum infusion rate of 0.2 mmol/kg/h.</p>
Monitoring	<p>Phosphate, calcium, magnesium, alkaline phosphatase concentrations are required at least fortnightly or more often if required. Once these concentrations normalise, serum analysis may be performed once monthly for 6 months or at the discretion of the clinician.¹⁰ Urinary calcium and phosphate and Tubular Reabsorption Phosphate (TRP)%, parathormone, and vitamin D concentrations may be useful under certain circumstances .</p>
Contraindications	Hyperphosphataemia, dehydration, severe renal insufficiency, shock.
Precautions	Hypernatraemia (avoid sodium dihydrogen phosphate). Hyperkalaemia (avoid potassium dihydrogen phosphate)
Drug Interactions	<p>Calcium and magnesium antacids (e.g. acetate, carbonate, citrate, hydroxide etc.) reduce phosphate absorption — separate doses by at least 2 hours. Additive effects with other drugs that may prolong QT interval. Potassium dihydrogen phosphate preparation may increase the risk of hyperkalaemia when used in conjunction with potassium sparing diuretics (e.g. spironolactone).</p>

Adverse Reactions	Diarrhoea (oral use only), hypocalcaemia, nephrotoxicity, prolonged QT interval, hypotension, hypomagnesaemia. Hyperphosphataemia – carpopedal spasm, seizures. ²
Compatibility	<u>Potassium dihydrogen phosphate</u> Compatible fluids: Glucose 5%, glucose 10%, glucose in Hartmann’s solution, glucose in Ringer’s solution, glucose in sodium chloride solutions, Hartmann’s, Ringer’s, sodium chloride 0.45%, sodium chloride 0.9%, sodium chloride 3%. Compatible via Y-site : No information. <u>Sodium dihydrogen phosphate</u> Compatible fluids: Glucose 5%, sodium chloride 0.9%. Compatible via Y-site : No information
Incompatibility	<u>Potassium dihydrogen phosphate</u> Fluids: No information Drugs: Aciclovir, amiodarone, anidulafungin, calcium folinate, calcium salts, caspofungin, ceftaroline, fosamil, ciprofloxacin, dolasetron, doripenem, ketamine, lorazepam, magnesium salts, mycophenolate, mofetil, rocuronium. Solutions that contain other cations such as calcium, magnesium, iron and aluminium may also precipitate. <u>Sodium dihydrogen phosphate</u> Fluids : No information Drugs: Aciclovir, amiodarone, anidulafungin, calcium folinate, calcium salts, caspofungin, ceftaroline, fosamil, ciprofloxacin, dolasetron, mycophenolate, mofetil. Calcium, aluminium or magnesium, iron and magnesium containing solutions.
Stability	Preparation from oral effervescent tablets: It is to be used immediately after preparation and discard unused portion. Oral preparation from IV sodium dihydrogen phosphate: 7 days
Storage	Store below 25°C.
Special Comments	
Evidence summary	Refer to full version.
References	Refer to full version.

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