



## Specialised Medication – Intravenous Phosphate Supplementation in Adults Guideline

### 1. Guiding Principles

This document provides guidance for the prescription and administration of intravenous phosphate supplementation in adults.

### 2. Guideline

#### 2.1 Classification

Metabolic electrolyte (phosphate supplement).

#### 2.2 Presentation<sup>2,3</sup>

**Sodium dihydrogen phosphate** = Sodium Acid Phosphate

Sodium ions = 1mmol per 1mL (10mL vial)

Phosphate ions = 1mmol per 1mL (10ml vial)

Sodium dihydrogen phosphate is the preferred agent unless the patient is hypokalaemic or hypernatraemic.

**Potassium dihydrogen phosphate** = Potassium Acid Phosphate

Potassium ions = 1mmol per mL (10mL vial)

Phosphate ions = 1mmol per mL (10mL vial)

Potassium dihydrogen phosphate is a form of concentrated injectable potassium and therefore prescription and administration within safe doses, concentration and rates for potassium also apply.

#### 2.3 Indication<sup>4, 5</sup>

**Prescription and monitoring by senior medical staff only.**

For the replacement of phosphate in a deficient patient where **oral replacement is inappropriate**. This includes:

- patients with absorption issues
- patients nil by mouth
- patients with symptomatic significant hypophosphataemia (as a guide, serum phosphate less than 0.3mmol/L).

**The doses and rates recommended in standard references for treatment of acute symptomatic hypophosphataemia in critically ill patients greatly exceed those in this guideline. The required monitoring is therefore much more intensive. Consult your region's Critical Care area or Pharmacy Department.**

## 2.4 Contraindications<sup>3</sup>

Intravenous phosphate is contra-indicated in patients with severe renal impairment (GFR <30% normal) due to an increased risk of hyperphosphataemia.

## 2.5 Precautions/ monitoring<sup>4</sup>

The monitoring of the following is required; prior to a phosphate infusion, before any subsequent infusions and at least every 24 hours

- Sodium or potassium (depending on salt used)
- Phosphate
- Magnesium
- Calcium
- Renal function

Incompatible with calcium and magnesium solutions due to the risk of precipitation.

Not for use in patients with an abnormal serum calcium (either hypo or hyper-) due to the close relationship between calcium and phosphate. The correction of calcium is recommended prior to the administration of intravenous phosphate.

## 2.6 Dosage/ administration<sup>1,4,6,7,8,9, 10,11</sup>

Compatible fluids: Sodium chloride 0.9%, glucose 5%

**Dose should be given over a long infusion time to allow for uptake into intracellular stores and bone. Standard recommendation for infusion is 10mmol of phosphate over 12 hours, however in practice higher rates are used.**

### Peripheral line:

**Dilute before use – FOR IV INFUSION ONLY**

**Dose: 10mmol of phosphate**

**Concentration: 10mmol of phosphate per minimum 250mL of compatible fluid**

**Rate: Administer over 2-12 hours (longer infusion times are preferable – see above)**

### Central Venous Line:

**Dilute before use – FOR IV INFUSION ONLY**

**Dose: 10mmol of phosphate**

**Concentration: 10mmol of phosphate per minimum 100mL of compatible fluid**

**Rate: Administer over 2-12 hours (longer infusion times are preferable – see above)**

## 2.7 Adverse effects<sup>2,3</sup>

Hyperphosphataemia, hyperkalaemia, hypernatraemia, hypomagnesaemia, hypocalcaemia, hypotension.

## 2.8 Nursing implications <sup>1,4,7,8,9</sup>

- An infusion pump (rate controlled device) must be used for administration.
- Monitor flow rate.
- Dilution before administration is essential, especially with potassium dihydrogen phosphate to avoid large potassium bolus.
- Never add either phosphate salt to a hanging bag or to a bag that already contains any additive
- **Invert bag at least ten times to ensure thorough mixing.**
- Avoid extravasation.
- Central Venous Line or large peripheral line is preferred.

Supply of both **sodium** dihydrogen phosphate and **potassium** dihydrogen phosphate ampoules are governed by the Pharmacy Department of each region and may require presentation of the appropriate IV fluid order for dispensing.

## 2.9 Non-Parenteral Supplementation<sup>12</sup>

### PHOSPHATE-SANDOZ SOLUBLE TABLETS

**Each tablet contains: 16mmol phosphate, 3mmol potassium and 20 mmol of sodium**

Dose: 2 tablets three times daily until serum phosphate normalises (reviewed daily) – unless chronic therapy is indicated.

Concurrent administration with aluminium, calcium or magnesium salts (contained in common antacids and supplements) may cause formation of insoluble salts and reduced absorption of phosphate. The spacing of oral phosphate doses from these products is recommended.

Oral phosphate supplementation is readily available and can be given per oral or via a nasogastric tube.

## 3. Definitions

|                             |   |
|-----------------------------|---|
| <b>Senior Medical Staff</b> | Medical officer practising at a level of registrar, general practitioner (GP) (for district sites) or higher. |
|-----------------------------|---|

## 4. Roles and Responsibilities

The **medical officer** is responsible for completing all treatment and duties within scope of practice.

The **registered nurse** is responsible for completing all nursing duties for the patient within scope of practice

## 5. Compliance

It is a requirement of the WA Health Code of Conduct that employees “comply with all state government policies, standards and Australian laws and understand and comply with all WA Health business, administration and operational directives and policies”. Failure to comply may constitute suspected misconduct under the [WA Health Misconduct and Discipline Policy](#).

## 6. Evaluation

Adverse events and clinical incidents relating to the administration of intravenous phosphate supplementation are to be zero (0).

## 7. References

1. WA Health [High Risk Medication Policy](#)
2. WACHS [High Risk Medications Procedure](#)
3. DBL Potassium Dihydrogen Phosphate Product Information. Accessed 2017.
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8. Miller D, Slovis C. Hypophosphataemia in the Emergency Department Therapeutics. Am J Emerg Med 2000; 18:457-61
9. Geerse D et al. Treatment of Hypophosphataemia in the Intensive Care Unit: A Review. Critical Care 2010. 14:R147
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11. Fiona Stanley Hospital – Intravenous Drug Administration Guideline: Sodium Dihydrogen Phosphate. Accessed 2017.
12. Bech A et al. Hypophosphataemia on the Intensive Care Unit: Individualised phosphate replacement based on serum levels and distribution volume. Journal of Critical Care 28:838-843
13. Sandoz-Phosphate Tablets Product Information. Accessed 2017.

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