Potassium phosphate intravenous infusion for adults

Who can administer

POTASSIUM phosphate

- **Infusions prepared at ward level using ampoules**
  - May be administered by registered competent doctor or nurse/midwife, PROVIDED theÂ guidelines belowÂ (in Methods of Administration) have been adhered to

Important information

- **There are two separate monographs for IV phosphate- sodium phosphate or potassium phosphate- please ensure you are using the correct monograph**
- Caution with rate of administration (due to potassium content)
- Suggest: **Senior doctor review** before administration of intravenous phosphate,Â as it's useÂ **can be dangerous**
  - **Caution:** the response to any given dose cannot be predicted, and IV use can cause hypocalcaemia (tetany), calcium-phosphate precipitation in the kidneys, and fatal arrhythmias [ref 1]
- Patients withÂ **HYPOcalcaemia**Â should have their calcium corrected before replacing phosphateÂ [ref 5]
- Patients withÂ **severe HYPERcalcaemiaÂ** who require phosphate replacement: seek specialist adviceÂ [ref 4]
- **Renal impairment**:Â Requires dose adjustment- see below
- **Give in a dedicated line**Â as it may precipitate with other drugsÂ

Available preparations

Phosphate salt	Volume	Phosphate content per vial/ampoule/bag	Sodium content per vial/ampoule/bag	Potassium content per vial/ampoule/bag
Potassium phosphate **ampouleÂ** (Braun)	20ml	12mmol	nil	20mmol
Phosphate polyfusor pre-mixed **bag** - very severe hypophosphataemia.Â **Supplied only on request.**	500ml	50mmol	81mmol	9.5mmol

Reconstitution

Already in solution

Ampoules should be diluted further prior to administration

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Addition of potassium phosphate concentrate to infusion bags

- Preparation must be done**Â jointly by a doctor and a nurseÂ** in the clinic room.
- Both the Controlled Drug register, and the Additive label**Â must be signed**Â by the SAME doctor and

nurse
- UNUSED ampoules must immediately be returned to the CD press and signed back into the CD register by the SAME doctor and nurse
- Clearly over-label the infusion bag to reflect the TOTAL amount of mmol of potassium phosphate
- After adding potassium phosphate concentrate to an infusion bag, squeeze and invert bag aÂ **MINIMUMÂ** of ten times to avoid inadvertent administration of a toxic bolusÂ

Infusion fluids

Sodium chloride 0.9% (preferred)Â

Glucose 5% may also be used if clinically appropriate

Methods of intravenous administration

Intermittent intravenous infusion (using an electronically controlled infusion device)

- Administer as per guidelines below

Dose in adults

Table 1: Guidance on route given below but clinical judgement is always requiredÂ [ref 1]	
Route of administration	Phosphate level
Oral/enteral replacement	PREFERRED if >0.32mmol/L and asymptomaticÂ **or** if level >0.48mmol/LÂ and symptomaticÂ
Intravenous route preferred	<0.32mmol/L **or** <0.48mmol and symptomatic **or** if unable to tolerate oral supplementation

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Table 2: POTASSIUM PHOSPHATEÂ via peripheral line
• **Consider ONLY IF co-existing hypokalaemiaÂ** • Preferable to treat hypophosphataemia and hypokalaemia separately using two individual infusion bags - rather than using Potasssium phosphate vial at all.Â Â This allows for the greatest amount of flexibility in the doses of both electrolytes • It isÂ difficult to provide concrete guidelines for the treatment of severe hypophosphataemia as regimens vary greatly across hospitals in the UK and Ireland - **we have tried to provide guidelines belowÂ but clinical judgment is always required**Â • Use caution when interpreting phosphate levels.Â Changes in phosphate levels may be transient - treating **underlying causes**Â may be sufficient to correct level.Â **Review medications** which may contribute e.g. sevelamar, antacids, diureticsÂ [ref 5] • The response to any given dose cannot be predicted, and IV use can cause hypocalcaemia (tetany), calcium-phosphate precipitation in the kidneys, and fatal arrhythmias [ref 1] • **Prescribe dose in terms of phosphate dose required and then the phosphate salt required** ◦ **egÂ Â '12mmol phosphate as potassium phosphate'**

<table>
<tr><td>Gentle replacement</td><td colspan="3">Dose: 9mmol phosphate over 12 hours, and repeat as necessaryÂ [ref 2,3]</td></tr>
<tr><td rowspan="4">More individualised dosingÂ [ref 1]</td><td>Level (mmol/L)</td><td>Phosphate dose</td><td>Maximum initial dose</td></tr>
<tr><td>less than 0.32</td><td>0.4mmol/kg</td><td>48mmolÂ phosphate</td></tr>
<tr><td>0.33 to 0.44</td><td>0.3mmol/kg</td><td>30mmolÂ phosphate</td></tr>
<tr><td>>0.45</td><td>0.2mmol/kg</td><td>20mmolÂ phosphate</td></tr>
<tr><td>Preparation</td><td colspan="3">Doses up to 24mmol phosphate (40mmol potassium)Â Â
• Add to 500mL infusion fluid
Doses 25 to 48mmol phosphate (40 [approx] to 80mmol potassium)Â Â
• Add to 1000mL infusion fluid
• For fluid restricted patients
◦ May be added to less volume provided the final concentration does not exceed 40mmol POTASSIUM per 500mL</td></tr>
<tr><td>Administration</td><td colspan="3">• Administer the required doseÂ over 12 hours
• May administer more quicklyÂ Â - however cannot exceed a rate of administration of the POTASSIUM element of 10mmol/hour
◦ Doses of 36mmol phosphate or less may be administered over minimum 6 hours if clinically appropriate
◦ Doses greater than 36mmol phosphate MUST be administered over minimum 8 to 12 hours</td></tr>
<tr><td>Renal impairment</td><td colspan="3">Use with great caution, consider specialist advice
Generally avoid in severe renal impairment [ref 6]</td></tr>
<tr><td>Critical care/Fluid restriction</td><td colspan="3">Higher doses and rates may apply in the Critical Care setting</td></tr>
<tr><td>Polyfusor</td><td colspan="3">Available in Critical care areas- note however- only contains 9.5mmol potassium per polyfusorÂ</td></tr>
<tr><td>Repeated doses</td><td colspan="3">• May require repeat infusions over subsequent days.
• Usual maximum is 50mmol phosphate per 24 hours</td></tr>
<tr><td>Switch to oral route</td><td colspan="3">Consider switch to oral route once level >0.48mmol/L</td></tr>
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Renal impairment

- Use reduced doses with caution- see tables above

Monitoring

- Monitor the following electrolytes every 6 to 12 hours: phosphate, calcium, potassium, sodium, magnesium
- Monitor fluid balance and blood pressure
- Monitor ECG

Storage

- Potassium phosphate ampoules are treated as a **controlled drug in GUHs** (as it is a potasisum concentrate as well as containing phosphate). The routine supply of potassium phosphate is restricted

to designated wards which are likely to be caring for critically ill patients
- Phosphate Polyfusor is NOT treated as a controlled drug
- Store below 25^{0}C

References

1. Uptodate. Hypophosphataemia: Evaluation and Treatment March 2024. Accessed online 23/01/2025
2. Martindale- accessed online 23/01/2025
3. BNF- accessed online 23/01/2025
4. UpToDate Potassium Phosphate monograph - accessed March 2025
5. Maidstone and Tunbridge Wells NHS Trust 'Treatment of acute hypophosphataemia in adults. Review date August 2027
6. Local specialist opinion - email on file25/06/2025

These local guidelines were also consulted in the preparation of guide (to try and create a consensus from different sources)

- Grampian staff guideline for the management of hypophosphataemia in adults July 2024
- Worcestershire acute hospitals NHS Trust 'guideline for the treatment of hypophosphataemia in adults, March 2023
- Liverpool University Hospitals NHS TrustÂ
- UKMI Leeds hospital 'How is acute hypophosphataemia treated in adults
- Adults Therapeutic Handbook (NHS Greater Glasgow and Clyde), May 2023 Management of hypophosphataemia