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 a**Â 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'**

Gentle replacement	**Dose:** 9mmol phosphate over 12 hours, and repeat as necessaryÂ [ref 2,3]		
More individualised dosingÂ [ref 1)]	**Level (mmol/L)**	**Phosphate dose**	**Maximum initial dose**
	less than 0.32	0.4mmol/kg	48mmolÂ phosphate
	0.33 to 0.44	0.3mmol/kg	30mmolÂ phosphate
	>0.45	0.2mmol/kg	20mmolÂ phosphate
Renal impairment	Use with great caution, consider specialist advice Generally avoid in severe renal impairment [ref 6]		
Critical care/Fluid restriction	Higher doses and rates may apply in the Critical Care setting		
Polyfusor	Available in Critical care areas- note however- only contains 9.5mmol potassium per polyfusorÂ		
Repeated doses	• May require repeat infusions over subsequent days. • Usual maximum is 50mmol phosphate per 24 hours		
Switch to oral route	Consider switch to oral route once level >0.48mmol/L		

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Administration using Potassium phosphate BraunÂ 12mmol phosphate per 20mL ampoule

mmol phosphate required (examples for guidance only- calculate dose required based on weight)	6mmol	9mmol	17mmol	20mmol	23mmol	26mmol
Volume of Potassium Phosphate injection required	10mL	15mL	28mL	33mL	38mL	43mL

Administration using Potassium phosphate BraunÂ 12mmol phosphate per 20mL ampoule	
Infusion volume	**Doses up to and including 24mmol phosphate (40mmol potassium)Â Â** • Add to 500mL infusion fluid **Doses above 24mmol phosphate (40mmol 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**
Administration	• 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

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