

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 the [guidelines below](#) (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, as its use **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 with **HYPOcalcaemia** should have their calcium corrected before replacing phosphate ^(ref 5)
- Patients with **severe HYPERcalcaemia** who require phosphate replacement: seek specialist advice ^(ref 4)
- **Renal impairment:** Requires dose adjustment- see below
- **Give in a dedicated line** as it may precipitate with other drugs

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 ampoule (Braun)	20ml	12mmol	nil	20mmol
Phosphate polyfusor pre-mixed bag - very severe hypophosphataemia. 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 **jointly by a doctor and a nurse** in the clinic room.
- Both the Controlled Drug register, and the Additive label **must be signed** 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 **MINIMUM** of ten times to avoid inadvertent administration of a toxic bolus

Infusion fluids

Sodium chloride 0.9% (preferred)

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 required ^(ref 1)

Route of administration	Phosphate level
Oral/enteral replacement	PREFERRED if >0.32mmol/L and asymptomatic or if level >0.48mmol/L and symptomatic
Intravenous route preferred	<0.32mmol/L or <0.48mmol and symptomatic or if unable to tolerate oral supplementation

Table 2: POTASSIUM PHOSPHATE via peripheral line

- **Consider ONLY IF co-existing hypokalaemia**
- Preferable to treat hypophosphataemia and hypokalaemia separately using two individual infusion bags - rather than using Potassium phosphate vial at all. This allows for the greatest amount of flexibility in the doses of both electrolytes
- It is 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 below but clinical judgment is always required**
- Use caution when interpreting phosphate levels. Changes in phosphate levels may be transient - treating **underlying causes** may be sufficient to correct level. **Review medications** which may contribute e.g. sevelamer, antacids, diuretics ^(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**
 - eg '12mmol phosphate as potassium phosphate'

Gentle replacement	Dose: 9mmol phosphate over 12 hours, and repeat as necessary ^(ref 2,3)		
More individualised dosing ^(ref 1)	Level (mmol/L)	Phosphate dose	Maximum initial dose
	less than 0.32	0.4mmol/kg	48mmol phosphate
	0.33 to 0.44	0.3mmol/kg	30mmol phosphate
	>0.45	0.2mmol/kg	20mmol phosphate
Preparation	Doses up to 24mmol phosphate (40mmol potassium) • Add to 500mL infusion fluid Doses 25 to 48mmol phosphate (40^(approx) to 80mmol potassium) • 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 dose over 12 hours • May administer more quickly - 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 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 polyfusor		
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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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 potassium 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 25⁰C

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 file 25/06/2025

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 Trust
- UKMI Leeds hospital 'How is acute hypophosphataemia treated in adults
- Adults Therapeutic Handbook (NHS Greater Glasgow and Clyde), May 2023 Management of hypophosphataemia