Insert your Directorate or Department here

Liverpool University Hospitals NHS Foundation Trust

Issue number: Version 1

Subject: **Management of Acute Hypophosphataemia**

Objective: The objective of this guideline is to provide a clear quick reference guide to support clinicians in the treatment of patients with acute hypophosphatemia in non-critical areas of Trust

Target Level: Clarify whether it is a Trust-wide, Divisional, Directorate or Sub-specialty Guideline

Prepared by: **(Insert the name of your team here if relevant):**

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Add any thanks or acknowledgements here

'CG Approved' logo will be added by CG Dept.

Evidence Base: **Rank: A, B, C or D** (CSG/CG Dept will categorise evidence base)

Associated Documents: Outline other documents that this document should be read in conjunction with or may be required for implementation of this clinical guideline (If appropriate).

Information Classification Label ☒ **Unclassified**
Date of Issue: month & year **Review Date:** month & year + 3

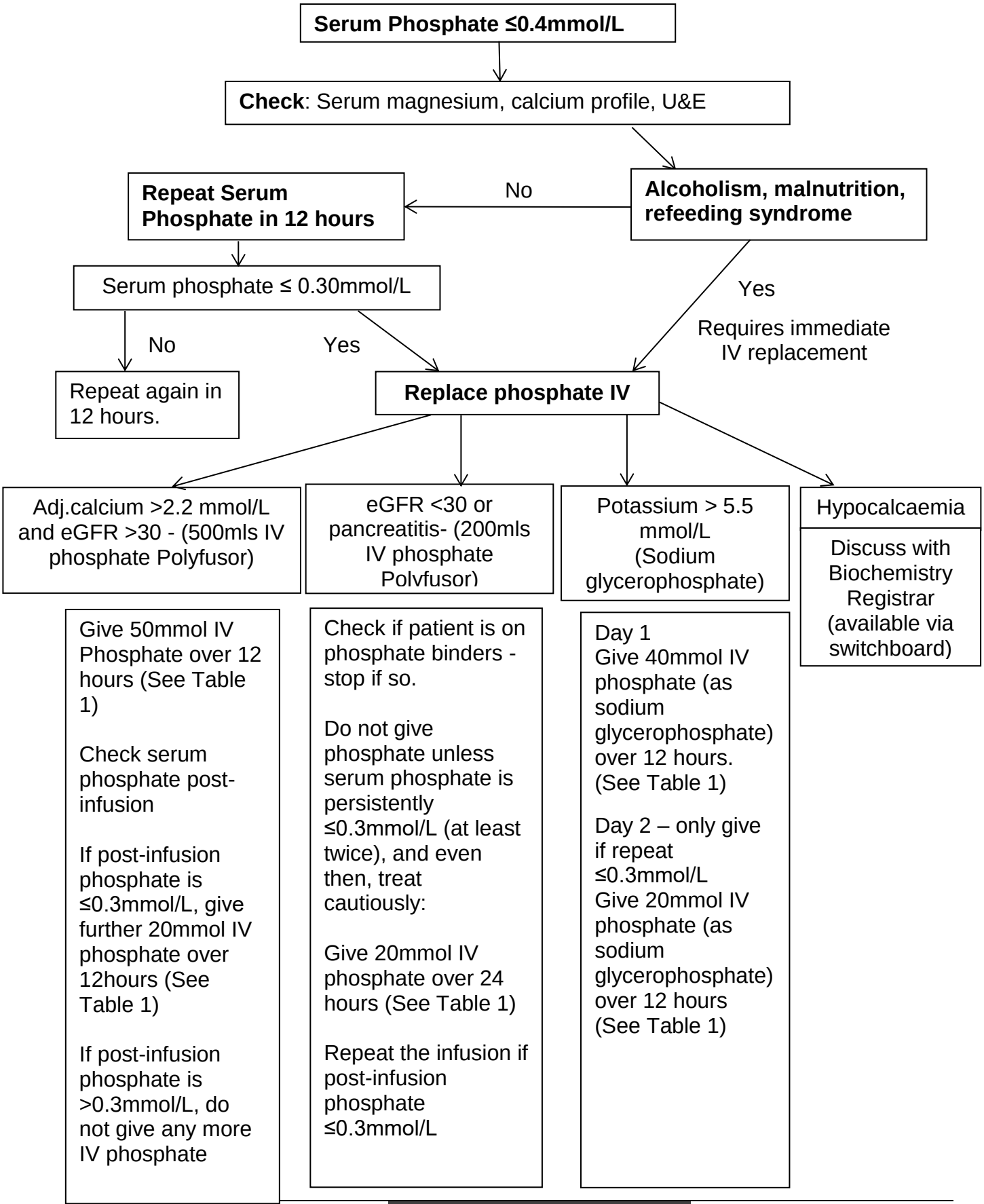
REVIEW HISTORY			
Issue No.	**Page**	**Changes made with rationale and impact on practice**	**Date**

Normal reference range of serum phosphate is 0.7 – 1.50 mmol/L.
Mild hypophosphataemia (0.5 to 0.7mmol/L) usually does not require any phosphate replacement as there is a rapid redistribution of phosphate between intra and extracellular spaces. Serum phosphate ≤0.40mmol (moderate to severe hypophosphataemia) may require phosphate replacement(AS SHOWN IN FLOW CHART BELOW).

The signs and symptoms usually observed if serum phosphate <0.4mmol/L, includes myopathy, rhabdomyolysis, muscle weakness respiratory failure arrhythmias, cardiomyopathy irritability, confusion, hallucinations, somnolence, convulsions, coma.

Causes of hypophosphataemia include refeeding syndrome, acute respiratory alkalosis, malnutrition (alcoholism, anorexia), drugs (e.g., antacids, bisphosphonates), post- glucose or insulin administration, malabsorption, vitamin D deficiency, GI loss (vomiting, diarrhoea), renal loss (hyperparathyroidism, Fanconi syndrome).

Moderate to severe hypophosphatemia (Serum phosphate ≤0.40mmol/L)



Monitoring and advice

- Check serum potassium, adj. calcium and magnesium before phosphate replacement
- Monitor serum phosphate, adj.calcium, magnesium, U&E, eGFR daily
- Check blood glucose, PTH, 25(OH)vitamin D if required
- Hypophosphatemia and hypomagnesaemia may co-exist; check serum magnesium in patients with low phosphate, particularly if there is a history of GI losses or alcohol abuse
- Excessive phosphate can cause hypocalcaemia and metastatic calcification, use caution when replacing phosphate in patients with hypocalcaemia and those with renal failure
- Phosphate preparations are given as the potassium or sodium salts or both, and may be associated with hyperkalaemia, hypernatraemia and dehydration
- Treat underlying cause e.g., vitamin D deficiency

Table 1: Prescribing and administration of intravenous phosphate infusion

	Phosphate Polyfusor® **Preferred product where available**	**Sodium glycerophosphate 21.6%**
Licensed indication	Treatment of moderate to severe hypophosphataemia	Supplement in intravenous nutrition to meet the requirements of phosphate in adults
Presentation	500mL Polyfusor® Ready to administer	20mL ampoule **Must be diluted prior to administration**
Electrolyte Content	**Phosphate:** 50mmol **Sodium:** 81mmol **Potassium:** 9.5mmol	**Phosphate:** 20mmol **Sodium:** 40mmol **Potassium: no potassium**
Dilution Instructions	Further dilution not required Depending on dose part of the polyfusor may need to be discarded	****ALWAYS dilute before administration**** **Peripheral administration:** To administer 20mmol of phosphate dilute 20mL of Sodium glycerophosphate 21.6% in 250mL (or 500mL) glucose 5% or sodium chloride 0.9% To administer 40mmol of phosphate, dilute 40mL of Sodium glycerophosphate 21.6% in 500mL glucose 5% or sodium chloride 0.9% **Central administration (Critical Care only):** To administer 20mmol of phosphate dilute 20mL of Sodium glycerophosphate 21.6% in 50mL glucose 5% or sodium chloride

		0.9% To administer 40mmol of phosphate, dilute 40mL of Sodium glycerophosphate 21.6% in 100mL glucose 5% or sodium chloride 0.9%
	Administer via an infusion pump – see flow chart above for rate of administration. Flush with sodium chloride 0.9% or glucose 5%	
	Phosphate and magnesium infusions should be administered in different arms if given at the same time, and must not be combined in an IV solution bag due to the risk of precipitation.	

Oral Phosphate

Treatment for mild hypophosphataemia is often not needed, as such, oral replacement of phosphate is not routinely recommended. See below for oral doses if oral replacement is considered clinically indicated:

- Use Phosphate-Sandoz® effervescent tablets (off label), each tablet contains:
  PO_4^{2-} 16.1 mmol
  Na^+ 20.4 mmol
  K^+ 3.1 mmol

Dissolve in water prior to administration, can be given via enteral feeding tubes.

Mild deficiency (>0.6 - 0.7mmol/L)	1 tablet once daily for 2 days
Moderate deficiency (>0.4 - 0.6mmol/L)	1 tablet twice daily for 3 doses

Recheck serum phosphate on day 2, stop Phosphate-Sandoz® if ≥1.5mmol/L.

Cautions

- In cases where restricted sodium intake is required, eg. congestive cardiac failure, hypertension or pre-eclamptic toxaemia, the sodium and potassium content of Phosphate-Sandoz® tablets (see above) should be taken into consideration.
- Diarrhoea is a common side effect of oral phosphate and may necessitate dose reduction
- Oral phosphate supplements should not be taken with aluminium, calcium or magnesium salts as these will bind phosphate and reduce its absorption (timing of these supplements should be reviewed and adjusted as appropriate)

References

- Injectable Medicine Guide. Sodium glycerophosphate concentrate (Glycophos) monograph. Date published: 03/12/2019. Accessed via medusa.wales.nhs.uk (13/02/2021)
- Injectable Medicine Guide. Phosphate Polyfusor monograph. Date published: 03/12/2019. Accessed via medusa.wales.nhs.uk (13/02/2021)
- Summary of Product Characteristics. Phosphate Sandoz tablets. HK Pharma Limited. Date of revision of text July 2015. Accessed via www.medicines.org.uk (13/02/2021)

Getting it **right**
for **every** patient
every time