

Paediatric Oncology management of hypophosphataemia flowchart

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Date of Ratification	
Signature of ratifying Group Chair	Juliet Gray
Author's and job titles	Dr Gary Nicolin Paediatric Oncology Consultant Editor: Dr Amy Mitchell Paediatric Oncology Consultant, Caroline Cole Paediatric Pharmacist
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Relevant national or international Guidance eg NICE, SIGN, BTS, BSPED	
Consultation document completed: see Appendix A	
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Does this document replace or revise an existing document? No	

1.1 Introduction

1.2 Scope

This guideline applies to all paediatric oncology patients in the Wessex region. It does not apply to neonates on neonatal units.

1.3 Purpose

Children receiving treatment at the Southampton Paediatric Oncology Principal Treatment Centre (PTC) have open access to the designated Paediatric Oncology Ward at either the PTC or their Paediatric Oncology Shared Care Unit (POSCU) Hospital. Their parents/carers will be in possession of contact details for these wards and have been instructed to contact them for any medical problems that arise while they are receiving treatment. These Guidelines are intended for the use of the medical teams at the PTC or POSCU. If one of the Paediatric Oncology patients presents to a medical service outside of the PTC or POSCU, please contact the medical teams at the PTC or POSCU for advice.

2 Implementation

Network updated at Network meeting of changes in guideline.

3 Process for Monitoring Effectiveness

Reduced variation in practice has been shown to improve outcomes. Please detail how the impact of this guideline will be measured to demonstrate it's effectiveness and identify areas for further development. Where possible this should include patient reported outcomes.

4 References:

5 Appendices

Appendix A Paediatric Regional Guideline Consultation Documentation:

Appendix A

Paediatric Regional Guideline Consultation Documentation Paediatric Oncology Consultants (UHS):

The Wessex paediatric oncology network have agreed that new guidelines being developed by the wessex paediatric oncology supportive care guidelines working party can be ratified as follows:

All documents are edited by Dr Amy Mitchell and all are approved by at least 1 other Paediatric Oncology Consultant. Any controversial issues are brought before the MDT and final sign off is by the Network Lead Dr Juliet Gray.

On this basis the region accept the use of these guidelines for the management of their shared care paediatric oncology patients.

Name of person consulted* (print)	Signature	Date Signed
Dr Gary Nicolin	Dr Gary Nicolin	02/05/18
Dr Amy Mitchell	Dr Amy Mitchell	02/05/18

* this person agrees they have read the guidelines, consulted with relevant colleagues and members of MDT, managers and patients, young people & their families as appropriate. Any queries raised during consultation and review process should be documented with responses and any changes made to guideline.

§ this can be electronic for ease

Management of Hypophosphataemia in PaedOnc

Symptoms and signs: of hypophosphataemia

An acute, significant drop in serum phosphate (>50-60% of normal) may cause muscle weakness, paraesthesias, cranial nerve palsies and reduced deep tendon reflexes.

Prolonged hypophosphataemia in children may lead to rickets and delayed growth in addition to muscle effects, and if severe haemolytic anaemia or rhabdomyolysis can occur.

If unexpected consider repeating to confirm

Define severity

Mild to moderate and asymptomatic
<0.9 mmol/l

Prescribe oral supplementation if tolerated

Severe and or Symptomatic
< 0.65mmol/L

Prescribe IV phosphate replacement

Oral phosphate:

Neonate: 1mmol/kg daily in 1-2 divided doses

1mo – 5yr: 2-3mmol/kg (max 48mmol) daily in 2-4 divided doses, adjusted daily as necessary

5 – 18yr: 2-3mmol/kg (max 97mmol) daily in 2-4 divided doses, adjusted daily as necessary

Available as Phosphate-Sandoz effervescent tablets (16.1mmol phosphate, 3.1mmol potassium and 20.4mmol sodium per tablet)

Intravenous sodium glycerophosphate:

(Available as 21.6% injection containing 1mmol phosphate and 2mmol sodium per ml)

Neonate: 1mmol/kg phosphate

1mo-2yr: 0.7mmol/kg

2-8yr: 0.4mmol/kg

Over 25kg: 10mmol (not per kg)

All replacements should be given over 12 hours.

Dilute prior to administration with glucose 5% or sodium chloride 0.9%. For peripheral use dilute to 0.02mmol/ml. For central administration, may be diluted to 0.1mmol/ml. Do not y-site with any other drugs or infusions

Caution: administration of intravenous phosphate to hypercalcaemic patients may result in precipitation of calcium phosphate in tissues, e.g. kidneys.

If drops to severe or becomes symptomatic

Consider likely cause of hypophosphataemia

Tubular phosphate leak is often a significant part of acquired proximal tubular damage from cytotoxic drugs e.g. cisplatin, carboplatin and ifosfamide.

Alkalosis (especially respiratory) and acute increases in glucose intake will increase phosphate movement into cells. Check if renal leak (TMp/GFR: normal ≥ 1.1 if < 1yr age, ≥ 1.0 if ≥ 1 yr age), review intake, assess nutritional state. If chronic problem check Ca, ALP & PTH levels & wrist X-ray for bony changes.

$TMp/GFR = \frac{\text{plasma Po}_4 - (\text{urine Po}_4 \times \text{plasma creatinine})}{\text{urine creatinine}}$

Renal reabsorption of phosphate = $1 - \frac{(\text{plasma creat} (\text{mmol/L}) \times \text{Urine Po}_4)}{(\text{plasma Po}_4 \times \text{urine creat})}$

expressed as a %, normal range: 85 - 95 % but 95%+ in presence of hypophosphataemia.

Calculations with urine only useful in steady state. If phosphate acutely low then treat according to serum level unless likely to rapidly correct spontaneously.