

# NEPHROLITHIASIS & NEPHROCALCINOSIS GUIDELINE

## INDICATIONS FOR USE OF GUIDELINE

Diagnosis of nephrolithiasis or nephrocalcinosis on USS  
Strong suspicion of renal stone based on symptoms

## SYMPTOMS

Flank/Abdominal pain  
Haematuria (macroscopic/microscopic)  
Recurrent UTIs

## RISK FACTORS

Prematurity  
Ketogenic diets  
Drugs – Diuretics, Topiramate  
Family history

## INVESTIGATIONS

### Urine

- Dipstick (blood & protein)
- Calcium:Creat ratio
- Urate:Creat ratio
- Oxalate:Creat ratio
- Citrate:Creat ratio
- Spot Cystine (to UHS)
- pH (Fresh urine)

### Blood

- Renal profile
- Phosphate
- Bicarbonate
- Bone Profile
- Magnesium
- Urate
- Alkaline Phosphatase
- PTH
- FBC

### Radiology

- USS renal tract +/- XR KUB

**If stone passed** to send to UHS for analysis by Fourier Transform Infrared spectroscopy

## NORMAL VALUES FOR INTERPRETATION

	1m – 1y	1y – 2y	2y – 3y	3y – 5y	5y – 7y	7y – 10y	10y – 17y
<b>Calcium</b> <small>(mmol/mmol creatinine)</small>	0.09 – 2.2	0.07 – 1.5	0.06 – 1.4	0.05 – 1.1	0.04 – 0.8	0.04 – 0.7	
<b>Urate</b> <small>(mmol/mmol creatinine)</small>	0.7 – 1.5	0.5 – 1.4	0.47 – 1.3	0.4 – 1.1	0.3 – 0.8	0.26 – 0.56	0.2 – 0.44
<b>Oxalate</b> <small>(mmol/mmol creatinine)</small>	0.06 – 0.17	0.05 – 0.13	0.04 – 0.1	0.03 – 0.08	0.03 – 0.07	0.02 – 0.06	
<b>Citrate</b> <small>(mmol/mmol creatinine)</small>	>0.15						
<b>Cystine</b>	Interpreted by UHS laboratory as part of urine amino acid profile						
<b>pH</b>	5.3 – 7.07						

## MANAGEMENT AND REFERRAL

- Routine hydration advice – [www.nutrition.org.uk/healthyiving/hydration/hydration-for-children](http://www.nutrition.org.uk/healthyiving/hydration/hydration-for-children)
- Analgesia and anti-emetics as required. NICE guidelines on this to be released in late 2018.
- Passed stones and nephrocalcinosis do not require urology referral. Nephrology referral as below if evidence of metabolic stone disease
- Confirmed stones (non-obstructing) should be referred via routine outpatients to Mr Stephen Griffin, Consultant Paediatric Urologist, UHS.
- Obstructing stones should be referred urgently to Paediatric urology, UHS, for consideration of JJ stent or nephrostomy.
- Outpatient referral to Dr Shuman Haq, Paediatric Nephrologist, **only** if investigations reveal evidence of metabolic stone disease

## Nephrolithiasis and Nephrocalcinosis

<b>Version:</b>	1
<b>Approval Committee (eg Clinical network):</b>	Regional clinical network for paediatric nephro-urology
<b>Date of Approval:</b>	April 2018
<b>Signature of approving Group Chair</b>	Dr Shuman Haq
<b>Ratification Group:</b>	Children's Services Review Group, University Hospital Southampton
<b>Date of Ratification:</b>	CSRG to input
<b>Signature of ratifying Group Chair</b>	Chair of Children's Services Review Group
<b>Author's and job titles</b>	Dr Tamali Hodgkinson. Paediatric ST4 trainee. Dr James Edelman. Consultant Paediatrician, UHS Dr Shuman Haq. Consultant Paediatric Nephrologist, UHS Mr Stephen Griffin. Consultant Paediatric Urologist, UHS Dr Paul Cooke. Consultant in Chemical Pathology and Metabolic medicine, UHS
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<b>Key words:</b>	Renal stones Metabolic stone screen Nephrolithiasis Nephrocalcinosis
<b>Main areas affected:</b>	General paediatric departments locally
<b>Other stakeholders consulted e.g. other clinical networks, departments</b>	Wessex PIER Regional Guideline Governance Group
<b>Summary of most recent changes (if updated guideline):</b>	
<b>Relevant national or international Guidance eg NICE, SIGN, BTS, BSPED</b>	NICE guidance to be released late 2018
<b>Consultation document completed: see Appendix A</b>	Yes
<b>Total number of pages:</b>	
<b>Is this document to be published in any other format?</b>	On line

**Does this document replace or revise an existing document?**

No

## Contents

	Flowchart
1	Introduction
1.2	Scope
1.3	Aim/Purpose
1.4	Definitions
2	[Additional Headings as required] e.g. procedures to be followed
3	Implementation (including training and dissemination)
4	Process for Monitoring Compliance/Effectiveness of this policy
5	References

## Appendices

Appendix A Consultation signatures

# 1

## 1.1 Introduction

This guideline is for use when paediatric renal stones and nephrocalcinosis are suspected or confirmed. It covers which investigations are required for a metabolic stone screen, which is required in all cases of confirmed stones, and gives a standardised approach to interpreting these results.

The guideline has been approved for use by Dr Shuman Haq (Consultant Paediatric Nephrologist, UHS), Mr Stephen Griffin (Consultant Paediatric Urologist, UHS) and Dr Paul Cooke (Consultant in Chemical Pathology and Metabolic Medicine, UHS)

## 1.2 Scope

This guideline applies to all paediatric patients in the region with confirmed or suspected renal stones or nephrocalcinosis.

## 1.3 Purpose

The purpose of this guideline is to describe to provide a standardised approach to the management of paediatric renal stones and nephrocalcinosis.

## 1.4 Definitions

Nephrolithiasis- Kidney stones

Nephrocalcinosis- Generalised calcium deposition in renal parenchyma and tubules

## 2 Additional headings as required eg procedures to be followed or chart titles

## 3 Implementation

This guideline will be made available regionally on the PIER Website. Local leads for paediatric nephro-urology will disseminate guideline and raise awareness locally.

## 4 Process for Monitoring Effectiveness

The Paediatric Nephro-urology network will review problems associated with a failure to comply with this guideline through its regional governance process.

## 5 References

## Appendix A

### Paediatric Regional Guideline Consultation Documentation:

Trust	Name of person consulted*	Designation of signatory	Signature
Chichester	Dr Nick Brennan	Consultant paediatrician	
Dorchester	Dr Phil Parslow	Consultant paediatrician	
Hampshire Hospitals Foundation Trust	Dr Ian Rodd	Consultant paediatrician	
Poole	Dr Steve Wadhams	Consultant paediatrician	
Portsmouth	Dr Judith Scanlan	Consultant paediatrician	
Salisbury	Dr Rowena Staples	Consultant paediatrician	
Southampton	Dr Faye Hawkins	Consultant paediatrician	
Reading	Dr Ann Gordon	Consultant paediatrician	
Jersey	Dr David Lawrenson	Consultant paediatrician	

\*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.