Ashford and St. Peter's Hospitals
NHS Foundation Trust

Urinary Tract Infections (UTIs) in children aged 0-18 years

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Guideline History

Date	Comments	Approved By
Aug 2016	Guideline created Authors: Dr Fiona MacCarthy, Dr Alison Groves, Deborah Hopper, Dr Jayakeerthi Rangaiah and Dr Farnaz Dashti	
Aug 2017	Guideline reviewed If concern pyelonephritis low threshold for admission and IV co-amoxiclav 7-10 days. If able to tolerate oral then PO co-amoxiclav or ciprofloxacin. Trust chose on advice from microbiology consultants to treat simple UTI with 5 days rather than recommended 3 days. USS now in all infants with 1 st time typical UTI within 6 weeks DMSA scan to be carried out at 4-6 months following acute infection in all children 3 years or under, all with recurrent UTIs	
Apr 2023	Guideline reviewed Updated list of signs and symptoms not stratified by frequency of presentation due to lack of good quality evidence as per updated NICE guidance. Advice on requesting urine microscopy, culture and sensitivity on cerner. DMSA not required in children >3 years old with atypical UTI	Paediatric Guideline Group

Contents

Page

1. UTI in children guideline

Indication for use: Children aged 0-18 years with suspected UTI, for diagnosis and management of UTI in children.

Diagnosis

- Infants and children presenting with unexplained fever of 38°C or higher should have a urine sample tested as soon as possible and within 24 hours of presenting.
- Children presenting with signs and symptoms of UTI should have their urine tested.
- Signs and symptoms of UTI in children include:
    - Painful urination (dysuria)
    - More frequent urination
    - New bedwetting
    - Foul smelling (malodorous) urine
    - Darker urine
    - Cloudy urine
    - Frank haematuria (visible blood in urine)
    - Reduced fluid intake
    - Fever
    - Shivering
    - Abdominal pain
    - Loin tenderness or suprapubic tenderness
    - Capillary refill longer than 3 seconds
    - Previous history of confirmed urinary tract infection
- Do not routinely test the urine of babies, children and young people 3 months and over who have symptoms and signs that suggest an infection other than a UTI. If they remain unwell and there is diagnostic uncertainty, consider urine testing.

Urine collection

- Take urine samples prior to prescribing antibiotics wherever possible.
- A clean catch urine sample is recommended
- If a clean catch sample is not possible then perform in-and-out catheterisation or suprapubic aspirate following USS confirmation of urine in the bladder (USS fast scan in A&E majors)
- If an infant is high risk then do not delay starting treatment whilst awaiting urine collection.
- Urine microscopy, culture and sensitivities can be requested on Surrey Safe Care using requests and searching for 'Urine Culture' AND 'Urine Microscopy', and marking the request 'Urgent'.
- Make sure to send sample in SLIM RED TOP container (8ml of urine needed) as otherwise the sample may not be processed!
- If only a small sample of less than 8 mL then it may go in a WHITE top container but write on the form that is an urgent sample of a baby/child and no more urine could be obtained!

Urine-testing strategies

- For infants under 3 months
    - All infants under 3 months with a suspected UTI should have an urgent sample sent for microscopy and culture.
    - Manage these infants as high risk for sepsis and treat accordingly as per the sepsis guideline.
- For infants older than 3 months up to children aged 3 years
    - Urgent microscopy is preferred method of diagnosis in this age group. Urine sample should be sent for urgent microscopy and culture where UTI is suspected in this age group.
    - Children with symptoms specific to UTI should be started on antibiotics while awaiting urine MC&S results.

- Children with symptoms non-specific for UTI management should be based on risk of serious illness:
  - For an infant or child with a high risk of serious illness: they should be managed in line with sepsis guidelines.
  - For an infant or child with an intermediate risk of serious illness: Urgent MC&S should be arranged. Antibiotic treatment should be started if microscopy is positive or dipstick is nitrites positive.
  - For an infant or child with a low risk of serious illness: MC&S should be arranged. Antibiotic treatment should only be started if microscopy or culture is positive.

- For infants 3 years or older
  - Dipstick testing for leukocyte esterase and nitrite is diagnostically as useful as M,C&S in children over 3 years of age. There is a higher threshold to treat children in this age group than younger children.

	Leucocyte +ve	**Leucocyte -ve**
Nitrite +ve	Assume the child has a urinary tract infection (UTI) and give them antibiotics. If the child has a high or intermediate risk of serious illness or a history of previous UTI, send a urine sample for culture.	Give the child antibiotics if the urine test was carried out on a fresh urine sample. Send a urine sample for culture. Subsequent management will depend on the result of urine culture.
Nitrite -ve	Send a urine sample for microscopy and culture. Do not give the child antibiotics unless there is good clinical evidence of a UTI (for example, obvious urinary symptoms). A positive leukocyte esterase result may indicate an infection outside the urinary tract that may need to be managed differently.	Assume the child does not have a UTI. Do not give the child antibiotics for a UTI or send a urine sample for culture. Explore other possible causes of the child's illness.

Further history and examination in UTI/suspected UTI

- Poor flow
- History of previous UTI
- Recurrent fever of unknown origin
- Antenatally diagnosed renal anomaly
- Family history of renal anomaly
- Constipation
- Dysfunctional voiding
- Enlarged bladder
- Abdominal mass
- Spinal lesion
- Poor growth
- High blood pressure

Management

Acute management

Antibiotic choices:

Please refer to Microguide for up to date antibiotic guidelines in UTI.

- Parents should seek further help if their child's condition is not improving after 24-48 hours of starting treatment.

Prophylaxis

- Should not routinely be prescribed for first episode of UTI
- Only if there is recurrent UTI should prophylactic antibiotics be considered. Please discuss with a paediatric consultant if you think prophylactic antibiotics may be indicated.
- To be given the day before an MCUG scan and then to complete a total of 3 days full treatment dose of trimethoprim or nitrofurantoin (not in infants under 3 months of if G6PD deficiency)

Atypical and recurrent UTI

Atypical UTI, if any of the following	Recurrent UTI, if any of the following
• Seriously ill • Unwell children < 6 months old requiring admission and IV antibiotics • Poor urine flow • Abdominal or bladder mass • Raised creatinine • Septicaemia • Failure to respond to treatment with suitable antibiotics within 48 hours • Infection with non-E. coli organisms	• Two or more episodes of UTI with acute upper UTI (acute pyelonephritis) • One episode of UTI with acute upper UTI plus 1 or more episodes of UTI with lower UTI (cystitis) • Three or more episodes of UTI with lower UTI

Imaging

- USS acute
    - To assess for complications of UTI such as renal abscess.
- USS within 6 weeks
    - USS does not need repeating if performed in acute infection.
    - Identifies abnormalities of the renal tract that may predispose to UTI
- Dimercatosuccinic acid scintigraphy (DMSA)
    - Radioisotope uptake scan that can detect long term scarring to the kidney as a result of UTI
    - Request via cerner ‘NM Renal DMSA’
    - 4-6 months following acute infection
- Micturating cystourethrogram (MCUG)
    - Only used in children under 1 year or over 4 years.
    - Used to diagnose vesicoureteric reflux
    - Request via cerner ‘Micturating cystourethrogram’
    - Additional indications for children >6 months
        - Dilatation on USS
        - Poor urine flow
        - Non-E. Coli UTI
        - Family history of VUR

	Children younger than 6 months			Children older than 6 months		
	Simple UTI, responds well to 48h of treatment	**Atypical UTI**	**Recurrent UTI**	**Simple UTI, responds well to 48h of treatment**	**Atypical UTI**	**Recurrent UTI**
Acute USS	NO	YES	YES	NO	YES	NO
USS within 6 weeks	YES	YES (if no acute USS)	YES (if no acute USS)	NO	NO	YES
DMSA	NO	YES	YES	NO	YES *(only if age <3 years)*	YES
MCUG	NO *(unless abnormal USS)*	YES	YES	NO	NO	NO

Follow-up

- Infants who do not undergo imaging investigations should not be routinely followed-up.
- If normal investigations these can be communicated in writing.
- If recurrent UTI or abnormal imaging these patients need follow-up in general paediatric clinic in 8-12 weeks.
- If bilateral renal impairment, raised blood pressure or proteinuria specialist nephrology follow-up is indicated. Cases of concern can be discussed with Dr Hyde.

Advice to parents

- Bring child back for reassessment if no improvement in condition following 24-48 hours of treatment.
- Encourage fluid intake
- Ensure access to toilets to avoid delayed voiding
- Monitor for constipation and treat with diet/ Movicol as indicated
- Cotton underwear
- Avoid bubble baths

- Useful resources for parents:
    - InfoKID: MCUG (available on Paediatric Guideline page)
    - GOSH: DMSA leaflet (available on Paediatric Guideline page)
    - NHS UTI guidance - https://www.nhs.uk/conditions/urinary-tract-infections-utis/

2. Supporting References

- NICE guidelines CG54, updated QS36 (updated 2017) and NG224 (updated 2022)
- Microguide

3. Supporting relevant trust guidelines

- Paediatric department guidelines available on Trustnet
- Sepsis guidelines including
- Fever in under 5s guideline
- Pyrexia of Unknown Origin (PUO) guideline

4. Guideline Governance

a. Scope

i. This guideline is relevant to all staff caring for all children from 0-18 years old across the emergency department, inpatient ward and outpatient department.

b. Purpose

i. This guidelines aims to facilitate a common approach to the management of children. At times deviation from the guideline may be necessary, this should be documented and is the responsibility of the attending consultant.

ii. This guideline is subject to regular review to ensure ongoing evidence based practice.

c. Duties and Responsibilities

i. All healthcare professionals responsible for the care of all children 0-18 years should be aware of practice according to this guideline.

d. Approval and Ratification

i. This guideline will be approved and ratified by the Paediatric Guidelines Group.

e. Dissemination and Implementation

i. This guideline will be uploaded to the trust intranet 'Paediatric Guidelines' page and thus available for common use.

ii. This guideline will be shared as part of ongoing education within the Paediatric Department for both medical and nursing staff.

iii. All members of staff are invited to attend and give comments on the guideline as part of the ratification process.

f. Review and Revision Arrangements

i. This policy will be reviewed on a 3 yearly basis by the appropriate persons.

ii. If new information comes to light prior to the review date, an earlier review will be prompted.

iii. Amendments to the document shall be clearly marked on the document control sheet and the updated version uploaded to the intranet. Minor amendments will be ratified through the Paediatric Guidelines Group. A minor amendment would consist of no major change in process, and includes but is not limited to, amendments to documents within the appendices.

g. Equality Impact Assessment

Background • Who was involved in the Equality Impact Assessment
Author and the supervising consultants.
Methodology • A brief account of how the likely effects of the policy was assessed (to include race and ethnic origin, disability, gender, culture, religion or belief, sexual orientation, age) • The data sources and any other information used • The consultation that was carried out (who, why and how?)
All groups of staff and patients were taken into consideration and there is no bias towards or against any particular group.
Key Findings • Describe the results of the assessment • Identify if there is adverse or a potentially adverse impacts for any equalities groups
There is no evidence of discrimination.
Conclusion • Provide a summary of the overall conclusions
There is no evidence of discrimination.
Recommendations • State recommended changes to the proposed policy as a result of the impact assessment • Where it has not been possible to amend the policy, provide the detail of any actions that have been identified • Describe the plans for reviewing the assessment
This guideline is appropriate for use.

h. Document Checklist

To be completed (electronically) and attached to any document which guides practice when submitted to the appropriate committee for approval or ratification.

Title of the document: Urinary Tract Infections (UTIs) in children aged 0-18 years

Policy (document) Author:

Executive Director: N/A

		Yes/No/ Unsure/NA	Comments
1.	**Title**		
	Is the title clear and unambiguous?	**Yes**	
	Is it clear whether the document is a guideline, policy, protocol or standard?	**Yes**	
2.	**Scope/Purpose**		
	Is the target population clear and unambiguous?	**Yes**	
	Is the purpose of the document clear?	**Yes**	
	Are the intended outcomes described?	**Yes**	
	Are the statements clear and unambiguous?	**Yes**	
3.	**Development Process**		
	Is there evidence of engagement with stakeholders and users?	**No**	

		Yes/No/ Unsure/NA	Comments
	Who was engaged in a review of the document (list committees/ individuals)?	**N/A**	**Dr Sophie Walpole FY1** **Dr Claire Mitchell, paediatric consultant**
	Has the policy template been followed (i.e. is the format correct)?	**Yes**	
4.	**Evidence Base**		
	Is the type of evidence to support the document identified explicitly?	**Yes**	
	Are local/organisational supporting documents referenced?	**Yes**	
5.	**Approval**		
	Does the document identify which committee/group will approve/ratify it?		**Chair of guidelines committee: Dr Claire Mitchell**
	If appropriate, have the joint human resources/staff side committee (or equivalent) approved the document?	**N/A**	
6.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?	**Yes**	**Made available on trustnet**
	Does the plan include the necessary training/support to ensure compliance?	**No**	

		Yes/No/ Unsure/NA	Comments
7.	**Process for Monitoring Compliance**		
	Are there measurable standards or KPIs to support monitoring compliance of the document?	**No**	
8.	**Review Date**		
	Is the review date identified and is this acceptable?	**Yes**	**Every 3 years, due May 2026**
9.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for coordinating the dissemination, implementation and review of the documentation?		
10.	**Equality Impact Assessment (EIA)**		
	Has a suitable EIA been completed?	Yes	

Committee Approval (Paediatric Guidelines Group)			
If the committee is happy to approve this document, please complete the section below, date it and return it to the Policy (document) Owner			
Name of Chair	**Dr Claire Mitchell**	**Date**	**26/05/2023**
Ratification by Management Executive (if appropriate)			
If the Management Executive is happy to ratify this document, please complete the date of ratification below and advise the Policy (document) Owner			
Date: n/a			