Suspected Urinary Tract Infection

Clinical Assessment/ Management tool for Children

Management - Primary Care and Community Settings

Patient presents →

Suspected UTI ?

- Fever with no clear focus
- Vomiting
- Poor feeding
- Lethargy
- Irritability
- Abdominal pain
- Dysuria/frequency
- Loin pain

Consider differential diagnoses: sepsis, meningitis, GI obstruction, appendicitis, gastroenteritis.
Other differentials for dysuria/discomfort include vulvovaginitis and threadworms.

Green – Low risk	Amber – Intermediate risk	Red – high risk
Systemically well, temp <38°C	Temp ≥38°C but haemodynamically stable (see table 1 - normal ranges for HR and RR)	Fever ≥ 38°C in a child under 3 months or features suggestive of sepsis (see sepsis pathway) / haemodynamic instability (see table 1)

Green – Low risk

Able to obtain urine sample? (see box 1)

Yes

Under 3 Months	3 months to <3 years	≥3 years
• In a child under 3 months, a negative urine dip does not exclude a UTI. • If you suspect a UTI please refer	• If nitrites and leuk both -ve, UTI unlikely. Do not send for culture • If nitrites +ve or leuk +ve, send for culture (see box 1) and treat empirically (see box 2)	• If nitrites and leuk both -ve, UTI unlikely. Do not send for culture. • If nitrites +ve, send for culture and treat empirically as UTI (see box 2). • If leuk +ve but nitrites -ve, consider alternative diagnosis. If good clinical evidence of UTI, send culture (see box 1) and treat empirically awaiting culture results (see box 2)

No

- Provide family with collection pot (to return with sample within next 6-12 hours). If OOH setting, give family red bottle for urine collection - attend own GP when next open for dipstick +- send for culture (see box 1)
- Provide fever safety netting sheet

Provide family with UTI safety netting sheet
Arrange follow-up / imaging as required (see boxes 3&4) If recurrent UTIs (see box 3), review risk factors (see box 5) Think Safeguarding

Amber – Intermediate risk

Able to obtain urine sample? (see box 1)

Yes

- If nitrites and leuk both -ve, UTI unlikely. Do not send for culture.
- If nitrites and/or leuk +ve on dipstick, assume UTI. Send sample for culture (see box 1) and treat empirically as upper UTI awaiting culture results (see box 2)
- If child ≥3 years of age and dipstick +ve only for leuk, consider alternative diagnosis

No

- If features of pyelonephritis (loin pain, abdominal pain, vomiting, high spiking fever), needs referral to 2° care.
- If otherwise well, give family a collection pot (to return with sample within next 6-12 hours). If OOH GP setting, consider treating empirically as upper UTI (see box 2) but give family red bottle for urine collection before starting Abs- attend own GP when next open for dipstick+- send for culture.
- Provide fever safety netting sheet

Provide family with UTI safety netting sheet
Arrange follow-up / imaging as required (see boxes 3-4)
If recurrent UTI's (see box 3), r/v risk factors (box 5)
Think Safeguarding

Urgent Action

- Refer immediately to emergency care – consider 999
- Alert Paediatrician
- If sepsis, consider antibiotics if transfer time will be >1 hour (benzylpenicillin 300mg age <1 year, 600mg age 1-9 years, 1.2g > = 10 years)

Hospital Emergency Department / Paediatric Unit

Microbiology
UTI is only confirmed by laboratory evidence of single growth of bacteria >10 to the power of 5

First version Nov 2017. Most recent update September 2019 - CS50217 Reviewed May 2023 Next Review May 2026

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This document was arrived at after careful consideration of the evidence available including but not exclusively NICE, SIGN, EBM data and NHS evidence, as applicable. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. The guidance does not, however, override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient in consultation with the patient and / or carer.

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Table 1: Normal Paediatric Values:

(APLS*)	Respiratory Rate at rest (b/min)	Heart Rate (b/min)
< 1 year	30 - 40	110 - 160
1 - 2 years	25 - 35	100 - 150
> 2 -5 years	25 - 30	95 - 140
5 - 12 years	20 - 25	80 - 120
Over 12	15 - 20	60 - 100

* Advanced Paediatric Life Support The Practical Approach Fifth Edition Advanced Life Support Group Edited by Martin Samuels; Susan Wieteska Wiley-Blackwell / 2011 BMJ Books.

Box 1

Urine collection and preservation

- Clean catch is recommended method. Gentle suprapubic cutaneous stimulation using gauze soaked in cold fluid helps trigger voiding*
- If absolutely unavoidable pads / bags must be put on clean skin and checked very regularly to minimise contamination risk
- Unless urine can get straight to lab preservation in a boric acid (red top) container will allow 48 hours delay

*Urine collection in infants
Kaufmann et al BMJ open

Box 2

Treatment

≤3 month: treat as pyelonephritis (refer to paediatrics)

>3 months of age:

If unable to tolerate oral Abs or systemically unwell (suggestive of bacteraemia), requires consideration of IV antibiotics– refer to paediatrics.

- Lower UTI: Trimethoprim, if previous treatment with trimethoprim in the last 3 months, use nitrofurantoin if able to swallow tablets and [egfr] >45ml/minute. If first line antibiotics are not suitable or no improvement in 48 hours consider second line antibiotics such nitrofurantoin (if not used first line), cefalexin, or amoxicillin (if culture susceptible)
- Upper UTI/Pyelonephritis: Cefalexin, or co-amoxiclav (if sensitivity known)
- For more information about treatment, see BCICB guidelines for antibiotic prescribing in the community below.

Box 3

Who needs imaging?

Ultrasound:

- Under 6 months - within 6 weeks, acutely if atypical** or recurrent*** infection
- Over 6 months - not routinely, acutely if atypical** infection, within 6 weeks if recurrent*** infection.

DMSA:

- Atypical** infections under 3 years
- Recurrent*** infections at all ages

MCUG:

- Under 6 months with atypical** or recurrent*** infections
- Consider in all under 6 months with abnormal ultrasound.
- Consider 6-18 months if non E-Coli UTI, poor flow, dilatation on USS or family history VUR

**Atypical UTI = seriously ill/ sepsis, poor urine flow, non E-Coli, abdominal or bladder mass, raised creatinine, failure to respond in 48 hours
*** Recurrent UTIs = ≥3 lower UTIs, ≥2 upper UTIs or 1 upper and 1 lower UTI

Box 4

Who needs paediatric follow-up?

- Children with recurrent UTIs not responding to simple advice (see risk factors)
- Children with abnormal imaging or if appropriate imaging cannot be arranged in primary care

Box 5

Risk factors for recurrent UTIs

- Constipation
- Poor fluid intake
- Infrequent voiding esp at school (holding on)
- Irritable bladder (can happen following UTI)
- Neuropathic bladder
  - Examine spine
- Genitourinary abnormalities
  - Examine genitalia

For further information, see NICE guidelines: https://pathways.nice.org.uk/pathways/urinary-tract-infection-in-under-16s#path=view%3A/pathways/urinary-tract-infection-in-under-16s/diagnosing-urinary-tract-infection-in-under-16s.xml&content=view-index

This guidance has been reviewed and adapted by healthcare professionals from across the Black Country.

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BCICB guidelines for antibiotic prescribing in the community.

LOWER UTI

ORAL FIRST LINE:
NITROFURANTOIN OR TRIMETHOPRIM (IF LOW RISK OF RESISTANCE OR LIQUID IS PREFERRED).

Trimethoprim

Child 3–5 months
4 mg/kg twice daily (max. per dose 200 mg) for 3 days, alternatively 25 mg twice daily for 3 days.
Child 6 months–5 years
4 mg/kg twice daily (max. per dose 200 mg) for 3 days, alternatively 50 mg twice daily for 3 days.
Child 6–11 years
4 mg/kg twice daily (max. per dose 200 mg) for 3 days, alternatively 100 mg twice daily for 3 days.
Child 12–15 years
200 mg twice daily for 3 days.
Child 16–17 years
200 mg twice daily for 3 days (7 days in males).

Nitrofurantoin – use capsules where possible, oral solutions have significant high cost implication

- Using immediate-release medicines

Child 3 months–11 years
750 micrograms/kg 4 times a day for 3 days.
Child 12–15 years
50 mg 4 times a day for 3 days (7 days if pregnant).
Child 16–17 years
50 mg 4 times a day for 3 days (7 days in males and if pregnant).

- Using modified-release medicines

Child 12–15 years
100 mg twice daily for 3 days (7 days if pregnant).
Child 16–17 years
100 mg twice daily for 3 days (7 days in males and if pregnant).

ORAL SECOND LINE (IF NO IMPROVEMENT AFTER AT LEAST 48 HOURS OR FIRST LINE NOT SUITABLE):
NITROFURANTOIN (IF NOT USED FIRST LINE) OR AMOXICILLIN (IF CULTURE SUSCEPTIBLE) OR CEFALEXIN.

Amoxicillin

Child 3–11 months
125 mg 3 times a day for 3 days.
Child 1–4 years
250 mg 3 times a day for 3 days.
Child 5–15 years
500 mg 3 times a day for 3 days. (if pregnant for 7 days)

Cefalexin

Child 3–11 months
12.5 mg/kg twice daily, alternatively 125 mg twice daily for 3 days.
Child 1–4 years
12.5 mg/kg twice daily, alternatively 125 mg 3 times a day for 3 days.
Child 5–11 years

12.5 mg/kg twice daily, alternatively 250 mg 3 times a day for 3 days.
Child 12–15 years
500 mg twice daily for 3 days. (if pregnant for 7 days)

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ACUTE PYELONEPHRITIS

CHILDREN AGED 3 MONTHS TO UNDER 16 YEARS
ORAL FIRST LINE:
CEFALEXIN, OR CO-AMOXICLAV (IF SENSITIVITY KNOWN).

Cefalexin

By mouth
Child 3–11 months
12.5 mg/kg twice daily for 7 to 10 days, alternatively 125 mg twice daily; increased if necessary to 25 mg/kg 2–4 times a day (max. per dose 1 g 4 times a day), increased dose used in severe infections.
Child 1–4 years
12.5 mg/kg twice daily, alternatively 125 mg 3 times a day for 7 to 10 days; increased if necessary to 25 mg/kg 2–4 times a day (max. per dose 1 g 4 times a day), increased dose used in severe infections.
Child 5–11 years
12.5 mg/kg twice daily, alternatively 250 mg 3 times a day for 7 to 10 days; increased if necessary to 25 mg/kg 2–4 times a day (max. per dose 1 g 4 times a day), increased dose used in severe infections.
Child 12–17 years
500 mg 2–3 times a day for 7 to 10 days; increased to 1–1.5 g 3–4 times a day, increased dose used in severe infections.

CO-AMOXICLAV (doses for 125/31 suspension)

Child 3–11 months
0.25 mL/kilogram 3 times a day for 7 to 10 days, dose doubled in severe infection.
Child 1–5 years
0.25 mL/kilogram 3 times a day, alternatively 5 mL 3 times a day for 7 to 10 days, dose doubled in severe infection.

CO-AMOXICLAV (doses for 250/62 suspension)

Child 6–11 years
0.15 mL/kilogram 3 times a day, alternatively 5 mL 3 times a day for 7 to 10 days, dose doubled in severe infection.

CO-AMOXICLAV TABLETS

Child 12–15 years
250/125 mg 3 times a day for 7–10 days, alternatively 500/125 mg 3 times a day for 7–10 days.
Child 16–17 years
500/125 mg 3 times a day for 7–10 days.