Suspected Urinary Tract Infection

Clinical Assessment/ Management tool for Children

Management – Combined Acute and Primary Care

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)

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

Able to obtain urine sample? (see box 1)

Yes

Under 3 Months	3 months to <3 years	≥3 years
• If nitrites or leuc +ve, send for culture (see box 1) and treat empirically (see box 2)(see box 2) • If nitrites and leuc both -ve, send for culture. If culture positive and child well, repeat sample, ideally with clean catch. Liaise with paediatrics if clinical concern	• If nitrites and leuc both -ve, UTI unlikely. Do not send for culture • If nitrites +ve or leuc +ve, send for culture (see box 1) and treat empirically (see box 2)	• If nitrites and leuc both -ve, UTI unlikely. Do not send for culture. • If nitrites +ve, send for culture and treat empirically as UTI (see box 2). • If leuc +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)

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

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

In a child under 3 months, a negative urine dip does not exclude a UTI.

Able to obtain urine sample? (see box 1)

Yes

- If nitrites and leuc both -ve, UTI unlikely. Do not send for culture, unless <3m
- If nitrites and/or leuc +ve on dipstick, assume UTI. Send sample for culture (see box 1) and treat empirically as upper UTI awaiting culture results (see box 2). Liaise with paediatrics if <3m
- If child ≥3 years of age and dipstick +ve only for leuc, 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

Microbiology

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

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Table 1 Normal Values:

Age	Guide weight (kg)	RR At rest Breaths per minute 5th-95th centile	HR Beats per minute 5th-95th centile	BP systolic		
				5th centile	50th centile	95th centile
Birth	3.5	25-50	120-170	65-75	80-90	105
1 month	4	25-50	120-170	65-75	80-90	105
3 months	5	25-45	115-160	65-75	80-90	105
6 months	8	20-40	110-160	65-75	80-90	105
12 months	10	20-40	110-160	70-75	85-95	105
2 years	12	20-30	100-150	70-80	85-100	110
3 years	14	20-30	90-140	70-80	85-100	110
4 years	16	20-30	80-135	80-90	85-100	110
5 years	18	20-30	80-135	80-90	90-110	110-120
6 years	20	20-30	80-130	80-90	90-110	110-120
7 years	23	20-30	80-130	80-90	90-110	110-120
8 years	24	15-25	70-120	80-90	90-110	110-120
9 years	28	15-25	70-120	80-90	90-110	110-120
10 years	30	15-25	70-120	80-90	90-110	110-120
11 years	35	15-25	70-120	80-90	90-110	110-120
12 years	40	12-24	65-115	90-105	100-120	125-140
14 years	50	12-24	60-110	90-105	100-120	125-140
Adult	70	12-24	60-110	90-105	100-120	125-140

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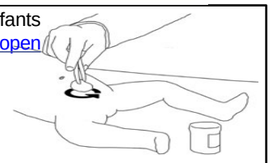
Box 1

Urine collection and preservation

- Clean catch is recommended method. Gentle suprapubic cutaneous stimulation using gauze soaked in cold fluid helps trigger voiding*
- 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 (4mg/kg (max 200mg/dose) 12 hourly for 3 days). If previous treatment with trimethoprim in preceding 3 months, use nitrofurantoin if able to swallow tablets (age 12-18 years 50mg 6 hourly) for 3 days or cefalexin 25mg/kg 8 hourly for 3 days (max 1g/dose). If confirmed severe penicillin allergy and unable to swallow nitrofurantoin tablets, prescribe ciprofloxacin 20mg/kg 12 hourly for 3 days (max 750mg/dose).
- Upper UTI/pyelonephritis: cefalexin (25mg/kg 8 hourly (max 1g/dose) for 7 days). If severe penicillin allergy, use ciprofloxacin 20mg/kg 12 hourly for 7 days (max 750mg/dose).

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 urine flow
- Poor fluid intake
- Dysfunctional or infrequent voiding esp at school
- Irritable bladder (can happen following UTI)
- Neuropathic bladder. Evidence of spinal lesion
  - Examine spine
- Genitourinary abnormalities
  - Examine genitalia
- Previous suspected or confirmed UTI
- Recurrent fever of uncertain origin
- Antenatally diagnosed renal abnormality
- FH of VUR or renal disease
- Enlarged bladder
- Abdominal mass
- Poor growth
- Hypertension

For further information, see NICE guidelines