Urinary tract infection

History

In infancy often fever alone
May have poor feeding , failure to thrive
Malodorous urine +renal angle pain uncommon

Commoner in un - circumcised males

90% due to E.coli

Accurate diagnosis via urine culture is essential

Examination

- Often normal
- Centiles + BP
- Examine lower back
- Check for renal angle tenderness +/- renal masses
- Outrule constipation

obtaining urine

Clean catch is the best method

High contaminatio n of bag specimens

Red Flags

Under 1 month olds may present with FTT / jaundice /poor feeding – if post.urethral valves have poor urinary flow and acute renal failure

Extra care if neuropathic bladder

Investigations

- **Dipstick LE not as effective as urinalysis**
- **send urine c/s to lab**
- Renal ultrasound
- MCUG if under 6 months
- DMSA to detect scarring (see guideline)

Evidence Base

Antibiotic prophylaxis preferable to surgery except if severe grades of reflux or breakthrough infections

Treatment

- if under 6 months or signs of pyelonephritis will require i/v antibiotics
- Oral amoxycillin/ trimethoprim+
- sulphamethoxazole

References

- NICE guidelines CG 54
- National UTI guidelines (Riordan et al)
- Forum 23;10: 24-24

TAKE HOME MESSAGES

UTI to be considered in all infants with fever
Clean catch is the best method of collection
If under 6/12 – u/s and MCUG
Renal scars in 10% of UTI's

UTI in older girls

Most have dysfunctional voiding -> repeated episodes of cystitis

Appendix : Guide to Managing First Urinary Tract Infection in Childhood

Age:	0 to 6 Months	6 months to 2 years well	6 months to 2 years ill	2 to 16 years well	2 to 16 years ill
Symptoms:	Do not require fever to be critically unwell, high index of suspicion. Consider urosepsis and meningitis	Fever <38C; systemically well	Fever >38C and systemically unwell; loin pain	Fever <38C and systemically well	Fever >38C and systemically unwell; loin pain
Diagnosis:	Single clean catch sample with >20 white cells OR any white cells on supra pubic aspiration*	Single clean catch sample with >50 white cells in the absence of epithelial cell contamination	Single clean catch sample with >50 white cells in the absence of epithelial cell contamination	Single mid stream, clean catch sample with >50 white cells in the absence of epithelial cells OR dipstick +ve for nitrite and leucocytes in well	Single clean catch sample with >50 white cells in the absence of epithelial cell contamination
Hospital/ GP:	**Hospital admission**	General practitioner	**Hospital admission**	General practitioner	**Hospital admission**
Treatment:	0-8 weeks: cefotaxime, amoxycillin and gentamicin (preterm babies require specialist advice) 2 to 6 months: augmentin and gentamicin	Home on adequate dose of oral augmentin or an appropriate cephalosporin determined by local sensitivities	IV augmentin and gentamicin	Home on adequate dose of oral augmentin (boys) or trimethoprim (girls)	IV augmentin and gentamicin
Imaging:	Renal ultrasound scan (USS) within 72 hours of admission Discharge on prophylactic antibiotic. Repeat USS and DMSA at 4 months post UTI to look for evolving scarring.. If obstruction suspected discuss urgently with paediatric urology/nephrology. If vesico-ureteric reflux (VUR) suspected then suggest MCUG between 3-6 months of age.	Consider prophylaxis if under 1 year of age – can be stopped at 1 year of age if no further infections. Renal USS at 4-6 months post UTI. DMSA is a potential alternative but renal USS alone is likely sufficient if original renal USS was normal. If VUR suspected then suggest MCUG if <12 months of age. MCUG should never be performed in children over a year of age without discussion with Nephro-urology.	Renal USS prior to discharge. If obstruction suspected discuss urgently with paediatric nephro-urology Renal USS at 4-6 months post UTI. DMSA is a potential alternative but renal USS alone is likely sufficient if original renal USS was normal. If VUR suspected then MCUG if <12 months of age. MCUG should never be performed in children over a year of age without discussion with Nephro-urology.	Imaging is generally not required unless: 1. Pyuria and significant growth of a single organism in a boy with no evidence of balanitis. A routine outpatient renal USS should be requested. 2. Recurrent urine infections - a routine outpatient renal USS should be requested.	Renal USS prior to discharge. Repeat USS at 6 months to 1 year post UTI – looking for evolving scarring. DMSA is a potential alternative but USS alone is likely sufficient if original USS was normal.
Follow up:	Confirm culture results before discharge. Advise parents on signs/symptoms of UTI. General paediatric follow up to check BP/ urinalysis and review renal USS.	General practitioner or emergency department - check antibiotic sensitivities within 5 days. No follow up needed if imaging normal at 4-6 months.	Confirm culture results before discharge. General paediatric follow up to check BP and review renal USS.	General practitioner or emergency department. General Paediatric follow up if imaging required. Check antibiotic sensitivities within 5 days	Confirm culture results before discharge. General paediatric follow up to check BP and review renal USS.

Sample collection:
A clean catch mid stream sample is best – essential for children < 6 months unless suprapubic performed.
In babies clean the perineum with water/wipes, lie them down with the nappy open and offer a feed.
With the nappy open instruct a parent to wait with an open sample jar and catch a mid stream sample when passed.
Consider dehydration if urine is not passed.

Where urine collection by clean catch is not deemed possible.

A. Consider suprapubic aspiration of the bladder ***(babies < 1year).***
Best performed with volumetric ultrasound guidance to ensure a full bladder.
Examine the abdomen for masses carefully before undertaking this test.
Avoid more than one attempt. **Avoid if you have not been trained to perform this test.**

B. Consider collecting 2 separate bag samples.
Clean the perineum with water/wipes.
Apply a suitably sized bag to the peri urethral area.
Instruct the parents to keep the child upright and to keep the bag visible outside the nappy.
Remove the bag immediately when urine has been passed.
Change the bag after 30 minutes if urine has not been passed - consider dehydration.
Collect 2 separate samples - if either is culture negative then UTI is unlikely,

Recurrent Urinary Tract Infections

more than one proven urinary tract infection

based on 2 separate episodes at which
urine culture demonstrates
pure growth of a single organism
from an appropriately collected sample

Atypical Urinary Tract Infections

Significant systemic illness,
poor urine flow, abnormal renal function
abdominal or bladder mass
septicaemia
infection with non-E. coli organism, persisting
significant pyuria
strong family history of kidney problems
abnormal antenatal renal imaging

Duration of treatment:
Children well enough to be treated with oral antibiotics should receive between 5 and 7 days treatment.
Children sick enough to require IV antibiotics should receive 10 days treatment.
Children can be switched to oral antibiotics and sent home if : a). received 48 hours of IV antibiotics , b). clinically well , c). fever has settled for at least 48 hours, d). blood cultures are negative , e). no significant abnormality on renal USS, *f.*) a suitable oral antibiotic is available based on urine culture sensitivities

Role of the micturating cysto-urethrogram:
Some degree of vesico- ureteric reflux (VUR) will be found in 1/3 of children presenting with a UTI. It is not clear that identification and treatment of low grade VUR alters outcome and children presenting with a first UTI do not necessarily need an MCUG as part of their work up.

Indications that an MCUG might be useful include: age <6 months at presentation; male gender; renal scarring; hydronephrosis with hydroureter; recurrent infection; strong family history of reflux nephropathy; or known abnormalities of antenatal imaging suggestive of reflux.

MCUG should not be performed on children under 3 months of age without IV antibiotic prophylaxis.
A clear urine culture should be available prior to the MCUG and the test covered with prophylactic antibiotics. MCUG should never be performed in children over a year of age without consultation with nephro-urology services. IF POSTERIOR URETHRAL VALVES ARE SUSPECTED THEN THE PATIENT SHOULD BE DISCUSSED WITH UROLOGY PRIOR TO PERFORMING AN MCUG.

Refer to General Paediatrics if:
Recurrent infections
Atypical infections

Discuss with Nephro-Urology if:
Imaging suggests urinary obstruction, significant unilateral scarring/dysplasia, calculi or bilateral renal abnormality - copies of all imaging are essential
Not getting better after 48 hours IV treatment
Poor urine output/raised creatinine
Palpable bladder or abdominal mass

Guidelines are not intended as a substitute for common sense.
Urgent treatment should not be delayed when required.
Antibiotic choices should be guided by local organism sensitivities

This algorithm has been produced by the National Paediatric and Neonatology Clinical Programmes. It is aimed at medical, nursing and allied health professionals working in both primary and emergency care settings.

Amendments following suggestions from QIP committee of the ICGP . Additional guideline re investigations enclosed . Secondary care investigations and treatment denoted in pink

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