Urinary tract infection in children

#1 presentation to paediatric urologist
A/w increased risk of underlying anatomical abnormality c.f. adults
Untreated episodic UTI a/w sepsis, renal scarring, hypertension and ESRF
Boys > girls in first year of life; girls > boys thereafter
Overall affects 5% girls and 1.5% boys in childhood
50% of girls will have a further UTI
No evidence that childhood UTI predicts adult UTI except in those with underlying anomalies
Organisms (top 3)
  E Coli  85%
  Proteus
  Klebsiella

40% of children will have underlying urinary tract abnormality: of these;
  VUR/scarring  70%
  Obstruction  12.5%
  Duplication  12.5%
  Other  5%

Many of these abnormalities are insignificant. It has been estimated that significant abnormalities in 25%. Increased risk of finding underlying urinary tract abnormality in 2 situations:
  Positive family history (VUR & duplication abnormalities heritable)
  Febrile UTI
  [No increased risk with recurrent UTI, age or male sex]

Diagnosis
Confirm definite UTI
Type of specimen important
  Clean catch  Patience required
  Collection bag  Routine, few false positive/negative
  Catheter/SPA  Equivocal cases only. Invasive

Culture
  >10^5 cfu/ml
  > 5 x 10^6 wcc/l significant pyuria
  NB. UTI without pyuria controversial ? contaminant ? a/w scarring.
  Conventionally investigated and treated as for UTI

Upper tract UTI a/w fever, rigors, vomiting and loin pain – not seen with simple lower tract UTI

Investigation
USS first-line in almost all cases: findings dictate further investigation (see below)
However USS has a false negative rate of ~40% for VUR and scarring. Thus further investigation (usually with DMSA) warranted in a number of high risk groups:
  < 2 yrs
  Febrile UTI
  FHx VUR
If USS and DMSA normal, MCUG indicated for all above. Once children get older than 4 the risk of new scar formation lessens, such that MCUG would only be performed for recurrent febrile UTI.

**Management**

Appropriate ABx for acute UTI for 5-7 days

IV antibiotics for infants and older kids with pyelonephritis

Antibiotic prophylaxis for children <4 at least till investigation completed

Attention to dysfunctional voiding and bowel regime, particularly in girls

**NICE guidelines for childhood UTI** (August 2007 – CG54)

3 types of UTI: Typical, atypical and recurrent.

(i) Typical

E.coli, responds to Abx within 48 hours

(ii) Atypical

Non E.coli

No response to Abx within 48 hours

Severely unwell

Septicaemia

Abnormal creatinine

Bladder mass

Poor flow

(iii) Recurrent

3 x cystitis

2 x pyelonephritis

One of each

Investigation predicated on the observation that most underlying abnormalities are of dubious significance (VUR in ~70%) and after the age of 3 years the likelihood of renal scarring and deterioration is reduced.
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<tr>
<th>Typical UTI</th>
<th>&lt; 6 months</th>
<th>USS @ 6 weeks</th>
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<td>6 months to 3 years</td>
<td>None</td>
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<tr>
<td></td>
<td>&gt; 3 years</td>
<td>None</td>
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<tr>
<td>Atypical UTI</td>
<td>&lt; 6 months</td>
<td>Acute USS</td>
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<td>DMSA 4-6 months</td>
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<td>Acute USS only</td>
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