Objective

Discuss the 2011 AAP UTI Clinical Practice Guidelines with emphasis on the 7 action statements.

Discuss the corresponding literature and rationale for the diagnosis and treatment recommendations

Utilize the guidelines in case scenarios

Guideline Development

Major revision of the 1999 practice guidelines

Developed by a subcommittee of the AAP Steering Committee on Quality Improvement and Management then reviewed by multiple groups within the AAP and 5 external organizations.

Consistent with 1999, focus is on the diagnosis and treatment of the initial febrile UTI in children 2-24 months of age.

Guideline Development

Surveillance of literature over the past 10 years

Systematic review of the literature on prophylactic antimicrobial therapy.

The subcommittee discussed and reached consensus on the quality of evidence and the strength of the recommendation.

Action Statement 1

If a clinician decides a febrile infant with no apparent source for the fever needs antimicrobial therapy secondary to their degree of illness, then a urine specimen should be obtained for both urinalysis and culture prior to administration of the antimicrobial agent by means of SPA or catheterization.
**Action Statement 1**

Benefits
- Missed diagnosis can lead to renal scarring.
- Once given, antimicrobials will obscure culture results
- Over diagnosis can lead to unnecessary treatment and cost

Risk
- Catheterization is invasive

Conclusion: Preponderance of benefit over risk.

**Action Statement 2 (2a and 2b)**

2 – If a clinician decides a febrile infant with no apparent source of the fever does not need immediate antimicrobial agents, then the likelihood of a UTI should be considered.

2a – low likelihood of UTI, clinical follow up only

2b – Not in low-risk group, then obtain urine for evaluation

**Action Statement 2**

Benefits
- Missed diagnosis can lead to renal scarring.
- Over diagnosis can lead to unnecessary treatment and cost

Risk
- Catheterization is invasive
- Small number of low likelihood children will delay diagnosis

Conclusion: Preponderance of benefit over risk.

**Action Statement 3**

To establish the diagnosis of UTI, clinicians should require both a urinalysis suggestive of infection and the presence of at least 50,000cfu of a uropathogen cultured from a properly obtained urine specimen.

**Action Statement 3**

Benefits
- Missed diagnosis can lead to renal scarring.
- Over diagnosis can lead to unnecessary treatment and cost
- Reduction in overdiagnosis of asymptomatic bacteriuria

Risk
- Stringent diagnostic criteria may miss some UTIs.

Conclusion: Preponderance of benefit over risk.
**Action Statement 4**

4a – When initiating treatment, the route of administration should be based on practical considerations. As oral and parenteral treatment is equally efficacious, the choice should be based on local sensitivity patterns and adjusted according to the sensitivity of the isolated uropathogen.

4b – The clinician should choose 7-14 days of antimicrobial therapy.

**Benefits**
- Adequate treatment can prevent renal scarring.
- Outcomes of short course therapy (1-3d) are inferior to those of 7-14d.

**Risk**
- Minimal harm and cost effect on choice and duration.

**Conclusion:** Preponderance of benefit over risk.

**Action Statement 5**

Febrile infants with UTIs should undergo renal and bladder ultrasonography (RBUS).

**Benefits**
- RBUS will be abnormal in about 15% of cases with 1-2% leading to further action (additional evaluation, referral, or surgery).

**Risk**
- False-positive result in 2-3% of cases.

**Conclusion:** Preponderance of benefit over risk.

**Action Statement 6**

6a – VCUG should not be performed routinely after the first febrile UTI. VCUG is indicated if RBUS reveals hydronephrosis, scarring, or other findings suggestive of high-grade VUR or obstructive uropathy.

6b – Further evaluation should be conducted if there is recurrence of a febrile UTI.
TABLE 5
Rates of VUR According to Grade in Hypothetical Cohort of Infants After First UTI and After Recurrence

<table>
<thead>
<tr>
<th>VUR</th>
<th>After 1st UTI (N=100)</th>
<th>After Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade I–III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No VUR</td>
<td>65</td>
<td>26</td>
</tr>
<tr>
<td>Grades IV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VUR</td>
<td>29</td>
<td>56</td>
</tr>
<tr>
<td>Grade V VUR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VUR</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Grade V VUR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VUR</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>

Action Statement 6a
Benefits
The avoidance for the vast majority of febrile infants with UTIs radiation exposure, expense, and discomfort.

Risk
Delayed detection of a small number of high-grade VUR cases and correctable abnormalities.

Conclusion: Preponderance of benefit over risk.

Action Statement 6b
Benefits
VCUG after a second UTI should identify infants with high-grade VUR.

Risk
Discomfort, cost, and radiation exposure of VCUG.

Conclusion: Preponderance of benefit over risk.

Action Statement 7
Benefits
Early treatment of UTIs reduce the risk of renal scarring.

Risk
Additional cost and inconvenience to parents with more frequent visits to the clinician for fever evaluation.

Conclusion: Preponderance of benefit over risk.
Conclusions

7 key action statements for the diagnosis and treatment of infants and children ages 2-24 months with UTI.

Strategies for diagnosis and treatment depend on whether the use of antimicrobials can be delayed.

Diagnosis is based on pyuria and at least 50,000 cfu of a uropathogen appropriately collected.

Conclusions

RBUS should be performed on initial febrile UTI and 7-14 days of treatment is sufficient.

VCUG following the first UTI is not indicated, unless the RBUS reveals hydronephrosis, scarring, or findings suggestive of high-grade VUR.

VCUG should be performed following a recurrent febrile UTI.

Case #1

5 month old previously well girl presents to the office with fever to 102.4. Mom reports no rash, vomiting, diarrhea, cough, or nasal congestion. PE reveals a well appearing child with a normal exam.

What is indicated in the initial evaluation?

Case #2

The mother of a 12 month old female calls the office as her daughter has a fever and vomiting. She had a febrile UTI at age 6 months with a normal RBUS and was treated with oral antibiotics. She would like to know if she needs to come in for an evaluation.

Case #3

A 5 month old male diagnosed with a UTI last night in the ER with a positive UA was given an oral antimicrobial and discharged home. He comes in for follow up this morning to the clinic. If he is doing well clinically, what is the next step?

Case 3 (cont.)

His urine culture was reported as 50,000 cfu of pansensitive E.coli. A RBUS was performed on day 4 of the illness and was concerning for mild left hydronephrosis. Do any additional studies need to be performed?
Case 3 (cont.)

VCUG was completed the following day and revealed Grade II VUR on the left and no VUR on the right. The mother would like to know if he needs any further treatment and what are the likely outcomes.

References

- Texas Children's Hospital First Febrile Urinary Tract Infection Clinical Guideline: Evidence-Based Outcomes Center. September 2011.