UTI

Clinical picture with 2 suggestive dipstix (leucs, nitrites, +/-protein/blood
Post UTI Investigation. Some advise only give antibiotics after positive cultures, others (Pocket Paediatrics) advise emperic therapy while awaiting sensitivity results. Bottom line- if labeled 'UTI' committed to investigations so don't make the diagnosis without significant effort (in paeds)

Wythenshawe Protocol
First Infection
Any age-
USS

AND
Age <1yr
- DMSA
-MCUG

Age 1-2yrs
-DMSA
-MCUG if infection with fever, FHx, social circumstances

Age 2-5yrs
-?DMSA must if infection with fever
If abnormal MCUG

>5yrs
USS

Second Infection
DMSA if not already done
Plain film

Recommendations from Royal College of Paediatrics and Child Health, based on Guidelines from the American Academy of Pediatrics

SUMMARY OF 'AGREE' FINDINGS
The methods used to identify the evidence
MEDLINE 1966-1996 was the only database searched. The files of the authors of the guideline were also searched.
Which professionals were involved
The American Academy of Pediatrics (AAP) Committee on Quality Improvement selected a Subcommittee composed of pediatricians with expertise in the fields of epidemiology and informatics, infectious diseases, nephrology, pediatric

practice, radiology, and urology to participate as the guideline development team.

Involvement of parents &/or children

There is no mention of any child or parent involvement.

Consensus method used

No formal consensus method was used.

OTHER PUBLICATIONS ON RELATED TOPICS

Long-term antibiotics for preventing recurrent urinary tract infection in children, Williams GJ, Lee A, Craig JC. Cochrane library. Clinical Evidence. The Scottish Intercollegiate Guidance Network (SIGN) currently has plans to produce an evidence based guideline on childhood UTI

LEVELS OF EVIDENCE/DERIVATION OF GRADES OF RECOMMENDATIONS

The levels of evidence used are those derived from the US Agency for Health Care Policy and Research, 1993 for therapeutic studies, and those described by Sackett for diagnostic and prognostic studies (see below). **Please note that those recommendations ORIGINALLY ascribed a Grade C equivalent have not been appraised by the College.**

Therapeutic Studies	Diagnostic studies	Prognostic studies
Grade A:	Requires at least one randomised controlled trial as part of the body of evidence of overall good quality and consistency addressing the specific recommendation.	Independent blind comparison of an appropriate spectrum of consecutive patients, all of whom have undergone both the diagnostic test and the reference standard, +- systematic review.	Individual inception cohort study with >=80% follow up, +- systematic review.
Grade B:	Requires availability of well-conducted clinical trials but no randomised clinical trials on the topic of the recommendation.	Independent blind comparison • but either in non-consecutive patients, • or confined to a narrow spectrum of study individuals (or both), all of whom have undergone both the diagnostic test and the reference standard, • or of an appropriate spectrum but with reference standard not applied to all study patients, +- systematic review.	Retrospective cohort study or follow up of untreated control patients in an RCT, +- systematic review.
Grade C:	Requires evidence from expert committee reports or opinions and/or clinical experience of respected authorities. Indicates absence of directly applicable studies of good quality.	Reference standard was not applied independently or not applied blindly.	Case series (and poor-quality cohort and case-control studies)

Recommendations

Grade	Appraised by the College

Diagnosis

B 

• UTI occurs in about 2-10% of infants and young children 2 months to 2 years of age with unexplained fever. (**Original Statement**: The presence of UTI should be considered in infants and young children 2 months to 2 years of age with unexplained fever. Grade A)

American Academy of Pediatrics

Evidence-based Guidelines for the Diagnosis, Treatment and Evaluation of the Initial Urinary Tract Infection in Febrile Infants and Young Children

KEY POINTS

• The guideline does not address the link between childhood UTI's, renal abnormalities and long term outcome with or without treatment.Without this link, the recommendations for initial management of children following UTI cannot be considered valid.
• The guideline was based on the US health system, and the grading system used was poorly defined. The college therefore applied a recognised system of grading (see below).
• There is no mention of any child or parent involvement.
• The use of urine dipstick tests followed by urine culture for confirmation of diagnosis of UTI is supported by research evidence.

These recommendations have been derived from an original guideline document produced by theAmerican Academy of Pediatrics. The full guideline may be obtained at the following website:http://www.aap.org/policy/ac9830.htm. **NB:** The original guideline is **NOT** the work of the RoyalCollege of Paediatrics and Child Health. This document represents the College's appraisal of the authors'completed guidelines. The College's appraisal should not be considered valid beyond September 2004,and new evidence at any time could invalidate these recommendations.

Recommendations Grade Appraised by the College

A

• In infants and young children 2 months to 2 years of age with unexplained fever, the degree of toxicity, dehydration, and ability to retain oral intake must be carefully assessed

B

• If an infant or young child 2 months to 2 years of age with unexplained fever is assessed as being sufficiently ill to warrant immediate antimicrobial therapy, a urine specimen should be obtained by SPA or transurethral bladder catheterization due to the risk of the urine being contaminated if collected in a bag (**Original statement**: Grade A). *See comment below.*

B

• If an infant or young child 2 months to 2 years of age with unexplained fever is assessed as not being so ill as to require immediate antimicrobial therapy, there are two options:

1) Obtain and culture a urine specimen collected by SPA or transurethral bladder catheterization.
2) Obtain a urine specimen by the most convenient means and perform a urinalysis. If the urinalysis suggests a UTI, obtain and culture a urine specimen collected by SPA or transurethral bladder catheterization; if urinalysis does not suggest a UTI, it is reasonable to follow the clinical course without initiating antimicrobial therapy, recognizing that a negative urinalysis does not rule out a UTI (**Original statement**: Grade A).

Comment: The decision model underpinning this and the previous recommendation assumed that the benefits of antibiotic prophylaxis outweigh harms in children with reflux and therefore that imaging for VU reflux would be done if UTI were diagnosed. SPA/catheter specimens were therefore preferred to bag specimens to reduce the number of children with false positive urine cultures who unnecessarily undergo invasive imaging for reflux. However, a systematic review of antibiotic prophylaxis following UTI found that RCTs were limited to children without reflux. There was weak evidence for a reduction in recurrent UTIs in children given prophylaxis but no information on the effects on renal damage and symptoms.

An alternative strategy to invasive imaging for all children with a first UTI is to limit investigation to those with recurrent UTIs or other risk factors. Children with an uncomplicated first UTI should receive short course antibiotic treatment, no invasive imaging, and repeated urine testing if symptoms recur. Given the management consequences of this latter strategy, a third option, namely bag urine culture in children with a positive urine dipstick, is appropriate.

A

• Diagnosis of UTI requires a culture of the urine.

Comment: an approach which involves screening with the use of urine dipstick tests (leucocyte esterase or nitrite) combined with urine culture in children with a positive dipstick result is consistent with research evidence (Gorelick M, Shaw K. Screening tests for urinary tract infection in children: a meta-analysis. Pediatrics (1999); 104: e54)

Treatment

B

• In the infant or young child 2 months to 2 years of age who may not appear ill but who has a culture confirming the presence of UTI, antimicrobial therapy should be initiated orally (**Original statement*:*** parenterally or orally)

B

• Infants and young children 2 months to 2 years of age with UTI who have not had the expected clinical response with 2 days of antimicrobial therapy should be reevaluated and another urine specimen should be cultured

A

• Infants and young children 2 months to 2 years of age, including those whose treatment initially was administered parenterally, should complete a 7- to 14-day antimicrobial course orally

C

• After a 7- to 14-day course of antimicrobial therapy, infants and young children 2 months to 2 years of age with UTI should receive antimicrobials in prophylactic dosages until the imaging studies are completed (**Original statement***:* After a 7- to 14-day course of antimicrobial therapy and sterilisation of the urine, infants and young children 2 months to 2 years of age with UTI should receive antimicrobials in therapeutic or prophylactic dosages until the imaging studies are completed. Grade B*). Comment: an alternative strategy that is consistent with the evidence is to defer prophylactic antibiotics and invasive imaging unless UTI recurs.*

Clinical audit: The original published guideline document did not contain clinical audit standards.

Overview

This publication presents evidence-based recommendations for the recognition, diagnosis, treatment and assessment of UTI in children. Please note that the original guideline also contains extensive advice in addition to that summarised here, and it is strongly recommended that the full guideline be accessed. Guidelines are 'systematically developed statements to assist decisions about appropriate care for specific clinical circumstances' based on systematic reviews of the research literature. Guidelines are not intended to restrict clinical freedom, but practitioners are expected to use the recommendations as a basis for their practice. Local resources and the circumstances and preferences of individual patients will need to be taken into account. Where possible, recommendations are based on, and explicitly linked to, the evidence that supports them. Areas lacking evidence are highlighted and may form a basis for future research.

The Role of the Royal College of Paediatrics and Child Health

In order to raise awareness about the existence of the original guideline and to ensure its relevance for children's health, the College (through its Quality of Practice Committee) appraised the original guideline against the 'AGREE' checklist laid out in its 'standards' document.[1] Having established the quality of the guideline's methodology in this way, the College recruited independent reviewers to examine the recommendations presented in the guideline document in the context of the original research papers from which they were derived. These reviewers were expert in both the clinical area under examination and in critically appraising research literature. The findings of the reviewers are presented here. Where discrepancies between their findings and the originals exist, both recommendations have been included. The shaded boxes indicate these areas of discrepancy. In addition, where papers have been identified that post-date the publication of the guideline or further support the validity of the recommendations, these have been included.

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Renal Cortical Scintigraphy (DMSA)

Background

$^{99}Tc^{m}$ DMSA is injected iv, it is bound to the proximal tubules of the kidney and has an extraction efficiency of 6-8%.

Common Indications.

Detection of focal renal parenchymal abnormalities.

- Assessment of the kidney in the acute phase of a Urinary Tract Infection (UTI)
- Assessment of the kidney for detection of scar in the late phase following a UTI
- Assessment of the Horseshoe, solitary or ectopic kidney
- Localisation of the poor or very poorly functioning kidney
- Assessment of renal function in the presence of an abdominal mass

Reporting format:

- Description
- The position, size and overall morphology of the functioning renal tissue should be noted.
- The number, size and location of areas of cortical loss should be noted.
- Diffuse reduced uptake may be seen in a kidney with a UTI.

Pitfalls

-Acute and chronic pyelonephritis cannot be distinguished on the cortical scan. If a defect is present 6 months after the last UTI then this is a scar.
-A recent UTI may cause temporary reduced uptake / focal defect and a follow-up DMSA scan should be undertaken
-The diagnosis of renal scars is difficult in the infant under 3-6 months of age because of renal immaturity. If appropriate the scan should be delayed.
-There is a wide range of normal variants which should be recognised