

# Nurse led education plus direct access to imaging improved diagnosis and management of urinary tract infections in children

Coulthard MG, Vernon SJ, Lambert HJ, *et al*. A nurse led education and direct access service for the management of urinary tract infections in children: prospective controlled trial. *BMJ* 2003;**327**:656–9.

**Q** In general practice, does nurse practitioner (NP) led education plus direct access to imaging improve diagnosis and management of urinary tract infections (UTIs) in children?

## METHODS

**Design:** cluster randomised controlled trial.

**Allocation:** {concealed}\*.

**Blinding:** unblinded.

**Follow up period:** mean 20 months.

**Setting:** 88 general practices in a paediatric nephrology secondary catchment area in the UK.

**Participants:** 107 100 children who were followed up for incidence of UTIs.

**Intervention:** 44 general practices were allocated to a NP led intervention (NLI) (n = 55 800 children and 185 physicians) and 44 to usual care (UC) (n = 51 300 children and 161 physicians). Physicians in the NLI group were educated about the study and new management guidelines. Physicians used the new management guidelines to order imaging investigations for children with bacteriologically proven UTIs through the NP who was based in the nephrology department. The NP organised imaging, reviewed the results with a paediatric nephrologist, and informed the physician and family of normal test results. Paediatricians in the UC group followed their standard practice.

**Outcomes:** rate and quality of diagnosis of UTI, use of prophylactic antibiotics, and number of infants with vesicoureteric reflux in whom renal scarring could have been prevented.

**Patient follow up:** all children were included in the intention to treat analysis.

\*Information provided by author.

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## MAIN RESULTS

The rate of diagnosis of UTIs was greater in the NLI group than in the UC group (6.42 v 3.45 cases/1000 children/y, relative benefit increase 86%, 95% CI 42% to 144%). More children in the NLI group than in the UC group had bacteriologically proven UTIs (table). Among children < 4 years of age, more children in the NLI group received prophylactic antibiotics than in the UC group (94% v 41%, p<0.001). 12 infants in the NLI group had reflux without scarring compared with none in the UC group (p>0.05).

## CONCLUSION

Nurse led education plus direct access to imaging improved the rate of paediatric diagnosis and management of urinary tract infections in general practice.

## Commentary

The study by Coulthard *et al* addressed an important aspect of paediatric primary health care. UTIs are not always considered as a diagnosis for children >1 year of age with fever not yet determined. Even fewer are investigated, especially without office evidence of white blood cells or nitrates on urine dipstick testing. Coulthard *et al* aimed to determine whether a health services model that attempted to bridge the gap between general practice and secondary care could improve the care of children with UTIs and thus prevent renal scarring.

The design of the intervention was complex, involving the development of concise clinical guidelines, formal education for physicians, and a NP providing support and coordinating access to secondary services. Further instruction was available as required. The guideline for the NLI group recommended treatment with antibiotics upon clinical suspicion of a UTI, urine collection using pads for young children, and access to investigational imaging if a diagnosis of UTI was confirmed. The results show improved management of children with UTIs in the NLI group and a 4 fold increase in UTI diagnosis in infants (<1 y of age)—those at greatest risk of renal scarring. The study findings appear to reinforce those of a previous study.<sup>1</sup>

The study by Coulthard *et al* promotes several important considerations for general practice. Firstly, suspect UTI in children with fever without a focus, and treat. Secondly, do not rely exclusively on office dipsticks to guide management. Thirdly, question whether catheterisation is the best way to obtain a urine specimen in children not yet toilet trained. Fourthly, use antibiotics judiciously while awaiting culture results. These guidelines, although controversial, should prompt practitioners to question practice. This study is an important contribution to paediatric primary healthcare practice and may start to shift clinical thinking.

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1 Esbjorner E, Berg U, Hansson S. *Pediatr Nephrol* 1997;**11**:438–42.

Nurse led education plus direct access to imaging v usual care for paediatric patients in general practices (subgroup analysis of children referred for imaging)\*

Outcomes at 20 months	Nurse led intervention	Usual care	RBI (95% CI)	NNT (CI)
Bacteriologically proven UTIs	79%	60%	31% (16 to 54)	6 (4 to 8)

\*UTIs = urinary tract infections. Abbreviations defined in glossary; RBI, NNT, and CI calculated from data in article.