

BETS

Clean catch or bag specimen in UTI in non toilet trained children?

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A short cut review was carried out to establish whether bagged specimens of urine in children are more likely to be contaminated than clean catch specimens. 316 papers were found of which two presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are tabulated. The clinical bottom line is that clean catch is a better non-invasive method of obtaining a urine specimen, compared with bag urine, in non-toilet trained children.

Three part question

In a [non toilet-trained child with suspected UTI] is [clean catch or bag specimen of urine] better at [reducing the risk of contamination and therefore providing an accurate diagnosis of UTI]?

Clinical scenario

An 18 month old child with fever and vomiting is brought to the emergency department by its parents. There is no clear focus of infection on clinical examination and you suspect the child has a urinary tract infection. You wonder if a bag specimen of urine or clean catch specimen would be more accurate in diagnosing UTI.

Search strategy

Using Medline database 1966 to week 3 November 2005 via OVID.

The Cochrane Library 2005, Issue 4.

CinAHL: CINAHL 1982 to December 2005.

Search details

Medline: [uti.mp OR exp Urinary Tract Infections] AND [specimen.mp OR exp Specimen Handling/OR urine bag.mp OR clean catch.mp] AND [BestBETS paediatric filter] LIMIT to human and English language.

Cochrane: urinary and specimen and catch.

CinAHL: [specimen.mp OR exp Specimen Handling/ OR urine bag.mp OR clean catch.mp]

Search outcome

Medline: 337 papers were found of which 2 were relevant.

Cochrane: 17 citations. no new papers found. CinAHL: 100 citations. no new papers found

Comment(s)

There is much debate in the literature about the best technique for collecting urine specimens in children, however little evidence comparing the two methods commonly used in Emergency Departments. Alam *et al* reveals that clean catch is a better method of obtaining a urine specimen than bag urine, however, both techniques are not 100% sterile and free of contamination, and therefore can produce misleading results. Other methods of obtaining a sterile specimen of urine in non-toilet trained children should be researched, such as supra-pubic aspiration or catheterisation. One concern may be that the clean catch specimen is seemingly more difficult to collect (an increased miss rate in the Alam study) and this may present problems in the emergency department setting.

► CLINICAL BOTTOM LINE

One study has shown that clean catch is a better non-invasive method of obtaining a urine specimen, compared with bag urine, in non-toilet trained children.

Hardy JD, Furnell PM, Brumfitt W. Comparison of sterile bag, clean catch and suprapubic aspiration in the diagnosis of urinary tract infection in early childhood. *Br J Urol* 1976;**48**(4):279-83.

Alam MT, Coulter JB, Pacheco J, *et al*. Comparison of urine contamination rates using three different methods of collection: clean-catch, cotton wool pad and urine bag. *Annals of Tropical Paediatrics* 2005 Mar;**25**(1):29-34.

Table 1

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Hardy <i>et al</i> 1976 UK	30 unwell children with suspected UTI	Compared clean catch, bag specimen and suprapubic aspiration of urine	Pure growth or contamination	bag specimens 4/30 pure growth 22/30 contaminated. Clean catch specimens 2/30 pure growth 22/30 mixed growth. Suprapubic aspiration 4/30 pure growth, no contaminated specimens	Children were in-patients in paediatric ward having routine screening. No power study and small numbers. Authors actually found supra-pubic aspiration to be most effective (but not specifically the topic of this BET)
Alam <i>et al</i> 2005 Brazil	191 children, (125 were boys) <3 years without known UTI. All children had attempts at clean catch, urine bag and cotton wool pad sampling. If all three results were positive it was declared a positive UTI and excluded from the analysis.	Diagnostic study	Bacterial contamination of three methods of urine sampling. Missing samples (i.e. not obtainable by method)	Clean catch 14.7%, urine bag 26.6%, urine pad 29% (significantly higher than for clean catch $p < 0.01$) clean catch (12%), bag (4%), pad (4%).	More boys than girls Exclusion of true UTIs may have biased results.