

## Urine collection methods for infants under 3 months of age in clinical practice.

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**Introduction:** Clean-catch urine stimulation technique (CCUST) is a non-invasive technique that allows urine to be obtained from infants quickly, safely and effectively. The technique is based on bladder stimulation manoeuvres which includes gentle tapping in the suprapubic area followed by lumbar paravertebral massage.

**Objective:** To describe methods used to collect urine for culture in infants under 3 months of age and compare results and contamination rates.

**Methods:** In this retrospective observational cohort study, urine cultures were collected from infants <3 months of age at the Hospital Universitario Infanta Sofía, Madrid, between January 2016 and December 2019. Attending paediatrician decided the method depending on the clinical characteristics of the patient. The collection methods were CCUST, urethral catheterization (UC) or urine bag (UB) samples. UC was performed on patients with CCUST failures, with poor feeding, altered general condition or hemodynamic instability. Urine cultures were considered positive if pure bacterial growth was present at a concentration of >10,000 colony forming units per mL (CFU/mL) in specimens obtained using UC, and >100,000 CFU/mL in specimens obtained using CCUST. Urine cultures were considered negative if <1000 CFU/mL of bacteria growth were present in a sample obtained using UC or <10,000 CFU/mL of growth in a sample obtained using CCUST. Urine cultures were considered contaminated if they contained mixed bacterial growth or growth of one or more non-pathogenic bacterial species (i.e., Lactobacillus species or coagulase-negative strains such as those of the genera Staphylococci and Corynebacterium), irrespective of the colony counts.

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## Urine Collection Methods for Infants Under 3 Months of Age

**Results:** Median age of patients was 36 days with 54.6% being male. A total of 721 samples were evaluated. CCUST was the most common method with 592 (82.1%) samples collection followed by 77 (10.7%) by UC and 52 (7.2%) by urine bag (UB). Positive cultures were obtained in 11.7% (95% CI: 9.1, 14.3) of CCUST samples and in 28.6% (95% CI: 18.5, 38.7) of UC samples ( $p < 0.001$ ). The contamination rate was 13.7% (95% CI: 10.9, 16.4] for CCUST, 23.1% (95% CI: 11.6, 34.6) for UB and 5.2% (95% CI 0.2, 10.2) for UC, with statistically significant differences ( $p = 0.007$ ) between UB and UC collection.

Urine culture results	Collection method			p-value		
	CCUST (n=592)	UC (n=77)	UB (n=52)	CCUST/UC	CCUST/UB	UC/UB
Negative %	65.7	57.1	51.9	0.41	0.09	1
Intermediate %	9.0	9.1	11.5	1	1	1
Positive %	11.7	28.6	13.5	<0.001*	1	0.13
Contaminated %	13.7	5.2	23.1	0.11	0.19	0.007*

**Conclusions:** The contamination rate of UC is lower but NOT significantly different to that of CCUST. Urine collection by CCUST serves as a non-invasive alternative to UC for diagnosis of UTI in infants under 3 months of age.



Step 1



Step 2

CCUST: The technique is based on bladder stimulation manoeuvres which includes gentle tapping in the suprapubic area followed by lumbar paravertebral massage.

### EXPERT COMMENT

“CCUST is a feasible method of urine collection for infants in the emergency room and in-patient settings. Training of nursing staff with the help of videos or sessions is required prior to implementation of this method in clinical practice.”

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With warm regards,

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### Reference

Herreros ML, Gili P, Del Valle R, et al. Urine collection methods for infants under 3 months of age in clinical practice. *Pediatr Nephrol.* 2021 Jun 7. doi: 10.1007/s00467-021-05142-4.