

BRIEF REPORT

Urine collection techniques in non-toilet trained children: Switzerland's paediatric office practices in 2022

Urinary tract infections (UTIs) are common in children. Paediatric scientific societies have issued recommendations on urine collection methods for UTI diagnosis. The midstream clean-catch (CC) sampling is performed easily when the child urinates on demand but is tedious in non-toilet-trained children. In this case, several methods of urine collection are available: trans-urethral bladder catheterisation (CATH); suprapubic bladder aspiration (SPA); collection bag (CB); CC urine collection relying on stimulation methods.^{1,2}

2021 Swiss guidelines³ recommend SPA and CATH for urine culture but consider the CC methods with stimulation as valid alternatives. CB sampling can be used to exclude a UTI.

The literature shows discrepancies between practice guidelines and reality on urine collection methods for non-toilet-trained children. While CATH, SPA and CC urine collection are the methods taught in medical schools, CB was widely used across Europe.^{4,5}

We wished to know if Switzerland's office-based paediatricians followed their most recent national guidelines for urine collection technique in non-toilet trained children with a suspected UTI and, specifically, if less CB and more CATH/CC techniques were used currently compared with almost 10 years ago.

The study was realised between January 14 2022 and March 10 2022. Paediatricians were invited to participate in an online survey. The choice of collection techniques could be dichotomised according to the suspected child's clinical condition (poor/good general condition [GC]). Data analysis relied on R statistical software. Multinomial logistic regressions were used for comparative statistics. The association of paediatricians' demographic characteristics with urine collection methods was tested. Conditional odds ratios (OR) and 95% confidence intervals (CI) were used.

Of 1280 paediatricians, 356 answered and 258 responses were included. Reasons for exclusions were no office-based practice ($n = 41$) and incomplete answers ($n = 57$). The mean age was 49 years. 54% had been for more than 10 years in office. 82% worked in a group office. 55% were located less than 10 km from a paediatric emergency unit. 76% saw between 1000 and 4000 cases/year. 58% requested ≤ 1 /week urine collection for suspected UTI. 47% performed CATH. SPA was rarely used.

Paediatricians' age was significantly associated with the choice of collection technique: first, CC rather than CB, was chosen by younger paediatricians, regardless of the child's GC (good GC: 46 versus 50 years, OR 0.96; 95% CI, 0.94–0.99. Poor GC: 46 versus 50 years, OR 0.96; 95% CI, 0.92–0.99), and second, CATH rather than CB was chosen by younger paediatricians in poor GC children (47 versus 50 years, OR 0.96; 95% CI, 0.93–1.00). In good GC children, paediatricians with more than, respectively, less than 10 years of hospital training, relied on CC more often than CB (OR 1.83, 95% CI 1.01–3.30).

Forty-four percent of paediatricians used first-line CB only to exclude UTI. [Table 1](#) shows the results.

A substantial part of office-based paediatricians thinks that the official Swiss urine collection guidelines are difficult (37%) or impossible (17%) to follow. The main barriers are the felt invasiveness of the CATH and SPA methods (87%), the lack of time (68%) and the lack of staff (60%).

Most paediatricians (89%) are aware of the CC stimulation methods. Only 36% have been trained for these techniques; 81% think these techniques could be implemented as the first collection choice in their practice. The main barriers to their use are lack of time (87%), staff (83%) and space (65%).

Our survey shows that in a homogeneously structured health system, office-based paediatricians do not follow their national guidelines although they seem to follow them more than almost 10 years previously.⁴ Younger paediatricians tend to prefer the CC collection methods which could be explained by their awareness of the most recent (2021) guidelines and/or their most modern training. The reluctance to CATH urine sampling is partially linked not only to the procedure's perceived invasiveness but also, as for CC, to lack of time/staff. These barriers are the same as those reported in the literature.

The recommended urine collection techniques are still underutilised by office-based paediatricians in Switzerland. Although CB is non-invasive and easy to use, it carries a high risk of contamination, leading to false positive results, UTI overdiagnosis and antibiotic overprescription with its consequent bacterial resistance rise. Barriers to proper urine collection techniques must be overcome: CC collection techniques could be promoted by practical workshops

Abbreviations: CATH, trans-urethral bladder catheterisation; CB, collection bag; CC, clean catch; GC, general condition; SPA, suprapubic aspiration; UTI, urinary tract infection.

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TABLE 1 Switzerland's office-based paediatrician preferred urine collection method in non-toilet trained children (>3 months) with suspicion of urinary tract infection (>24 h fever, no apparent source, no risk factors).

	Child's GC influences choice		Child's GC does not influence choice
	N = 162		N = 96
	Good GC	Poor GC	
	n (%)	n (%)	n (%)
First choice for urine collection			
CB	100 (62)	33 (20)	51 (53)
CC	56 (35)	28 (17)	32 (33)
CATH	5 (3)	48 (30)	9 (9)
SPA	0 (0)	2 (1)	0 (0)
Refer to the paediatric emergency unit for CATH or SPA	1 (1)	51 (31)	4 (4)
	Good GC	Poor GC	No influence
	N = 100	N = 33	N = 51
Management if first bag-sampled dipstick suggests UTI			
Urine culture and empirical antibiotic therapy	27 (27)	18 (55)	23 (45)
Urine culture without empirical antibiotic therapy	29 (29)	0 (0)	7 (14)
Refer to the paediatric emergency unit for CATH or SPA	20 (20)	13 (39)	8 (16)
Second sampling	24 (24)	2 (6)	13 (25)
	Good GC	Poor GC	No influence
	N = 24	N = 2	N = 13
Second sampling method if first bag-sampled dipstick suggests UTI			
CB	1 (4)	0 (0)	2 (15)
CC	11 (46)	0 (0)	3 (23)
CATH	12 (50)	2 (1)	8 (62)
SPA	0 (0)	0 (0)	0 (0)

Abbreviations: CATH, trans-urethral bladder catheterisation; CB, collection bag; CC, clean catch; GC, general condition; N, total number of respondents; SPA, supra pubic aspiration; UTI, urinary tract infection.

for staff members, delegation to parents or implementing better financial support for the required collection time. Finally, stressing that CATH's relative invasiveness is counterbalanced by its rapidity/specificity, especially when used in poor GC children, is a key message to all paediatricians.

The main restriction of our survey is its low response rate, which could reflect a selection bias.

AUTHOR CONTRIBUTIONS

Chloé Progin imagined the study, built the survey up, analysed the data and wrote the report. Jean-Yves Pauchard took part in the reviewing of data, conclusions and report writing. Michael Amiguet analysed the data and took part in the report writing. Bernard Laubscher imagined the study and took part in all the study steps.

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KEYWORDS

child, guidelines, urinary tract infection, urine collection

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CONFLICT OF INTEREST STATEMENT

The authors report no conflicts of interest.

DATA AVAILABILITY STATEMENT

All data generated or analysed during this study can be requested from corresponding author.

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REFERENCES

1. Herreros Fernández ML, Merino G, García AT, et al. A new technique for fast and safe collection of urine in newborns. *Arch Dis Child.* 2013;98:27-29.
2. Kaufman J, Tosif S, Fitzpatrick P, et al. Quick-wee: a novel non-invasive urine collection method. *Emerg Med J EMJ.* 2017;34:63-64.
3. Buettcher M, Trueck J, Niederer-Loher A, et al. Swiss consensus recommendations on urinary tract infections in children. *Eur J Pediatr.* 2021;180:663-674.
4. Hadjipanayis A, Grossman Z, del Torso S, et al. Current primary care management of children aged 1-36 months with urinary tract infections in Europe: large scale survey of paediatric practice. *Arch Dis Child.* 2015;100:341-347.
5. Kennedy KM, Glynn LG, Dineen B. A survey of the management of urinary tract infection in children in primary care and comparison with the NICE guidelines. *BMC Fam Pract.* 2010;11:6.