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# Nurses' and Physicians' Perceptions of Indwelling Urinary Catheter Practices and Culture in Their Institutions

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**Objectives:** Indwelling urinary catheters (IUCs) are commonly used devices in acute care that may lead to catheter-associated urinary tract infections or noninfectious complications. Responsibilities for IUC are usually shared between nurses and physicians, and a common mental model among the two professional groups is thus essential for a successful reduction in catheter use. The aim of this study was to determine variation in the perceptions of current practices and culture regarding IUC use between these two groups.

**Methods:** Nurses and physicians (N = 1579) from seven Swiss hospitals completed a written survey on safe IUC use in their institution. The survey assessed participant's perceptions of current practices and culture in their institution, and their perceived responsibilities related to IUC care. *t* tests and logistic regression were used to examine differences in responses between physicians and nurses.

**Results:** Nurses and physicians each have their own tasks but also share responsibilities for catheter placement, care, and removal. Overall, nurses were more positive than physicians about current practices and culture regarding IUC use within their institution (mean scale scores = 5.4 for nurses versus 5.1 for physicians,  $P < 0.001$ ). Perceptions of the two professional groups diverged most strongly on practices to avoid unnecessary placement of IUCs, the presence of shared values and attitudes in support of restrictive catheter use, and the other group's leadership commitment.

**Conclusions:** Indwelling urinary catheter management is a strong inter-professional domain and a shared responsibility. It is crucial that measures to raise awareness and to communicate new standards target both nurses and physicians and are discussed in inter-professional formats.

**Key Words:** patient safety, urinary catheter, preventable harm, staff survey, teamwork, perceptions

(*J Patient Saf* 2020;16: e82–e89)

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This work was supported by a grant from the Swiss Federal Office of Public Health (no. 15.011083).

The authors disclose no conflict of interest.

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Indwelling urinary catheters (IUCs) are commonly used devices in acute care that may lead to catheter-associated urinary tract infections or noninfectious complications such as hematuria and urethral injury.<sup>1–4</sup> Recent data indicate that 12% to 25% of patients receive an IUC during hospitalization.<sup>1</sup> Although justified in a number of clinical scenarios, IUCs are frequently placed without appropriate indication.<sup>5,6</sup> Hence, numerous quality improvement programs have been established to reduce the use of unnecessary IUCs by implementing evidence-based intervention bundles focusing on the avoidance of unnecessary catheter use, proper insertion techniques, and catheter maintenance.<sup>7–9</sup> Common components of successful bundles include catheter restriction protocols instituting appropriate indications for catheter placement and suggesting alternatives to IUC use, reminder strategies such as electronic reminders or stop orders to prompt early catheter removal, and educational efforts addressing nurses and physicians to increase awareness of the problem and refine clinical skills.<sup>10</sup>

In Swiss hospitals, IUCs are traditionally placed, maintained, and removed by nurses, whereas physicians are responsible for ordering catheter placement and removal. Physicians are also required to insert catheters, especially when difficulties arise during placement in institutions without urology services or during night and weekend shifts. As observed in clinical practice, however, duties of physicians and nurses may overlap and responsibilities are not always clearly assigned to the involved healthcare workers. Catheters are often placed without an order,<sup>6,11</sup> and physicians may be unaware of whether their patients have an IUC.<sup>12</sup>

Improving practice regarding urinary catheter placement and removal also requires changing the individual expectations and habits of the involved healthcare workers regarding IUC use and the culture of their environment. A shared mental model among the involved healthcare workers is crucial for a successful reduction in catheter use.<sup>10</sup> Therefore, it is important to understand the perceptions and attitudes of nurses and physicians concerning current IUC practices in an institution. Several studies have addressed knowledge,<sup>13–16</sup> attitudes, and perceptions<sup>17–21</sup> of healthcare workers. However, studies that investigate potential differences in perceptions between nurses and physicians regarding restrictive catheter use and safe catheter handling are lacking. The aim of this study was therefore to determine variation in the perceptions of the current practices and culture regarding IUC use between nurses and physicians.

## METHODS

### Study Design

This cross-sectional staff survey was conducted as part of a larger multisite quality improvement (QI) program in seven Swiss hospitals. The aims of the QI program were to reduce IUC use and to promote safe catheter insertion and maintenance by using a multimodal intervention bundle consisting of an evidence-based

indication list, daily re-evaluation of the catheter, and staff training.<sup>22</sup> The participating hospitals were located in both urban and rural areas across Switzerland and included two university hospitals, four mid-sized regional hospitals, and one smaller site. Each hospital determined which of their organizational units were going to participate as “pilot units” and committed to implement the intervention bundle on these units. Each hospital designated a project leader and an interdisciplinary project team in charge of implementing the bundle. The project leaders were either physicians or nurses working in hospital epidemiology or quality management. The project teams usually consisted of physicians and nurses from the participating organizational units and representatives from the quality management, infectious diseases, and hospital epidemiology departments. The QI program and all data assessments were approved by the lead ethics committee of the Canton of Bern (Number 2016-00682).

The staff survey was conducted in all seven hospitals during the baseline phase of the QI program in October 2016. The sample consisted of nursing and medical staff working on the pilot units at the time of the survey. Excluded were staff members not working in direct patient care, healthcare workers in education, and affiliated physicians. Print versions of the questionnaire as well as reply-paid envelopes were distributed by the local project leaders. The recipients were informed about the study and encouraged by the local project teams to participate in the survey. Participation in the survey was voluntary and anonymous. The returning of the questionnaire was considered to imply informed consent.

## Questionnaire Instrument

We developed a structured questionnaire based on previous survey research and similar studies published in the literature.<sup>13–16,21</sup> The questionnaire included a total of 55 items and was divided into four thematic sections that covered knowledge, current practices and culture, responsibilities, and personal behavior. In this study, we report the results for the sections on current practices and culture and on responsibilities. The last section of the questionnaire included demographics and questions on the participant’s previous experience with catheter placement and how frequently they were placing catheters in their current position.

The section on current practices and culture within the organization consisted of a scale with 13 items. The aim of the scale was to measure the extent to which nurses and physicians considered measures to reduce catheter use and to prevent catheter-associated complications to be already in place within their organization. One item asked about the shared values between the two professional groups and two items assessed nurses’ perception of the commitment of medical staff and vice versa. Participants were asked to respond to each item on a seven-point Likert scale from “strongly disagree” to “strongly agree.” We assessed the respondents’ perceived responsibilities related to the prescription, placement, and handling of IUCs by means of a multiple-response question.

The questionnaire was developed in German and tested among 43 physicians and nurses from three hospitals not participating in the program. Based on the results from this pretest, minor revisions were made to increase clarity and comprehensibility of the questionnaire. The final version of the questionnaire was then translated into French and Italian by professional translators. Translations were reviewed by eight native speakers.

## Data Analysis

For each item included in the analysis, descriptive statistics (means, confidence intervals, and relative frequencies) were

calculated. Cronbach  $\alpha$  value was calculated to determine the internal consistency of the 13-item scale. A mean scale score across all items was computed. Mean scores were classified for interpretation as follows: 1 to 2.5 = strong disagreement, 2.6 to 3.9 = moderate disagreement, 4 = neutral, 4.1 to 5.4 = moderate agreement, and 5.5 to 7 = strong agreement.

To compare the results for nurses and physicians, we created a new variable with two groups: “nurses” included all respondents identifying as nurse assistant, registered nurse, or head nurse; “physicians” included all respondents identifying as resident physician, attending physician, senior physician, and chief physician. Respondents identifying as operating room attendants or other were coded as missing. *t* tests were used to test for differences in mean scores for physicians and nurses. All tests were two-sided and a *P* value of less than 0.05 was considered statistically significant. No correction for multiple testing was applied. Cohen *d* was calculated as a measure for effect size. To account for bias due to unbalanced hospital subsamples, a logistic regression was used to determine the relationship between the scale score and profession (physicians/nurses) adjusted for the influence of the individual hospital, unit of work, and frequency of catheter placement. For the binary dependent variable, the average scale scores were split at the median with 0 = values below the median and 1 = values equal to or higher than the median. To correct for clustering of respondents within hospitals, robust Sandwich estimators were used. All analyses were performed with Stata Version 14.1 (StataCorp, College Station, TX).

## RESULTS

### Response Rate and Study Sample

Of the 3245 eligible healthcare workers, 1579 (overall response rate = 49%, range = 27%–75% response rate per hospital) participated in the survey and were included in the analysis. Table 1 presents the characteristics of the study sample. The number of respondents from each hospital varied because of differences in hospital sizes and number of pilot units participating in the program.

Respondents were fairly experienced with the use of IUCs. Most nurses (91%) and most physicians (72%) had placed an IUC six times or more during their professional career. Forty-nine percent of nurses and 24% of physicians indicated that they place an IUC sometimes (a few times a month) or often (a few times a week) in their current practice.

### Roles and Responsibilities

Figure 1 describes the self-reported responsibilities with regard to IUC management. Most of the nurses felt responsible for placing, maintaining, and removing an IUC, whereas physicians perceived themselves to be responsible mainly for prescribing catheter placement and removal. However, results also show that there is a substantial overlap between the two professional groups in terms of who considers themselves responsible for each of the tasks.

### Perception of Current IUC Practices and Culture

Cronbach  $\alpha$  indicated good internal consistency of the scale ( $\alpha = 0.79$ ). Table 2 presents mean scores and confidence intervals (CIs) for each item and for the overall scale by professional group. On a scale level, the mean score was 5.3 (95% CI = 5.3–5.3) of 7. Overall, nurses provided significantly higher mean ratings than physicians.

Four items focused on current practices to *avoid unnecessary placement of IUCs*. Nurses and physicians both moderately

**TABLE 1.** Study Sample Characteristics by Profession

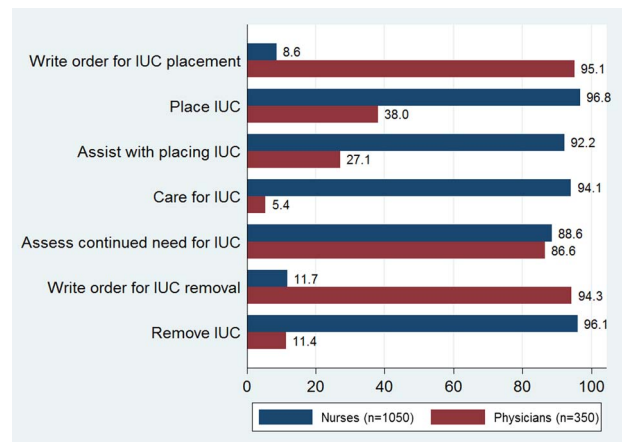
	N = 1579	Nurses (n = 1050)	Physicians (n = 350)
Participants per hospital, n (%)			
Hospital A (approx. 900 beds)*	221 (14.0)	156 (14.9)	51 (14.6)
Hospital B (approx. 800 beds)*	154 (9.8)	97 (9.2)	36 (10.3)
Hospital C (approx. 500 beds)*	138 (8.7)	91 (8.7)	37 (10.6)
Hospital D (approx. 500 beds)*	362 (22.9)	245 (23.3)	76 (21.7)
Hospital E (approx. 400 beds)*	347 (22.0)	238 (22.7)	60 (17.1)
Hospital F (approx. 300 beds)*	284 (18.0)	174 (16.6)	69 (19.7)
Hospital G (approx. 100 beds)*	73 (4.6)	49 (4.7)	21 (6.0)
Male, n (%)	342 (22.4)	142 (13.6)	160 (46.1)
Female, n (%)	1187 (77.6)	901 (86.4)	187 (53.9)
Age, mean (SD), y	36.8 (10.5)	36.5 (11.1)	36.7 (8.8)
Years working in this hospital, n (%), y			
<2	376 (24.5)	189 (18.0)	167 (47.7)
2 to <5	385 (25.0)	258 (24.6)	100 (28.6)
5 to <10	264 (17.2)	190 (18.1)	38 (10.9)
10 to <20	307 (20.0)	235 (22.4)	36 (10.3)
≥20	206 (13.4)	177 (16.9)	9 (2.6)
Work unit in the past three months, n (%)			
Ward	906 (58.5)	751 (72.8)	89 (25.8)
Emergency department	248 (16.0)	126 (12.2)	102 (29.6)
Intensive care unit	144 (9.3)	82 (8.0)	37 (10.7)
Operating room	146 (9.4)	28 (2.7)	81 (23.5)
Other	104 (6.7)	44 (4.3)	36 (10.4)
Overall experience with catheter placement throughout career, n (%)			
Never	26 (1.7)	10 (1.0)	15 (4.3)
1–5 times	169 (11.0)	83 (7.9)	83 (23.8)
6–20 times	341 (22.2)	247 (23.6)	82 (23.5)
>20 times	1002 (65.2)	708 (67.6)	169 (48.4)
Frequency of catheter placement in current position, n (%)			
Never	161 (10.3)	34 (3.3)	110 (31.9)
Rarely (a few times a year)	710 (45.5)	497 (47.8)	153 (44.4)
Sometimes (a few times a month)	552 (35.4)	432 (41.5)	64 (18.6)
Often (a few times a week)	138 (8.8)	77 (7.4)	18 (5.2)

Because of rounding percentages, it may not always add up to 100%.

\*In the larger hospitals, not all of the departments participated in the project.

agreed that daily assessment of the ongoing need for catheterization is given, with an overall mean score of 5.3 (95% CI = 5.2–5.3) and no statistically significant differences in mean scores between the two groups. For the other three items, mean scores differed significantly between the two groups. Nurses strongly agreed that, on their units, IUCs are only placed when medically indicated (5.6 [95% CI = 5.5–5.6]); the respective mean scores for physicians were significantly lower (5.2 [95% CI = 5.1–5.4]). Nurses were more likely than physicians to agree that alternative methods to urine collection are used whenever possible instead of an IUC (nurses = 5.1 [95% CI = 5.0–5.2], physicians = 4.0 [95% CI = 3.8–4.2]). Finally, physicians agreed more strongly than nurses that nursing workload plays an important role in the decision-making process for placing an IUC (physicians = 3.6 [95% CI = 3.5–3.8], nurses = 2.6 [95% CI = 2.5–2.7]).

Four items referred to practices to *reduce the risk for infections and noninfectious complications when placing and caring for catheters*. Asked about catheter placement practices, nurses moderately agreed that two healthcare workers usually work together to place a catheter, i.e., one person inserting the catheter and the



**FIGURE 1.** Self-reported responsibilities with regard to IUC. Numbers show percentage of respondents by profession.

**TABLE 2.** Perception of Current IUC Practices and Culture: Mean Scores by Profession

	N = 1579*		Nurses (n = 1050)*		Physicians (n = 350)*		P†	Cohen d
	Mean	95% CI	Mean	95% CI	Mean	95% CI		
On my unit, IUCs are placed only as clearly indicated medical measure.	5.5	5.4–5.6	5.6	5.5–5.6	5.2	5.1–5.4	<0.001	0.23
For medical leadership on my unit, restrictive use of IUCs is very important.	5.1	5.0–5.2	5.0	4.9–5.1	5.5	5.4–5.7	<0.001	–0.34
For nursing leadership on my unit, restrictive use of IUCs is very important.	5.1	5.1–5.2	5.3	5.2–5.4	4.7	4.5–4.9	<0.001	0.40
Nursing workload plays an important role when a decision is made for placing an IUC.	2.8	2.7–2.9	2.6	2.5–2.7	3.6	3.5–3.8	<0.001	–0.64
People in charge on my unit make sure that everyone placing IUCs is sufficiently trained for this task.	5.4	5.3–5.4	5.4	5.3–5.5	5.3	5.2–5.4	0.473	0.04
Whenever possible, staff on my unit tries to use alternatives to an IUC (e.g., condom catheters, incontinency pads).	4.7	4.6–4.8	5.1	5.0–5.2	4.0	3.8–4.2	<0.001	0.62
The daily assessment to evaluate if an IUC is still needed is a given for us.	5.3	5.2–5.3	5.3	5.2–5.4	5.2	5.0–5.4	0.259	0.07
Basic infection prevention measures are well complied with during placement and care of IUCs.	6.0	6.0–6.1	6.1	6.0–6.1	6.0	5.9–6.1	0.495	0.04
If someone needs help when placing an IUC, it is clear on my unit who can be contacted.	5.8	5.7–5.9	5.8	5.7–5.9	5.7	5.5–5.8	0.209	0.08
Medical and nursing staff on my unit have a similar attitude concerning the use of IUCs.	5.1	5.0–5.2	5.2	5.1–5.2	4.9	4.7–5.0	0.002	0.19
For staff members on my unit, it is a matter of course to openly question the placement of an IUC.	5.5	5.4–5.6	5.5	5.5–5.6	5.4	5.3–5.5	0.068	0.11
It is difficult on my unit to speak up when rules of hygiene are broken during placement and care of an IUC.	2.9	2.8–3.0	2.9	2.8–3.0	3.0	2.8–3.1	0.625	–0.03
It is common on my unit that whenever possible, two health care workers work together to place a catheter.	5.0	4.9–5.1	5.3	5.2–5.4	4.5	4.3–4.6	<0.001	0.46
<b>Mean scale score‡</b>	<b>5.3</b>	<b>5.3–5.3</b>	<b>5.4</b>	<b>5.3–5.4</b>	<b>5.1</b>	<b>5.0–5.1</b>	<b>&lt;0.001</b>	<b>0.38</b>

Items translated from German.

\*Sample size differs slightly for each item because of a varying number of missing values.

†Differences between professional groups are considered statistically significant if  $P < 0.05$

‡Cronbachs  $\alpha$  for scale:  $\alpha = 0.79$ .

other one assisting (5.3 [95% CI = 5.2–5.4]). Physicians in turn agreed less strongly with this statement (4.5 [95% CI = 4.3–4.6]). For the other three items, there were no significant differences in mean scores between the two professional groups. Overall, respondents strongly agreed that basic infection prevention measures are well complied with during placement and care of IUCs (6.0 [95% CI = 6.0–6.1]) and that if someone needs help when placing a catheter, it is clear who they can contact (5.8 [95% CI = 5.7–5.9]). They moderately agreed that leadership ensures that everyone placing IUCs is sufficiently trained for this task (5.4 [95% CI = 5.3–5.4]).

Two items assessed respondent’s perception of the current *culture of speaking up and voicing concerns*. There were no statistically significant differences between the two professional groups for both items. Respondents strongly agreed that it is a matter of course to openly question the decision to place a catheter (5.5 [95% CI = 5.4–5.6]). They only moderately disagreed that it is difficult to speak up about problems surrounding catheter placement and care (2.9 [95% CI = 2.8–3.0]).

Lastly, two items elicited the presence of *shared values and attitudes* within the organization in support of restrictive catheter use. Both professional groups only moderately agreed that medical and nursing staff have a similar attitude concerning the use of IUCs, with an overall mean score of 5.1 (95% CI = 5.0–5.2).

Physician mean scores were significantly lower compared with nurse mean scores (physicians = 4.9 [95% CI = 4.7–5.0], nurses = 5.2 [95% CI = 5.1–5.2]). In addition, respondents only moderately agreed that restrictive use of catheters was important to nursing leadership (5.1 [95% CI = 5.1–5.2]) and medical leadership (5.1 [95% CI = 5.0–5.2]). Interestingly, nurses and physicians both rated the commitment of the other groups’ leadership significantly lower than leadership commitment of their own group.

Effect sizes range from 0.2 to 0.6 for statistically significant differences between the two groups. Observed differences in scale scores between physicians and nurses were further analyzed using logistic regression. Results show that professional group was a significant predictor for the dichotomized average scale score, even after adjusting for respondents’ place of work (work unit and hospital) and for their exposure to catheter placement (Table 3). Differences between physicians and nurses were present across all sites and could not be explained by unbalanced representations of nurses and physicians of different work units and hospitals, nor by their unequal amount of exposure to catheterization in daily practice.

## DISCUSSION

In recent years, many efforts have taken place to identify successful strategies for reducing catheter use and avoid catheter-

**TABLE 3.** Association of Dichotomized Scale Score ( $\geq$ Median) and Profession, Adjusted for Hospital, Unit of Work, and Frequency of Catheter Placement (Robust Standard Errors)

	OR (95% CI)	P
Profession		
Nurses	Reference	
Physicians	0.64 (0.46–0.88)	0.007
Work unit		
Ward	Reference	
Emergency department	0.38 (0.27–0.54)	<0.001
Intensive care unit	0.38 (0.25–0.60)	<0.001
Operating room	0.52 (0.32–0.84)	0.007
Hospital		
Hospital A	Reference	
Hospital B	0.70 (0.42–1.16)	0.162
Hospital C	0.74 (0.46–1.20)	0.220
Hospital D	0.76 (0.52–1.10)	0.148
Hospital E	0.60 (0.41–0.89)	0.012
Hospital F	0.50 (0.33–0.75)	0.001
Hospital G	0.49 (0.27–0.91)	0.023
Frequency of catheter placement		
Low (sometimes a year or never)	Reference	
High (sometimes a month or more often)	0.86 (0.67–1.1)	0.229

Results of binary logistic regression.

associated complications. Most of these interventions aimed to change the expectations and habits of both nurses and physicians regarding restrictive catheter use and safe catheter handling.<sup>10,23</sup> In the present study, we examined in more detail how the perceptions of nurses and physicians aligned with respect to the presence of measures for reducing catheter use and catheter-associated complications within their organization. Because the management of urinary catheters is a strong interprofessional domain, for interventions to be successful, nurses and physicians need to agree on the same issues and pursue the same goals. The findings of our study may provide a better understanding of potential facilitators and barriers for change.

We compared the perceived responsibilities for catheter placement, care, and removal between nurses and physicians. Our results confirm that the responsibilities from writing an order for ICU placement to removing a catheter oscillate back and forth between nurses and physicians. Physicians usually decide whether catheters are placed or removed, whereas nurses generally place, manage, and remove them. However, we also found a substantial overlap between the professions, notably with regard to the perceived responsibility of writing orders for placement and removal, placing a catheter and, most of all, assessing the need for continued catheterization. Our results thus confirm that IUCs are not a topic assigned to one professional group alone. The overlap of perceived responsibilities between the professions can have several implications for practice. On the one hand, it confirms that both physicians and nurses are involved in the decision-making process and the handling of urinary catheters. It is therefore crucial to offer training opportunities for safe catheterization and to convey knowledge about catheter-associated risks to both groups.

On the other hand, our study reveals that there are areas where both nurses and physicians feel responsible for a certain task, notably when assessing the patient for ongoing need of a catheter. This shared sense of responsibility is an important factor that

can be capitalized on to reduce unnecessary catheter utilization. However, clear definitions and communication of the expected roles and tasks of each staff member are needed to prevent misunderstandings, omissions, or duplications of work. Furthermore, as McComb et al.<sup>24</sup> suggests, a shared understanding about how role responsibilities are distributed between professions may lead to more respect and trust in each other’s work and ultimately result in a more effective collaboration. For the successful implementation of improvement programs, this finding also underlines the need for nurses and physicians to have a common understanding of which objectives they would like to pursue with regard to IUCs in the hospital. As Topal et al.<sup>25</sup> have pointed out in their article, rather than trying to address the issues separately and assess blame for inappropriate catheter use, programs to reduce catheter-associated urinary tract infection have to be shaped in a way to promote shared accountability and responsibility between the disciplines. A first step of an improvement program could be to ensure that nurses and physicians discuss their respective roles and agree on a clear allocation of responsibilities.

From the perspective of all staff members, many important measures for restrictive and safe catheter use were not yet standard practice in their units. Overall, nurses had a more positive view about current IUC practices and culture in their institution than physicians.

We found that perceptions between nurses and physicians diverged most strongly on practices to avoid unnecessary placement of IUCs. Compared with nurses, physicians were less likely to agree that IUCs are presently only used with an appropriate indication and that, whenever possible, alternative methods for draining urine are being considered. Physicians also seemed more likely to believe that nursing workload considerations play an important role in the decision-making process. Cohen effect size values for these items suggest moderate to high practical relevance. The causes underlying these differences cannot be identified by our study design. Some of the items may have been less pertinent to physicians as compared with nurses. It is conceivable that nurses may be overly optimistic or less critical about their own practices or that physicians may have insufficient insight into daily catheter routines to assess how well certain practices are put into place, or both. In line with other studies, this result suggests, however, that decision-making for placing an IUC or using alternative methods is complex and may be affected by a number of factors. Differing opinions on appropriate indications, different perceptions of risk, lack of availability of alternative products, and workload considerations can all affect the decision for placing a urinary catheter.<sup>19,26,27</sup> Our findings underline the importance of nurses and physicians making an effort to understand each other’s rationale for taking certain decisions.

When asked about the presence of shared values and attitudes in support of restrictive catheter use within the organization, nurses’ and physicians’ perceptions did also not fully align. Many respondents from both professional groups did not think that physicians and nurses have a similar attitude concerning the use of IUCs. This assessment is mirrored by the response behavior of nurses and physicians participating in the survey, where indeed nurses’ and physicians’ perceptions differ on several aspects. In addition, neither professional group perceived a very strong commitment of nursing leadership or of medical leadership with regard to the restrictive use of catheters. Nurses and physicians both rated the commitment of the other groups’ leadership significantly lower than leadership commitment of their own group. This cross-over result suggests that neither group knows about the importance that is attributed to the issue by the other group. Cohen effect size values for these items suggest small to moderate practical

relevance. The results underline the importance of nursing and medical leadership to communicate their attitudes not only to their own peers but also to other professionals. Communication across groups is especially important when new policies or interventions are introduced.

### Strengths and Limitations

This survey was conducted in seven hospitals in Switzerland and covered different geographic regions and a range of different institutions. The survey was conducted among staff members working on different units and departments, allowing for a broad range of experiences to be represented in the sample. However, the study also has several limitations. The study design does not allow us to identify policies or guidelines that are already in place and that may affect how respondents perceive current practices and culture in the institution. The results of the logistic regression reveal that both hospital site and work unit were associated with attitudes, but the effect of professional group persisted even after adjusting for these factors. The self-reported survey measures were not correlated to objectively measured outcomes (e.g., catheter utilization rates) to assess how perception of current culture and practices are linked to actual performance. We have no information on the reasons for nonparticipation in the survey. Questionnaires were distributed by local project leaders using different channels. In some hospitals, questionnaires were handed out during shift reports or other staff events; in others, they were distributed to all internal mail boxes. In one hospital, questionnaires were sent to staffs private mail addresses. The way questionnaires were distributed may have affected motivation of staff to participate. It is also possible that staff members with a high interest in patient safety or topics associated with urinary catheters were more likely to participate in the survey, especially because participation in the survey was voluntary. In this case, respondents may have been more aware of catheter-associated problems and more likely to critically evaluate the current practices and culture in their hospital. It is also possible that some of the respondents have already been aware of the institutions' participation in the QI program, even though the survey was conducted during the baseline phase. This might have caused social desirability bias. Lastly, the distribution of roles and responsibilities for IUC management between physicians and nurses is likely to vary among countries, which limits transferability of our findings to hospitals outside of Switzerland.

### CONCLUSIONS

Urinary catheters are an interprofessional topic and responsibilities oscillate between nurses and physicians. It is crucial that measures to raise awareness and to communicate new standards target both groups. Reasons for noncompliance with best practices need to be elaborated in interprofessional formats so that the complexity of the decision-making process and the different perceptions between nurses and physicians can be captured. Leadership commitment to restrictive catheter use needs to be visible beyond an individual's professional group to pave the road to improvement.

### ACKNOWLEDGMENTS

The authors thank all the participating nurses and physicians for completing the survey.

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## APPENDIX 1: SURVEY ITEMS

### Part 1 (correct answers provided in parentheses)

#### Please estimate:

How many patients in Switzerland receive a catheter during their hospital stay? (10%–25%)

#### Please indicate if the following statements are correct:

After 30 catheter-days, nearly all patients show bacteriuria. (correct)

The duration of catheterization is an important risk factor for the development of a urinary tract infection. (correct)

Most hospital-acquired urinary tract infections are associated with a urinary catheter. (correct)

Single-use urinary catheters carry a higher risk for infections as compared with indwelling catheters. (false)

A closed drainage system is essential for the prevention of catheter-associated urinary tract infections. (correct)

Compared with catheters, noninvasive methods for bladder draining (e.g., condom catheters, incontinence pads) have the advantage that they do not carry a risk for injuries. (correct)

Noninfectious complications (e.g., injuries or allergic reactions) only occur in absolutely rare instances during catheterization. (false)

The choice of an antiseptic for disinfecting the urethral meatus does not affect the correct asepsis when inserting a catheter. (false)

Up to 50 percent of catheters placed in an emergency department are not medically justified. (correct)

One effective measure to prevent catheter-associated urinary tract infections is to change catheters or drainage bags in regular intervals. (false)

#### In which of these situations is the placement of a urinary catheter indicated?

To monitor urine output in stable patients who can be weighed. (not indicated)

In case of distress at the request of a terminally ill patient. (indicated)

For patients requiring intensive care. (not indicated)

For patients with restricted mobility. (not indicated)

### Part 2

#### Please indicate if you agree with the following statements:<sup>1</sup>

On my unit, IUCs are placed only as clearly indicated medical measure.

For medical leadership on my unit, restrictive use of IUCs is very important.

For nursing leadership on my unit, restrictive use of IUCs is very important.

Nursing workload plays an important role when a decision for placing an IUC is made.

People in charge on my unit make sure that everyone placing IUCs is sufficiently trained for this task.

Whenever possible, staff on my unit tries to use alternatives to an IUC (e.g., condom catheters, incontinence pads).

The daily assessment to evaluate if an IUC is still needed is a given for us.

Basic infection prevention measures are well complied with during placement and care of IUCs.

If someone needs help when placing an IUC, it is clear on my unit who can be contacted.

Medical and nursing staff on my unit have a similar attitude concerning the use of IUCs.

For staff members on my unit, it is a matter of course to openly question the placement of an IUC.

It is difficult on my unit to speak up when rules of hygiene are broken during placement and care of an IUC.

It is common on my unit that, whenever possible, two healthcare workers work together to place a catheter.

### Part 3

#### What is your own role regarding the use of catheters? Please select all answers that apply.

It is part of my responsibility to...

...write orders for IUC placement

...write orders for IUC removal

...place an IUC

...assist another professional with placing an IUC

...care for an indwelling catheter

...assess the continued need for an IUC

...remove an IUC

(Continued next page)

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(Continued)

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**Part 4**

**Please indicate if you agree with the following statements:<sup>1</sup>**

I can properly estimate in which situations the use of an IUC is appropriate.

My colleagues appreciate my commitment to reduce the use of IUCs.

I can influence the use of IUCs in my daily work.

The risk from IUCs for patients is underestimated.

I find it difficult in my daily work to reduce the use of IUCs.

In my hospital I am expected to contribute to the reduction of IUCs.

I am convinced that I am proficient in caring for an indwelling catheter.

I am convinced that by reducing the use of IUCs, adverse events to patients can be avoided.

Our patients appreciate it when IUCs are avoided.

A reduced use of IUCs makes patient care more stressful for me.

My supervisors expect that everyone follows the internal protocols for inserting catheters.

I am convinced that I am proficient in inserting a urinary catheter.

I think that it's important to reduce the use of IUCs in the hospital.

My supervisors expect me to reduce the use of IUCs.

I am confident that I can reduce the use of IUCs in everyday work.

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All items analyzed for the present study are highlighted in grey. Items were translated from German original by the authors.

<sup>1</sup>Items were answered on a Likert-scale from 1 (do not agree at all) to 7 (completely agree).

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