Published in final edited form as:

J Emerg Nurs. 2015 September ; 41(5): 414–422. doi:10.1016/j.jen.2015.02.013.

Emergency Department Placement and Management of Indwelling Urinary Catheters in Older Adults: Knowledge, Attitudes, and Practice

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Abstract

BACKGROUND—Indwelling Urinary Catheters (IUCs) are placed frequently in older adults in the emergency department (ED). While often a critical intervention, IUCs carry significant risks, particularly for geriatric patients, including infection, delirium, and falls. In addition, once placed, IUCs are rarely removed in the ED and may remain for an extended period after transfer of care, leading to poor outcomes. The purpose of this research was to examine the current knowledge, attitudes, and practice of ED nurses and other providers regarding IUC placement and management in older adults.

METHODS—We surveyed ED providers including nurses, attending physicians, Emergency Medicine (EM) residents, nurse practitioners (NPs), and physician assistants (PAs) at a large, urban, academic medical center. We developed comprehensive written questionnaires designed using items from previously validated instruments and questions created specifically for this study. In addition, we assessed providers' management of 25 unique clinical scenarios, each representing an established appropriate or inappropriate indication for IUC placement.

RESULTS—127 ED providers participated: 43 nurses, 21 attending physicians, 47 residents, and 17 NP/PAs. 91% of nurses and 88% of other providers reported comfort with appropriate indications for IUC placement. Despite this, in the clinical vignettes nurses correctly identified the appropriate approach for IUC placement in only 40% of cases and other providers in only 37%. Reported practices were most divergent from accepted standards in delirium, with 3% of nurses

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and 1% of other providers appropriately avoiding IUC placement. Practice varied widely between individual providers, with the nurse participants reporting appropriate practice in 16%–64% of clinical scenarios and other providers in 8%–68%. Few nurses or other providers reported reassessing their patients for IUC removal at transfer to the hospital upstairs (28% of nurses and 7% of other providers), admission (24% and 14%), or shift change (14% and 8%).

CONCLUSIONS—Although ED nurses and other providers report comfort with appropriate indications for IUC placement, their reported practice patterns showed inconsistencies with established guidelines. Wide practice variation exists between individual providers. Moreover, nurses and other providers infrequently consider IUC removal after placement. Future research should focus on development of educational interventions and protocols to assist ED nurses and other providers with appropriate indications for and management of IUCs in older adults.

INTRODUCTION

Catheter-associated urinary tract infections (CAUTIs) are the most common hospital-acquired infection and have significant associated mortality, morbidity, and cost.^{1,2} Older adult patients are disproportionately affected, as they most commonly receive indwelling urinary catheters (IUCs) and are more susceptible to urinary tract infections and associated complications.³ Older adults are also more susceptible to non-infectious complications of IUCs, including delirium, urethral trauma, pain, and falls because of tethering.

While potentially appropriate for patients with acute urinary obstruction or critical illness, urinary catheters are frequently placed unnecessarily, at times for staff convenience.^{1,4,5} Prior studies indicate that nearly half of catheters placed in hospitalized patients are unnecessary,^{1,6} and as many as half lack documented physician orders.¹

Though efforts have focused on the inpatient setting to reduce CAUTIs by preventing inappropriate IUC placement and removing IUCs as soon as no longer necessary,⁷ only recently has the Emergency Department (ED) been targeted as a potential site for intervention.^{1,4,8,9} Nearly half of all hospitalizations originate in the ED, and 8–23% of ED patients who are admitted receive urinary catheters,^{1,6} with the highest rates in older adults.¹ Thus, an improved understanding of ED practices surrounding the use of IUCs may allow for the development of interventions to reduce inappropriate placement. The goal of our study was to describe the knowledge, attitudes, and practices of ED providers regarding placement and management of IUCs in older adults and the team dynamics in decision-making surrounding this intervention.

METHODS

We surveyed ED providers at a large, urban, academic medical center with approximately 70,000 adult ED visits annually, of which 26% are by patients aged ≥65. Participants included emergency nurses, attending physicians, mid-levels (nurse practitioners [NPs] and physician assistants [PAs]), and resident physicians. Participants were recruited as a convenience sample during scheduled in-service sessions for nurses and regularly scheduled staff meetings for attending physicians, mid-levels, and resident physicians.

We designed a comprehensive written survey to assess ED provider knowledge, attitudes, and practice regarding placement of IUCs, incorporating items from previously published instruments^{10–13} as well as questions created specifically for this study. This survey was then modified to reflect the clinical role of each participant type, yielding a total of 4 forms: for nurses, attending physicians, mid-levels (NPs and PAs), and resident physicians.

The surveys included demographic information, knowledge and attitudes about IUCs, team dynamics of decision-making in IUC placement and management, and current practice in various clinical scenarios. For questions of knowledge and attitudes, participants were asked to rate their agreement with statements on a 5-point Likert scale with options of “strongly agree,” “agree,” “neither agree nor disagree,” “disagree,” and “strongly disagree.” For practice surrounding team dynamics of decision-making, participants were asked how frequently they took certain actions, on a 5-point Likert scale with options of “very frequently,” “often,” “sometimes,” “infrequently,” or “never.”

To assess whether ED provider practices surrounding IUC placement aligned with current standards of care and expert recommendations, we first conducted an extensive literature review to identify clinical scenarios where IUC placement was considered appropriate or inappropriate. Based on this literature review, we categorized 25 scenarios as “IUC Placement Indicated,” “IUC Placement Should Be Considered with Alternate Modes of Urine Collection,” “Try Alternate Urine Collection Before IUC,” and “IUC Placement Contraindicated” (Figure 1). We created brief written vignettes for each scenario to assess current practice of ED providers and included these 25 vignettes as part of the written survey. For example, for the scenario “morbid obesity,” the vignette presented to participants was: “79 year-old morbidly obese patient with deep vein thrombosis.” For each scenario, participants were asked whether they would place an IUC and were given options of: “always,” “would consider alternatives,” “only if alternatives have failed,” “never,” and “unknown/unsure.”

The survey content was initially evaluated and revised by a multi-disciplinary expert panel which included the authors. Before administration to study subjects, each survey was pilot-tested with individuals who would have been eligible to participate in the study and revised based on comments and suggestions from this pilot phase. The self-administered surveys were completed during July-August, 2013. All surveys were completed anonymously. This study was approved by the Weill Cornell Medical College Institutional Review Board.

The survey responses were stored in a customized REDCap™ (Research Electronic Data Capture) database. Data were analyzed using Stata v12.0 (Stata Corp, College Station, TX). Data are presented as frequencies with proportions, means with standard deviations (SD), and medians with interquartile ranges (IQR). The mean proportion correct for the four scenario categories was calculated as the number of correct responses divided by the total number of scenarios in each category.

To facilitate comparison of knowledge, attitudes, and practice between emergency nurses and other providers, we reported the results for the individual provider types and in

aggregate for attending physicians, NPs/PAs, and resident physicians. NPs and PAs have similar roles in our ED, so we reported their results as a single category: mid-levels.

For analysis, we combined responses of “strongly agree” and “agree” into the category “agree” and responses of “disagree” and “strongly disagree” into the category “disagree,” as has been done in similar research in this area.^{11,14} Also, we combined responses “very frequently” and “often” into the category “frequently” and “infrequently” and “never” into “infrequently.” In analyzing the clinical scenario vignettes to assess whether ED provider practice aligned with current standards, we combined both intermediate categories of “IUC Placement Should Be Considered with Alternate Modes of Urine Collection” and “Try Alternate Urine Collection Before IUC.” Though our literature review suggested an important distinction between these categories that may be valuable to highlight in future educational interventions protocols, we felt that it was too subtle to report in a baseline study such as this.

RESULTS

129 nurses and providers completed the survey, representing 47% of the total ED workforce. Participants included 43 nurses, 20 attending physicians, 19 mid-levels, and 47 resident physicians (Table 1). Table 2 describes nurse and other ED provider self-reported knowledge and attitudes surrounding urinary catheters, including perspectives on team dynamics and practice of reassessment after IUC placement.

Self-reported practices among participants surrounding IUC placement in specific clinical scenarios aligned with current standards of care and best practices in 40% of cases for nurses and 37% of cases for providers (Table 3). Practice varied widely between individual providers, with the nurse participants reporting appropriate practice in 16%–64% of clinical scenarios and other providers in 8%–68%. Practices reported were most divergent from best practices for all provider types in the 12 scenarios for which an IUC is contraindicated (Table 4). Practices varied greatly depending on the clinical scenario. Very few of any provider type reported avoidance of IUCs in cases of delirium, while many more reported avoidance in alcohol intoxication. Large differences existed between self-reported practice of nurses and other providers in certain clinical scenarios. In dementia, nurses were more likely than other providers to report appropriate avoidance of IUCs, while in morbid obesity, nurses were less likely than other providers to report appropriate avoidance.

DISCUSSION

Encouragingly, both nurses and other providers self-report significant knowledge surrounding appropriate placement and management of IUCs, including the importance of avoiding CAUTIs. Notably, more nurses report comfort with IUC placement and management than other providers, particularly mid-levels and residents. This may be because, as direct care providers, nurses are more frequently involved in the placement and management of IUCs.

Despite this self-reported knowledge of appropriate indications for IUC placement and alternate modes of urine collection, when presented with clinical scenarios, the practice of

nurses and other providers aligns with the standard of care in less than half of all cases. Previous research examining other aspects of geriatric ED care has likewise shown that emergency providers, including nurses, self-report a higher level of knowledge than is demonstrated on written tests.¹⁵ Provider self-reported practice diverges most from the standard of care in clinical circumstances where an IUC is contraindicated, suggesting that both nurses and other providers are ordering and placing IUCs unnecessarily. This confirms previous research, which has suggested that a large percentage of IUCs placed in the ED¹ and on the inpatient floors^{1,6} are inappropriate.

Though practices of nurses and other providers, including attending physicians, aligned with standards of care in a similar percentage of case scenarios, close analysis reveals important distinctions. Nurses are much more likely than other providers to appropriately avoid placement in a patient presenting to the ED with dementia, suggesting that nurses may be better trained about appropriate care for cognitively impaired older adults. Conversely, nurses are much more likely than other providers to inappropriately place IUCs in morbidly obese patients. This may be due to nurses' concern about the resources required to frequently assist a morbidly obese patient to the bathroom or onto a bedpan¹⁶ in a busy ED, but further research is needed. Future interventions would benefit from educational modules targeted for specific provider types that take into account the responsibilities of different ED provider types. Educational efforts for nurses should recognize the legitimate concerns about resource allocation but emphasize the importance of using alternative methods of urine collection even in cases where placing an IUC may be much more convenient.^{1,4,5}

The clinical scenario resulting in the lowest concordance with recommendations for all provider types was delirium. This identifies a potentially high-impact target for future educational interventions. IUC placement may worsen or even precipitate delirium,¹⁷ and current recommendations state that placing IUCs should be avoided in delirious older patients, with intermittent catheterization preferable even for acute urinary retention management.¹⁸

Our research suggests that nurses and other providers view collaboration and communication about the decision to place an IUC differently. Many fewer nurses compared to other providers report believing that nursing input is frequently included in decision-making. In addition, while a majority of practitioners (65%) report asking nurses to try alternative methods of urine collection whenever possible, very few nurses (16%) report that other providers discuss alternative methods for urine collection with them. Different perspectives on collaborative decision-making between physicians and nurses have also been reported in other settings.¹⁹ In the past, the hierarchical nature of the relationship between nurses and physicians discouraged nurses from initiating communication and challenging physicians' decisions.^{20,21} More recently, with significant advances in the professionalization of nursing²² and the increasing presence of nurse practitioners and physician assistants in the ED, nurses are more actively involved in decision-making.²⁰ Despite this, many participants believe that the vestiges of the historical hierarchy still leaves nurses feeling disempowered to contribute to clinical decisions.^{20,21}

Poor interdisciplinary collaboration and communication has been shown to be a leading cause of medical errors, particularly in the busy, high-stress ED environment.²³ Improving teamwork has been shown to reduce errors,²³ and teamwork training has been shown to improve interdisciplinary communication.²³ Our study suggests that nurses want to be more involved in IUC-related decision-making. Protocols and educational initiatives should be designed to ensure that all members of the clinical team feel empowered to contribute to decisions. Encouraging collaborative discussion between nurses and other providers has already proven successful in reducing IUC placement.⁵

Nearly one quarter of nurses report that patients with IUCs placed in the ED are frequently transferred to the inpatient service without placement of a written/electronic order. This is concerning, given that a physician order is required before an IUC is inserted. This finding of a “documentation gap” is consistent with findings from inpatient literature¹ and supports recent findings suggesting that the ED may be an important contributor to poor documentation of IUC placement orders.⁴ Addressing this documentation gap is critical, as IUCs that are placed without documentation may remain unrecognized by inpatient providers,²⁴ hospital epidemiologists, infection control staff, and nursing leadership for several days, undermining in-hospital interventions for early removal.

While the majority of nurses (84%) and other providers (71%) report frequently reassessing patients for potential IUC removal at discharge, very few report re-evaluating the need for an IUC at other times, including admission (24% of nurses and 14% of other providers), transfer from the ED (28% of nurses and 7% of other providers), or at shift change / sign-out (14% of nurses and 8% of other providers). In this era of significant boarding of hospitalized patients in the ED,²⁵ often for prolonged periods, increased reassessment may represent an important additional opportunity for ED providers to reduce CAUTIs. Targeting shift change / sign-out, when new providers who have not been involved in a case assume care may be particularly valuable as a potential opportunity to re-evaluate the continuing need for an IUC.

A higher percentage of nurses compared to other providers reported reassessment of patients for potential IUC removal at each of these ED care milestones. This may be because, in our clinical setting, nurses typically place IUCs, and, as direct care providers, they are responsible for and more acutely aware of the routine associated management. Nurse-led inpatient protocols for IUC removal,^{26,27} which empowered nurses to independently remove IUCs that were no longer indicated, have been shown to be successful in reducing CAUTIs. Our findings and these results from recent literature suggest that nurses should take a leadership role in these initiatives in the ED.

LIMITATIONS

Our research was conducted in a single, urban, academic medical center, and our findings may not be generalizable to other clinical settings. We used a convenience sample of ED staff leading to the possibility that participants may represent a sub-group of providers interested in this topic. Given that we surveyed nearly half (47%) of all staff and that recruitment for the study took place during regular meetings and not during a special session

scheduled just for this study, we think that our results are likely reflective of our larger group of providers.

Our results are based on self-reported practice patterns, which may not accurately reflect actual practice. Participants may have responded anticipating what they thought the researchers or the ED administration wanted to hear, particularly because the investigators also work in the ED where the study was conducted. The use of anonymous surveys and assurance of participant confidentiality should have mitigated this concern. Further, this bias would likely have affected results in clinical practice by increasing participant reports of IUC avoidance, particularly in scenarios where placement is contraindicated. This suggests that actual ED provider practice may align with standards of care and best practices in these scenarios even less frequently than we report.

We have attempted to assess practice in different clinical scenarios using short written vignettes. Responses to these vignettes may not reflect actual practice, as this format is limited in its ability to reflect the nuances in each clinical case that may contribute to decision-making. Nevertheless, similar strategies have been used successfully in previous studies to ascertain practice patterns.^{10–12}

We chose to combine the results for NPs and PAs because these mid-levels have similar roles in our ED. These professions, however, require different training, and these practitioners may have different clinical responsibilities at other institutions. As a result, they may have different perspectives on IUCs that our study has not been able to identify.

IMPLICATIONS FOR EMERGENCY NURSES

Emergency Department nurses are the direct care providers who must often place and manage IUCs. Thus, emergency nurses play a critical role in ensuring that IUCs are not placed in inappropriate circumstances and are immediately removed when no longer necessary. Our research shows that, despite high self-reported knowledge of, and perceived comfort with, appropriate indications for IUC placement, actual ED nursing practice does not align with standards of care and best practices, particularly in circumstances where IUC placement is contraindicated. Also, large practice variations exist between emergency nurses, further suggesting that education and clinical protocols are needed to improve and standardize practice. Emergency department nurses can and should become champions for IUC avoidance and change culture when necessary to promote alternate methods of urine collection. Nurses should feel empowered to challenge practitioners who request inappropriate IUCs, as our research suggests that nurses are often better informed about practice standards. In addition, it is important for nurses to ensure that IUCs are never placed for convenience of care alone, regardless of how busy the ED may be. Nurses should ensure that all IUCs placed have a written/electronic order before patients are transferred from the ED. Emergency nurses can and should take a leadership role in championing removal of IUCs when no longer necessary, with formal opportunities existing for this assessment at sign-out, transfer, or discharge from the ED.

RECOMMENDATIONS FOR FUTURE RESEARCH

Future research should, and has begun to, focus on the design and assessment of interventions to improve appropriateness of IUC use in the ED. Our research may assist in identifying targets for future interventions, which include education about specific clinical scenarios where IUCs are contraindicated, such as delirium, promoting team-based decision-making surrounding IUCs, and highlighting the importance of reassessment of the continuing need for IUCs before patients are transferred from the ED. Future work should also focus on knowledge and attitudes of ED nurses and other providers surrounding IUC insertion practices. Ultimately, comprehensive, evidence-based ED-based protocols surrounding IUC placement and management need to be developed, and their efficacy needs to be systematically evaluated.

CONCLUSION

Current ED practice patterns show inconsistencies with established guidelines, notably with inappropriate placement of IUCs in patients suffering from diagnoses such as delirium. Wide practice variation exists between individual providers, with important differences also between ED provider types. ED nurses believe collaborative decision-making surrounding IUC placement may be improved. Many patients are transferred from the ED without a written/electronic order for IUC, an issue about which nurses are more aware than other providers. Also, ED providers infrequently consider IUC removal after placement, even when indicated. Improved understanding of current knowledge, attitudes, and practice of ED nurses and other providers surrounding IUCs helps identify gaps and offers insight for the future development of educational interventions and protocols to improve care.

ACKNOWLEDGEMENTS

We are grateful to the American Federation of Aging Research (AFAR), which provided the funding for ___'s participation through its Medical Student Training in Aging Research (MSTAR) fellowship program. We appreciate the generosity of Dyc et al, Drekonja et al, and Saint et al in sharing the instruments they used for their research, elements of which we incorporated into our work.

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IUC Placement Indicated	IUC Placement Should Be Considered with Alternate Modes of Urine Collection	IUC Placement Contraindicated
Critical illness requiring hourly I&O monitoring	IUC Potentially Indicated, but Consider Alternatives	Delirium
Acutely ventilated patients	Lower extremity injury requiring immobilization	Dementia
Acute Pulmonary Edema/CHF exacerbation requiring NIPPV	Maceration of perineal/sacral skin in setting of incontinence	Incontinence
Burns greater than 20% Total Body Surface Area	Palliative/comfort care	Bed-bound
Major trauma (per ATLS protocol)	Try Alternate Urine Collection Before IUC	Measuring post-void residual
Orthopedic injuries requiring immobilization (pelvis, spine)	Accurate I&O monitoring greater than one hour intervals	Obtaining urine sample
Hip Fracture	CHF exacerbation (not requiring NIPPV)	Urinary tract infection
Spinal cord injury	Pre-op without other indication	Alcohol intoxication
Acute Urinary Retention		Morbid obesity
		Patient/family request
		Patient refusal
		Convenience for care

Figure 1.

Clinical scenarios where Indwelling Urinary Catheter (IUC) placement is indicated, contraindicated, or should be considered with alternate modes of urine collection based on current standards of care and best practices from an extensive literature review

Table 1

Characteristics of emergency providers (n=129)

	Nurses (n=43)	Other Providers			
		Total (n=86)	Attending (n=20)	Mid-Levels (n=19)	Residents (n=47)
Female, n (%)	32 (74%)	31 (37%)	7 (35%)	7 (41%)	17 (36%)
Male, n (%)	11 (26%)	53 (63%)	13 (65%)	10 (59%)	30 (64%)
Experience					
Years in practice since training completion, median (IQR)	5 (3–9)	5 (3–9)	4 (2–9)	5 (4–7)	NA**
Years in emergency medicine practice since training completion, median (IQR)	3 (2–5)	5 (2–9)	4 (2–9)	5 (3–7)	NA**

* Mid-Levels include licensed nurse practitioners (n=6) and physician assistants (n=11).

** NA=Not asked of residents because they have not completed their training and not included in "Other Provider" summaries. For this study, emergency medicine resident participants were: 11 in post-graduate year (PGY) 4, 12 in PGY 3, 12 in PGY 2, and 12 in PGY 1.

Table 2
Self-reported knowledge of and attitudes about indwelling urinary catheter management among emergency providers (n=129)

Question, n (%)	Nurses (n=43)	Other Providers			
		Total (n=84)	Attendings (n=20)	Mid-Levels* (n=19)	Residents (n=47)
Comfortable with appropriate indications for IUC placement in older adults	39 (91%)	75 (87%)	16 (80%)	18 (95%)	41 (87%)
Know when placement of IUC in older adult inappropriate / not indicated	38 (88%)	63 (73%)	14 (70%)	13 (68%)	36 (77%)
Know when alternate modes of urine collection should be attempted before using an IUC in older adults	34 (79%)	57 (66%)	13 (65%)	13 (68%)	31 (66%)
Believe that preventing urinary tract infections is an important consideration in the decision about whether to place an IUC	42 (98%)	82 (95%)	20 (100%)	19 (100%)	43 (91%)
Team Dynamics					
Believe patient's nurse should be responsible for deciding need for placing an IUC	21 (49%)	6 (7%)	0 (0%)	2 (11%)	4 (9%)
Believe that input from nursing is frequently included in the decision about whether to place an IUC	24 (56%)	70 (81%)	15 (75%)	16 (84%)	39 (83%)
Try alternate methods of urine collection whenever possible	31 (72%)				
Ask nurse to try alternate methods of urine collection whenever possible		56 (65%)	14 (70%)	13 (68%)	29 (62%)
Are frequently asked by a practitioner to try alternative methods of urine collection	7 (16%)				
Frequently... place an IUC for which you have not yet received a verbal or electronic/written order from a practitioner	6 (14%)				
find that an IUC has been placed for which you have not given a verbal or electronic/written order		14 (16%)	6 (30%)	3 (16%)	5 (11%)
do not receive a written/electronic order for IUC placement from practitioner before the patient transferred from ED	10 (24%)				
do not place a written/electronic order for IUC placement from practitioner before the patient transferred from ED		9 (11%)	3 (15%)	3 (17%)	3 (6%)
Reassessment After Placement					
I frequently re-evaluate a patient to consider removing an IUC that may no longer be necessary:					
after improvement of clinical condition	25 (58%)	31 (36%)	5 (25%)	13 (68%)	13 (28%)
at shift change / sign-out	6 (14%)	7 (8%)	0 (0%)	3 (16%)	4 (9%)
at admission	10 (24%)	12 (14%)	0 (0%)	3 (16%)	9 (19%)
at transfer upstairs to hospital	12 (28%)	6 (7%)	0 (0%)	2 (11%)	4 (9%)
at discharge	36 (84%)	60 (70%)	14 (70%)	12 (63%)	34 (72%)

Mid-Level include licensed nurse practitioners (n=6) and physician assistants (n=11).

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Table 3

Percentage of emergency providers (n=129) whose self-reported practices surrounding indwelling urinary catheter (IUC) placement in 25 clinical scenarios* aligned with current standards of care and best practices based on extensive literature review

Practice comporting with standard of care (mean percentage correct $\pm$ standard deviation)	Nurses (n=43)	Other Providers			
	Total (n=84)	Attendings (n=20)	Mid-Levels** (n=19)	Residents (n=47)	
IUC indicated (8 scenarios)	56% $\pm$ 25	56% $\pm$ 25	62% $\pm$ 24	45% $\pm$ 18	58% $\pm$ 27
Alternate modes of urine collection should be considered (3 scenarios)	57% $\pm$ 34	52% $\pm$ 33	58% $\pm$ 37	60% $\pm$ 31	45% $\pm$ 31
Try alternate modes of urine collection first (2 scenarios)	43% $\pm$ 41	53% $\pm$ 35	63% $\pm$ 32	53% $\pm$ 35	50% $\pm$ 36
IUC contraindicated (12 scenarios)	25% $\pm$ 20	19% $\pm$ 16	18% $\pm$ 14	16% $\pm$ 13	21% $\pm$ 17
<i>Total (25 scenarios)</i>	<i>40% $\pm$ 13</i>	<i>37% $\pm$ 12</i>	<i>41% $\pm$ 13</i>	<i>33% $\pm$ 9</i>	<i>38% $\pm$ 12</i>

* Providers were given brief written vignettes describing each clinical scenario and asked to report on their current practice surrounding IUC placement choosing one of 4 options: always, consider with alternate modes of urine collection, would consider alternatives, only if alternatives have failed, and never. For scenarios for which the most appropriate practice is either would consider alternatives and only if alternatives have failed, we have considered provider practice aligned with best practices if they reported either of these strategies.

** Mid-Level Providers include licensed nurse practitioners (n=6) and physician assistants (n=11).

Table 4

Percentage of emergency providers (n=129) whose self-reported practices surrounding whether to place an indwelling urinary catheter (IUC) aligned with current standards of care and best practices in 12 clinical scenarios *

Scenario, n (%)	Nurses (n=43)	Other Providers			
		Total (n=84)	Attendings (n=20)	Mid-Levels** (n=19)	Residents (n=47)
Delirium	3 (7%)	1 (1%)	0 (0%)	0 (0%)	1 (2%)
Morbid obesity	6 (14%)	27 (32%)	6 (30%)	6 (32%)	15 (32%)
Measuring post-void residual	7 (17%)	5 (6%)	1 (5%)	0 (0%)	4 (9%)
Obtaining urine sample	7 (17%)	10 (12%)	1 (5%)	1 (5%)	8 (17%)
Patient/family request	8 (19%)	5 (6%)	1 (5%)	1 (5%)	3 (6%)
Bed-bound	9 (21%)	12 (14%)	3 (15%)	2 (11%)	7 (15%)
Convenience for care	10 (24%)	12 (14%)	3 (15%)	4 (21%)	5 (11%)
Urinary tract infection	11 (26%)	18 (21%)	2 (10%)	2 (11%)	14 (30%)
Dementia	13 (30%)	5 (6%)	1 (5%)	1 (5%)	3 (6%)
Incontinence	15 (35%)	34 (40%)	7 (35%)	9 (53%)	18 (38%)
Patient refusal	18 (43%)	38 (44%)	12 (60%)	7 (37%)	19 (40%)
Alcohol intoxication	22 (54%)	35 (41%)	9 (47%)	7 (37%)	19 (40%)

*. Scenarios ordered based by percentage of nurses whose self-reported practice aligned with current standards of care and best practices.

** Mid-Level Providers include licensed nurse practitioners (n=6) and physician assistants (n=11).