



Educational Interventions Improve Trainee Approach to Urine Culturing in Catheterized Patients

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BACKGROUND

- Asymptomatic bacteriuria is a common phenomenon, especially in chronically catheterized patients.
- The Infectious Disease Society of America (IDSA) guidelines recommend against culturing for pyuria and bacteriuria in asymptomatic patients.
- Inappropriate treatment of asymptomatic bacteriuria in catheterized patients leads to antibiotic overuse, the emergence of multi-drug resistant organisms, adverse drug interactions, and increased episodes of *Clostridium difficile* infections.
- Numerous studies have shown that presenting evidence-based information improves medical trainees' knowledge and skills.

OBJECTIVES

- To evaluate current knowledge and practices of trainees regarding indications to order urine cultures in catheterized patients.
- To educate trainees about current evidence-based indications to order urine cultures in catheterized patients.
- To assess the impacts of this educational intervention.

METHODS

- Setting: 1541-bed academic medical center, New Haven, CT.
- Survey:
 - Types: baseline and post education, paper and electronic.
 - Respondents: medical students, residents, fellows.
 - Survey period: January to March 2018; post education surveys given a range of immediately after to several weeks after education.
 - Components: questions about respondent's role, primary location of practice, and 13 questions to evaluate whether culturing practices were consistent with IDSA guidelines.
- Scores calculated on a scale of 0-12 (one question was controversial) with 1 point for each incorrect answer. Differences between the means of these populations were evaluated by ANOVA in GraphPad Prism.
- Education about the urine culture algorithm done via trainee-to-trainee self-directed word of mouth, email, or noon conferences.
- Post education surveys were distributed a range of timeframes after education-averaging two weeks after education.

RESULTS

- 163 out of an estimated 900 trainees (18%) responded to our baseline survey, with average scores improving with level of training - 6.4 for medical students, 4.2 for interns, 3.9 for residents, and 3.8 for fellows ($p < 0.05$, Table 1).
- 93 of 160 (57%) trainees responded to the post education survey, with improvement in scores across all levels ($p < 0.05$ for residents, Table 1) and all questions (Figure 1).
- Trainees who reported that they did not receive any form of education scored significantly worse than average (4.68 vs 2.84, $p < 0.005$, Figure 2), and the trainees who reported receiving multiple forms of education scored better than average (1.00 vs 2.84, $p = 0.06$).
- There was no difference in score based on how the trainees were educated (1.94 for email vs 1.89 for word-of-mouth vs 2.00 for in-person conference, $p = 0.99$, Figure 2).

Table 1: Comparison of baseline and post education survey scores of trainees

Level of Training	Baseline Survey (n=160)	Post Education Survey (n=93)	P-value
Medical Student (n=18)	6.43	6.08	0.79
Intern (n=59)	4.17	3.00	0.08
Resident (n=129)	3.85	2.00	<0.05
Fellow (n=42)	3.75	2.67	0.27
P-value	<0.05	<0.05	

Figure 1: Comparison of baseline and post education choices for obtaining urine cultures

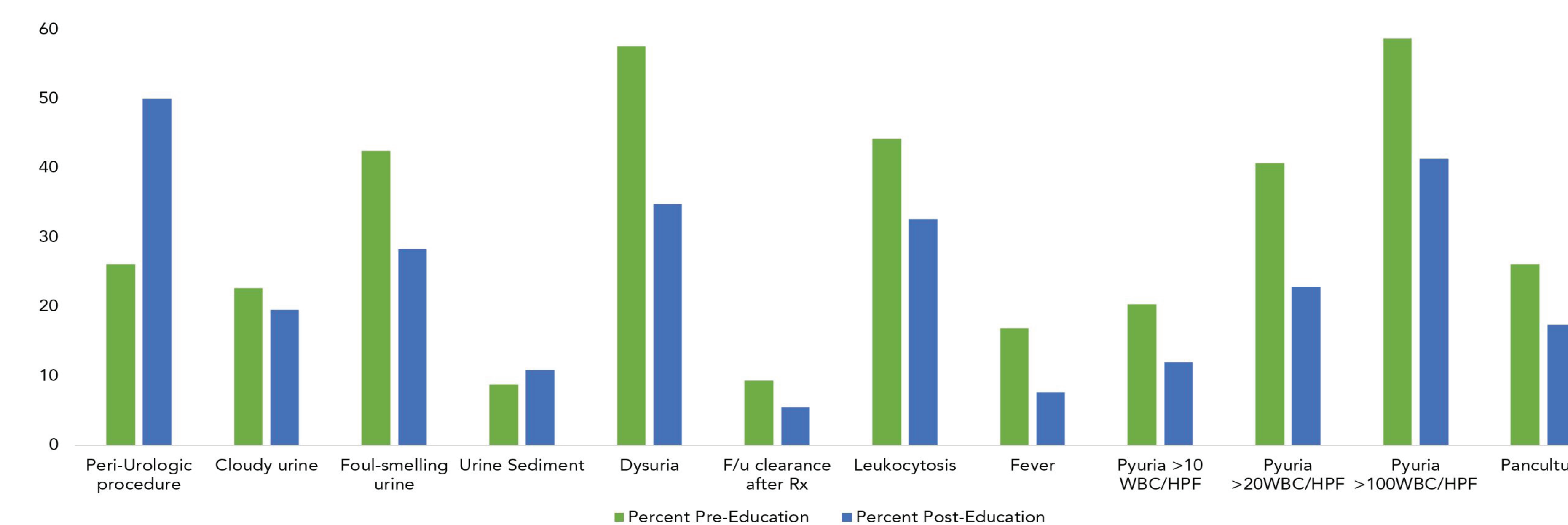
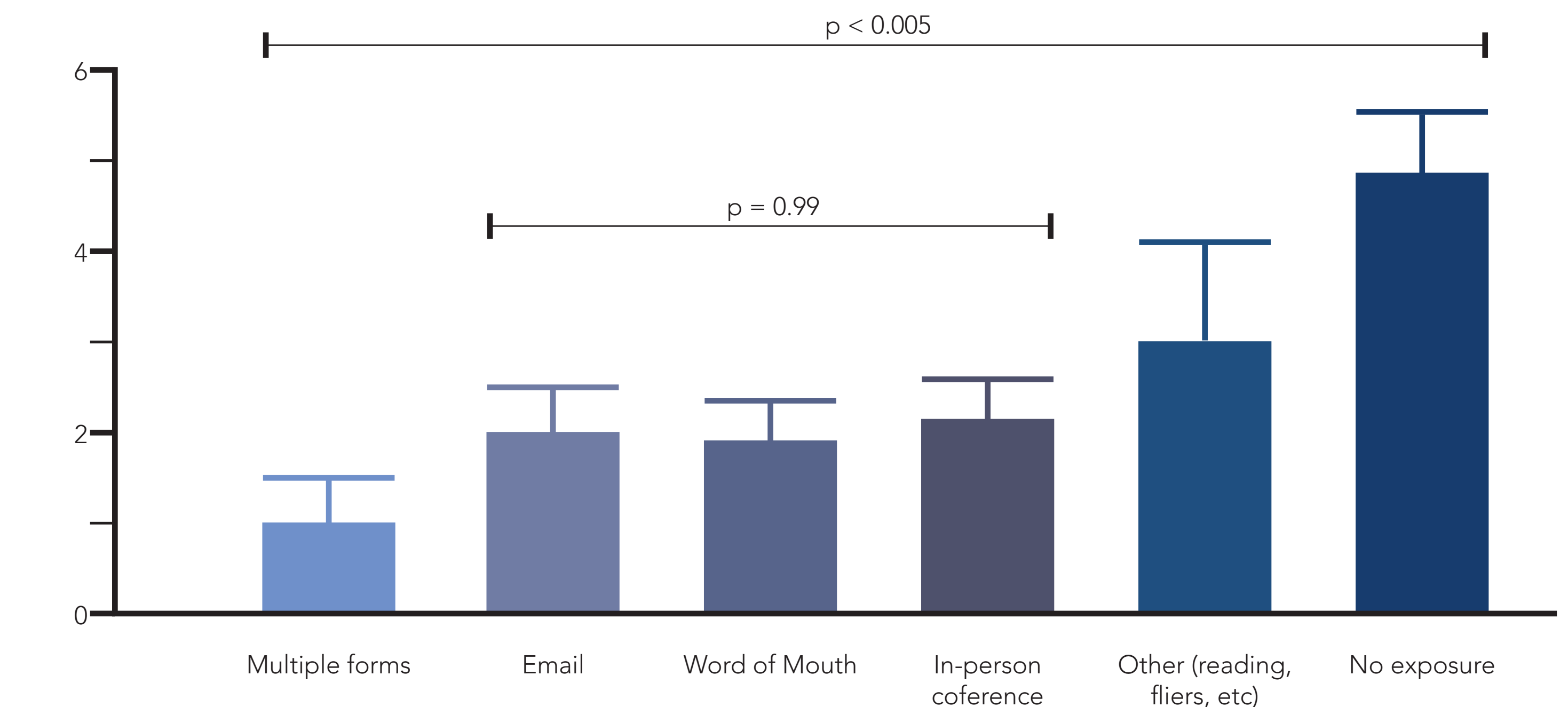


Figure 2: Comparison of post education survey scores by method of education



CONCLUSIONS

- Our data show that advanced trainees scored better than medical students and interns. However, trainees at all levels improved their scores with education about culturing.
- The form of the education did not make a difference in their scores, which suggests that it is just as effective to send out electronic resources as more time-intensive noon conferences.
- Our analysis shows that there is great opportunity and benefit to targeting education to trainees to promote diagnostic stewardship.
- Future studies should focus on the sustainability of the impact of these educational interventions.

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