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## Factors Associated with Not Removing Urinary Catheter after Reminder

*To the Editor*—Reminder systems (eg, a stop order or reminder) to minimize unnecessary urinary catheter use have been associated with a reduction in catheter-associated urinary tract infection (CAUTI).<sup>1</sup> However, little information has been reported for factors associated with prolonged urinary catheter use after implementation of a systematic reminder to remove urinary catheters. We established a urinary catheter team to remind physicians to remove unnecessary catheters in the medicine wards and intensive care units (ICUs) at Thammasat University Hospital, Pratumthani, Thailand. From March 16 to April 15, 2012, the team pursued two identified goals: to remind physicians to remove unnecessary catheters and to evaluate factors associated with not removing urinary catheters after the reminder. All patients in all medicine wards ( $n = 6$ ) and ICUs ( $n = 4$ ) were prospectively evaluated for appropriateness of urinary catheterization; criteria for inappropriate urinary catheterization were as previously defined.<sup>2</sup> After the reminder, patients were prospectively followed on days 2 and 7 for catheter removal, development of CAUTI, and indications for not removing an unnecessary urinary catheter. In this hospital, interns, resi-

dents, and staff were responsible for orders to insert and remove catheters. Criteria for diagnosis of CAUTI were derived from guidelines endorsed by the Infectious Diseases Society of America.<sup>3</sup> Factors associated with not removing urinary catheters were computed using multivariable analysis.

During the 1-month study period, 39 patients had urinary catheter placement, 22 (56%) of whom received inappropriate urinary catheterization (Table 1). A systematic face-to-face reminder to remove the urinary catheter was made to the ordering physician in all 22 cases. The majority of reminders (12 [55%]) were made to interns. Thirteen (59%) urinary catheters were removed within 48 hours, and 9 (41%) were not removed during the study period. Inappropriate indications associated with retained urinary catheters were urinary incontinence without skin breakdown (5 [56%]), staff forgetting to remove the urinary catheter (2 [22%]), and retained use after monitoring of urine output (2 [22%]). No patient had recatheterization after catheter removal. There was a significant trend of not removing the catheter if the reminder was made to physicians with more years of training (Table 1). One patient with retained catheter use (11%) developed a CAUTI within 1 week of the reminder. In multivariable analysis, a reminder to physicians who were not directly involved in patient care (resident 2 or 3) was associated with retained catheter use (adjusted odds ratio, 12.5; 95% confidence interval, 1.4–65.4;  $P = .04$ ).

In this 1-month study, we found that the initial prevalence of inappropriate urinary catheter use was high and that a systematic reminder to remove urinary catheters was asso-

TABLE 1. Characteristics of Participants

Variable	Proportion (%) of participants
Type of unit	
Medicine units	4/22 (18)
Intensive care units	18/22 (82)
Staff	
Intern	12/22 (55)
Resident 2	6/22 (27)
Resident 3	4/22 (18)
Catheter removal after reminder	13/22 (59)
Indications of unnecessary urinary catheterization	
Urinary incontinence without skin breakdown	5/9 (56)
Staff forgot to remove urinary catheter	2/9 (22)
No longer needed to monitor urine output	2/9 (22)
Other <sup>a</sup>	0/9 (0)
Type of physicians associated with retention of urinary catheter <sup>b</sup>	
Intern	3/12 (20)
Resident 2	2/6 (33)
Resident 3	4/4 (100)

<sup>a</sup> “Other” indications include convenience of care, staff are too busy, amphotericin B bladder irrigation, unclear indication, and neurogenic bladder for which intermittent catheterization is possible.

<sup>b</sup>  $P = .04$  ( $\chi^2$  for trend).

ciated with removal of 59% of unnecessary catheters. As did a previous study suggesting that physicians were unaware of their patients having urinary catheters,<sup>4</sup> we found that reminders to physicians with less training who were directly involved in patient care enhanced the effectiveness the reminder systems. We also identified 2 potentially modifiable gaps in knowledge of inappropriate urinary catheter-prescribing behaviors: incontinence without skin breakdown and retained use after monitoring of urine output. Ongoing and future efforts will require an evidence-based educational program of systematic reminders among physicians directly involved in patient care, with emphasis on infection prevention control, patient safety, and institutional support.

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## Hierarchy and Hand Hygiene: Would Medical Students Speak Up to Prevent Hospital-Acquired Infection?

*To the Editor*—Hand hygiene (HH) is important in reducing healthcare-associated infections (HAIs).<sup>1</sup> Despite this, and despite the presence of major HH campaigns, adherence remains low, especially among medical staff.<sup>2,3</sup>

Teams play an integral role in health care, and effective teamwork is essential for the reduction of medical errors.<sup>4,5</sup> Vigilance in HH practices from nurses, junior doctors, and physicians may improve adherence; however, the existence of steep hierarchies within the medical profession may prevent junior staff from questioning supervising colleagues.<sup>6,7</sup>

Medical students are junior members of healthcare teams and have been shown to play important roles in reducing patient harm.<sup>8</sup> This cross-sectional study assessed the willingness of medical students to speak up about poor HH practices among their colleagues and supervising doctors.

An anonymous survey was administered to Monash University medical students undertaking clinical placement during a 6-week period from January 23 to March 2, 2012. The Monash University Bachelor of Medicine and Surgery program is a 5-year undergraduate course; students are placed full time in a clinical environment for the final 3 years. Southern Health has 2,100 beds spread over 5 major hospitals. Approximately 250 students were placed across these campuses during the study period. Students were provided surveys to complete after they were informed of the nature and purpose of the study.

Survey questions involved demographic information, willingness to remind medical personnel to perform HH, reasons for not speaking up, perceived reactions of medical personnel and the individual student to being reminded to perform HH, and students' beliefs about their role in preventing HAIs and the importance of HH. Data were analyzed using Stata 12 (StataCorp). Comparisons were made using a  $\chi^2$  test where appropriate. All data were de-identified. The Southern Health Human Research Ethics Committee approved this study as quality research.

A total of 209 students (84%) participated in the study (82 third-year [38%], 64 fourth-year [31%], and 63 fifth-year students [31%]). Of these, 96% were younger than 25 years of age, 51% were male, and 53% were Australian born. Of those born overseas, 21% were from Malaysia or Singapore. A total of 83% were willing to speak up to fellow students about inadequate HH; however, this number decreased in a stepwise fashion for those who were willing to do so to interns (30%), residents (16%), registrars (9%), and consultants (6%). Female students were more likely to speak up to fellow medical students than were their male counterparts ( $P = .024$ ). There were no differences observed for medical year