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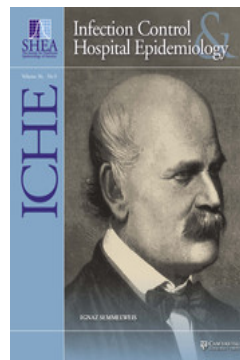
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Preventing Catheter-Associated Urinary Tract Infections: Hospital Location of Catheter Insertion

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Preventing Catheter-Associated Urinary Tract Infections: Hospital Location of Catheter Insertion

Urinary tract infections are the most common type of healthcare-associated infection, accounting for more than 30% of healthcare-associated infections reported by acute care hospitals.¹ These infections have been associated with increased patient morbidity, mortality, hospital cost, and length of stay.¹ Approximately 70% of healthcare-associated urinary tract infections are associated with the presence of an indwelling urinary catheter.² The rate of symptomatic catheter-associated urinary tract infection (CAUTI) ranges from 0.4 to 4.7 infections per 1,000 days catheterized, with the higher rates being reported from intensive care units and rehabilitation wards.³ Catheter-associated infection is associated with excess mortality, even after controlling for underlying factors, such as severity of illness and comorbidities.⁴

Recent guidelines have been published that provide recommendations for the prevention of CAUTI.⁵⁻⁸ Prevention

efforts are focused on four general areas: insertion of a urinary catheter only for appropriate indications, strict adherence to aseptic techniques for catheter insertion, proper techniques for catheter maintenance, and prompt removal of the catheter when no longer indicated. Current surveillance for CAUTI is focused on the hospital location where the patient resides at the time their urinary tract infection is diagnosed.³ However, only limited data are available on the hospital location where the catheter is inserted. This information is critical to focus the recommended quality improvement programs and education that involve appropriate indications for insertion of a urinary catheter and proper aseptic techniques for insertion. For this reason, we undertook the following study to determine the hospital location for insertion of urinary catheters.

This study was conducted at the University of North Carolina Hospitals, an 806-bed academic medical facility. Data were collected from October 14 to December 8, 2011. On randomly selected days each week, the nursing daily patient acuity report (QuadraMed Acuity Plus) was reviewed to determine all patients with a urinary catheter. From a list of patients with a urinary catheter hospitalized for fewer than 5 days, patient records were selected for further review using a computer-generated list of random numbers. Data recorded on each patient included date of catheter insertion, date of catheter removal, hospital location of catheter insertion, age, and gender. The electronic medical records were reviewed to determine the duration of urinary catheterization. This study was approved by the University of North Carolina Institutional Review Board.

Overall, 1,778 patients had a urinary catheter inserted during the study period. The electronic medical records of 280 randomly chosen patients were reviewed. Four patients were excluded due to chronic use of a urinary catheter. Forty-two patients were excluded due to insufficient information to determine the hospital site of insertion. For 231 patients (82.5%), sufficient data were available to be included in our analysis.

The most common hospital location for catheter insertion was the operating room, with approximately two-thirds (62.3%) of all catheters inserted at this location (Table 1). The second most common location was the emergency department, accounting for 11.3% of all insertions. Of interest, approximately 5% of catheters were inserted in an outside hospital or extended care facility before patient admission. Among the 54 catheters not inserted in the emergency department or in an operating room, 26 (48.1%) were inserted in an intensive care unit, 14 (25.9%) were inserted in an inpatient ward, 12 (22.2%) were inserted in a step-down unit, and 2 (3.7%) were inserted elsewhere. The mean and median durations for all catheters were 3.8 and 3 days (range, 0-32), respectively. The mean and median durations for catheters placed in the emergency department were 5.5 and 4 days (range, 1-15), respectively. The mean and median durations for catheters placed in an operating room were 2.7 and 2

TABLE 1. Hospital Location of Urinary Catheter Insertion ($n = 231$)

Site of insertion	No. of insertions	%
Operating room	144	62.3
Emergency department	26	11.3
Surgery service	20	8.7
Heart/vascular service	14	6.1
Outside hospital	12	5.2
Medicine service	9	3.4
Pediatric service	3	1.3
Obstetrics and gynecology service	1	0.4
Outpatient clinic	1	0.4
Other	1	0.4

days (range, 0–24), respectively (1 catheter was still in place at 24 days at the time of study termination). Catheters placed in the emergency department were maintained for a significantly longer duration ($P < .005$, 2-tailed t test) than catheters placed in the operating room.

Interventions designed around appropriate criteria for catheter insertion and prompt removal when no longer required have been demonstrated to reduce the use of urinary catheters.⁹ In addition to reducing patient morbidity and mortality, such interventions are increasingly important from a cost standpoint, since the Centers for Medicare and Medicaid Services no longer reimburses hospitals for CAUTIs.¹⁰ Knowing the hospital location of urinary catheter insertion is crucial to focus educational efforts. Our data revealed that more than 70% of urinary catheters are placed in the operating room (62%) or the emergency department (11%). Catheters placed in these locations may remain in place for a substantial period of time, increasing the risk of these patients to develop a urinary tract infection. Education efforts to ensure aseptic urinary catheter insertion and adherence to current guidelines for appropriate indications for catheter insertion should be focused on personnel working in the emergency department and operating room. Each healthcare facility should determine the locations of urinary catheter insertion to guide their preventive efforts. Additional larger studies should be undertaken to validate whether our data, which were obtained in an academic university hospital, are broadly generalizable to other healthcare facilities.

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