A Point Prevalence Study of Urinary Catheter Use Among Teaching Hospitals With and Without Reduction Programs

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Urinary catheter use can be associated with urinary tract infections, delirium, trauma, and immobility. Evidence-based strategies to reduce inappropriate use are available, however, their application across centers is variable. We aimed to characterize the prevalence and indication for catheters among Canadian teaching hospitals with and without catheter reduction programs.

METHODS
Twelve of 17 postgraduate internal medicine training program directors agreed to participate, and 9 Canadian teaching hospitals enrolled in this prevalence study of urinary catheter use among medical inpatients. Data collection used a standardized form and took place over 5 consecutive weekdays during August 2015. Each site anonymously collected the total number of catheters, total number of inpatient-days, and indications for use from either the bedside nurse or physician. Appropriate clinical indications were based on the 2009 guidelines from the Healthcare Infection Control Practice Advisory Committee. Potentially inappropriate indications included urine output measurement in non-critically ill patients, and “other” or “unknown” indications. A catheter reduction program was defined as the presence of a structured system to monitor and reduce use via: nurse-directed catheter removal, audit-feedback of use to providers, physician reminders, and/or automatic stop orders.

The primary outcome was the number of catheter days per 100 inpatient-days. We used generalized estimating equations to adjust the 95% confidence interval (CI) and P value to account for hospital-level clustering of the responses. The P values are from a 2-tailed Wald test against the true log scale parameter being equal to zero. The analysis was performed using R version 3.0.2 using the geepack package (Free Software Foundation, Boston, MA).

The McGill University Health Centre Research Ethics Board approved this study with concomitant authorization at participating sites.

RESULTS
The characteristics of participating hospitals are displayed in Table 1. Those with active catheter reduction programs reported established systems for monitoring catheter placement, duration, and catheter-associated urinary tract infections. More than half of the hospitals lacked a catheter reduction program. Overall, catheters were present on 13.6% of patient-days (range, 2.3%-32.4%). Centers without reduction programs reported higher rates of catheter use both overall and for potentially inappropriate indications. After adjustment for clustering, those with a formal intervention had 8.8 fewer catheter days per 100 patient-days as compared to those without (9.8 [95% CI: 6.0-15.6] vs 18.6 [95% CI: 13.0-26.1], P = 0.03). This meant that the odds of a urinary catheter being present were 2 times (95% CI: 1.0-3.4) greater in hospitals without reduction programs. Differences in appropriate catheter use did not reach statistical significance.

DISCUSSION
Despite the availability of consensus guidelines for appropriate use and the efforts of movements like Choosing Wisely, many Canadian teaching hospitals have not yet established a urinary catheter reduction program for medical inpatients. Our findings are similar to 2 non-Canadian studies, which demonstrated that fewer than half of hospitals had implemented control measures. In contrast to those other studies, our study demonstrated that hospitals that employed control measures had reduced rates of catheter use suggesting that systematic, structured efforts are necessary to improve practice.

Ours is the first nation-wide study in Canada to report urinary catheter rates and the effect of associated reduction programs. Data from the National Healthcare Safety Network suggest our Canadian estimates of urinary catheter rates in medical inpatients are similar to those of the United States (13.6 vs 14.8 catheter days per 100 inpatient-days, respectively, for general medical inpatients).
Several limitations of this study warrant discussion. First, we sampled only academic institutions at 1 time point, which may not represent annualized rates or rates in community hospitals. However, our findings are similar to those reported in previous studies. Second, our method of consecutive daily audits may have caused individuals to change their behavior knowing that they were being observed, resulting in lower catheter utilization than would have been otherwise present and biasing our estimates of catheter overuse downward. Third, we collected point prevalence data, limiting our ability to make inferences on causality. The key factor(s) contributing to observed differences in catheter overuse is unknown. However, pre- and postintervention data available for 3 hospitals suggest that improvements followed active catheter reduction efforts.

Fourth, we were unable to obtain outcome data such as catheter-associated urinary tract infection, delirium, or fall rates. However, catheter reduction is widely recognized as an important first step to reducing preventable harm for hospital patients.

We suggest that the broader uptake of structured models of care that promote early discontinuation of urinary catheters on medical wards is needed to improve their appropriateness. Fortunately, it appears as though a variety of models are effective. Therefore, when it comes to adopting Choosing Wisely’s “less is more” philosophy toward urinary catheter utilization, we suggest that less time be allowed to pass before more proven and structured interventions are universally implemented.