



Successful Reduction in Urinary Catheter Use in Patients Transferred out of the Intensive Care Units with Staff Education and Engagement

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Abstract:

Background: Avoiding catheter exposure is key to reduce catheter-associated urinary tract infections. Urinary catheter (UC) utilization is nearly four times greater in the intensive care unit (ICU) compared to the non-ICU, making it important to address UC need at the time of transfer out from the ICU.

Methods: The study employed a pre-post quasi-experimental design. We evaluated 3 periods: period 1 (no intervention, March 2012), period 2 (heightened awareness by staff of importance for catheter evaluation), and period 3 (educational intervention with audits and feedback, November 15th-December 14th). A 3rd year medical resident educated resident physicians and nurses regarding indications for use and the evaluation of catheter need prior to transfer out of ICU (formal presentation and provided educational materials on pocket cards). In addition, random audits and feedback were provided to the ICU staff. Data included catheter utilization, and the number of patients who had the catheter discontinued before transfer out of ICU.

Result: 490 patients were treated over the 3 periods. UC utilization was 0.72, 0.73, and 0.64 for the 3 consecutive periods (periods 1 vs.3 p=0.004; 2 vs. 3 p=0.004). The UC was discontinued before transfer out of ICU in 14.2% (21/148) period 1, 15% (15/100) period 2, and 25.5% (25/98) period 3 (p=0.03 for periods 1 vs. 3; p=0.07 for periods 2 vs. 3). Patients had the UC discontinued prior to transfer out of ICU in 14.5% (36/248) for combined periods 1-2 compared to 25.5% (25/98) for period 3 (p=0.02).

Conclusion: Education on appropriate UC use and random audits evaluating presence and catheter need are associated with higher discontinuation of UCs prior to transfer out of ICU. Continuous engagement of staff in safety processes is crucial for successful results.

Methods:

- The study employed a pre-post quasi-experimental design.
- We evaluated 3 periods: period 1 (**no intervention**, March 2012), period 2 (**heightened awareness** by staff of importance for catheter evaluation, September 2012), and period 3 (**educational intervention with audits and feedback**, November 15th-December 14th, 2012).
- A 3rd year medical resident educated residents and nurses regarding indications for use and the evaluation of catheter need prior to transfer out of the ICU (formal presentation and pocket cards with educational material).
- Random audits and feedback were provided to the ICU staff.
- Data were collected on catheter utilization and the number of patients who had the catheter discontinued before transfer out of the ICU.
- Data were analyzed comparing all three periods and then comparing periods 1 and 2 combined vs. period 3. Data were analyzed using chi-squared analysis and the z-test for proportions using person-time.
- Data were analyzed using SPSS v. 21.0 and a p-value of 0.05 or less was considered to indicate statistical significance.



Table 2 shows the results when the first two time periods are combined and compared with the third period.

Comparing Baseline-Preintervention to Intervention

	Baseline-Preintervention, N=351	Intervention (Nov 15-Dec 14, 2012) N=139	P-value*
Patient had UC used anytime	248 (70.7%)	99 (71.2%)	0.9
UC utilization (catheter-days/patient-days)	0.72 (726/1007)	0.64 (300/470)	0.0008
UC discontinued in MICU	36/248 (14.5%)	25/98 (25.5%)	0.02

Discussion

Resident physicians and nurses play an essential role in promoting safety in the intensive care units. They both have a substantial exposure to the patients and engaging them is a must. We show that heightened awareness of an issue is not enough to ensure safety. On the other hand, direct education and feedback on performance were more effective in reducing catheter use. It is important to note that we addressed both resident physicians and nurses. Although device use or need formally is dependent on the physician's decision to use or not to use the device, the intensive care nurses play a significant role in the decision making of placing or continued use of the catheter.

We have found that utilization of urinary catheters has dropped with intervention, in addition to discontinuation of the catheter before discharge from the intensive care unit. Device discontinuation prior to intensive care exit has a great potential to reduce exposure to the catheter in the non-intensive care units.

Finally, for the efforts to be successful, integration of the new process in the daily unit routine is the road to sustainability. Potential venues to consider include incorporating the device evaluation into the daily multidisciplinary rounds, and identifying champions to promote the safety risk with unnecessary catheter use.

Conclusions

- Intervention with a resident physician champion (education and feedback) is associated with higher rates of UC discontinuation prior to transfer out of the ICU.
- Future plans include the integration of the assessment for UC necessity into the resident physician and ICU nurse daily work and building a mechanism of transfer out of ICU to evaluate UC need.

Background:

Urinary tract infection is the most common hospital-acquired infection (HAI); 80% of these infections are attributable to an indwelling urethral catheter. The risk of bacteriuria increases by 5% every day the catheter remains in place.

Catheter-associated urinary tract infections (CAUTI) may lead to many complications and may increase hospital costs, length of stay, and possibly mortality.

The CAUTI rate is now used as a measure for comparing hospital performance in patient safety.

The two most important strategies to prevent CAUTI are to not use a urinary catheter and, if a catheter is necessary, to minimize the duration of use.

Most reasons for failure to discontinue the unnecessary use of UCs include unfamiliarity with the indications for use and lack of a defined nursing management plan to monitor their presence and need.

Urinary catheter utilization is nearly four times greater in an intensive care unit than on a general, "medical-surgical" unit. Therefore, interventions to discontinue unnecessary UC use once the patient is transferred out of the ICU are important.

The purpose of this investigation is to determine if ICU staff education and random audits will reduce the proportion of patients transferred out of the ICU to a medical-surgical unit with a UC.

Results

- Table 1 shows the comparison of the rates of catheter removal by time period.

490 patients over 3 periods

	1: Baseline (March 2012) N=205	2: Pre-intervention (Sep 2012) N=146	3: Intervention (Nov 15-Dec 14, 2012) N=139	P-value*
Patient had UC used anytime	148 (72.2%)	100 (68.5%)	99 (71.2%)	0.75 all periods;
UC utilization (catheter-days/patient-days)	0.72 (433/604)	0.73 (293/403)	0.64 (300/470)	NS 1 vs. 2, 0.004 1 vs 3; 0.004 2 vs. 3
UC discontinued in MICU	21/148 (14.2%)	15/100 (15%)	25/98 (25.5%)	0.053

*Chi square and z-test for two proportions used