2112. Assessing the Accuracy of Catheter-Associated Urinary Tract Infections (CAUTI) Identification Using Urinalysis Results Sarah Pender, MSc; Michael Phillips, MD and Anna Stachel, MPH, CIC; Infection Prevention and Control, NYU Langone Medical Center, New York, New York

Session: 234. Healthcare Epidemiology: Device-associated HAI
Saturday, October 6, 2018: 12:30 PM

Background. Catheter-associated urinary tract infections (CAUTI) negatively impact patient morbidity, mortality and insurance reimbursement rates in acute care hospitals. Since CAUTIs are solely defined by the National Health and Safety Network (NHSN), not by clinical definition or urinalysis (UA) result, eliminating unnecessary urine cultures will improve the accuracy of reportable CAUTI rates. Negative UA can accurately detect false-positive (FP) CAUTIs in patients with 100% negative predictive value.

Methods. We conducted a retrospective analysis of 2017 CAUTIs reported from two acute care hospitals (A and B) to determine the effectiveness of a UA screening protocol and the distribution of FPs. Hospital B implemented a UA screening protocol requiring a UA prior to urine culture. Hospital A relied solely on microbiology cultures. FPs were identified by a negative UA result, the absence of bacteria, performed on the same or prior day to the urine culture that resulted in a CAUTI.

Results. Our analysis showed that 13 (34%) of the 38 reported CAUTIs with an associated UA result at hospital A were FPs. Patients with a UC line duration >7 days had a CAUTI FF rate of 62% compared with 27% of those with a line duration between 3 and 7 days (Figure 1) (OR 4.6, CI: 0.9, 23.7, P = 0.09). Hospital A (no screening protocol) was 37.4 times more likely to have a FP CAUTI compared with hospital B (UA screening protocol) (CI: 0.2, 0.660.6; P = 0.0004).

Conclusion. A positive culture with a negative UA is indicative of asymptomatic colonization, not true infection. Preventing FP CAUTIs would result in a 34% reduction in CAUTI rates at hospital A, placing the hospital in a better reimbursement benchmark (Figure 2). Interventions include: (1) A best practice alert in the patient’s electronic medical record that can be used to notify the providers to re-evaluate patients with UCs in place ≥ 5 days. (2) A screening protocol that requires a UA order prior to/during specimen collection and prevents processing of urine cultures with a negative UA. In patients with UCs, a protocol should be implemented to reduce FP CAUTI to better understand the true epidemiology of CAUTIs in hospitals and increase reporting accuracy.

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2113. Process Change Implementation to Decrease Catheter-Associated Urinary Tract Infections Sara Reese, PhD, MPH, CIC, FAPIC; Bryan Knepper, MPH, MS, CIC; Jennifer Kurtz, BSN; Amber Miller, MSN, RN, CIC, GSPDT and Heather Young, MD; Patient Safety and Quality, Denver Health Medical Center, Denver, Colorado, Infectious Diseases, Denver Health Medical Center, Denver, Colorado

Session: 234. Healthcare Epidemiology: Device-associated HAI
Saturday, October 6, 2018: 12:30 PM

Background. More than 50% of catheter-associated urinary tract infections (CAUTI) occur within 5 days of urinary catheter (UC) insertion suggesting poor insertion technique. Breaks in sterile technique and inappropriate UC kit use were observed resulting in increased insertion-associated CAUTI (iCAUTI, CAUTI occurring ≤5 days post-UC insertion). Specific challenges with UC insertion were identified in the emergency department (ED, high patient flow) and critical care units (CCU, high acuity). The objective of the study was to change the UC insertion process in the ED and CCU to reduce iCAUTI.

Methods. The study included pre-intervention (August 2016–May 2017), implementation (June–December 2017) and post-intervention (January–March 2018) periods. The interventions were use of a buddy system for UC insertions and the reduction of UC insertions in the ED. The buddy system involved critical care nurses inserting UC catheters with another healthcare worker present to ensure correct process and identify breaches in sterile technique. The ED was notified of the patients who (1) received a UC within 24 hours of admission and (2) received the UC in the ED resulting in raised awareness and joint effort between ED and CCU. An iCAUTI rate was calculated for each of the three periods. The proportion of UCs inserted using the buddy system and the proportion of admitted patients with UCs inserted in the ED were calculated.

Results. The iCAUTI rate decreased by 72.4% between pre-intervention (0.33 iCAUTI/100 UCs inserted) and implementation period (0.08) and increased slightly in post-intervention period (0.16). The ED demonstrated the largest decrease in iCAUTI rate between pre-intervention (0.40) and post-intervention (0.0). Buddy system adherence was 47.3% for the implementation and 58.2% for the post-implementation period. Patients who had UCs inserted in the ED decreased from 59.8% in pre-intervention, to 42.4% in implementation to 35.1% in the post-intervention period.

Conclusion. A decrease in iCAUTI was observed with the implementation of a buddy system and reduction of UC insertions in the ED. Sustainability of the iCAUTI reduction program will be successful with the use of tools such as electronic medical records as well as culture change and staff buy in. Future directions will include expanding the program to acute care floors.

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2114. How to Predict Multi-Drug Resistance in Community-Acquired Urinary Tract Infections? Performance of an Easy and Simple New Scoring Model Houda Ben Ayed, MD; Makram Koubaa, MD; Fatma Hamamni, MD; Chakib Marrakhchi, MD; Tarak Ben Jemaa, MD; Imed Maaloul, MD; Jamel Dammak, MD and Mounir Ben Jemaa, MD; 1Department of Community Health and Epidemiology, Hedi Chaker University Hospital, Sfax, Tunisia, 2Department of Infectious Diseases, Hedi Chaker University Hospital, Sfax, Tunisia

Session: 234. Healthcare Epidemiology: Device-associated HAI
Saturday, October 6, 2018: 12:30 PM

Background. Antibiotic resistance is a growing problem in community-acquired urinary tract infections (CAUTI) leading to significant challenges and costs in the healthcare system. We aimed to propose a reliable and an easy-to-use clinical prediction model to identify patients with multidrug-resistant (MDR) uro-pathogens.

Methods. We conducted a retrospective study including 824 patients with documented CAUTI diagnosed at an infectious diseases department during 2010–2017. Logistic regression-based prediction scores were calculated based on variables independently associated with MDR. Sensitivities and specificities at various point cutoffs were studied and the determination of area under the receiver operating characteristic curve (AUROC) was performed.

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Figure 1. CAUTI true and false positive rates in patients with urinary catheters during 2017

Figure 2. Hospital A CAUTI rates with and without false positives during 2017

Figure 2. Hospital A CAUTI rates with and without false positives during 2017
Results. The median age of 824 patients with documented CAUTI was 54 years (IQR = [33–72 years]) and 542 cases (65.8%) were females. MDR germs were found in 372 cases (45.1%). Multivariate analysis showed that age ≥ 70 years (Adjusted OR = 2.5; 95% CI = [1.8–3.5]), diabetes (adjusted OR = 1.65; 95% CI = [1.19–2.3]), history of urinary tract surgery in the last past 12 months (adjusted OR = 1.72; 95% CI = [1.22–2.7]) and previous antimicrobial therapy in the last past 3 months (adjusted OR = 4.6; 95% CI = [3–7]) were the independent risk factors of MDR in CAUTI. The results of Hosmer-Lemeshow chi-squared testing (7 = 3.4; P = 0.49) were indicative of good calibration of the model. At a cut-off of 22, the score had an AUROC of 0.71, a good sensitivity (70.5%) but a lower specificity (60%), a PPV of 60%, an NPV of 70% and an overall diagnostic accuracy of 65%. When the cutoff was raised to 6, the sensitivity dropped to 43% and the specificity increased to 85%.

Conclusion. Our study provided an insight into the clinical predictors of MDR in CAUTI. We developed a novel scoring system that can reliably identify patients likely to be harboring MDR uro-pathogens on hospital admission.

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2115. A Successful Bundled Approach to Decrease Catheter-Associated Urinary Tract Infections in a Community Hospital

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Session: 234. Healthcare Epidemiology: Device-associated HAIs Saturday, October 6, 2018: 12:30 PM

Background. Hospital acquired catheter-associated urinary tract infection (CAUTI) is a frequent occurrence in the healthcare setting. There is a known association between catheter usage and incidence of CAUTI. In this before/after intervention study, we analyzed data on 4,080 mostly general medical or surgical patients, 13,171 of which pre-intervention (August–October 2016) and 12,709 post-intervention (August–October 2017). Catheter utilization dropped from 23.7% to 21.0% (adjusted odds ratio 0.9 [95% confidence interval, CI], 0.84–0.96; P = 0.001). There were 1.02 CAUTI per 1,000 catheter-days (before) and 1.33 (after) [aOR 1.2 (0.6–2.4); P = 0.6]. Non-infectious complications decreased slightly from 39.4 to 35.4 events per 1,000 catheter-days [aOR 0.9 (0.77–1.07); P = 0.2]. The proportion of catheters with a documented proper indication went from 74.5% to 90.0% [aOR 4.1 (3.35–4.95; P < 0.001). Reevaluations increased from 167 to 623 per 1,000 catheter-days [aOR 3.12 (2.92–3.36); P < 0.001].

Conclusion. In this before/after intervention study, a simple bundle of 3 evidence-based measures reduced catheter utilization and led to increases in indicated usage of catheters and daily evaluations. The intervention had a small but statistically non-infectious complications, whereas the CAUTI rate remained on a low level. The next step is planning the national rollout of both the surveillance module and the intervention bundle.

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2117. Catheter-related Bacteremia in Hemodialysis Patients on Antibiotic Lock Therapy: Are Antibiotic Locks Ineffective?

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Background. Antibiotic lock therapy (ALT) is used to prevent catheter-related bacteremia (CRB) associated with tunneled/non-tunneled hemodialysis (HD) catheters. ALT exerts its action by preventing intraluminal biofilm formation, a common source of infection with long-term catheters. However, catheters that are in place for <2 weeks are most often infected extraluminally. ALT is unlikely to have any impact on extraluminal infection. Our study aims to define the characteristics of CRB in HD patients receiving prophylactic ALT (HD-ALT patients) and investigate for possible lack of efficacy of ALT.

Methods. ALT project was implemented in all HD patients with tunneled/non-tunneled catheters in 3 tertiary care hospitals in Detroit from June 2016 to October 2017. ALT containing Gentamicin (5 mg/2 ml) in 4% saline was instilled into each catheter lumen after HD. National Healthcare Safety Network (NHSN) criteria were used to define CRB. Retrospective chart review was done in HD-CRB patients.

Results. Out of 3,384 ALT,13 CRB were recorded (eight tunneled and five nontunneled). Nine of 13 patients received all ALT doses. Median duration from catheter insertion to CRB occurrence in these nine patients was 7 days (range 2–380 days) with six (67%) patients having catheter duration of ≤8 days. Three of nine CRB patients had catheters in place longer than 8 days (154, 194 and 380 days, respectively). The mean time to development of CRB after beginning ALT were 3.22 (SD ± 1.85). The three patients with prolonged duration of catheterization had catheters inserted long before the ALT project was implemented. Additional details of these HD-CRB patients are as follows: Mean age 61 years (± 10.7), 54% were male, 77% had catheters removed or replaced, one patient died. Most predominating organisms isolated were Staphylococcus aureus 6 (4/6 methicillin-resistant) and Pseudomonas aeruginosa 3. Two of 14 isolated organisms had gentamicin resistance.

Conclusion. A large proportion of ALT patients had catheters for short duration before CRB episode, therefore an intraluminal source of bacteremia due to biofilm formation is unlikely to have occurred. In those HD-ALT patients with long periods of catheterization, ALT duration might not have been sufficient to eradicate biofilm. Therefore, CRB occurrence in our population is probably not due to ALT failure.

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