however, the SUR can be an additional metric to reduce device-associated risks. Areas with high CAD/low SUR could be evaluated for other potential causal factors, including device insertion, care/maintenance techniques and accuracy of NHSN definition application.

Table. TAP Report, including SUR

Facility TAP Rank	CAUTIs	DUR %	12-Month SUR	CAD	SIR
1	5	14	1.85	4.10	4.1
2	4	6	0.72	3.40	*
3	3	8	1.00	2.40	*
4	4	9	1.12	2.00	1.5
5	1	7	0.85	0.80	*
6	1	5	0.63	0.80	*
7	1	5	0.67	0.80	*
8	1	10	1.29	0.70	*
9	1	6	0.83	0.70	*
10	1	17	2.14	0.60	*
11	1	12	1.57	0.50	*
12	0	7	0.92	-0.10	*
13	0	3	0.35	-0.10	*
14	0	6	0.78	-0.20	*
15	0	6	0.82	-0.20	*
16	0	3	0.35	-0.20	*
17	0	7	0.87	-0.20	*
18	0	8	1.07	-0.20	*
19	0	5	0.62	-0.30	*
20	0	7	0.96	-0.30	*
21	0	7	0.92	-0.30	*
22	0	10	1.31	-0.30	*
23	0	7	0.92	-0.30	*
24	0	7	0.95	-0.40	*
25	0	4	0.58	-0.40	*
26	0	12	1.50	-0.70	*

* Not calculated.

Disclosures. **All authors:** No reported disclosures.

2107. Decision Trees vs. Neural Networks for Supervised Machine Learning-Based Prediction of Healthcare-Associated Urinary Tract Infections

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

Background. Supervised machine learning (SML)-based methods could facilitate early prediction of healthcare-related adverse events. The role of SML in stratifying patient-risk of infectious events during hospitalization and their performance using limited subsets of standardized and widely available predictors is less known. Using a large cohort of adult inpatients, we use SML techniques to predict a diagnosis of urinary tract infection (UTI) during hospitalization.

Methods. We used previously validated data from adults (≥18 years old) hospitalized between 2009 and 2016 in a healthcare system as part of a federally funded study. The outcome was a UTI detected >2 days after admission. Predictors measured clinical complexity, history of healthcare-associated complications and specific risk factors for UTI. Predictors were restricted to those standardized and readily obtainable across facilities (e.g., ICD codes). Two SML methods, neural networks (NN) and decision trees (DT) were used. The NN used two hidden layers and a sigmoid output function. The DT used binary recursive portioning and Gini coefficient to measure node impurity. 60% of available hospitalizations were the training set, and 40% used as test set for validation. Cross validation was used to refine the model. Oversampling was used to adjust for the rare outcome. The area under the curve (AUC) for the test set measured model performance.

Results. From a total of 897,344 hospitalizations there were 16,069 UTIs identified from the data set during the study period. Applying NN and DT to the raw dataset, AUC's of 0.55 and 0.69 were achieved respectively with the test set. Model performance for DNN and DT improved with oversampling to 0.77 and 0.78, outperforming traditional logistic regression (Figure 1). The optimal DT is presented (Figure 2).

Conclusion. Reasonable prediction performance for an infectious event during hospitalization was achieved using a limited set of routinely available and standardized variables. While both SML methods had comparable performance, the DT was more interpretable. Further work will extend these methods to other infectious events, use more specific EHR data and link these predictions to interventions in real time.

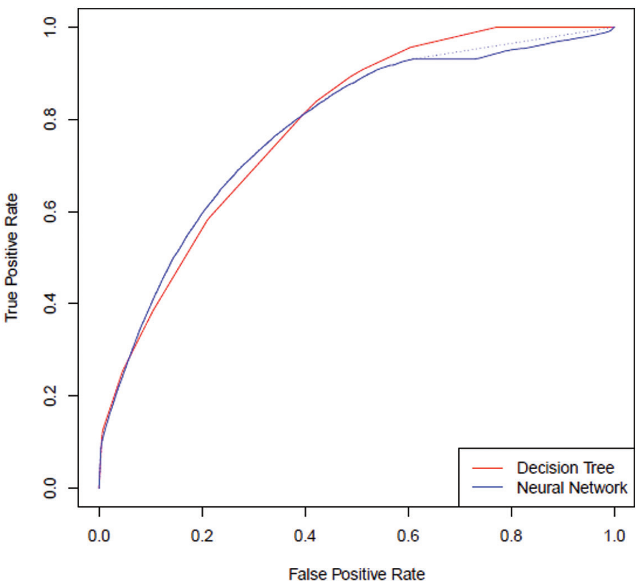

Figure 1. Neural Networks and Decision Tree Performance

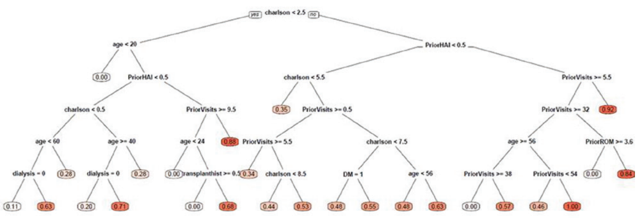

Figure 2. Decision Tree and Probability of UTI. Abbreviations: Charlson- (Charlson Comorbidity Score), ROM (Risk of Mortality Score), DM- (Diabetes Mellitus), transplanthist (history of transplantation).

Disclosures. **All authors:** No reported disclosures.

2108. Perfluorocarbon Omniphobic Treatment Prevents Bacterial Colonization of Urinary Catheter in a Rat Model

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

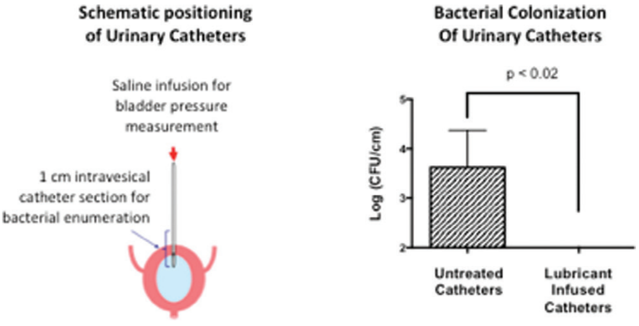
Background. The bacterial colonization of urinary catheters is a major source of hospital acquired urinary tract infections (HAUTI). Bacteria repellent coatings could lower HAUTI prevalence and minimize antimicrobial usage. We report a model of spontaneous bacterial colonization of an intravesical catheter in a spinalized rat model, and the first *in vivo* proof of the efficacy of lubricant-infused catheters (LICs) in preventing bacterial colonization.

Methods. LICs preparation: Oxygen plasma treated polyethylene catheters were immediately placed in a vacuum desiccator and 200 µL of trichloro (1 hour,1H,2H,2H-perfluorooctyl) silane) was placed beside the catheter segments. The vacuum pump connected to the desiccator was turned on with the exit valve closed once a pressure of −0.08 MPa was achieved. The chemical vapour deposition process was initiated for 4 hours. Catheters were removed from the desiccator and placed in an oven at 60°C for a minimum of 12 hours in order to complete the modification process. Catheters were saturated with a biocompatible fluorocarbon-based lubricant (perfluorodecalin) prior to implantation.

Thirty centimeters long native catheters and LICs were surgically implanted in the bladder of rats spinalized 19 days prior and programmed to undergo cystometry experiments 48 hours later. Each rat was maintained individually in a cage with food and water ad libitum until bladder functional evaluation, and benefitted from a of trimethoprim sulfadoxine and fluoroquinolone prophylaxis. At the end of the cystometry experiments, the animals were euthanized and the bladder catheter was removed. A 1 cm section from the intravesical end of the catheter was cut and placed in 1 mL of Amies medium (eSawb, Copan), vortexed and sonicated. Ten microliters of the suspension were plated on URIselect4 medium (Bio-Rad, Hercules, Ca) for bacterial enumeration.

Results. A significant reduction in bacterial colonization with *Enterobacteriaceae* and *Enterococci* was observed in the LICs group ($N = 6$, below 100 CFU threshold) compared with the native catheter group ($N = 5$, average 8200 CFU) ($P < 0.02$).

Conclusion. Lubricant-infused catheters effectively prevent bacterial colonization *in vivo* and provide an attractive and nonselective option for HAUTI prevention.



Disclosures. **All authors:** No reported disclosures.

2109. Reducing Catheter-associated Urinary Infections (CAUTI) in the Intensive Care Unit (ICU): Changing the Culture of Culturing

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

Background. CAUTIs are one of the most common preventable adverse events in hospitalized patients. Prior to the start of this intervention, CAUTI rates in our ICU's throughout our multicenter acute care system were significantly above the national average. Our hypothesis was that we could decrease CAUTI's by daily review of the urine culture orders for patients with a Foley catheter.

Methods. We implemented guidelines for appropriate ordering of urine culture for patients with Foley catheters in 2014. The culture was deemed appropriate if the patient had a fever >100.4°F within 48 hours or leukocytosis with no other identifiable source of infection and has one or more of the following: costovertebral angle/flank pain, suprapubic pain, increase in urinary frequency; urgency, frequency or dysuria after catheter removal, acute mental status change, worsening of clinical status. The ordering prescriber was called to cancel the order that did not meet the urine culture ordering guideline. If the ordering prescriber questioned the guidelines, Epidemiologists intervened to explain the rationale. This was a prospective, observational study. Chi-squared analysis was used to compare the reduction of CAUTIs.

Results. The data showed sustained improvement. Compared with the 2012 baseline rate of 4.28 cases per 1,000 device days, the 2013 rate was 2.70 ($P = 0.085$), the 2014 rate was 1.38 ($P = 0.00046$), the 2015 rate was 0.73 ($P < 0.0001$), and the 2016 rate was 0.63 ($P < 0.0001$).

Conclusion. We found that using guidelines combined with an Infection Preventionist review to determine the appropriateness of urine cultures was associated with a significant reduction in the rate of ICU CAUTI's. Real-time culture order review is a sustainable process that has continued the success of our CAUTI reduction program.

Disclosures. **All authors:** No reported disclosures.

2110. Taurolidine-Citrate Lock Solution for the Prevention of Central-Line-associated Bloodstream Infection (CLABSI) in Pediatric Hematology-Oncology and Gastrointestinal Failure Patients with High Baseline CLABSI Rates

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

Background. Catheter- line-associated bloodstream infection (CLABSI) is a serious complication of patients on long-term central venous catheters (CVC). Taurolidine-citrate solution (TCS) is a catheter-lock solution with broad- spectrum antimicrobial action that prevents biofilm formation. The aim of this study was to evaluate the efficacy of TCS in reducing CLABSI rate in pediatric patients with long-term CVC at a tertiary children's hospital.

Methods. This was an open-label trial of hematology-oncology (H/O) and gastrointestinal (GI) inpatients with the following inclusion criteria: Pediatric patients < 17 years of age, at least 1 previous CLABSI, required long-term CVC, e.g., long-term parenteral nutrition or undergoing chemotherapy for malignancy and have a minimum dwell time of at least 8 hours for TCS. The period of surveillance was from each patient's first CVC insertion till December 14, 2017 or discontinuation of TCS. CLABSI was calculated based on the number of CVC-associated BSI per 1,000 catheter-days. Statistics were derived using SPSS 19.0 and the student *T*-test for paired samples and nonparametric Wilcoxon analysis for two-related-samples test with a *P* value of < 0.05. OpenEpi v3.01 was used to compare 2 person-time rates and rate ratios with 95% confidence intervals.

Results. Thirty-four patients were recruited with a median age of 3.4 years (IQR 1.5–10.1 years). H/O patients constituted 58.8% ($n = 20$) and GI patients 41.2% ($n = 14$). The majority of CVC were Hickman line ($n = 16$, 47.1%) followed by Port-a-Cath ($n = 8$, 23.5%) and PICC ($n = 10$, 29.4%). The median duration of TCS usage was 138 days (IQR 62.50–307.25 days). The longest duration of TCS was 1737 days (4.8 years). Median pre- and post-TCS CLABSI rates for the whole cohort, H/O and GI patients were 14.92 ± 13.50 and 2.65 ± 4.31 ($P < 0.001$); 16.55 ± 12.96 and 2.81 ± 4.66 ($P < 0.001$); 12.59 ± 14.39 and 2.42 ± 3.91 ($P = 0.011$) per 1000 catheter days respectively. For the whole cohort, pre and post-TCS rate ratio was 0.20 (95% CI 0.12–0.33, $P < 0.001$). TCS reduced markedly the risk of CLABSI for the whole cohort by 80%; for H/O patients by 79% and GI patients by 88%.

Conclusion. Taurolidine-citrate solution was highly successful in reducing CLABSI rates by 80% in patients on long-term CVC with high baseline CLABSI rates.

Disclosures. **All authors:** No reported disclosures.

2111. Changing the Culture: A Quasi-Experimental Study Assessing the Burden of Urine Cultures and the Impact of Stewardship of Testing in an Urban Community Hospital

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

Background. Indwelling urinary catheters (IUC) may cause inflammation and colonization, decreasing the diagnostic yield of urinalysis and urine cultures (UC). Indiscriminate testing can lead to misinterpretation of positive results as a catheter associated urinary tract infection (CAUTI), increasing antibiotic use and CAUTI rates. We studied the burden of UC and implemented a UC stewardship initiative (UCSI) as part of a comprehensive CAUTI reduction program.

Methods. A retrospective review of cases with IUC and positive UC in 2014 was performed. UCSI was implemented in March 2017 (Figure 1). Nursing staff were instructed to contact the infectious diseases physician when UC from IUC were ordered. Cases were reviewed and, if no UC indication based on IDSA guidelines was met, cultures were discontinued after conferring with ordering physician. Twelve months pre- and post-intervention data were collected; including case description, catheter days, UC ordered, alternative cause of fever, and recommendations.

Results. The pre-USCI cohort had 23 UC in 19 cases. One UC (4%) met indication (Figure 2). Three (16%) met NHSN criteria for CAUTI and did not meet UC indication. The USCI cohort had 21 UC orders in 13 cases. Most UC did not meet indication and were cancelled (90%, 19/21). Alternative causes for fever were found in all cases with cancelled UC orders (19/19), including pneumonitis, pneumonia, pancreatitis and tuberculosis. Antimicrobials were used in 53% (7/13). UC orders per hospitalization ranged 1–4 (average 1.7). IUC days ranged from 3 to 18 days (average 8). In both cohorts, UC with indication (3) did not meet NHSN criteria for CAUTI and did not receive antimicrobials.

Figure 1. UCSI Implementation.