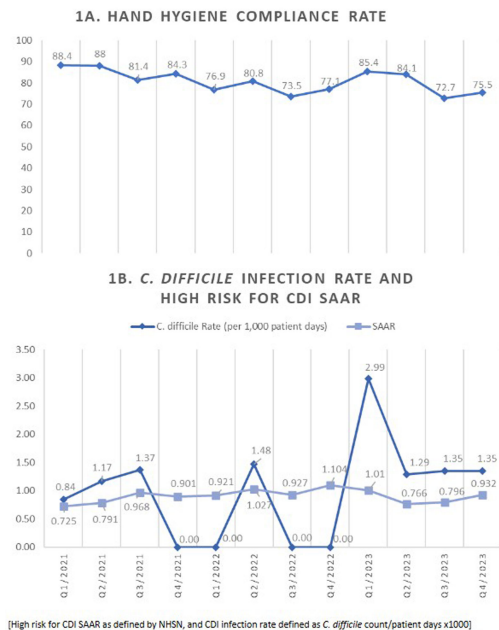


Figure 1. (A) Hand hygiene compliance rate and (B) *C. difficile* infection (CDI) rate, high risk for CDI standardized antimicrobial administration ratio (SAAR) for nephrology unit from 2021-2023



correlated with high CDI rates. Multicomponent interventions may be required to reduce the rates of HO-CDI in CKD patients. Opportunities include emphasis on diagnostic and antimicrobial stewardship, environmental cleaning and adherence to IPC practices, including hand hygiene.

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Subject Category: CAUTI

Factors Associated with Inappropriate Urine Culture Orders in Hospitalized Patients with Indwelling Urinary Catheters

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Background: Catheter-associated urinary tract infection (CAUTI) is among the most prevalent healthcare-associated infections. Clinical diagnosis of CAUTI and National Healthcare Safety Network (NHSN) definitions do not always align. Most patients with indwelling urinary catheters ultimately develop asymptomatic bacteriuria (ASB) due to bacterial colonization and may be misattributed as CAUTI. Urine cultures ordered on patients with ASB may lead to reporting of non-clinically significant CAUTI to NHSN. We sought to examine factors associated with ordering inappropriate urine cultures in patients with urinary catheters. **Methods:** All CAUTIs that were reported to the NHSN at a large academic medical center in Eastern North Carolina were evaluated from October 2021-July 2023. A logistic regression model was fit for patients treated for urinary tract infection (UTI) with the following covariates: age, sex, time of urine culture order, provider type, and days that the urinary catheter was in place. All data analysis was performed in SAS (SAS Institute Inc., SAS 9.4, Cary, NC; SAS Institute Inc., 2002-2023). **Results:** Table 1 demonstrates patient characteristics stratified by treatment for UTI. The analysis suggests that abnormal results from urine cultures ordered overnight were less likely to be treated with antibiotics, and this result was statistically significant in both the adjusted and unadjusted analyses – see table 2 and 3. The model also suggests abnormal results from urine cultures ordered by housestaff and older patients were more likely to be treated for UTI, but these results were not statistically significant – see table 3. Finally, the longer a catheter was in place the less likely an abnormal urine culture

Table 1: Patient characteristics.

	Treated for UTI	Not Treated for UTI	n
Male Sex	53 (77.9%)	15 (22.1%)	68
Female Sex	41 (85.4%)	7 (14.6%)	48
Average Age	62	54.7	-
Average WBCs/HPF	112.5	104.7	-
Average days catheter in place	7	13.9	-
Dayshift Culture Order	78 (86%)	13 (14%)	91
Nightshift Culture Order	16 (64%)	9 (36%)	25
Attending Ordered	21 (81%)	5 (19%)	26
Midlevel Ordered	33 (73%)	12 (27%)	45
Resident Ordered	40 (89%)	5 (11%)	45
Insertion	44 (85%)	8 (15%)	52
Maintenance	50 (78%)	14 (22%)	64
ID Consulted	8 (8.5%)	86 (91.5%)	94
ID Not Consulted	7 (31.8%)	15 (68.2%)	22
Foley Buddy	73 (78.5%)	20 (21.5%)	93
No Foley Buddy	14 (93.3%)	1 (6.7%)	15

Table 2: Unadjusted logistic regression model for time of day of urine culture order (dayshift 7am-6pm, nightshift 6pm-7am).

	OR	95% CI	p-value
Night Shift orders	0.30	0.11-0.81	0.02*

Table 3: Results of adjusted logistics regression model.

	OR	95% CI	p-value
Night Shift orders	0.21	0.061-0.74	0.01*
Midlevel orders	0.73	0.19-2.8	0.65
Housestaff orders	1.4	0.31-6.6	0.65
Male Sex	0.65	0.21-2.1	0.47
Age	1.03	1.0-1.06	0.05
Days catheter in place	0.89	0.83-0.96	0.003*

was to be treated and this finding was statistically significant – see table 3. **Conclusion:** Cultures that did not prompt antimicrobial treatment did not impact patient care decisions and could be considered as inappropriate orders. This can result in CAUTIs reported to NHSN that were not clinically significant. Abnormal results from cultures that were ordered by the overnight team were less likely to be treated for clinical UTI and this may represent an important target for diagnostic stewardship interventions.

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Does Urinary Catheter Replacement Prior To Obtaining Urine for Culture Make a Difference?

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Background: Indwelling urinary catheters (UCs) generate biofilm that grows over time, raising concern that after several days any culture from

a UC may generate a false positive result. Whether and when to replace a UC prior to culture is controversial, with prior studies recommending anywhere from 3 to 14 days as appropriate, but with no conclusive data. We evaluated urine culture results across a large healthcare system where, beginning in 2019, some facilities adopted the practice of changing UC before collection if indwelling for 3 days or more. **Method:** Analysis was from nursing electronic health record documentation of UC changes and urine cultures collected on patients with indwelling UC in 2022. UC changes were defined as a stop followed by a start within 12 hours. Patient exclusion criteria included a UC other than “temporary/indwelling” and surgical procedure during the admission. Statistics applied Pearson’s Chi-squared test with Yates continuity correction using R Core Team (2023) R: A Language and Environment for Statistical Computing. **Result:** Total UC episodes meeting criteria was 88,347 across 152 acute care hospitals. Episodes in days was 0-3 for 65%, 4-9 for 29% and >9 for 6%. Most urine cultures were taken at 3 days (p UC Changed? Culture Negative Culture Positive No 4916 (98.8%) 61 (1.2%) Yes 588 (98.7%) 8 (1.3%) Cultures were positive at the same rate whether a UC change occurred or not at >3 days (p=0.96). No difference was found in NHSN reported CAUTI prevalence among the UC change vs. no change in the >3 day groups. **Conclusion:** Urine culture results do not appear to be impacted by UC change as early as 3 days. UC change without benefit may generate unnecessary costs and complications.

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Analysis of CAUTIs and Projected Effect of Increasing Pyuria Threshold in Urinalysis with Reflex to Culture

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Background: Catheter-Associated Urinary Tract Infections (CAUTI) are preventable hospital acquired infections that contributes to patient morbidity, prolonged hospital stays and increased healthcare costs. Complete compliance to the CAUTI bundle is critical for preventing infection—not only reducing catheter days, but also ensuring appropriate indications are present for urine culture collection. **Methods:** This retrospective study included 145 patients diagnosed with CAUTI per NHSN definitions from July 1, 2020 to June 30, 2023. Data collected included laboratory data, catheter duration, catheter indication, urinalysis/culture indication and if foley was appropriately removed/changed prior to specimen collection. A urinary catheter indication order was implemented in February 2021 requiring providers to select specific criteria for catheter placement/maintenance. In July 2023, the threshold for urinalysis to reflex to culture was increased to ≥ 10 WBCs and this criteria was applied to these cases to estimate the effect on diagnosis of CAUTI. **Results:** The most common indications for urinary catheters were input and output monitoring 76 (52%) and urinary retention/obstruction 34 (23%). No indication was entered on 22 (15%) patients. No difference was seen in the number of catheters without an indication before or after the 2021 order update. Mean catheter duration was 11.5 days with a median of 7 days. The most common indications for obtaining a urine specimen were leukocytosis/fever/sepsis 91 (63%), urinary symptoms/abdominal/flank pain 13 (9%), urine appearance 6 (4%), and altered mental status 4 (3%). In 31 (21%) patients, no indication was identified. A urinalysis with reflex to culture was completed in 105 (72%) and the catheter was removed prior to culture collection in 68 (47%). Of the 127 patients with a urinalysis and culture, 11 had 0-5 WBCs, 16 had 6-9 WBCs, 15 had 10-20 WBCs and 85 had >20 WBCs. Using the new pyuria criteria for urinalysis to reflex to culture, 27 (19%) CAUTIs could have been avoided. **Conclusion:** Review of CAUTI cases identified opportunities

for improving documentation and education of appropriate indications for urinary catheters and evaluation of urinary tract infection. The majority of urine cultures were obtained due to non-specific symptoms and less than 10% had specific urinary symptoms indicating need for continued education and diagnostic stewardship. Increasing the pyuria threshold needed to reflex to culture has the potential to significantly reduce CAUTIs but additional education is needed to ensure catheters are changed prior culture collection and specimens are only sent when signs and symptoms of urinary tract infection are present.

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Inter-rater agreement of CAUTI (catheter-associated urinary tract infections) diagnosis among Infectious disease physicians

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Background: CAUTIs constitute forty percent of nosocomial infections, yet their direct link with mortality remains debated. In 2009, NHSN estimated the economic burden of CAUTIs in the U.S. to be over \$340 million. Limited data exist on inter-physician concordance in diagnosing CAUTIs,

Figure 1: Demographics

	Full Cohort, N(%)
Age (years), med(IQR)	72 (63,82)
Female	62 (11.3)
race/ethnicity	
NHW	134 (24.5)
NHB	103 (18.8)
HW	260 (47.4)
HB	21 (3.8)
other	21 (3.8)
unknown	9 (1.6)
diabetes	279 (50.9)
# of elixhauser comorbidities, med(IQR)	8.0 (5.0,11.0)
Abnormalities of the Genitourinary anatomy	
urethral/bladder transurethral surgical procedures	15 (2.7)
malignant neoplasm of the prostate	57 (10.4)
neuromuscular dysfunction of bladder	87 (15.9)
bladder neck obstruction	18 (3.3)
BPH without LUTS	220 (40.1)
BPH with LUTS	149 (27.2)
other artificial openings of urinary tract	23 (4.2)
Disposition	
home	296 (54.0)
facility	160 (29.2)
dead	92 (16.8)
# of urine cultures	
1	258 (47.1)
2	159 (29.0)
3	61 (11.1)
4	32 (5.8)
5+	38 (6.9)
# of foleys	
1	368 (67.2)
2	120 (21.9)
3+	60 (10.9)

BPH= benign prostatic hypertrophy
LUTS= lower urinary tract symptoms

NHW= Non-Hispanic white, NHB= Non-Hispanic black, HW=Hispanic white, HB= Hispanic black