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Background

- ❖ *Staphylococcus aureus* is a relatively uncommon cause of urinary tract infections.
- ❖ *S. aureus* bacteriuria is thought to result most commonly from urinary tract instrumentation (ascending infection) or via hematogenous seeding of the genitourinary tract (descending infection).
- ❖ Given the devastating impact of invasive *S. aureus* infection and awareness that *S. aureus* bacteriuria is often a marker for *S. aureus* bacteremia, growth of *S. aureus* from urine cultures should prompt urgent clinical assessment, including blood culture collection.
- ❖ In April 2021, a comment nudge (see Figure 1) was added to the microbiology culture and susceptibility report for all *S. aureus* isolated from urine cultures performed at the Atlantic Consolidated Laboratory (ACL) at Atlantic Health System.
- ❖ The purpose of this study is to assess the impact of a comment nudge on the diagnostic evaluation of *S. aureus* bacteriuria.

Methods

- ❖ Retrospective chart review
 - ❖ Patients with growth of *Staphylococcus aureus* from a urine culture identified from the ACL microbiology database
- ❖ Study groups:
 - ❖ Pre-Comment: October 2020 – April 2021
 - ❖ Post-Comment: May 2021 – November 2021
- ❖ Endpoints (difference between Pre- and Post-Comment groups)
 - ❖ Primary
 - ❖ Percent of patients with blood culture collection within 96 hours of positive urine culture
 - ❖ Secondary
 - ❖ Incidence of *S. aureus* bacteremia among patients with collected blood cultures
 - ❖ 30-day admission among outpatients
 - ❖ 60-day all-cause mortality
- ❖ Statistical analysis
 - ❖ Categorical data: Chi-square test

Study Intervention

Figure 1: Comment nudge added to microbiology culture and susceptibility report for *Staphylococcus aureus* isolated from urine cultures



Results

Table 1: Patient Characteristics

	Pre-Comment (n=122)	Post-Comment (n=188)
Age, years, median (IQR)	74 (25)	72 (25)
Inpatient status at time of urine culture collection, n (%)	64 (52%)	118 (64%)
Urine Culture Results, n (%)		
MRSA	38 (31%)	69 (37%)
Polymicrobial	41 (34%)	67 (36%)

Primary Endpoint

Figure 2: Percent of patients with blood culture collection within 96 hours of positive urine culture

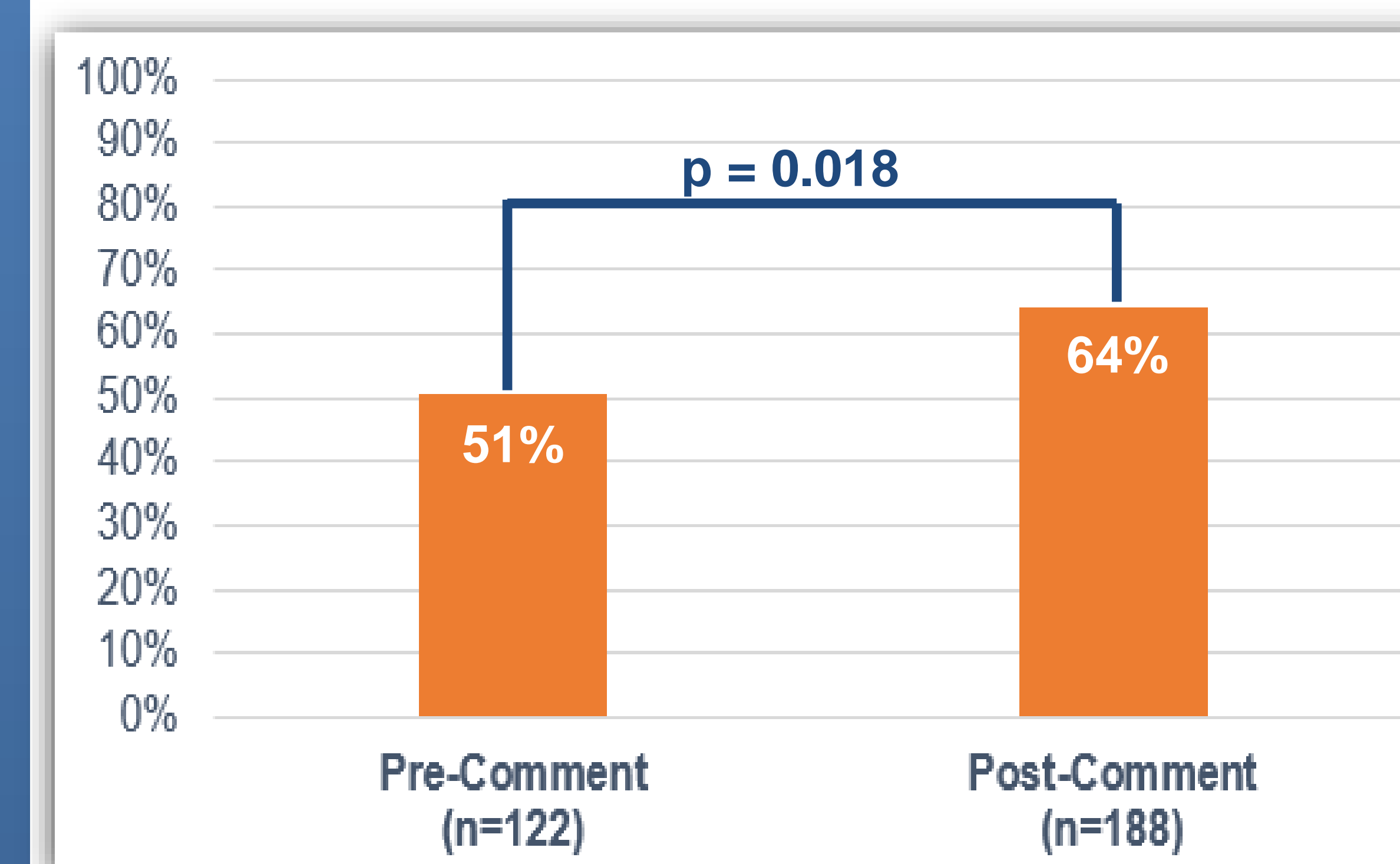


Table 2: Subgroup analysis of primary endpoint relative to patient disposition at time of urine culture collection, n/N (%)

	Pre-Comment	Post-Comment	p-value
Inpatient	51/64 (80%)	95/118 (80%)	0.89
Outpatient	11/58 (19%)	26/70 (37%)	0.02

Secondary Endpoints

Table 3

	Pre-Comment	Post-Comment	p-value
<i>S. aureus</i> bacteremia among patients with collected blood cultures, n/N (%)	18/62 (29%)	19/121 (16%)	0.03
30-day admission among outpatients, n/N (%)	7/58 (12%)	11/70 (16%)	0.53
60-day all-cause mortality, n/N (%)	15/122 (12%)	10/188 (5%)	0.03

Discussion

- ❖ The addition of a comment nudge was associated with a 13% absolute increase in patients with blood culture collection within 96 hours of a urine culture growing *S. aureus*. This difference was most pronounced in the outpatient population.
- ❖ The incidence of concomitant *S. aureus* bacteremia was significantly higher in the Pre-Comment group.
 - ❖ This is likely reflective of more frequent pre-emptive blood culture collection in the Post-Comment group.
- ❖ Among outpatients, no difference in subsequent 30-day admission was noted.
- ❖ A significant reduction in 60-day all-cause mortality was observed in the Post-Comment group.
 - ❖ This unexpected finding warrants further investigation but is unlikely to be fully explained by the intervention
 - ❖ Of the 23 deaths with blood cultures collected, only 10 patients (43%) had *S. aureus* bacteremia
- ❖ Limitations
 - ❖ Retrospective nature may not establish causality
 - ❖ Mortality documentation in electronic medical record
- ❖ Future Directions
 - ❖ Inclusion of *S. aureus* bacteriuria diagnostic evaluation algorithm in institutional UTI guideline
 - ❖ Educational outreach to Emergency Department and Outpatient providers

Conclusion

Follow-up blood culture collection significantly improved after the addition of a comment nudge to the microbiology report of urine cultures growing *S. aureus*. Health systems may consider implementation of similar interventions, particularly in resource-limited settings, to avoid delayed recognition of *S. aureus* bacteremia.

References

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Disclosures

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation: Nothing to disclose