Significance of *Staphylococcus epidermidis* in Urine Cultures at Michigan Medicine

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**ABSTRACT**
Following a procedure change to reporting pure and numerous urogenital flora organisms in urine cultures, *Staphylococcus epidermidis* (S. *epi*) was by far the most reported. To determine the significance of S. *epi* in these cultures an investigation was conducted to determine correlation with other lab values that indicate infection, as well as urinary catheterization as S. *epi* is known to colonize medical devices via biofilms. A review of the medical record was performed and it was determined that patients whose urine cultures grew pure >100,000 cfu/mL S. *epi* had higher mean microscopic urine white blood cell counts, more positive leukocyte esterase, and were more likely to be catheterized than patients with negative urine cultures.

**METHODS**
- A list of clean catch urine culture accessions growing >100,000 cfu/mL *S. epi* between 5/26/2022 and 11/25/2022 was assembled in lab information system.
- A list of randomly selected negative urines reported as "no growth" or "normal urogenital flora present" was assembled to serve as a control.
- A list of randomly selected urines growing >100,000 cfu/mL *Escherichia coli* was also gathered for comparison as the prototypical uropathogen.
- A review of the medical record was conducted for recorded signs of urinary catheter use on or immediately before the date of sample collection, as well as for urinalysis data for signs of infection.

**RESULTS**

<table>
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<tr>
<th>Mean Microscopic Urine WBC Count</th>
<th>% Likely Catheterized</th>
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<tbody>
<tr>
<td>&gt;100,000 cfu/mL <em>S. epi</em></td>
<td>254.3 wbc/hpf</td>
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<tr>
<td>No growth or Normal flora Present</td>
<td>26.5 wbc/hpf</td>
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</tbody>
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**CONCLUSIONS**
- The procedure change to reporting pure >100,000 cfu/mL flora organisms succeeded in reporting *S. epi* when it was significant.
- Correlation of pure >100,000 cfu/mL *S. epi* growth with positive leukocyte esterase and high urine microscopic white cell counts supports its significance in these cultures.
- A significant amount of urines designated as clean catch were likely catheterized urines, meaning the *S. epi* would not have been reported before the procedure change.
- As a result of the large amount of catheterized urines ordered as clean catch found in this study, a mandatory "site" field was added when ordering urine cultures requiring the ordering provider to free-text a method of collection.

Urine culture growing pure >100,000 cfu/mL *S. epidermidis* at 20 hours on BAP, incubated on BD Kiestra.