Poster #1413

# Effect of Automated Identification of Antimicrobial Stewardship Opportunities for Urinary Tract Infections

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## Background

- Treatment of asymptomatic bacteriuria (ASB) does not improve clinical outcomes in most patients and may be associated with an increased risk of adverse events such as *Clostridioides difficile* infection
- Clinical decision support system (CDSS) implementation is an effective strategy to improve stewardship-related outcome measures and may be useful to quickly identify ASB-treated patients
- A best practice alert (BPA) was created to identify patients with possible ASB for antimicrobial stewardship (AS) review
- This study aimed to determine whether automated identification of ASB improved the timing of stewardship intervention

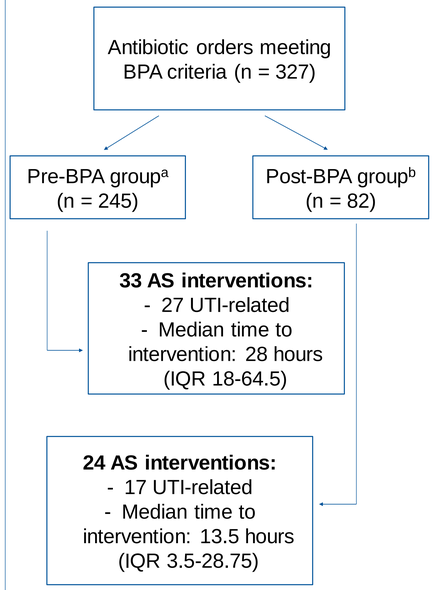
## Methods

- Retrospective analysis of pre- and post-BPA patients admitted to a tertiary academic medical center between 01/01/2020 to 12/31/2020 and 01/20/2021 to 04/10/2021, respectively
- BPA message to inpatient AS pharmacists was activated on 01/19/2021 and identified the following:
  1) inpatients with a new antibiotic order, **AND**
  2) an associated genitourinary indication, **AND**
  3) a preceding urinalysis within 7 days with 0 to 5 WBC/hpf
- AS interventions within 7 days of antibiotic order were captured through pharmacist 'iVent' documentation; UTI-related interventions were specified
- Median time to AS intervention was compared between groups using the Mann Whitney U test; rates of UTI-related interventions were compared with Fisher's Exact test

## Results

- 327 antibiotic orders met BPA criteria for analysis (Figure 1)
- Median time to intervention was shorter post-BPA compared to pre-BPA [13.5 hours vs 28 hours, p = .03 (Figures 1 & 2)]
- Pre-BPA UTI-related intervention rate was lower compared to post-BPA [11.0% vs 20.7%, p = .04 (Figure 1)]

**Figure 1. AS intervention by BPA group**



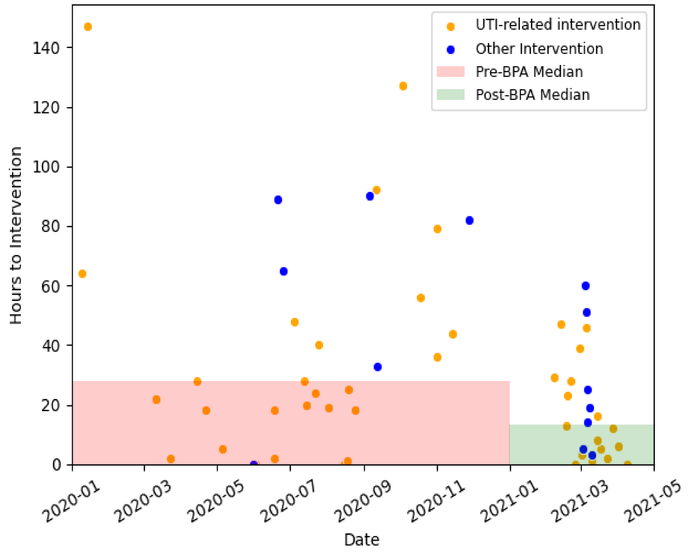

[a]Pre-BPA group: 01/01/2020 – 12/31/2020
[b]Post-BPA group: 01/20/2021 – 04/10/2021

**Table 1. Baseline Characteristics[a]**

| Characteristics | Eligible Pre-BPA (n = 245) | Eligible Post-BPA (n = 82) |
|---|---|---|
| **Median age, years (IQR)** | 64 (45-74) | 58.5 (39-72) |
| **Sex, male** | 101 (41.2) | 32 (39) |
| **Race** | | |
| **Caucasian** | 141 (57.6) | 49 (59.8) |
| **African American** | 79 (32.2) | 23 (28) |
| **Other** | 25 (10.2) | 10 (12.2) |
| **eGFR within 48 hours** | 197 (80.4) | 75 (91.5) |
| **Median eGFR (IQR)** | 71 (45-93) mL/min/1.73m$^2$ | 75 (51-92.5) mL/min/1.73m$^2$ |
| **Pregnant** | 3 (1.2) | 0 (0) |
| **Serum WBC measured within 48 hours** | 212 (86.5) | 80 (97.6) |
| **Median Serum WBC (IQR)** | 8.9 (6.9-13) x 10$^9$/L | 9.2 (7.1-11.3) x 10$^9$/L |
| **ANC < 1000** | 3 (1.2) | 2 (5) |
| **Urinary catheter** | 63 (25.7) | 15 (18.3) |
| **Urinalysis** | | |
| **Positive nitrite** | 66 (26.9) | 26 (31.7) |
| **Urine culture in preceding 7 days** | 227 (92.6) | 74 (90.2) |
| **No growth** | 35 (15.4) | 13 (17.6) |
| **Mixed flora or < 10,000 cfu/mL organisms** | 73 (33) | 16 (50) |
| **Organism(s) identified** | 119 (52.4) | 27 (36.5) |
| **Urine culture organism** | 119 (48.6) | 27 (32.9) |
| **Enterobacterales** | 88 (73.9) | 15 (55.6) |
| **Enterococcus spp.** | 17 (14.3) | 7 (25.9) |
| **Pseudomonas aeruginosa** | 4 (3.4) | 0 (0) |
| **Other** | 10 (8.4) | 5 (18.5) |

[a]Data reported as n (%) or median (IQR)
eGFR: estimated glomerular filtration rate; WBC: white blood cell; ANC: absolute neutrophil count;

**Figure 2. Time-to-Intervention among patients with UTI antibiotic order indication, absence of pyuria, and stewardship intervention**




## Conclusion

- Automated identification of antibiotics targeting UTI with urinalysis showing absence of pyuria reduced the time to AS intervention and increased rate of UTI-specific interventions
- The use of clinical decision support may aid in efficiency of AS review and syndrome-targeted AS impact

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