Session: P-63. Pediatric Antimicrobial Stewardship (inpatient/outpatient pediatric focused)

Background. Antimicrobial overuse leads to antimicrobial resistance, adverse events, and excess costs. Antibiotic time-outs (ABTOs) offer a structured approach to reevaluate antimicrobial regimens, but implementing and maintaining ABTOs can be challenging. In this project, we built on previous ABTO implementation in adult inpatient units to incorporate ABTOs in pediatrics using quality improvement (QI) methods.

Methods. We identified champions, including attending physicians, residents, nurses, team coordinators, and pharmacists. Following pilot testing, ABTOs began in November 2019 and January 2020 for two general pediatric teams, and in June 2020 in the pediatric ICU (PICU). Patients were eligible for an ABTO if they were on antibiotics for 36-72 hours. ABTOs were documented in the electronic medical record (EMR) with a structured note template. These notes along with patient antimicrobial regimens were extracted and analyzed using an automated EMR query. Metrics included: (1) Proportion of ABTO-eligible patients with an ABTO; (2) Proportion of ABTOs conducted within goal time frame; (3) Documented plan changes in ABTOs (e.g. change IV antibiotics to PO); and (4) Proportion of documented changes completed within 24 hours

Results. To date, there have been 342 pediatric ABTOs over 145 team weeks on the general pediatrics teams and 50 weeks in the PICU, representing 96.8% of eligible patients. 77.8% of ABTOs were completed within the recommended time frame. A majority of ABTOs (67%) resulted in no change to antibiotic regimen, and 18% of patients had already had de-escalation. In 10.5% of patients, the ABTO led to a de-escalation (antibiotics discontinued in 2%, converted from IV to PO in 8.5%). 86.8% of planned changes occurred within 24 hours of ABTO.

Conclusion. In vitro penicillin resistance was rare at our institution. Further, before and after ABTO implementation, and characterization of antimicrobial options. ABTOs led to clear de-escalation in 10.5% of cases, with other changes made in 5%.

Disclosures. All Authors: No reported disclosures

Figure 1. Compliance with antibiotic time-outs over time, by week. The green line represents the goal of 80%, and the orange line represents median performance.

Figure 2. Planned changes to antimicrobial regimen documented in antibiotic time-out.

Table 1. Antibiotic time-out performance on participating pediatric services.

| Time-Out Action | Type (n=468) | 342 (73.5%) | 126 (26.5%) | Total (n=468) |
|-----------------|-------------|-------------|-------------|--------------|
| 342 (73.5%)     | 126 (26.5%) | Total (n=468) |

Conclusion. This project demonstrates that ABTOs can be implemented across a variety of teams and showed successful spread of an adult-based QI project to pediatricians. ABTOs led to clear de-escalation in 10.5% of cases, with other changes made in 5% of cases. Future directions include continued spread to inpatient teams, development of EMR-based ABTO alerts, comparison of overall antibiotic use and adverse events before and after ABTO implementation, and characterization of antimicrobial optimization prior to ABTO.

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Session: P-63. Pediatric Antimicrobial Stewardship (inpatient/outpatient pediatric focused)

Background. Amoxicillin 90 mg/kg/day divided twice daily is recommended for children with mild community acquired pneumonia (CAP). While adequate for fully susceptible Streptococcus pneumoniae isolates, three times daily dosing allows achievement of pre-antimicrobial exposure for isolates that may be mecillinam with minimum inhibitory concentrations (MIC) of ≥2 μg/mL. We evaluated our current twice daily amoxicillin dosing strategy by characterizing 1) the MIC distribution among S. pneumoniae isolates and 2) the frequency of clinical amoxicillin treatment failures.

Methods. We performed a retrospective cohort study of all S. pneumoniae isolates from sterile and non-sterile sites between 2017-2020. Breakpoints established by the CLSI were used for both meninitis and non-meningitis isolates. Only the first isolate per patient was included. We also evaluated the frequency of amoxicillin treatment failure in patients diagnosed with CAP who were discharged from the ED in 2019. CAP was defined as a discharge diagnosis code for pneumonia and an antibiotic prescription. Treatment failure was defined as an ED or primary care revisit, or admission, within 14 days during which an antibiotic change was made.

Results. 28 S. pneumoniae isolates were identified from sterile sites between 2017-2020 and 171 isolates were identified overall. All isolates from sterile sites had penicillin MICs of ≤2 μg/mL and 165 (96%) of isolates overall had penicillin MICs of ≤2 μg/mL. Of these, 10 isolates had MICs of ≥2 μg/mL from non-sterile sites. In 2019, 586 patients were treated for CAP in the ED; 447 (76%) received amoxicillin (747 (78%) received amoxicillin). A total of 21 patients (3.3%, 95% CI 1.9-5.5%) and in 5 patients (3.5%, 95% confidence interval 1.2-8.0%) treated with alternative antibiotics.

Conclusion. In vitro penicillin resistance was rare at our institution. Further, given that S. pneumoniae is rarely identified by culture, we also demonstrated that clinical amoxicillin treatment failures were infrequent using twice daily amoxicillin dosing. Coupled with provider and family preference, these data supported continuing our current practice of twice daily amoxicillin dosing.

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Session: P-63. Pediatric Antimicrobial Stewardship (inpatient/outpatient pediatric focused)

Background. In children, urinary tract infection (UTI) represents one of the most common indications for antibiotics. While previous data has demonstrated high rates of misdiagnosis and inconsistencies with empiric antibiotics, the impact and opportunities for antibiotic reduction once final culture and susceptibility data are available, particularly in pediatric patients seen in the emergency department (ED), is unknown.

Methods. This was a retrospective study conducted over a period of 18-months, which included subjects less than 18 years of age who were discharged from the ED with a diagnosis of UTI. Episodes in which urine cultures were negative or grew only commensals were excluded. Rates of clinical amoxicillin treatment failures were infrequent using twice daily amoxicillin dosing strategy by characterizing 1) the MIC distribution among S. pneumoniae isolates and 2) the frequency of clinical amoxicillin treatment failures.

Results. In 2019, 589 patients were treated for CAP in the ED; 447 (76%) received amoxicillin (747 (78%) received amoxicillin). A total of 21 patients (3.3%, 95% CI 1.9-5.5%) and in 5 patients (3.5%, 95% confidence interval 1.2-8.0%) treated with alternative antibiotics.

Conclusion. In vitro penicillin resistance was rare at our institution. Further, given that S. pneumoniae is rarely identified by culture, we also demonstrated that clinical amoxicillin treatment failures were infrequent using twice daily amoxicillin dosing. Coupled with provider and family preference, these data supported continuing our current practice of twice daily amoxicillin dosing.

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Table 1. Antibiotic susceptibilities of S. pneumoniae isolates

| Antibiotic | Sensitive (N=177) | Intermediate (N=1) | Resistant (N=177) | Sensitive (N=177) | Intermediate (N=1) | Resistant (N=177) |
|------------|-------------------|-------------------|------------------|------------------|-------------------|------------------|
| Penicillin | 4/2 (2%)          | 165/96 (96%)      | 2 (1%)           | 165/96 (96%)     | 2 (1%)            | 165/96 (96%)     |
| Vancomycin | 0/0 (0%)          | 0/0 (0%)          | 171/100 (100%)   | 0/0 (0%)         | 171/100 (100%)   | 0/0 (0%)         |
| Ceftazidime | 0/0 (0%)         | 0/0 (0%)          | 170/99 (100%)    | 0/0 (0%)         | 170/99 (100%)    | 0/0 (0%)         |
| TMP-SMX    | 20/71 (78%)       | 5/22 (22%)        | 114/88 (89%)     | 20/71 (78%)      | 5/22 (22%)       | 114/88 (89%)     |
| TMP-SMX    | 20/71 (78%)       | 5/22 (22%)        | 114/88 (89%)     | 20/71 (78%)      | 5/22 (22%)       | 114/88 (89%)     |

Conclusion. This project demonstrates that ABTOs can be implemented across a variety of teams and showed successful spread of an adult-based QI project to pediatricians. ABTOs led to clear de-escalation in 10.5% of cases, with other changes made in 5% of cases. Future directions include continued spread to inpatient teams, development of EMR-based ABTO alerts, comparison of overall antibiotic use and adverse events before and after ABTO implementation, and characterization of antimicrobial optimization prior to ABTO.

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There were 272 and 152 PICU admissions before and after initiation of a telehealth antimicrobial stewardship program (ASP) over time. The dashed line represents the start of the antimicrobial stewardship mission diagnoses, together compromising 60.7% and 61.2% pre- and post-ASP, respectively.

A decline in DOT was observed across all antibiotic classes, except for ceftriaxone resistance.

Table 2. Empiric antibiotic regimens, including type of antibiotic and duration

| Antibiotic | Number of prescriptions | Median duration, days (OR) |
|------------|-------------------------|----------------------------|
| 3rd generation cephalosporin | 37 (42.5) | 10 (9) |
| Cephalosporin | 20 (23.5) | 7 (9) |
| Trimethoprim/sulfamethoxazole | 9 (10.3) | 7 (5) |
| Amoxicillin/sulbactam | 5 (10.7) | 7 (8) |
| Nafcillin | 4 (14.8) | 7 (2) |
| Amoxicillin | 2 (2) | 8.3 (8) |
| Fluoroquinolones | 1 (1.2) | 7 (7) |

Table 3. Comparison of episodes in which empiric antibiotics were active against isolated bacteria versus those in which empiric antibiotics were inactive

| Age, years, median (IQR) | Active (n=130) | Inactive (n=12) | p-value |
|--------------------------|----------------|---------------|--------|
| 0-12 | 2 (13) | 2 (2) | 0.07 |
| 13-24 | 38 (89.7) | 13 (91.7) | 0.3 |
| Race, white, n (%) | 27 (90.2) | 4 (33.3) | 0.004 |
| Ethnicity, n (%) | | | |
| Hispanic | 4 (10.3) | 5 (41.7) | 0.02 |
| Non-Hispanic | 34 (87.2) | 6 (50.0) | |
| Unknown | 1 (2.8) | 1 (8.3) | |
| Underlying comorbidities, n (%) | 12 (20.8) | 3 (25.0) | 0.3 |
| Prior UTI, n (%) | 18 (46.3) | 4 (33.3) | 0.4 |
| Empyema antibiotic-cephalosporin, n (%) | 10 (25.6) | 7 (58.3) | 0.04 |
| Duration of empiric antibiotics, n (%) | 7 (3) | 8 (6.6) | 0.2 |
| Complications, n (%) | 5 (12.2) | 0 (0) | 0.3 |

Conclusion. Antibiotics are rarely adjusted after discharge from the ED. Lack of adjustment results in unnecessary total and broad-spectrum antibiotic exposures. Initiation of empiric antibiotic use post-discharge could result in significant decreases in unnecessary antibiotics, and ultimately reduced rates of antibiotic resistance.

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1134. The Effect of Telehealth Antimicrobial Stewardship Program on Antimicrobial Use in a Pediatric Intensive Care Unit

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Background. Inappropriate antimicrobial use is common in pediatric intensive care units (PICU). We aimed to evaluate the effect of telehealth antimicrobial stewardship program (ASP) on the rate of PICU antimicrobial use in a center without a local infectious diseases consultation service.

Methods. A retrospective cohort study was performed between October 1st, 2018 and October 31st, 2020 in Farwaniyah Hospital PICU, a 20-bed unit. All pediatric patients who were admitted to PICU and received systemic antimicrobials during the study period were included and followed until hospital discharge. Patients admitted to the PICU prior to the study period but still receiving intensive care during the study period were excluded. Weekly prospective audit and feedback on antimicrobial use was provided starting October 8th, 2019 (post-ASP period) by the ASP team. A pediatric infectious diseases specialist would join ASP rounds remotely. Descriptive analyses and a pre-post intervention comparison of days of therapy (DOT) were used to assess the effectiveness of the ASP intervention.

Results. There were 272 and 152 PICU admissions before and after initiation of ASP, respectively. Bronchiolitis and pneumonia were the most common admission diagnoses, together compromising 60.7% and 61.2% pre- and post-ASP. Requirement for respiratory support was higher post-ASP (76.5% vs 91.5%, p=0.001). Average monthly antimicrobial use decreased from 92.2 (95% CI 74.5 to 100) to 48.5 DOT/1,000 patient-days (95% CI 24.6 to 72.2, P < 0.05) (Figure). A decline in DOT was observed across all antibiotic classes, except for ceftriaxone and clarithromycin. No effect on length of PICU stay, hospital length of stay, or mortality was observed. Most (89.7%) ASP recommendations were followed fully or partially changes in antimicrobial days of therapy (DOT)/1,000 patient-days over time. The dashed line represents the start of the antimicrobial stewardship program (ASP)