**272. Impact of Matrix-Assisted Laser Desorption Ionization Time-of-flight Mass Spectrometry (MALDI-TOF MS) on Time to Optimal Antimicrobial Therapy in Pediatric Patients with Positive Blood Cultures at Children's Cancer Hospital-Egypt (CCHE-57357)**

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**Background.** The clinical microbiology laboratory at CCHE-57357 implemented the MALDI-TOF MS for pathogen identification directly from positive blood cultures in 2016. Prior to that conventional method was used. The purpose of this study was to evaluate the impact of using the MALDI-TOF MS on the time to pathogen identification, time to antimicrobial treatment, and on the clinical outcomes for pediatric patients at CCHE-57357.

**Methods.** This was a retrospective, descriptive, observational study design. Data were collected for children admitted to CCHE-57357 with positive blood cultures identified by conventional culture method from July 1, 2015 to September 30, 2015 and by MALDI-TOF MS from July 1, 2016 to September 30, 2016. Outcome measures included time from reporting of a positive blood culture until organism identification and susceptibilities, time to optimal antimicrobial treatment, and clinical outcome across the two study periods (before and after the use of MALDI-TOF MS).

**Results.** A total of 172 positive blood cultures were included in the analysis: 64 before and 108 after the implementation of MALDI-TOF MS. The mean time to blood cultures positivity detected by BACTEC system was similar in both time periods, while the mean time to organism identification decreased significantly by 35% from 60 to 39 hours (P = 0.001) after the use of MALDI-TOF MS. Concurrently, the time to susceptibilities was significantly reduced by 30% from 82 to 57 hours (P = 0.001) and the time to starting optimal antimicrobial therapy was reduced significantly by 33% from 81 to 54 hours (P = 0.001). Optimal antimicrobial therapy was initiated within 72 hours from the time of blood culture inoculation in 37% of pediatric patients before and 76% after the use of MALDI-TOF MS (P = 0.01). Thirty-day all-cause mortality was lower after the use of MALDI-TOF; but the difference was not statistically significant (9.2% vs. 16.9%, P = 0.122).

**Conclusion.** The study concluded that applying MALDI-TOF technology significantly reduced the time needed to pathogen identification and to initiate optimal antimicrobial therapy. This will eventually improve patient clinical outcomes, and reduce mortality in our immunocompromised pediatric population.

**Disclosures.** All authors: No reported disclosures.

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**273. Effects of a Rapid Meningitis/Encephalitis Panel on Antimicrobial Use and Mortality in our Immunocompromised Pediatric Population.**

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**Background.** Rapid molecular diagnostic assays are increasingly used to guide effective antimicrobial therapy. Data on their effectiveness to decrease antimicrobial use have been limited and varied. We aimed to assess the impact of the implementation of the FilmArray Meningitis Encephalitis Panel (MEP) on antimicrobial (AM) use and outcomes in children.

**Methods.** In an observational retrospective study performed at Atlantic Health System (NJ), we reviewed medical records of patients <21 years of age evaluated for meningitis/encephalitis who received empiric AM therapy between January 1, 2015 and September 30, 2018. Oncology and Neurosurgery patients were excluded. FilmArray MEP (BioFire Diagnostics, Salt Lake City, UT) was incorporated November 2016. The primary outcome was to evaluate duration of empiric AM therapy measured as days of therapy (DOT). Secondary outcomes included length of stay (LOS), all-cause mortality, and 30-day readmission rates.

**Results.** Ninety-nine patients with negative CSF blood, and urine cultures who received empiric AM therapy were included in the preliminary analysis. Patient characteristics are depicted in Table 1. The median duration of antibiotic (AB) therapy prior to the implementation of the MEP was four DOT (IQR 6) vs. two DOT (IQR 4). During the pre-implementation era, the median DOT for individual AB was three (IQR 2) for third-generation cephalosporins (GCS) (n = 23), three (IQR 1) for ampicillin (AMP) (n = 19), and two (IQR 1) for vancomycin (VAN) (n = 8). Median DOT when MEP was performed was two (IQR 1) for GSCs (n = 28), two (IQR 1) for AMP (n = 18), and two (IQR 1) for VAN (n = 6). Few patients received acyclovir (ACY), with a median DOT of four (IQR 0) before (n = 4) and after MEP (n = 8), respectively. Secondary outcomes are shown in Table 2.

### Table 1: Patient Characteristics

| Pre-MEP | MEP |
|---------|-----|
| Age in years, mean (range) | 3.8 (0–18) | 3.5 (0–17) |
| Male:female | 11:1 | 11:1 |
| NICU/PICU care, % | 11 (23) | 16 (32) |
| CSF WBC, median (IQR) | 2 (14) cells/mm³ | 3 (10) cells/mm³ |

### Table 2: Comparison of Antibiotic Use and Outcomes before and after MEP Implementation

| Pre-MEP | MEP |
|---------|-----|
| LOS, median (IQR) | 4 (3) | 3 (2) |
| All-cause 30-day-readmission | 4 | 0 |
| All-cause mortality | 0 | 0 |

**Conclusion.** In our experience, the implementation of the MEP decreased AB use and LOS. This impact was noted mainly on GSCs and AMP. Few patients received VAN and ACY to assess the effect on these agents.

**Disclosures.** All authors: No reported disclosures.

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**274. Diagnostic Stewardship for Positive Endotracheal Cultures in a Pediatric Intensive Care Unit (PICU)- Reassessing the Role of Neutrophil Quantification in Clinician Decision-Making**

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**Background.** Quantitative or semiquantitative assessment of neutrophils (microbiologic purulence-MP) is routinely reported for endotracheal aspirate cultures, but is not well standardized. The association of MP with symptoms of ventilator-associated infections or its role in guiding antibiotic therapy has not been well studied in the pediatric population. We examine MP as an independent predictor of antibiotic treatment and assess its association with clinical symptoms and ventilator-days.

**Methods.** Charts of children with positive endotracheal cultures sent from January to December 2016 from three PICUs were reviewed. The outcome variable was antibiotic administration for 25 calendar-days that targeted organisms identified in the culture. The predictor variable was MP defined as a neutrophil count reported as moderate/many by the clinical microbiology laboratory. Covariates included demographics, comorbidities, including immunosuppression and recent surgery, changes in vital signs, respiratory support (including ventilator settings), and laboratory values (e.g., WBC count, C-reactive protein). Multivariable logistic regression was used to model the outcome.

**Results.** Of 361 positive endotracheal cultures in the cohort, 81 (22.6%) were treated with targeted antibiotics. Culture reports with MP were treated more frequently (30% vs. 10%). MP was the strongest predictor for 25 calendar-days of antibiotics (OR 3.3, 95% CI 1.6–6.8) followed by fever (OR 2.0, 95% CI 1.0–4.1), or increased respiratory support (OR 2.3, 95% CI 1.2–4.3). Compared with patients with MP reported as moderate/many, those without MP had similar rates of fever/hypotension (22% vs. 17%) and increased respiratory support (35% vs. 28%). Reported MP was lower with longer ventilator duration at the time of sampling (Figure 1).

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Conclusion. MP was an independent predictor of antibiotic use for positive endotracheal aspirate cultures, but was not associated with clinical symptoms or increased respiratory support. MP varied with ventilator-days at time of sampling. MP assessments lack intra- and inter-facility standardization and should be interpreted with caution when used as a rationale to prescribe antibiotics.

Disclosures. All authors: No reported disclosures.

275. Evaluation of Vancomycin Prescribing Quality in Hospitalized Pediatric Patients
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Background. Vancomycin is the most common antimicrobial drug administered to hospitalized pediatric patients, including children >90 days old, although the prevalence of β-lactam antibiotic resistance among Gram-positive pathogens is relatively low in children. Reducing inappropriate vancomycin use in children can reduce harm from antibiotic-associated adverse events and antimicrobial resistance (AR). We developed an approach to evaluating pediatric inpatient (IV) vancomycin prescribing quality using medical record data.

Methods. Hospitals in three Emerging Infections Program (EIP) sites (CA, NM, and TN) were recruited to participate. Patients <18 years who received IV vancomycin in 2013 were identified through pharmacy records, excluding those on IV vancomycin solely for surgical prophylaxis. Trained EIP staff collected medical record data. We created a prescribing quality evaluation pathway using data on infection type, signs, symptoms, penicillin allergy, and AR risk factors. Clinically supported prescribing events were those with a positive culture for a Gram-positive organism with β-lactam resistance or unknown susceptibility; severe penicillin allergy; bone, joint, skin/soft tissue or central nervous system infection; pneumonia with AR risk factors; or events where vancomycin was stopped within 1 day of culture results for an oxacillin or penicillin/ampicillin-susceptible organism.

Results. Sixty-five patients in 12 hospitals were evaluated. The median age was 7 years (interquartile range [IQR] 4–14), and median hospital stay was 7 days (IQR 3–16). The median vancomycin treatment length was 3 days (IQR 2–6); 41 patients (63%) received vancomycin for infections lacking Gram-positive cocci (GPC). We aimed to evaluate the use of vancomycin in our NICU after implementing key changes in 2016, and determine further areas of improvement.

Conclusion. Further analysis will utilize this prescribing pathway to evaluate the most recent assessments lack intra- and inter-facility standardization and should be interpreted with caution when used as a rationale to prescribe antibiotics.

Disclosures. All authors: No reported disclosures.

276. Vancomycin Utilization in a Neonatal Intensive Care Unit
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Background. The collaboration between antimicrobial stewardship program (ASP) and NICU has implemented key strategies including antibiotic restriction, audits and direct feedback, education, standardized guidelines for neonatal sepsis, and discontinuation of vancomycin at 48 hours if cultures are negative for resistant Gram-positive cocci (GPC). We aimed to evaluate the use of vancomycin in our NICU after implementing key changes in 2016, and determine further areas of improvement.

Methods. Retrospective chart review was conducted in NICU patients who received vancomycin between January 1, 2017 and December 31, 2017. The use of vancomycin for surgical prophylaxis was excluded. The outcome measures were the use of vancomycin according to the guidelines and its deviations, monitoring of drug levels, renal function, microbiological, and clinical outcomes. Utilization of vancomycin was also evaluated by days of therapy (DOT) per 1,000 patient-days.

Results. There were 336 vancomycin courses administered to 176 infants. Most of vancomycin use (252/336, 75%) was discontinued at 48 hours. Of these, no infants developed invasive Gram-positive infections requiring reinitiating of vancomycin. Among those with continued vancomycin courses, more than half (45/84, 54%) occurred in the absence of evidence of resistant GPC infections. Commonly stated reason for continuation of vancomycin was the infants’ severity of illness. Of the total 319 troughs drawn, 24 (7.5%) had subtherapeutic (<5) trough whereas 61 (19%) had supratherapeutic (>15). Acute kidney injury (increase in serum Cr ≥ 1 time baseline) was found in 4 courses (1.2%) in 278. Developing a Logistic Regression Model to Aid Clinicians Evaluate Outpatients and Predict Odds of Hospital Transfer in a Nicaraguan Pediatric Population: Comparison of Epidemiological Models to Predict Hospitalization with a Focus on Antimicrobial Stewardship.

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Background. The study showed that the use of TDM increased following implementation of a pharmacist-driven voriconazole clinical practice guideline (CPG) in a pediatric hospital. An interdisciplinary team was convened to develop a CPG to standardize initial voriconazole dosing, appropriate use and timing of therapeutic drug monitoring (TDM), and dose modifications based on measured drug concentrations. To operationalize the CPG, pharmacists with advanced training in pharmacokinetics were granted authority to order laboratory evaluations and make dose adjustments.

Methods. After 6 months, the initial CPG was reviewed and modified to refine TDM recommendations. Adherence to the guideline and ability of the CPG to achieve target voriconazole trough concentrations were assessed before and after the revision. Patients in the analysis included those admitted to a large free-standing children’s hospital and receiving voriconazole-predicted fungal infection from April 1, 2015 to December 31, 2016 (25 subjects, median age 10 years).

Results. The study showed that the use of TDM increased following implementation of a CPG from 42% to 100% with improved timing of TDM to reflect concentrations drawn at steady state. Of the patients receiving TDM, achievement of voriconazole concentration in the therapeutic range increased from 70% to 100% with the CPG; however, there was no improvement in the time to reach target concentration. We observed an inability of American Academy of Pediatrics-recommended doses to reach target concentration in 53% of patients, with doses based on pharmacist judgment performing as well as published dosing.

Conclusion. We conclude that a pharmacist-driven voriconazole CPG improved monitoring and achievement of therapeutic concentrations in our children’s hospital. Analysis of effectiveness of our voriconazole CPG in conjunction with pharmacist feedback has been essential to improving patient outcomes and informing future guideline modifications.

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278. Developing a Logistic Regression Model to Aid Clinicians Evaluate Outpatients and Predict Odds of Hospital Transfer in a Nicaraguan Pediatric Population: Comparison of Epidemiological Models to Predict Hospitalization with a Focus on Antimicrobial Stewardship.

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