Methods. Institutional approval was obtained for a quality improvement project in our quaternary pediatric ED. For uncomplicated pediatric UTIs, the aim was to reduce misdiagnosis by 50% and promote antimicrobial stewardship over a 24-month period. Using the Model for Improvement, two interventions were implemented using PDSA cycles: (1) a UTI diagnostic algorithm embedded in the electronic medical record, (2) a urine culture callback system. Outcome measures included the percentage of patients with UTI misdiagnosis (urine culture negative) and antibiotic-days saved. Process measures included adherence to the UTI algorithm and callback system as well as antibiotic duration standardization. As a balancing measure, patients developing positive urine cultures without UTI diagnosis were reviewed for potential harm.

Figure 3: Run chart of urinary tract infection misdiagnosis rate

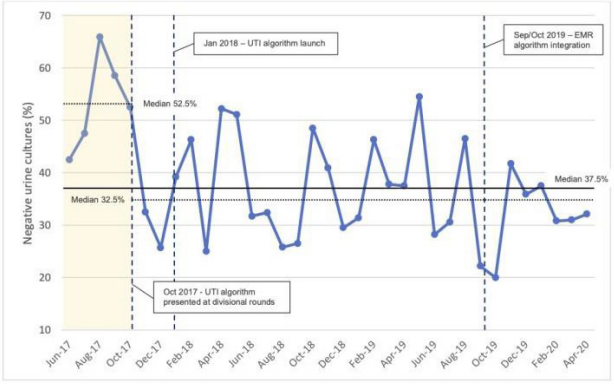

Figure 3: Run chart of urinary tract infection misdiagnosis rate

Figure 4: Callback system - Percent patients contacted and antibiotics-days saved

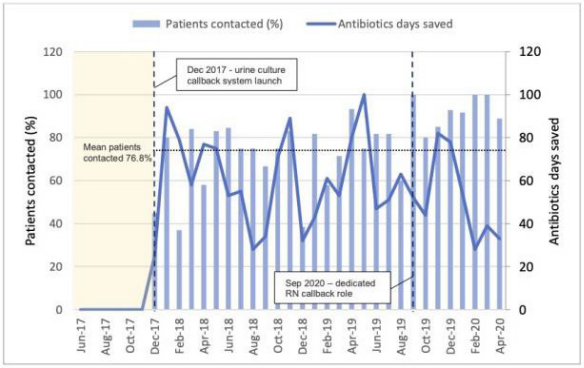

Figure 4: Callback system - Percent patients contacted and antibiotic-days saved

Results. From June 2017-April 2020, 2,183 children (0.97% of all visits) were diagnosed with a UTI in the ED. 1,381 (63.3%) met inclusion criteria for analysis. Following UTI algorithm launch, median UTI misdiagnosis decreased by 20% (52.5% vs. 32.5%), median correct antibiotic duration increased by 30% (45.2% vs. 75.1%), and algorithm adherence was 78.9%. With implementation of the callback system, 1,678 antibiotic-days were saved as mean patients contacted to discontinue antibiotics increased from 0% to 76.8%. Of 106 patients with positive urine cultures with missed UTI diagnosis over a 29-month period, 8 patients returned to the ED within 72 hours and 2 patients required admission for intravenous antibiotics.

Conclusion. Implementation of a UTI diagnostic algorithm and urine culture callback system for uncomplicated pediatric UTIs reduced UTI misdiagnosis and promoted antimicrobial and resource stewardship in the ED. Future directions include improving UTI algorithm adherence through targeted clinician audit and feedback, plus sustainability planning.

Disclosures. Olivia Ostrow, MD, Choosing Wisely Canada (Advisor or Review Panel member)

1354. Reducing vancomycin utilization rate in a level 4 NICU

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Session: P-60. Pediatric Antimicrobial Stewardship (inpatient/outpatient pediatric focused)

Background. Vancomycin is frequently used empirically in suspected sepsis in neonatal intensive care unit (NICU). However, inappropriate or unnecessary use can lead to additional morbidities and emergence of drug resistant pathogens. Standardization of vancomycin use is imperative for safer and more efficient patient care.

Methods. This study was part of a QI initiative to optimize vancomycin use by revising a standardized late onset sepsis (LOS) guideline with defined indications and criteria for empiric vancomycin. The implementation was started in 9/19 after completion of providers' education. To reduce seasonal variations, 1/19-3/19 (pre-guideline) and 12/19-2/20 (post-implementation) data was retrospectively compared, including demographics, antibiotic indications, days of therapy/1000 patient days (AUR), positive cultures, isolated pathogens and resistance profiles. Clinical outcomes and adherence to the guideline were evaluated. Wilcoxon rank sum test was applied for continuous variables and Pearson chi-square test was applied for categorical variables. $p< 0.05$ was considered significant.

Results. There were 53 LOS antibiotic courses in 35 patients pre-guideline and 113 in 64 patients post-implementation. We found an overall increase in vancomycin AUR in the post-implementation period (66.92 vs. 70.72, respectively, p=0.79), however, largely due to appropriate use of vancomycin for documented infections with gram-positive pathogens (including CONS and MRSE). Mortality was not statistically significant between two periods (Table 1 and 2). Vancomycin was ordered significantly less empirically, as per guideline, in the post implementation period (71.43% vs 46.15%, p=0.02). Adherence to the LOS antibiotics guideline was 69%.

Table 1: Demographic characteristics of infants pre and post-guideline

Demographics	Pre-guideline (N=53)	Post-guideline (N=113)	p-value
Age (days)*+	61.76	71.89	0.382
Gestational Age at birth (weeks)*+	34.51	32.47	0.078
Gestational age at LOS (weeks)*+	43.14	42.47	0.555
Birth weight (grams)*+	2400	1860	0.015
Weight at LOS (grams)*+	3.59	3.40	0.350
Length of stay (days)*+	123.26	94.46	0.143
Gender			0.770
Male (%)	31.13	68.87	
Female (%)	33.33	66.67	
Race			0.186
Asian (%)	27.27	72.73	
Black/African American (%)	14.29	85.71	
White/Caucasian (%)	23.64	76.36	
Other (%)	38.71	61.29	
Ethnicity+			0.238
Hispanic (%)	27.78	72.22	
Non-Hispanic (%)	41.18	58.82	
Presence central Line (%)+	69.81	74.34	0.541
Hx MRSA n(%)	0 (0)	1 (0.86)	0.498

*Mean

+Variable with different denominator

Table 2: Therapy indication, medication exposure and clinical outcomes 30 days after LOS treatment pre and post-guideline

	Pre-guideline	Post-guideline	p-value
Therapy indication			
Sepsis rule out n(%)	28 (52.83)	65 (55.08)	0.784
Gram positive culture n(%)	5 (9.43)	4 (3.39)	0.102
Blood stream infection n(%)	2 (3.77)	7 (5.93)	0.559
Meningitis n(%)	0 (0)	7 (5.93)	0.581
Necrotizing enterocolitis n(%)	0 (0)	3 (2.54)	0.242
Pneumonia n(%)	9 (16.98)	18 (15.25)	0.775
Ventilator associated pneumonia n(%)	4 (7.55)	2 (1.69)	0.054
Urinary tract infection n(%)	4 (7.55)	11 (9.32)	0.704
Other n(%)	1(1.89)	1 (0.85)	0.559
Medication exposure			
Aminoglycosides n(%)	4 (7.55)	9 (7.96)	0.926
NSAIDS n(%)	0 (0)	2 (1.77)	0.330
Diuretics n(%)	21(39.62)	58 (51.33)	0.159
IV contrast n(%)	0	0	
H2 blockers n(%)	20 (37.74)	34 (30.09)	0.327
Clinical outcomes			
Pneumonia n(%)	5 (9.43)	16 (14.16)	0.393
Necrotizing enterocolitis n(%)	1 (1.89)	1 (0.88)	0.581
Blood stream infection n(%)	3(5.66)	9 (7.96)	0.593
Meningitis n(%)	1 (1.89)	1 (0.88)	0.581
Urinary tract infection n(%)	1 (1.89)	7 (6.19)	0.227
Surgical site infection n(%)	5 (9.43)	5 (4.42)	0.206
Acute kidney injury n(%)	0 (0)	10 (8.85)	0.026
Mortality n(%)	13 (24.53)	20 (17.70)	0.350

Conclusion: Development of a standardized guideline for empiric antibiotic therapy is important to reduce unnecessary and inappropriate use of vancomycin. We demonstrated that use of a guideline significantly decreased vancomycin ordering as an empiric antibiotic. Further analysis is needed in order to identify safety of the guideline's criteria, factors contributing to unnecessary vancomycin use, as well as educational needs to ensure appropriate antibiotic use.

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

1355. Resistance in Gram-Negative Bacteria in the Pediatric Patient Population by Age and Sex

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Session: P-60. Pediatric Antimicrobial Stewardship (inpatient/outpatient pediatric focused)

Background. Previous research within the Beaumont Infectious Diseases Research Program found an overall increase in antibiotic resistance in adult males versus females. Furthermore, there is a peak in resistance in 18-29-year-old males, not seen in females. The origin of this early peak of antibiotic resistance in adults is unclear. This study examines these trends in the pediatric patient population.

Methods. Resistance data for all Gram-negative bacterial clinical isolates from Beaumont Health System's clinical microbiology lab between October 1st, 2010, and December 31st, 2014 was analyzed. The pediatric isolates were categorized into sextiles (0-2, 3-5, 6-8, 9-11, 12-14, 15-17) and the sensitivities for each antibiotic were compared based on gender and age and separated by urine isolates vs. non-urine isolates to account for potential bias based on an abundance of urine samples in females.

Results. There were 7878 pediatric Gram-negative bacterial isolates in the database, and 96 duplicate samples were removed, leaving 7782 isolates to be analyzed. There were more female isolates (n=6888) than male isolates (n=890) due to the preponderance of urine cultures in females. At most age ranges, antibiotic resistance was significantly higher in males than females. In males, antibiotic resistance was highest between 12-14 and 15-17 years old. When analyzing the cultures based on sample type, the peak in resistance in males is seen in urine isolates, but the patterns of resistance are chaotic in non-urine isolates. This is likely attributable to a low number of isolates.

Conclusion. Sex is an important factor in determining antibiotic resistance in the pediatric patient population, as males exhibit higher resistance. The peak in antibiotic resistance initially noted in 18-29-year-old males in previous research originates in the pediatric age group and appears to develop between 12-17 years old. Further research is needed to determine the cause of the observed gender bias, to ascertain if it is modifiable in order to reduce antibiotic resistance.

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

1356. Ribavirin Use in Hospitalized Children

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Session: P-60. Pediatric Antimicrobial Stewardship (inpatient/outpatient pediatric focused)

Background. Respiratory syncytial virus (RSV) infection is a significant cause of morbidity and mortality in immunocompromised children. Aerosolized ribavirin is approved for treatment of RSV lower respiratory tract infections. However, due to high cost, challenges to administration and uncertainty about benefit, use is limited. Recent studies in adult patients have reported similar outcomes between patients treated with aerosolized and oral ribavirin. We sought to characterize trends in use of ribavirin for hospitalized children.

Methods. We used the Pediatric Health Information System (PHIS), an administrative database which contains resource utilization data from 52 children's hospitals, to perform a retrospective analysis of children hospitalized between January 1, 2010 through December 31, 2019 who were billed for ribavirin treatment. Data related to ribavirin use (number of courses, route of administration) and clinical characteristics were abstracted. International Classification of Diseases, 9th Revision (ICD-9) or 10th Revision (ICD-10) codes and All Patients Refined Diagnosis Related Groups (APR DRG) classifications were used to define underlying clinical conditions and illness severity. Summary statistics were used to describe patient characteristics and the use of ribavirin.

Results. Thirty-eight hospitals reported ribavirin use; 1 hospital was excluded due to inaccuracies in charge coding. We identified 837 children who received 937 courses of ribavirin (Table 1). The overall frequency of ribavirin use was unchanged over the study period, and the number of ribavirin treatment courses per hospital ranged from 1 to 228 (Figure 1). The most frequent routes of administration were inhalation (603/937, 64%) and oral (322/937, 34%). There was a decrease in the use of aerosolized ribavirin over time, with a corresponding increase in the use of oral ribavirin (Figure 2).

Table 1: Patient demographics (N=837)

Characteristics	N(%)
Age, mean ± SD	6.5 ± 5.2
Gender	
Male	485 (58)
Female	352 (42)
Race*	
White	556 (66)
Black	85(10)
Asian	45 (5)
Pacific Islander	7 (1)
American Indian	11 (1)
Other	133 (16)
Unknown	10 (1)
Ethnicity	
Hispanic or Latino	271 (32)
Not Hispanic or Latino	527 (63)
Unknown	39 (5)

Figure 1: Total ribavirin treatment courses over the study period (a) by year and (b) by treating hospital