Conclusion: Natural language processing of outpatient pediatric visit documentation can be used successfully to create models accurately identifying cases of AOM based on clinical documentation. Combining NLP and structured data can improve automated case detection, leading to more accurate assessment of antibiotic prescribing practices. These techniques may be valuable in optimizing outpatient antimicrobial stewardship efforts.

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1359. Utilization of West Virginia Pediatric Medicaid Claims Data to Guide Outpatient Antimicrobial Stewardship Interventions

Jacob T. Kilgore, MD, MPH¹; Mariana M. Lanata Piazzon, MD, FAAP²; Jonathan M. Willis, MS³; Joseph Evans, MD⁴; Michael J. Smith, MD, MSc.E⁵; ¹Duke University, Durham, North Carolina; ²Marshall University, Huntington, West Virginia; ³Marshall Health (Marshall University), Barboursville, West Virginia; ⁴Marshall Health, Huntington, West Virginia; ⁵Duke University Medical Center, Durham, NC

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

Background. Antimicrobial resistance is a significant public health risk with overuse and misuse of antibiotics as primary drivers. West Virginia (WV) leads the nation in per capita prescribing in the outpatient setting, where the majority of antibiotic use occurs.

Methods. We analyzed outpatient pharmacy and medical claims for WV Medicaid recipients age < 20 years from 1/1/2018 – 12/31/2019. Dental claims were excluded. Oral antibiotics were identified using National Drug Codes (NDCs). Key demographic variables extracted from the claims include patient age (as of December 31st of that calendar year [CY]), sex, race, ethnicity, Medicaid region, place of medical service, provider, and cost. Rates of prescribing were calculated as the number of prescriptions per 1,000 children and stratified by age, race/ethnicity, sex, and WV Medicaid region. We used geographic information system (GIS) mapping to depict geographic variation in prescribing by county. Oral antibiotic prescriptions were compared across CY 2018 and 2019 including spectrum of antibiotic coverage.

Results. In CY 2018, 204,576 pediatric patients received 237,759 antibiotics (1,162 prescriptions/1,000 children). In 2019, 201,520 pediatric patients received 227,440 antibiotics (1,129 prescriptions/1,000 children). Prescription rates were higher among females, Caucasians and a younger (0-2) age group (Table 1). Antibiotics were more commonly prescribed by non-physician (e.g. nurse practitioner, etc.), non-pediatric specialty providers. Amoxicillin, cefdinir, and azithromycin were the most commonly prescribed antibiotics across CYS. Table 2 summarizes commonly prescribed antibiotics and their associated cost. Medicaid region 4 encompassed the highest prescription rates. Figure 1 is a GIS map of prescription rates by WV county.

Table 1. West Virginia pediatric (0 – 19 years*) Medicaid patient population demographic summary by calendar year (CY).

Demographic Characteristics	2018				2019			
	Patients	Rxs	%	Rate per 1,000	Patients	Rxs	%	Rate per 1,000
Summary								
Total (All WV MCD Claims)	204,576	237,759		1,162	201,520	227,440		1,129
Total (All entries with WV MCD Region)	197,636	231,331		1,170	196,910	223,826		1,137
Provider type / Specialty								
Physician / Pediatrics	41,060	17,276	17.27%		39,178	17,236		
Physician / Other Specialty	60,122	25,296	25.29%		52,180	22,944		
Other Provider / Pediatrics	5,447	2,295	2.29%		5,017	2,211		
Other Provider / Other Specialty	131,130	55,152	55.15%		131,065	57,633		
Antibiotic prescription type								
Broad-spectrum	110,842	46,826	46.82%		103,488	45,500		
Narrow-spectrum	126,917	53,389	53.38%		123,952	54,500		
Race/Ethnicity								
African American	25,012	25,887	10.89%	1,035	25,537	26,493	11.65%	1,037
American Indian/Alaskan Native	101	96	0.04%	950	95	84	0.04%	884
Caucasian	151,410	183,049	76.99%	1,209	147,986	173,855	76.44%	1,175
Hispanic	130	127	0.05%	977	115	108	0.05%	939
Unknown/not documented	27,223	28,601	12.03%	1,054	27,787	26,900	11.85%	968
Sex								
Female	101,027	127,586	53.66%	1,263	99,467	121,600	53.46%	1,223
Male	103,547	110,173	46.34%	1,054	102,053	105,840	46.54%	1,037
Patient geographic location (WV Medicaid region)								
Region 1	47,339	49,590	20.86%	1,048	46,826	48,656	21.39%	1,039
Region 2	54,489	62,719	26.38%	1,151	54,679	60,840	26.75%	1,113
Region 3	49,489	53,200	22.38%	1,075	49,435	50,300	22.12%	1,017
Region 4	46,319	65,822	27.68%	1,421	45,970	64,030	28.15%	1,393
Age Groupings*								
0-2	34,726	51,487	21.66%	1,483	33,904	47,802	21.02%	1,410
3-9	75,209	91,528	38.50%	1,217	73,126	87,979	38.68%	1,203
10-19	94,641	94,744	39.85%	1,001	94,490	91,659	40.30%	970

*Age for Pts is as of December 31st of claim year; for prescription (Rx), at date of service (DOS)

Table 2. Oral antibiotic prescription review including cost, CY 2018-2019.

Table 2. Oral antibiotic prescription review including cost, CY 2018-2019.				
CY 2018	Prescriptions (n)	Total Cost (U.S. \$)	% of all Antibiotic Prescriptions	% Cost of all Antibiotic Prescriptions
Amoxicillin	83,275	\$1,017,252	35.02%	23.03%
Cefdinir	39,163	\$906,316	16.47%	20.52%
Azithromycin	33,818	\$528,126	14.22%	11.96%
Amoxicillin-Clavulanate	28,786	\$679,990	12.11%	15.40%
Trimethoprim-Sulfamethoxazole	14,688	\$327,289	6.18%	7.241%
Cephalexin	12,798	\$250,034	5.38%	5.66%
Doxycycline	4,811	\$95,408	2.02%	2.16%
Minocycline	3,773	\$77,592	1.59%	1.76%
Clindamycin	3,187	\$110,336	1.34%	2.50%
Total	224,299	\$3,992,343	94.33%	90.40%
CY 2019	Prescriptions (n)	Total Cost (U.S. \$)	% of all Antibiotic Prescriptions	% Cost of all Antibiotic Prescriptions
Amoxicillin	81,593	\$1,024,741	35.87%	25.12%
Cefdinir	39,079	\$757,707	17.18%	18.57%
Azithromycin	29,943	\$450,124	13.17%	11.03%
Amoxicillin-Clavulanate	27,572	\$598,807	12.12%	14.88%
Trimethoprim-Sulfamethoxazole	13,169	\$267,190	5.79%	6.55%
Cephalexin	12,847	\$245,105	5.65%	6.01%
Doxycycline	5,212	\$82,583	2.29%	2.02%
Minocycline	3,456	\$69,703	1.52%	1.71%
Clindamycin	2,963	\$102,666	1.30%	2.52%
Total	214,834	\$3,598,626	94.89%	88.21%

*All includes all outpatient, non-oral antibiotic prescriptions for WV pediatric Medicaid patients

Figure 1. Geographic information system (GIS) mapping of prescriptions per 1,000 children by WV county.

Figure 1. Geographic information system (GIS) mapping of prescriptions per 1,000 children by WV county.

Conclusion: There is significant variation in antibiotic prescribing across WV. Potential areas of stewardship intervention should focus on non-physician, non-pediatric providers in Medicaid Region 4, the southern and arguably most rural portion of the state. Secondary analysis revealed an alarmingly high total number of broad-spectrum antibiotic use compared to narrow-spectrum. Further data analysis will examine diagnosis-specific prescription practices within this population.

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1360. Variation in Duration of Antibiotic Therapy for Central-line Associated Blood Stream Infections Caused by Gram Negative Bacilli in Hospitalized Children

Grant R. Whitmer, BS¹; Tonya Scardina, PharmD, BCPS, BCIDP²; Shan Sun, PhD³; Xiaotian Zheng, MD, PhD³; Sameer Patel, MD MPH⁴; ¹Northwestern University Feinberg School of Medicine, North Barrington, Illinois; ²Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, IL; ³Northwestern University Feinberg School of Medicine; Ann and Robert H. Lurie Children's Hospital of Chicago, Chicago, IL; ⁴Ann & Robert H. Lurie Children's Hospital of Chicago/Northwestern University Feinberg School of Medicine, Chicago, IL

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

Background. Central-line associated bloodstream infections (CLABSI) are associated with increased morbidity, mortality, and duration of hospitalization in children. Existing guidelines recommend a broad range (7-14 days) for duration of antibiotic therapy. Unnecessarily prolonged therapy may be associated with emergence of antibiotic resistance and adverse events.

Methods. We performed a retrospective review of all patients diagnosed with CLABSI caused by Gram negative bacilli (GNB) at our institution from August 2009 to April 2019. CLABSI was defined as isolation of a GNB from the blood >48 hours after hospital admission with presence of a central venous catheter. Children who died before completion of treatment were excluded. Data collection variables included severe neutropenia (defined as absolute neutrophil count < 500), immunocompromised status (defined as receipt of bone marrow transplant, solid organ transplant, or immunosuppressive medication), and catheter removal. The duration of effective antibiotic therapy was calculated from the date of last positive culture to discontinuation. Effective therapy was defined as use of an agent to which the isolated organism was susceptible by antimicrobial susceptibility testing. The primary outcome was microbiological recurrence of the same organism and/or all-cause mortality within 30 days of discontinuation.

Results. Overall, 95 CLABSI were included. Of 92 patients, 46 (50%) were immunocompromised. For patients with catheters removed prior to the end of therapy (n=48), the median duration of effective therapy was 13.5 days (IQR: 8.75-16 days). For patients who retained catheters throughout treatment (n=47), the median duration of effective therapy was 13 days (IQR: 9-15 days). Of these 95 CLABSI, one patient (retained catheter) had microbiological recurrence within 30 days. Seven patients died (without microbiological recurrence), with range of duration of therapy of 6-14 days.

Conclusion. There was a wide variation in length of therapy for CLABSI caused by GNB in children. Microbiological recurrence was rare, and mortality was unrelated to microbiological recurrence. Future studies should evaluate standardization of shorter duration therapy to avoid unnecessarily prolonged antibiotic exposure.

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1361. Variation in Perioperative Antibiotic Use for Children Undergoing Congenital Heart Disease Surgery in U.S. Academically Affiliated Centers

Peter B. Cooch, MD¹; Rachel Wattier, MD, MHS²; Martina Steurer-Muller, MD, MAS¹; ¹University of California, San Francisco, San Francisco, California