

Presentation Type:

Poster Presentation - Poster Presentation

Subject Category: Antibiotic Stewardship

Perceptions on Penicillin Allergy Labels among Nurses and Prescribers in Three Pediatric Urgent Care Sites

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Background: National guidelines recommend penicillins (PCN) as first-line treatment for many common pediatric infections in the outpatient setting. Although less than 1% of the United States population has a true, IgE-mediated PCN-allergy, approximately 10% of patients are labeled with a PCN-allergy. Accurate adverse drug reaction (ADR) documentation plays an important role in this over-labeling. We have previously shown that nurses feel assessment and documentation of PCN-allergies are critical to their role. However, additional evidence purports nurse hesitancy to interrogate allergy accuracy or reclassify parent’s response to side effect. Our objective was to explore frontline clinicians’ confidence in assessing, documenting, and responding to PCN-allergy labels. **Methods:** To expose barriers and prioritize improvement ideas for a multidisciplinary quality improvement (QI) project aimed to improve PCN-allergy labeling in our pediatric urgent care clinics, we deployed this investigator-developed survey to prescribers and nurses. It’s comprised of 14-questions scored on a 5-point Likert scale (4 demographic, 4 PCN/safety, 3 allergy types, 4 allergy documentations, 3 treatment options), and 1 optional free-text. We used descriptive statistics to compare survey responses between prescribers and nurses and evaluated free text comments for themes. **Results:** Eighty-seven clinicians across 3 sites participated, with a response rate of 35%, with variation by sites (25.3% to 41.4%). Forty-one percent of (n=36) responders have been in practice >15 years and 40.2% (n=35) have worked at our hospital > 15 years (Table 1). Overall, perceived knowledge of PCN-allergies and safety was favorable (Table 2). Prescribers reported higher confidence with: 1) perceiving many patients who believe they are allergic to PCN can safely take PCN (prescribers median=5 [IQR: 4, 5] vs. nurses median=4 [4,4], p = 0.003); and 2) perceiving that time pressures influenced their ability to reconcile allergies and side effects (prescribers

Agreement related to PCN allergy and safety	Prescribers (n=40)		Nurses (n=46)		Significance P value
	Answered*	Median [IQR]	Answered*	Median [IQR]	
I am confident in my ability to identify delayed reactions to antibiotics based on timing of symptoms after ingestion of the antibiotic.	40	4 [3, 4]	46	3 [3, 4]	0.416
Many patients who think they are allergic to PCN can safely take PCN.	39	5 [4, 5]	46	4 [4, 4]	0.003
I am knowledgeable about the risks of avoiding PCN in patients that have a documented PCN allergy.	39	4 [4, 5]	45	4 [3, 4]	0.056
I can distinguish between common pediatric conditions that are often misinterpreted as a PCN allergy (i.e., viral rash, vomiting/diarrhea).	40	4 [3, 4]	47	4 [3, 4]	0.880
I am aware that PCN allergy sensitivities can change over time.	40	4 [3, 75, 4]	47	4 [4, 4, 5]	0.160
I am able to identify factors associated with true allergic reactions.	40	4 [4, 4]	45	4 [4, 4]	0.980
I am aware of the types of PCN antibiotic allergy challenges that Children’s Mercy offers.	40	3 [2, 4]	45	3 [2, 4]	0.987
I feel confident in my ability to appropriately document an adverse drug reaction (ADR) in the EMR, even when a parent describes side effects.	40	4 [3, 4]	46	4 [3, 25, 5]	0.010
My documentation of ADRs influences future antibiotic prescribing.	40	4 [4, 5]	44	4 [4, 5]	0.356
Time pressures (e.g., patient flow) influence my ability to reconcile between allergy and side effect.	39	4 [3, 4]	45	3 [2, 4]	0.001
Perceived parent expectations influence my ability to reconcile between allergy and side effect.	40	4 [3, 75, 4]	44	4 [3, 4]	0.529
I feel confident continuing to administer or prescribe an antibiotic in the setting of a reported ADR.	40	3 [2, 4]	44	3 [2, 4]	0.409
I feel confident in my ability to talk with families about antibiotic side effects and reactions.	40	4 [3, 4]	46	4 [3, 4]	0.033
Additional education would be beneficial in helping me talk with families on the relationship between PCN allergies and treatment.	39	5 [4, 5]	47	4 [4, 5]	0.487

Note: 1-Strongly disagree; 2-Disagree; 3-Neutral; 4-Agree; 5-Strong agree
* Selected a response other than "I don't know"

median=4 [4, 5] vs. nurses median=3 [2, 4], p = 0.001). Both prescribers and nurses reported lower confidence in continuing to administer or prescribe an antibiotic in the setting of a reported ADR. Thirteen respondents (15%) provided comments with specific requests for additional family education and practice guidance, including the referral process to subspecialty clinics for PCN-allergy testing. **Conclusions:** Our survey results identified barriers to accurate PCN-allergy labels, including knowledge on documentation, time pressures, hesitancy to challenge parent report, and uncertainty on referral process for PCN-allergy testing. This survey will inform future drivers for our QI. Opportunities include electronic medical record refinement, improving referrals to PCN-allergy de-labeling clinics, and the development of scripted education to guide family discussions.

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Budget Impact Analysis for the Spread and Financial Sustainability of Videoconference Antimicrobial Stewardship Programs

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Background: In rural areas, antimicrobial stewardship programs often have limited access to infectious disease (ID) expertise. Videoconference Antimicrobial Stewardship Teams (VASTs) pair rural Veterans Affairs (VA) medical centers with an ID expert to discuss treatment of patients with concerns for infection. In a pilot study, VASTs were effective at improving antimicrobial use. Here, we evaluated 12-month operating costs for staffing for 3 VASTs. **Methods:** We used the following data to describe 12 months of clinical encounters for 3 VASTs operating from January 2022 – March 2023: the number of VAST sessions completed and clinical encounters; Current Procedural Terminology (CPT) codes associated with clinical encounters; session attendees (by role) and the time spent (percent effort) on VAST-related activities. The annual operating cost was based on the annual salaries and percent effort of VAST attendees. We used these

Respondent characteristics	Prescribers (n=40)		Nurses (n=47)	
	Respondents	Percent	Respondents	Percent
Role				
Advanced Practice Nurse	7	17.5%	-	-
Physician	33	82.5%	-	-
Nurse Manager/Director	-	-	5	10.6%
Staff Nurse	-	-	42	89.4%
Urgent Care				
Blue Valley	13	32.50%	14	29.80%
North	11	27.50%	11	23.40%
East	14	35.00%	22	46.80%
Missing	2	5.00%	0	0.00%
Graduated with my last clinical degree				
Less than 1 year ago	0	0.00%	1	2.13%
1-5 years ago	5	12.50%	8	17.02%
6-10 years ago	10	25.00%	10	21.28%
11-15 years ago	9	22.50%	7	14.89%
More than 15 years ago	16	40.00%	20	42.55%
Missing	0	0%	1	2.13%
Worked at Children’s Mercy				
Less than 5 years	9	22.50%	10	21.28%
5-10 years	10	25.00%	12	25.53%
11-15 years	7	17.50%	3	6.38%
More than 15 years	14	35.00%	21	44.68%
Missing	0	0%	1	2.13%

Table 1. VAST 12-Month Operating Cost for Staffing Summary and Statistics

Site	Annual operating cost	Sessions	Clinical encounters	Average cost per session	Average cost per clinical encounter	Clinical encounters needed to break even
A	\$28,922.32	61	109	\$474.14	\$265.34	56
B	\$41,484.74	18	72	\$2304.71	\$576.18	81
C	\$65,707.38	38	48	\$1729.14	\$1,368.90	127

characteristics combined with private-sector and Medicare reimbursements to evaluate the cost of implementation and number of clinical encounters needed to offset those costs (breakeven) for each site. **Results:** Three VASTs recorded 229 clinical encounters during 117 sessions (Table 1). Based on CPT codes, the approximate revenue per patient was \$516.46. Site A, the only site to break even, had the most sessions and clinical encounters as well as the lowest operating costs. For Site B, a slight increase in the clinical encounters, which might be achieved by 3 additional VAST sessions, would help achieve breakeven. For Site C, increasing the number of clinical encounters to 3-4 per session would have helped their VAST break even without requiring a decrease in operating costs. **Conclusions:** The frequency of VAST sessions, volume of clinical encounters, and low operating costs all contributed the VAST at Site A achieving a financial break-even point within 12 months. Consideration of the potential number of clinical encounters and sessions will help other VASTs achieve financial sustainment, independent of cost-savings related to potential decreases in expenditures for antibiotics and antibiotic-related adverse events. These results also provide insight into possible adoption and diffusion of VAST-like programs in the Medicare hospital setting.

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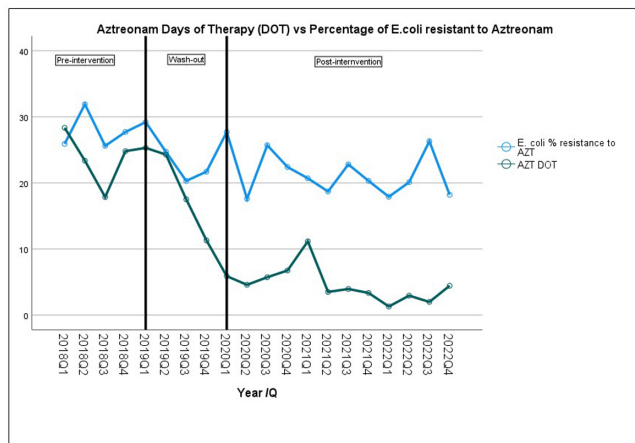
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Impact of an intervention that decreased aztreonam DOT on Enterobacteriales' susceptibility to aztreonam

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Background: Aztreonam (AZT) is frequently used for the treatment of Enterobacteriales-related infections, particularly for patients with penicillin allergy. We aimed to analyze the impact over time of changes in AZT days of therapy (DOTs) on AZT susceptibility from some Enterobacteriales after a multifaceted intervention to improve antibiotic management at a



DOT= Days of therapy; AZT= AZTREONAM; Q= Quarter

Table 1. Changes in AZT DOT and E. coli resistance

	Pre Intervention Mean (SD)	Wash-out Mean (SD)	Post-Intervention Mean (SD)	Overall Mean (SD)	Change Before/after
AZT DOT	23.6 (4.4)	19.6 (6.5)	4.6 (2.6)	11.4 (9.3)	80% ↓
E. coli R to AZT (%)	26.6 (1.4)	23.9 (3.9)	21.5 (3.3)	23.3 (4.1)	19% ↓

Key: AZT= aztreonam; DOT= Days of therapy; SD= standard deviation

Table 2. Linear regression for aztreonam days of therapy and selected Enterobacteriales susceptibility to aztreonam

	Simple linear regression				
	Aztreonam DOT Independent variable				
	B	t	p-Value	95.0% Confidence Interval for B Lower Bound	Upper Bound
E. cloacae resistant (%) to AZT	0.037	0.155	0.879	-0.46	0.533
E. coli resistant (%) to AZT	0.276	3.418	0.003*	0.106	0.446
K. aerogenes resistant (%) to AZT	-0.185	-0.492	0.628	-0.973	0.604
K. oxytoca resistant (%) to AZT	0.153	0.428	0.674	-0.597	0.902
K. pneumoniae resistant (%) to AZT	0.005	0.032	0.974	-0.296	0.306
M. morgani resistant (%) to AZT	0.02	0.09	0.929	-0.442	0.482
P. mirabilis resistant (%) to AZT	-0.016	-0.173	0.865	-0.205	0.174
S. marcescens resistant (%) to AZT	-0.162	-0.903	0.379	-0.537	0.214

Key: DOT= Days of therapy; AZT= aztreonam; B=slope

University Hospital in Florida. **Methods:** The study took place at a 560-bed academic hospital in Miami, FL. A multifaceted intervention was implemented in this hospital to improve antibiotic management of patients with reported allergies to penicillin. The intervention included use of algorithm-based guidance, education, and feedback to providers. The analysis period spans from 2018 (pre-intervention) through 2022 (post intervention); 2019 was considered the wash-out period (Figure 1). Quarterly data for AZT-DOT and percentage of resistance to AZT for Enterobacteriales were collected as part of the normal operations of the antimicrobial stewardship program (ASP) using the infection control module integrated in the electronic medical record (Epic Bugsy). DOT and Enterobacteriales antibiotic resistance to AZT was analyzed using linear regression in SPSS. **Results:** We identified a decrease in DOT AZT and percentage of AZT resistance from E. coli during the study period (Table 1). This intervention led to AZT DOT's decrease from a quarterly average of 24 DOTs in 2018 levels to a sustained quarterly average of 4.3 DOTs for 2020 to Q2 2023 (decrease 80%) Antibiotic resistance to E. coli AZT changed from a 26.6% to 21.5% (19% decrease) (Table1). Simple linear regression identified a decrease in percentage of E. coli resistance to AZT associated with a decrease on AZT DOT (P-value 0.003), there was no association for other Enterobacteriales. For each unit of decrease in AZT DOT there was 0.3% decrease in percentage of E. coli resistance to AZT (Table 2.) **Conclusions:** A decrease in AZT DOT during the observation period was associated with a decrease in E. coli resistance to AZT. Interventions aimed to decrease inappropriate antibiotic use are pivotal part of the fight against antimicrobial resistance; in our study we report a decrease in E. coli resistance to aztreonam related to decrease in the use of this antibiotic using education, guidance, and feedback to providers.

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Barriers and Facilitators to Optimal Antibiotic Prescribing on Discharge from the Hospital to Nursing Homes

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