for aminoglycosides and all neonatal antibacterial agents. SAARs were compared using the NHSN Statistics Calculator.

Results. For third generation cephalosporins, there were 385 observed antimicrobial days (OAD) and 115 expected antimicrobial days (EAD) in the pre-implementation period compared to 597 OAD and 228 EAD in the post implementation period. This resulted in a SAAR of 3.34 and 2.62, respectively; a reduction of 22% ($p < 0.001$). For aminoglycosides, there were 713 OAD and 584 EAD compared to 1617 OAD and 1155 EAD. This resulted in a SAAR of 1.22 and 1.4; an increase of 15% ($p = 0.002$). For all neonatal antibacterial agents, there were 2716 OAD and 1739 EAD compared to 5321 OAD and 3438 EAD. This resulted in a SAAR of 1.56 and 1.55; indicating no change in use ($p = 0.70$). See Table 1 for results.

Table 1. Antibiotic Use

	Pre-Implementation			Post-Implementation			Difference	p-value
Antibiotic Use	OAD	EAD	SAAR	OAD	EAD	SAAR		
3G Cephalosporin	385	115	3.34	597	228	2.62	-22%	< 0.001
Aminoglycosides	713	584	1.22	1617	1155	1.4	+15%	0.002
All Agents	2716	1739	1.56	5321	3438	1.55	-1%	0.70

3G: third generation; OAD: observed antimicrobial days; EAD: expected antimicrobial days; SAAR: Standardized Antimicrobial Administration Ratio

Conclusion. While this initiative resulted in decreased use of third generation cephalosporins, this was not associated with a decrease in antibiotic use overall. Use of SAARs in the NICU may be helpful in both identifying opportunities to improve antibiotic use and monitoring antibiotic use over time.

Disclosures: **Steven Smoke, PharmD, Karius** (Advisor or Review Panel member) **Shionogi** (Scientific Research Study Investigator, Advisor or Review Panel member)

133. A Review of Antimicrobial Formularies at Rural Hospitals: Stewardship Opportunities Abound

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Session: P-08. Antimicrobial Stewardship: Special Populations

Background. Management of a hospital's antimicrobial formulary is an important aspect of antimicrobial stewardship and cost containment strategies. Ensuring that essential medications for clinical care are available and excluding therapeutic duplicates and unnecessary antimicrobials is time and resource intensive. Comparisons of antimicrobial formularies across multiple rural hospitals have not been evaluated in the literature. We hypothesized that a comprehensive formulary evaluation would reveal important opportunities for antimicrobial stewardship efforts and could help smaller hospitals optimize available medications.

Methods. The University of Washington Tele-Antimicrobial Stewardship Program (UW-TASP) is comprised of 68 hospitals of varying sizes, most of which are rural and critical access, in Washington, Oregon, Arizona, Idaho, and Utah. We surveyed UW-TASP participating hospitals and other networked rural hospitals in multiple Western states using REDCap, a HIPAA-compliant, electronic data management program. Respondents reported which antimicrobials are on their hospital formulary as well as basic information about hospital size and inpatient units. Data were reviewed by a panel of infectious diseases trained physicians and pharmacists at UW-TASP.

Results. Surveys from 49 hospitals were received; two were excluded from the data analysis (Table 1) – one submission was incomplete, and one was a large inpatient psychiatric hospital. Select antimicrobials and proportion of hospitals carrying these agents is shown in Table 2. Several antimicrobials are on the formulary at all hospitals, regardless of size. In some critical access hospitals (< 25 beds), empiric first-line bacterial meningitis and viral encephalitis coverage (Table 3) was lacking. Six hospitals (12.7%) lacked ampicillin for *Listeria* coverage and only one had a suitable alternative agent (meropenem). Seven hospitals (14.9%) lacked intravenous acyclovir, although three had oral valacyclovir. Formulary inclusion of agents for multi-drug resistant organisms was rare.

Table 1. Characteristics of participating hospitals

Total number of hospitals = 47					
	Washington	Idaho	Oregon	Arizona	Utah
Location	27 (57.4)	12 (25.5)	4 (8.5)	3 (6.4)	1 (2.1)
	0-25	26-49	>50		
Number of inpatient beds	40 (85.1)	3 (6.4)	4 (8.5)		
	Yes	No			
Does the hospital participate in the TASP program?	44 (93.6)	3 (6.4)			
Does the hospital have ICU beds?	21 (44.7)	26 (55.3)			
Does the hospital have LTC beds?	21 (44.7)	26 (55.3)			

Data are presented as no. (%)

Table 2. Formulary data

Size of hospital (inpatient beds)		0-25	25-50	>50
Number of hospitals in the study		40	3	4
Aminoglycosides	Amikacin	5	0	75
	Gentamicin	95	100	100
	Tobramycin	32.5	66.6	100
Carbapenems	Ertapenem	92.5	66.6	100
	Imipenem-cilastin	40	0	25
	Meropenem	82.5	100	100
Cephalosporins	Cefazolin	100	100	100
	Ceftriaxone	100	100	100
	Ceftazidime	70	66.6	75
	Cefepime	85	66.6	100
	Ceftazidime-avibactam	0	0	50
	Ceftolozane-tazobactam	0	0	25
	Ceftaroline	15	33.3	50
Fluoroquinolones	Ciprofloxacin	95	100	75
	Levofloxacin	100	100	100
	Moxifloxacin	15	0	25
Glycopeptides, Glycolipopeptides, and Lipopeptides	Oritavancin	5	33.3	25
	Dalbavancin	2.5	0	50
	Daptomycin	65	66.6	75
	Vancomycin	100	100	100
Penicillins	Amoxicillin	100	100	100
	Amoxicillin-clavulanate	100	100	100
	Ampicillin	85	100	100
	Piperacillin-tazobactam	100	100	100
Tetracyclines	Doxycycline	100	100	100
	Minocycline	7.5	0	75
	Tigecycline	10	0	50
Miscellaneous antibiotics	Azithromycin	100	100	100
	Clindamycin	100	66.6	100
	Linezolid	67.5	100	100
	Metronidazole	100	100	100
	Trimethoprim-sulfamethoxazole	100	100	100
Antivirals	Acyclovir (intravenous formulation)	82.5	100	100
	Valacyclovir	62.5	66.6	100
Antifungals	Amphotericin	7.5	33.3	75
	Fluconazole	97.5	100	100
	Voriconazole	10	0	75
	Micafungin	27.5	33.3	75
	Caspofungin	7.5	33.3	25

Data are presented as percentage of hospitals with each medication on formulary

Green = >90%, Yellow = between 50% and 90%, Red = <50%

Table 3. Hospitals lacking encephalitis/meningitis coverage

Critical Drugs Missing from Formulary	Number of hospitals (N =47)
IV Ampicillin	6 (12.7)
Alternative available (meropenem)	1 (2.1)
IV Acyclovir	7 (14.9)
Alternative available (valacyclovir)	3 (6.4)

Data are presented as no. (%)

Conclusion. In critical access hospitals in the Western USA, lack of essential empiric antimicrobials may be more of a concern than inclusion of agents with unnecessarily broad spectra.

Disclosures. **Chloe Bryson-Cahn, MD**, **Alaska Airlines** (Other Financial or Material Support, Co-Medical Director, position is through the University of Washington)

134. Impact of an Antibiotic Stewardship Treatment and Management Algorithm for Liver Abscesses

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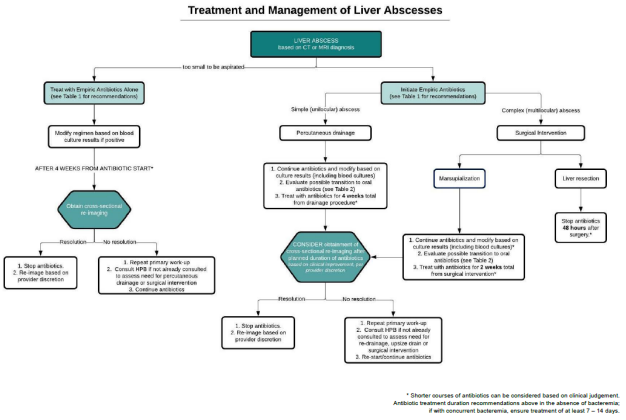
Session: P-08. Antimicrobial Stewardship: Special Populations

Background. Antibiotic prescribing for pyogenic liver abscess(es) (PLA) is highly variable with literature primarily aimed at assessing surgical intervention with a scarcity of data for antibiotic selection and duration of therapy. Given the lack of data, there is no clear consensus for treatment options or length of treatment. Our Antimicrobial Support Network (ASN) in collaboration with the hepatopancreatobiliary (HPB) team created a treatment and management algorithm to guide duration of therapy and antibiotic selection.



Methods. A retrospective, quasi-experimental cohort study was performed at Carolinas Medical Center in hospitalized patients with PLA with an HPB and/or infectious diseases consult. The primary outcome was antipseudomonal beta-lactam days of therapy (DOT) per 1000 patient days (PD) in the pre-versus post-intervention group. Secondary outcomes included rates of treatment failure at 90 days, 90-day all-cause and abscess-related hospital readmission, *C. difficile* and multi-drug resistant organism (MDRO) colonization at 90 days from diagnosis, and hospital length of stay (LOS). Additional *a priori* subgroup analyses of duration of therapy, treatment failure, all-cause and abscess-related readmissions were also conducted based on surgical intervention.

Results. A total of 93 patients were included, 49 patients in the pre-intervention group and 44 patients in the post-intervention group. Baseline characteristics were similar between the groups. The majority of liver abscesses were unilocular and monomicrobial. Anti-pseudomonal beta-lactam DOT per 1000 PD decreased by 13.8% (507.4 versus 437.5 DOT/1000 PD). Treatment failure occurred in 30.6% of pre-intervention patients and 18.2% of post-intervention patients (p = 0.165). Patients in the post-intervention group were discharged a median of 2.4 days sooner than the pre-intervention period (12.2 days vs. 9.8 days, p = 0.159). No significant differences resulted in 90-day readmission rates or 90-day *C. difficile* or MDRO rates.

Table 1. Primary Outcome for Patients with Pyogenic Liver Abscesses Treated Pre- and Post-Antibiotic Stewardship Algorithm

Efficacy Endpoint	Pre-Intervention n = 49	Post-Intervention n = 44	Percent change
Overall DOT per 1000 patient days			
Anti-pseudomonal beta-lactams	507.4	437.5	-13.8
Novel spectrum anti-pseudomonal	0	62.5	
Meropenem/vaborbactam	0	62.5	
Traditional spectrum anti-pseudomonal	507.4	375	-26.1
Aztreonam	0	4.6	
Cefepime	86.8	34.7	
Ceftazidime	20	0	
Meropenem	41.7	39.4	
Piperacillin/tazobactam	358.9	296.3	
Total patient days	599	432	

Table 2. Secondary Outcomes for Patients with Pyogenic Liver Abscesses Treated Pre- and Post-Antibiotic Stewardship Algorithm

Efficacy Endpoint	Pre-Intervention n = 49	Post-Intervention n = 44	p-value
Treatment failure, n (%)	15 (30.6)	8 (18.2)	0.165
Clinical worsening associated with liver abscess(es) requiring a change in antibiotics and/or additional surgical intervention	8 (16.3)	8 (18.2)	0.813
Abscess recurrence	5 (10.2)	0	0.058
Increase in liver abscess size	4 (8.2)	4 (9.1)	0.873
Development of new or return of bacteremia while on treatment	4 (8.2)	1 (2.3)	0.365
90-day readmission, n (%)	18 (36.7)	12 (27.3)	0.379
All-cause	9 (50.0)	8 (66.7)	0.465
Abscess-related	9 (50.0)	4 (33.3)	0.296
Clostridiodes difficile at 90 days, n (%)	1 (2.0)	0 (0.0)	1.0
MDRO at 90 days, n (%)	7 (14.3)	2 (4.6)	0.164
VRE	4 (8.2)	1 (2.3)	0.365
CRE	2 (4.1)	0 (0.0)	0.496
MRSA	1 (2.0)	0 (0.0)	1.0
ESBL	0 (0.0)	1 (2.3)	0.473
Transition to oral therapy, n (%)	27 (55.1)	20 (45.5)	0.353
Length of hospital stay, median (IQR)	12.2 (6-16)	9.8 (5-13.5)	0.159
Percutaneous drainage	12.4 (7-14)	8.1 (5-8)	0.079
Marsupialization	14 (9-17)	7.9 (3-12)	0.051
Liver resection	15.9 (7-22)	9.2 (5-15)	0.220
No intervention	8.5 (5-8)	15.2 (9-20)	0.013*
Length of therapy, median (IQR)	26.8 (17-30)	24.3 (14.5-32)	0.877
Percutaneous drainage	27.6 (17-30)	22.2 (16-29)	0.460
Marsupialization	24.3 (14-32)	20.4 (12-28)	0.354
Liver resection	27.3 (17-35)	15.8 (11-21)	0.124
No intervention	23.4 (14-29)	33.4 (29-39)	0.010*

Conclusion. The implementation of a PLA treatment and management algorithm led to a decrease in anti-pseudomonal beta-lactams without impacting clinical outcomes and a trend towards decreased LOS.

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

135. Influence of Prescribers on Antibiotic Use among Skilled Nursing Care Residents in 29 U.S. Nursing Homes

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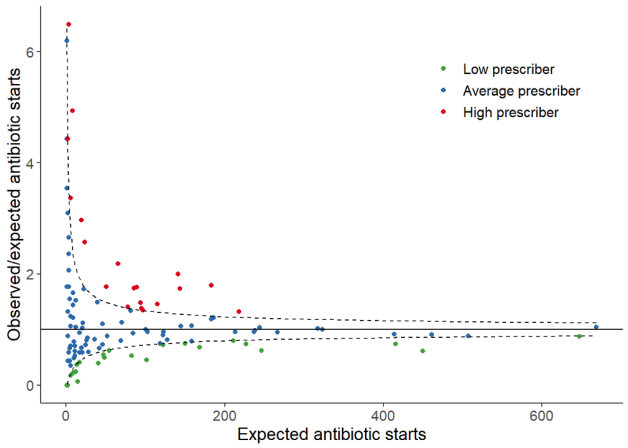
Session: P-08. Antimicrobial Stewardship: Special Populations

Background. In nursing homes, federal mandates call for more judicious use of antibiotics and antipsychotics. Previous research indicates that practice patterns of nursing home practitioners, rather than resident's signs and symptoms or overall medical conditions, drive antibiotic use. We hypothesized that nursing home practitioners who prescribe antibiotics more frequently than their peers may display a similar practice pattern for antipsychotics. Here, we examine similarities in prescribing patterns for antibiotics and antipsychotics among practitioners at 29 U.S. nursing homes.

Methods. Prescription data came from 2016 invoices from a pharmacy common to all 29 nursing homes. We defined practitioners as individuals who prescribed ≥1% of systemic medications at a nursing home and excluded practitioners without no prescriptions for anti-hypertensive drugs assuming they were not treating a general nursing home population (i.e. treating hospice or dementia patients). Using anti-hypertensive starts for standardization, we calculated the expected number of starts for both antibiotics and antipsychotics. Using funnel plots with Poisson 99% control limits for the observed-to-expected ratio, we identified practitioners whose use of either class of drugs exceeded these control limits. Practitioners were classified as high, average, or low prescribers for each class of drugs.

Results. We analyzed 129 practitioners who wrote for 113669 systemic medications. For antibiotics, 27 (20%) and 19 (15%) of practitioners were low and high prescribers, respectively. For antipsychotics, 53 (41%) and 14 (11%) were low and high prescribers, respectively (**Figure 1**). Among the low antibiotic prescribers, 59% (16/27) were also low antipsychotic prescribers. Among the high antibiotic prescribers, 21% (4/19) were also high antipsychotic prescribers (**Figure 2**).

Figure 1. (a) Funnel plot for antibiotics



(b) Funnel plot for antipsychotics