

Introduction

- With increasing rates of antimicrobial resistance, the need for effective antimicrobial stewardship is at an all-time high
- The process of prospective audit and feedback is described as a review of antimicrobial therapy accompanied with recommendations to optimize therapy after the antimicrobial has already been initiated
- Literature describing the successful implementation of antimicrobial stewardship programs often illustrates initiatives and tasks accomplished by trained infectious diseases pharmacists
- Our study is unique as it describes a successful antimicrobial stewardship program within a small community hospital and our experience with a staff pharmacist-driven prospective audit and feedback program

Objectives

- Assess the impact of a prospective audit and feedback program completed by staff pharmacists on antibiotic utilization in a community hospital
- Staff pharmacist feedback on the program was assessed to gain a better understanding of the program's impact on daily workflow, engagement with providers as a result of the program, and the impact of antimicrobial training on pharmacist's clinical decision-making skills

Methods

- Pre- and post-intervention study to assess the primary outcome of days of therapy (DOT) for targeted antimicrobials (ciprofloxacin, levofloxacin, cefepime, ceftazidime, piperacillin/tazobactam)

Inclusion Criteria

- Employed by Hartford HealthCare
- Staff pharmacists at MidState Medical Center who participated in the prospective audit and feedback initiative
- Age ≥ 18 years old with no upper limit (although there will be a practical limit of approximately 70 based on the two criteria above)
- Willing/able to participate in voluntary survey

Exclusion Criteria

- Per-diem pharmacists
- Oncology, anticoagulation, and IV room pharmacists who did not participate in prospective audit and feedback process

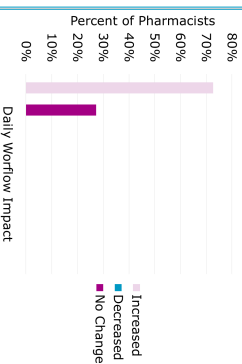
Endpoints

- | Primary Endpoint | Secondary Endpoints |
|--|--|
| • Days of therapy per 1,000 patient days (DOT) | • Antibiotic expenditures |
| | • Rates of <i>Clostridioides difficile</i> infection (CDI) |
| | • Rates of antimicrobial susceptibility |

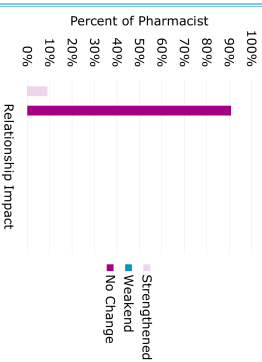
Pharmacist Survey of Initiative

- 17 pharmacists are employed at MidState Medical Center. After exclusion of ineligible pharmacists, 11 were surveyed
- Average number of years practicing as a pharmacist: 16.2 years
- Average number of years as a pharmacist at MidState Medical Center: 9.25 years
- 55% of pharmacists reported having no prior antimicrobial stewardship training prior to this initiative
- Pharmacists requested additional one-on-one training, small in-services, and decision pathways to help further enhance future antimicrobial therapy assessments

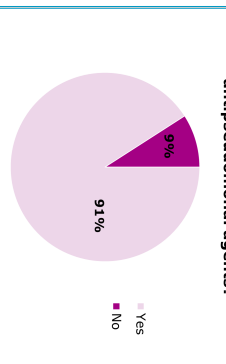
Impact on Pharmacist Daily Workflow



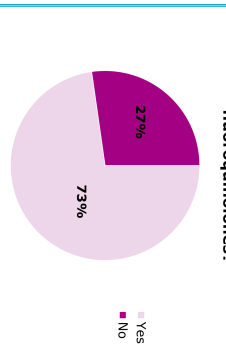
Impact on Provider Relationships



Did stewardship training improve pharmacist assessment of antipseudomonal agents?



Did stewardship training improve pharmacist assessment of fluoroquinolones?



Results

Table 1	Primary Endpoint	Pre-intervention	Post-intervention	P value
	Days of Therapy (DOT/1,000 PDS)			
	Piperacillin/tazobactam	29.88	9.25	<0.001
	Cefazidime	8.75	6.47	0.083
	Cefepime	20.47	34.35	<0.001
	All antipseudomonal agents	62.91	51.67	<0.001
	Ciprofloxacin	23.22	9.97	<0.001
	Levofloxacin	11.2	5.07	<0.001

Table 2	Secondary Endpoints	Pre-intervention	Post-intervention	P value
	Antimicrobial Expenditures			
	Piperacillin/tazobactam	\$52,498	\$10,937	<0.001
	Ceftazidime	\$9,952	\$7,457	0.29
	Cefepime	\$25,638	\$40,097	0.001
	Ciprofloxacin	\$6,700	\$1,954	<0.001
	Levofloxacin	\$2,168	\$672	<0.001
	Total targeted antimicrobial expenditure	\$95,715	\$62,837	<0.001
	Antimicrobial Susceptibility Rate: <i>Pseudomonas aeruginosa</i>			
	Piperacillin/tazobactam	84%	89%	0.111
	Levofloxacin	67%	72%	0.238
	Ciprofloxacin	68%	72%	0.342
	Antimicrobial Susceptibility Rate: <i>Escherichia coli</i>			
	Piperacillin/tazobactam	89%	93%	<0.001
	Cefepime	93%	94%	0.266
	Levofloxacin	82%	0.162	
	Ciprofloxacin	79%	81%	0.170
	<i>Clostridioides difficile</i> Infection Rate	4.9/10,000 PDS	2.61/10,000 PDS	0.931

Discussion

- Implementation of a staff pharmacist-driven prospective authorization and feedback program led to a significant decrease in DOT for piperacillin/tazobactam, ciprofloxacin, levofloxacin, and overall for all antipseudomonal drugs used at MidState Medical Center, though increases were observed in cefepime DOT and expenditure
- Total antimicrobial expenditures significantly decreased post-intervention
- Significant increases in piperacillin/tazobactam susceptibility rates for *E. coli* was observed
- A trend towards lower rates of CDI were observed post-intervention
- Staff pharmacists can significantly benefit antimicrobial stewardship initiatives