Impact of Audit and Feedback on Targeted Antibiotic Prescribing: A Pre- and Post-intervention Study

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Introduction & Objective

- Ceftaroline is a cephalosporin antibiotic utilized for various infections due to its broad-spectrum of activity including coverage of methicillin-resistant staphylococcus aureus (MRSA) as well as gram-negative pathogens.
- A notable increase in ceftaroline use at our institution was observed and raises antibiotic stewardship concerns as alternative antibiotic options are available. Inappropriate ceftaroline use may expedite the emergence of resistant bacterial strains.
- Our Antibiotic Stewardship Program (ASP) created an initiative aimed to optimize ceftaroline utilization by monitoring prescribing patterns and providing real-time feedback to prescribers.

The purpose of this study is to evaluate the impact of providing real-time feedback to prescribers of ceftaroline. Investigators will compare ceftaroline usage before and after implementation of our ASP initiative.

Methods

- A drug utilization report was generated using Cerner Discern Analytics to identify patients who received ceftaroline from January 2023 to March 2024. Data included patients dispensed ceftaroline and doses administered.
- Study researchers compiled this data to evaluate prescribing patterns at our institution. Patient electronic medical records were accessed to ascertain the appropriateness of prescribing.
- Members of our ASP began an initiative in September 2023 to monitor ceftaroline prescribing in real time, ensure appropriate utilization, and provide feedback to prescribers.
- Data collection continued until March 2024, enabling a quasi-experimental investigation into the impact of this initiative on ceftaroline, including days of therapy (DOT) per 1000 patient days.

Figure 1. Days of Therapy / 1000 Patient Days

Results

Table 1. Costs

Q1 2023	$50,735.68
Q2 2023	$90,304.42
Q3 2023	$51,640.75
Q4 2023	$40,617.65
Q1 2024	$64,562.86

Figure 2. Cost Trends with Intervention

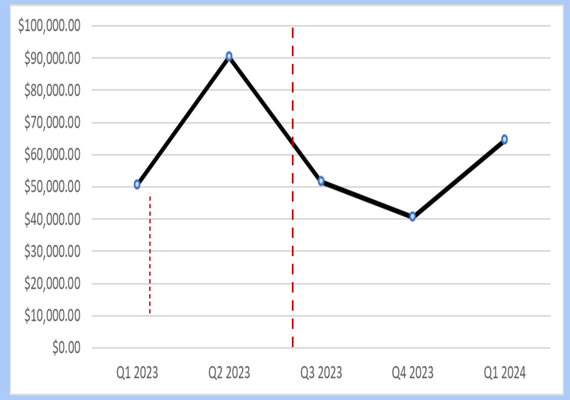

Table 2. Vials Dispensed

Q1 2023	232
Q2 2023	451
Q3 2023	294
Q4 2023	204
Q1 2024	406

Figure 3. Vials Dispensed with Intervention

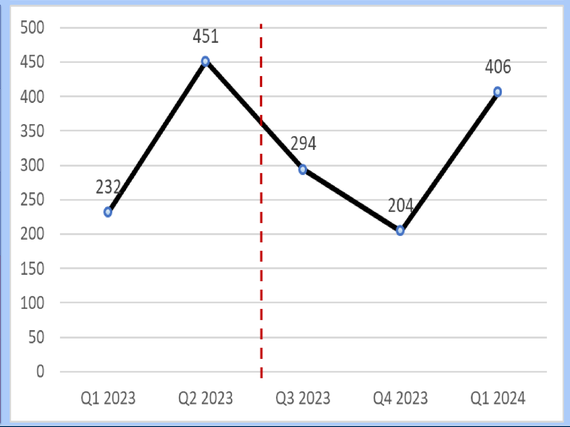

Table 3. Monthly Averages Pre- and Post-Intervention

Measures	Pre-Intervention	Post-Intervention	Reduction
Cost / Month	$23,556.97	$15,629.37	34%
Patients / Month	14	9	39%
Vials Dispensed / Month	116	94	19%

Discussion

- DOT per 1000 patient days saw a decrease after our ASP initiative. In July through September of 2023 the average DOT per 1000 patient days was 11, and in October to December of the same year decreased to 4, then increased to 7.5 which can be expected as utilization can be impacted by a small number of patients. **(Figure 1)**.
- The average monthly expenditure at our institution for ceftaroline before and after our intervention was $23,556.97 and $15,629.37 respectively. An average costs saving of $7,927.60 per month was realized following our real-time intervention **(Table 3)**. Purchases for ceftaroline from February to August were approximately $175,803.86. Post-intervention purchases from September to March decreased to $109,405.61, a 38% decrease in spending despite an increase in Q1 2024.
- Increased spending can be affected by hospital census, a better representation of utilization can be measured by DOT per 1000 patient days. This metric is standardized across various sizes of patient populations and better represents our goal of optimizing antibiotic therapy and improving patient outcomes.
- Following the implementation of our targeted intervention, there was a substantial decrease in the amount of ceftaroline dispensed. February to August saw 866 vials dispensed while September to January had only 656 vials. This was a 24% decrease in ceftaroline utilization.
- Success of our intervention conveys the importance of the pharmacists' role in prescriber education and the necessity for ongoing stewardship activities. Our results suggest exploring additional antibiotics and medications within our institution and future targeted audits to ensure optimal prescribing choices.

Conclusion

Prospective audit and feedback is an effective tool for ASPs. Antibiotic stewardship program led education with real-time prescriber feedback can enhance antibiotic prescribing choices and save hospital systems significant expenses.

Disclosure panel: The authors have nothing to disclose concerning financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter.