

Facilitating the Everyday Steward: Impact of Mandatory Antimicrobial Indication/Duration and a 48 Hour Time Out

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Background

- Mandatory antimicrobial indication, duration, and a 48 hour time out are integral parts of antimicrobial stewardship standards put forth by accrediting and professional organizations.
- Limited data are available to demonstrate an effect on antimicrobial utilization and stewardship practice of these practices.
- Children's Mercy Kansas City (CM) is a 367-bed academic pediatric medical center located in Kansas City, Missouri, which provides care to a 5-state region.
- The antimicrobial stewardship program (ASP) at CM was established on March 3, 2008, with the primary focus of optimizing broad-spectrum antimicrobial use.
- To align with ASP standards, mandatory antimicrobial indications/durations and a pharmacist-driven 48 hour antimicrobial time out were implemented on February 14, 2017.

48 Hour Time Out

- Task triggers for a specific antimicrobial review at 48 hours
- Pharmacist discusses antimicrobial plans with team and documents in the EMR

Mandatory Indications

- Selected at computerized physician order entry (CPOE)
- Broad infectious categories for antibiotics (ENT, CNS, etc.)
- Prophylaxis or treatment options for antivirals/antifungals

Mandatory Durations

- Required at CPOE
- Reviewed by team pharmacists daily using the Antimicrobial Discontinuation Report
- "Double-check" performed daily by ASP

Objective

- Evaluate the impact of mandatory declared indication/duration along with a pharmacist-driven 48 hour time out on antibiotic utilization and ASP interventions.

Methods

- A retrospective evaluation of ASP interventions and antimicrobial use was performed between February 1, 2016, to January 31, 2018.
- Pre-and post-implementation utilization rates were measured for antibiotic days of therapy (DOT) per 1000 patient days using Poisson models and seasonal decomposition analyses to account for seasonal variability.

Results

Figure 1. Antibiotic DOT per 1000 Days Pre-and Post-Implementation

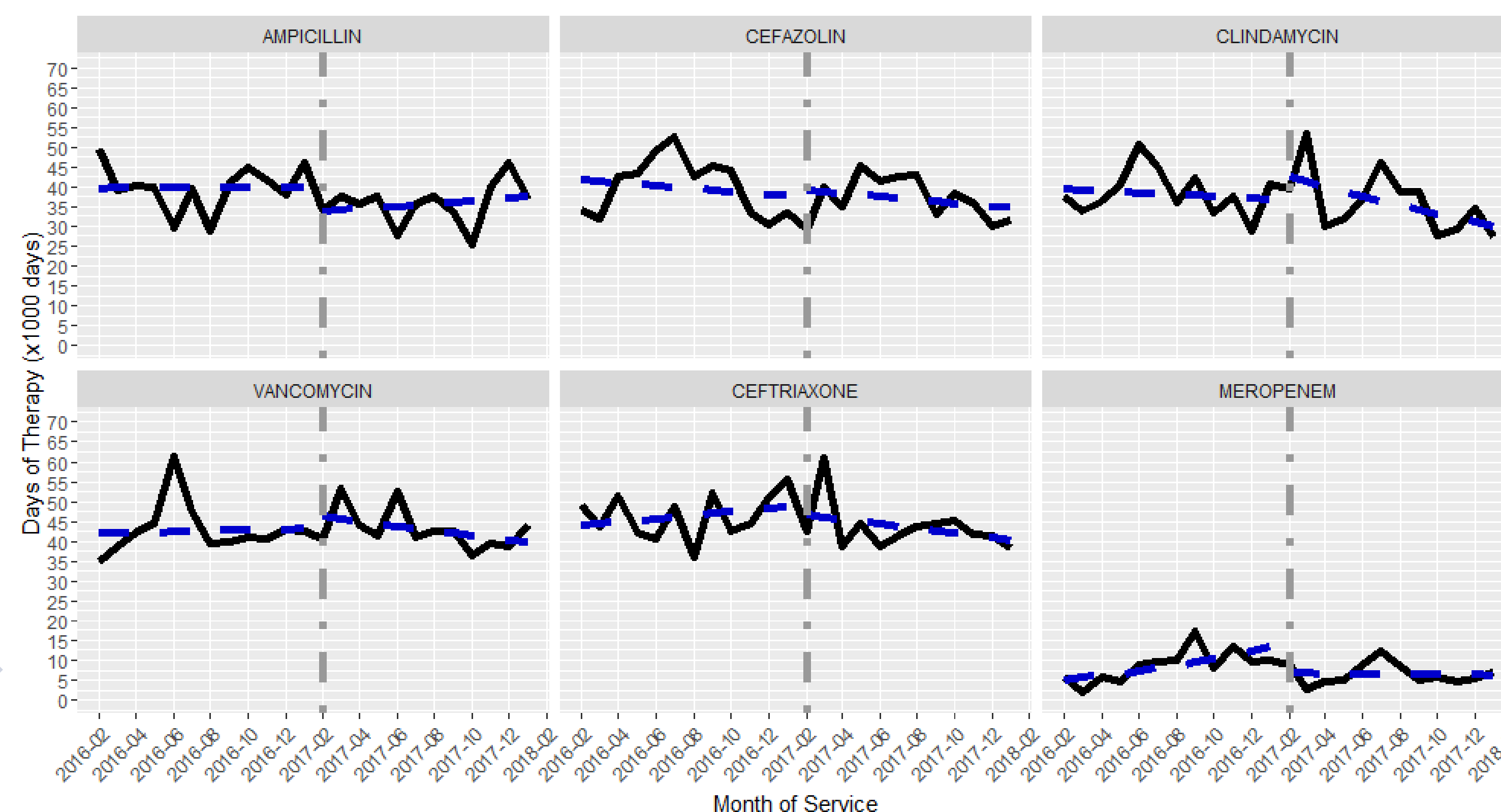


Table 1. Antibiotic DOT per 1000 Patient Days Pre-and Post-Implementation

Antibiotic	Pre-Implementation	Post-Implementation	P-value
Ampicillin*	40	36	<0.001
Cefazolin*	40	37	<0.001
Clindamycin*	38	36	<0.001
Vancomycin	43	43	0.696
Ceftriaxone	47	43	<0.001
Meropenem	9	7	<0.001

*Not monitored by the CMH ASP

Figure 2. Overall ASP Interventions Pre-and Post-Implementation

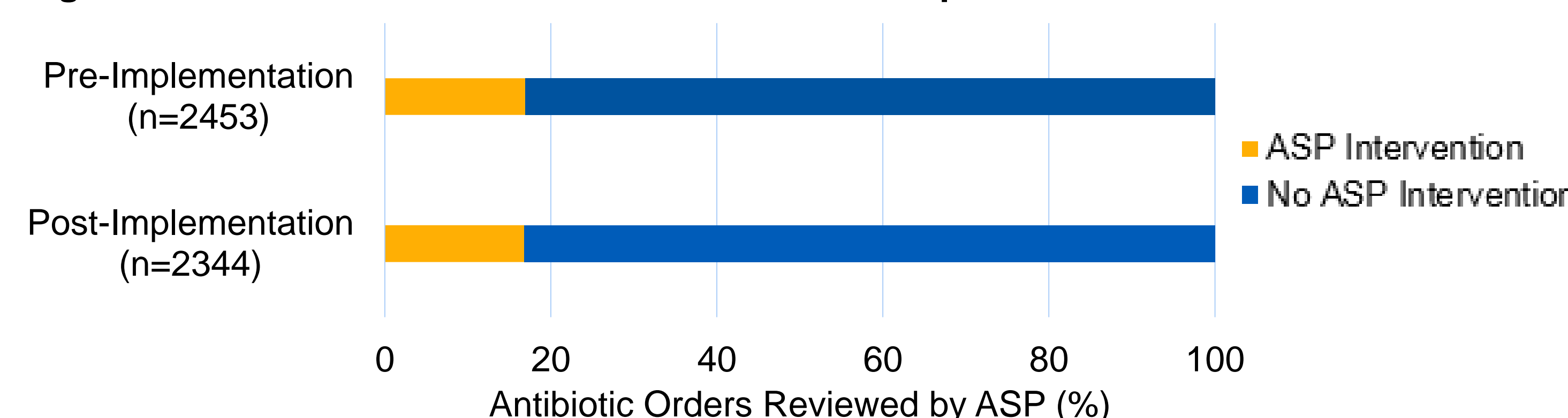


Table 2. ASP Interventions Per Indication Pre-and Post-Implementation

Infectious Indication	Pre-Implementation (%)	Post-Implementation (%)	P-value
2 or More	30	18	0.01
Bacteremia	17	13	0.24
Bone & Joint	7	0	0.49
CAP	38	39	0.84
Cardiovascular	6	8	1
CNS	13	13	1
ENT	25	23	0.73
Febrile Neutropenia	2	4	0.29
Gastrointestinal	21	11	0.03
Genitourinary	29	35	0.25
Neonatal Fever	7	6	1
Prophylaxis	4	3	0.54
Respiratory (non-CAP)	18	16	0.64
Sepsis	8	13	0.02
SSTI	18	18	1
Surgical	15	17	0.31

CAP: Community acquired pneumonia; CNS: Central nervous system; ENT: Ear, nose, throat; SSTI: Skin and soft tissue infection

Conclusions

- Implementation of additional stewardship practices, including mandatory antimicrobial indication/duration and a 48 hour time out, decreased the use of antibiotics at our institution, including those not monitored by our ASP.
- These efforts augmented but did not replace existing stewardship efforts as demonstrated by no change in our ASP intervention rate.
- These results support initiatives highlighted by national organizations to minimize antimicrobial use through ASP.

Limitations

- Cefepime and piperacillin/tazobactam, both frequently utilized at our institution, were excluded due to the impact of drug shortages.
- Practice changes (i.e. post-operative antibiotic use) may have impacted antibiotic DOT.
- Cost savings was not assessed.

References

- Centers for Disease Control and Prevention. Core Elements of Hospital Antibiotic Stewardship Programs. <https://www.cdc.gov/antibiotic-use/healthcare/implementation/core-elements.html>. Last Accessed March 30, 2018.
- Centers for Medicare & Medicaid Services Hospital Infection Control Worksheet. <https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/Survey-and-Cert-Letter-15-12-Attachment-1.pdf>. Last Accessed March 30, 2018.
- The Joint Commission Antimicrobial Stewardship Standard. https://www.jointcommission.org/assets/1/6/New_Antimicrobial_Stewardship_Standard.pdf. Last Accessed March 30, 2018.