

# Mandatory Antimicrobial Durations at Time of Computerized Physician Order Entry: What's the Harm?

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## Background

- Mandatory antimicrobial stop dates at time of order entry are recommended as a core element of antimicrobial stewardship programs (ASP)
- The implementation of mandatory antimicrobial stop dates have been challenging given safety concerns for unintentional discontinuations (DC)
- To align with ASP standards, CM implemented mandatory durations in the form of stop dates for all antimicrobial orders at time of computerized physician order entry on February 14, 2017
- A safety process was created to minimize risk of unintentional DCs

Figure 1. DC Report Safety Process



## Objective

- Evaluate the safety of mandatory stop dates with an implemented safety process on antimicrobial orders in a free-standing pediatric institution

## Methods

- Setting:** Children's Mercy Kansas City (CM) is a 367-bed academic pediatric medical center in Kansas City, Missouri, which provides care to a 5-state region
- Study design:** A retrospective evaluation of DC report reviews and interventions performed between February 14, 2017, to March 31, 2018
- Outcomes:**
  - Rate of ASP interventions on DC report antimicrobial orders
  - Unintentional DCs resulting in missed doses identified through event reports

## Results

- 4,905 DC antimicrobial orders reviewed; ASP intervened on 350 orders (7.1%)
- Median orders reviewed each day: 12 [9, 15]

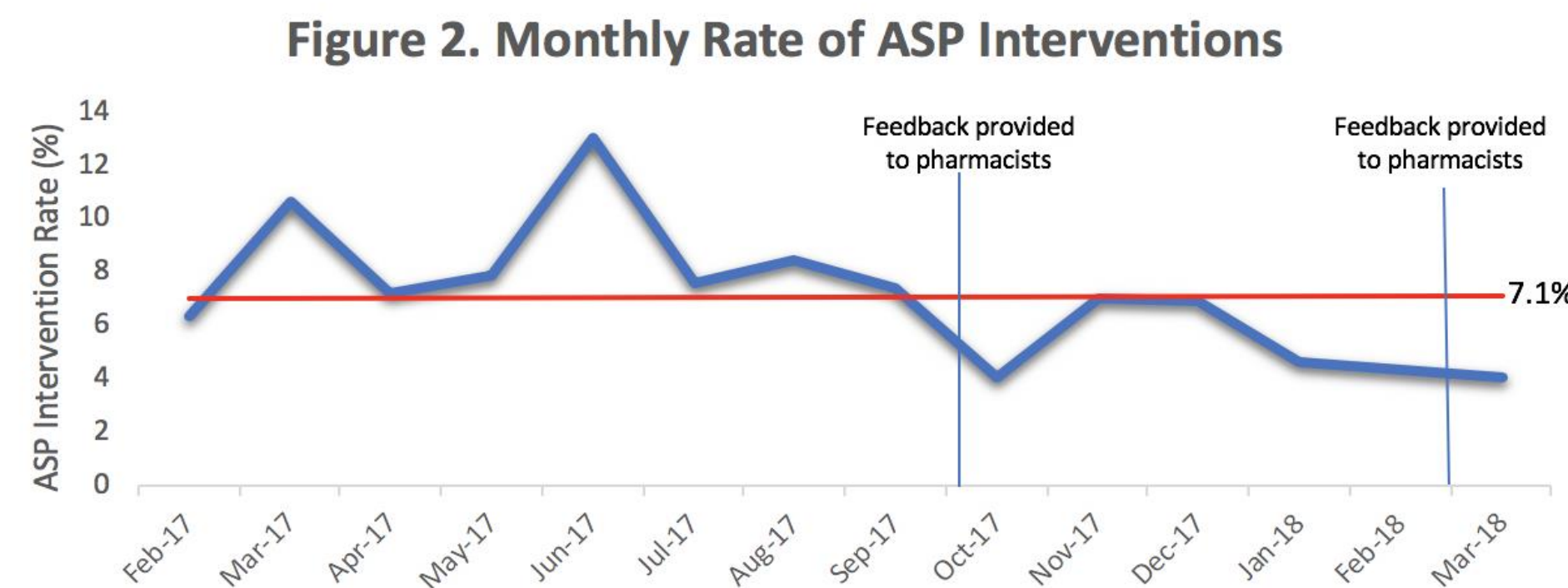


Table 1. Order Characteristics ASP Interventions (n = 350)

Primary Service	# of Antimicrobial Orders (%)
Pediatric Intensive Care Unit	90 (26)
General Pediatrics	83 (24)
Surgery	53 (15)
Hematology/Oncology	41 (12)
Antimicrobial Indications	# of Antimicrobial Orders (%)
Rule out sepsis/bacteremia	82 (23)
Prophylaxis/suppressive	54 (15)
Intra-abdominal/Gastrointestinal	34 (10)
Skin and soft tissue	26 (7)
Antimicrobial Agents	# of Antimicrobial Orders (%)
Ceftriaxone	46 (13)
Cefepime	43 (12)
Cefazolin	32 (9)
Vancomycin	30 (9)

\*Other indications with ASP interventions: fever/neutropenia, urinary tract infection/genitourinary, pneumonia, bone/joint/musculoskeletal, meningitis/CNS, cystic fibrosis exacerbation, catheter related blood stream infection, ear/nose/throat

Figure 3. ASP Intervention Rate by Day of Week

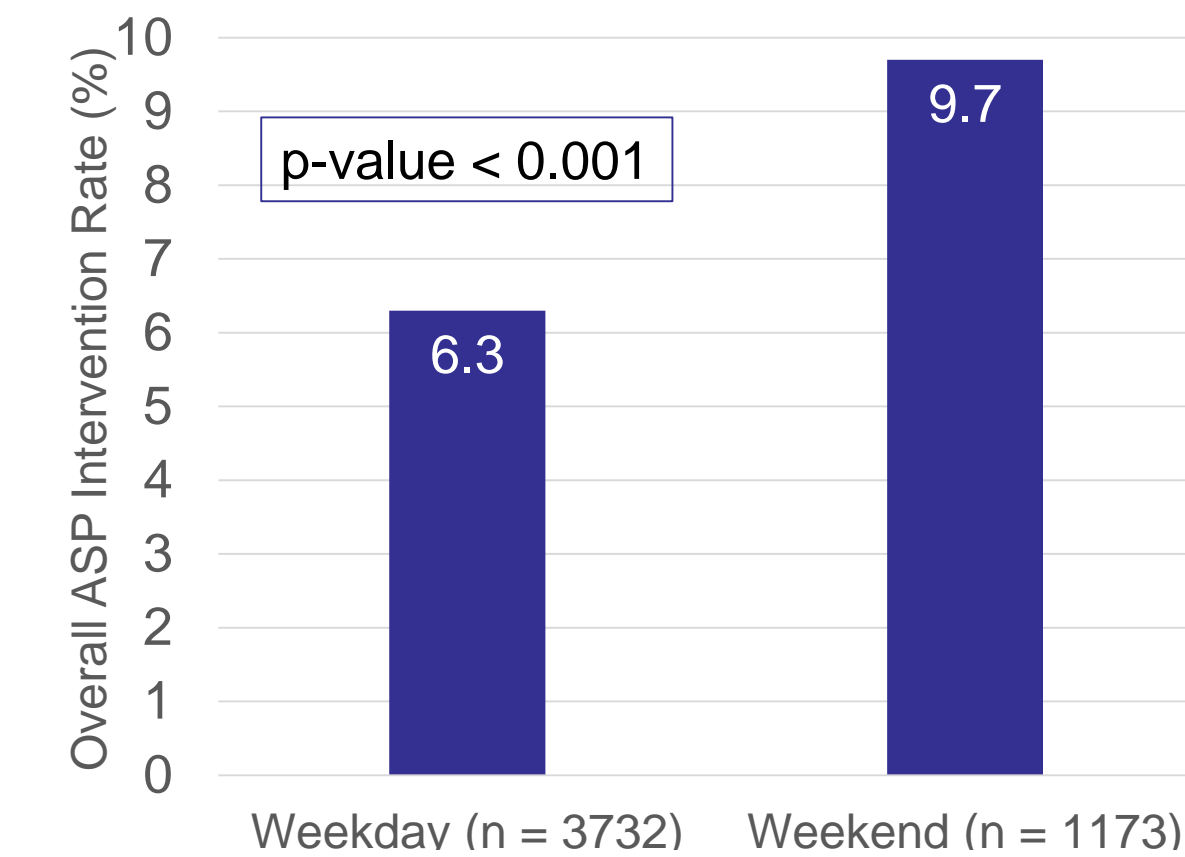


Table 2. Missed Antimicrobial Doses (n = 4)

Primary Service	# of Patients
Pulmonology	2
Surgery	1
Bone Marrow Transplant	1
Indication	# of Patients
Cystic Fibrosis Exacerbation	2
Bone/Joint/Musculoskeletal	1
<i>Clostridioides difficile</i>	1

\*No patient harm occurred from missed doses

## Conclusions

- Mandatory antimicrobial stop dates at point of order entry can be safely implemented with clinical pharmacy involvement and a "double-check" ASP process
- Significantly higher rates of ASP DC report interventions were observed on weekends compared to weekdays, which may be related to fewer pharmacy staff on weekends
- Our findings suggest unintentional discontinuation of antimicrobial agents may occur for a variety of indications without a structured double-check procedure

## Limitations

- Current safety process may under represent the true incidence of missed doses
- Retrospective evaluation of ASP interventions limited given variation in documentation during initial eight months of study period
- Variations in ASP reviewers of DC report may bias results

## 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](https://www.jointcommission.org/assets/1/6/New_Antimicrobial_Stewardship_Standard.pdf). Last Accessed March 30, 2018.