

Presentation Category: Original - Research Complete

Abstract Title

Evaluating the Impact of Gentamicin Surgical Prophylaxis Workflow Updates on Operational and Clinical Outcomes

Learning Objective

Report the impact on operational and clinical outcomes following changes to the institution's preoperative gentamicin surgical prophylaxis weight-based dosing protocol.

Abstract

Purpose

Preoperative antibiotic surgical prophylaxis is an essential practice to significantly reduce the occurrence of surgical wound infections. Without preoperative antibiotics, the incidence of surgical site infections was demonstrated to increase up to 30% and was associated with increases in morbidity and mortality. Current practice guidelines strongly recommend the administration of preoperative antibiotics within 60 minutes of surgical incision. The University of Chicago Medicine has adopted a fixed, weight-based dosing protocol for preoperative gentamicin surgical prophylaxis in order to expedite the process. Institutions that follow antibiotic fixed-dosing protocols should be cautious of not sacrificing patient safety. Acute kidney injury (AKI) is a common complication postoperatively and following the use of aminoglycosides. The purpose of this study was to compare operational and clinical outcomes following changes to preoperative gentamicin surgical prophylaxis weight-based dosing protocol.

Methods

This was a retrospective, single-center, quasi-experimental study evaluating an intervention to simplify weight-based gentamicin dosing recommendations for preoperative surgical prophylaxis in adult surgical patients. The primary endpoint was to evaluate the effect of the simplified gentamicin dosing recommendations on the incidence of automatic dispensing cabinet (ADC) stock outs. Key secondary operational endpoints included generation of batched gentamicin doses, generation of expired/wasted gentamicin doses, incidence of 7-day AKI, incidence of 30-day SSI, and incidence of 90-day surgery-related readmission.

Results

The study included all batched gentamicin doses between February 1, 2022 to July 31, 2022 (pre-intervention) and February 1, 2023 to July 31, 2023 (post-intervention) totaling 4,911 gentamicin doses of which 375 gentamicin orders were reviewed for clinical outcomes. The primary endpoint was found to be 73 vs 50 stockouts ($p = 0.76$) between the pre-intervention and post-intervention groups, respectively. The operational secondary endpoint of average number of batched gentamicin doses per month was 497 vs 321 doses ($p = 0.001$). The total number of expired gentamicin doses was 465 vs 251 doses ($p = 0.01$), and the average number of expired gentamicin doses per month was 77 vs 52 doses ($p = 0.04$). The clinical secondary endpoint of 30-day surgical site infection was 6 vs 16 ($p = 0.03$). All other key operational and clinical secondary endpoints were not statistically significant.

Conclusions

From an operational perspective, the simplification of weight-based gentamicin dosing achieved a substantial reduction in batched and expired gentamicin doses. However, the primary outcome of ADC stockouts remained unchanged. Clinically, the simplified protocol resulted in a numerically

small, but significant increase in surgical site infections. Future assessments and/or interventions should prioritize decreased stock outs, leverage lean principles, evaluate postoperative implications, and review adherence with protocol recommendations.

Submitting Author: Christopher David

Organization: University of Chicago Medicine

Authors:

Christopher David, PharmD, University of Chicago Medicine; PGY-1 Pharmacy Resident

Gourang Patel, PharmD, MSc, BCPS, BCCCP, FCCP, FCCM; University of Chicago Medicine;

Director of Pharmacy Services

James A.M. Rhodes, PharmD, MBA, BCPS; University of Chicago Medicine; Manager of Pharmacy

Distribution Services

Joann Huynh, PharmD; University of Chicago Medicine; Clinical Pharmacist

Cynthia Nguyen, PharmD, BCIDP; University of Chicago Medicine; Clinical Pharmacy Specialist -

Infectious Disease

Caroline Kruszecki, PharmD, BCCCP; University of Chicago Medicine; Clinical Pharmacy Specialist

- Critical Care