Research Days   GME Research Days 2019

May 13th, 11:30 AM - 1:30 PM

Optimization of Surgical Prophylaxis in Penicillin-Allergic Labeled Patients

Katie A. VanderVelde

Let us know how access to this publication benefits you

Follow this and additional works at: https://scholarlyexchange.childrensmercy.org/researchdays

Part of the Higher Education and Teaching Commons, Infectious Disease Commons, Medical Education Commons, Orthopedics Commons, Pediatrics Commons, and the Public Health Education and Promotion Commons

Quality Improvement Abstract Title: Optimization of Surgical Prophylaxis in Penicillin-Allergic Labeled Patients
Submitting/Presenting Author (must be a trainee): Kathryn VanderVelde, MD
Primary Email Address: kavandervelde@cmh.edu
Primary Mentor (one name only): Sarah Suppes, PharmD
Other authors/contributors involved in project: Kevin Latz, MD; Angie Vanderpool, MSN, APRN, RN CPNP, ONC; Jennifer Goldman, MD, MS; Amol Purandare, MD; Rana El Feghaly, MD, MSCI; Katie Gibbs, MHA, CCLS; Chris Miller, MD

Describe role of Submitting/Presenting Trainee in this project (limit 150 words):
The problem was identified by Dr. Kevin Latz, who reached out to the Antibiotic Stewardship Program requesting assistance with the evaluation of patients in need of antibiotic surgical prophylaxis with documented antibiotic allergies. Sarah Suppes, pharmacist, began clarifying drug allergies in requested orthopedic cases in November 2017 to optimize perioperative selection. The submitting trainee joined the project in the fall of 2018 and has a primary role in enhancing overall perioperative drug selection in surgical patients with further involvement of the Learning Improvement Academy QI Course for Fellows from fall 2018-2019 to implement plan-do-study-act (PDSA) cycles and improve patient care.

Problem Statement/Question, Background/Project Intent (Aim Statement), Methods (include PDSA cycles), Results, Conclusions limited to 500 words

Background: Antibiotic prophylaxis is recommended for many orthopedic surgeries, and cefazolin is the drug of choice. A penicillin (PCN)-allergy label is life-long and has been shown to result in more expensive, less effective, and broader-spectrum antibiotics being utilized for surgical prophylaxis. Approximately, 10-15% of pediatric patients are labeled as PCN-allergic nationwide. Only 1-3% of these patients have a severe PCN-allergy and should avoid cefazolin.

Problem Statement: At CMH, 6.6% of surgical patients receiving perioperative antibiotics are labeled PCN-allergic. The majority of these patients receive a cefazolin alternative unnecessarily, which has been associated with increased operating room times, adverse drug reactions (ADR), and inferior surgical outcomes. Currently, no process exists to identify PCN-allergic patients preoperatively, and CMH policy doesn't specify on when to use an appropriate alternative antibiotic. Optimizing prophylactic antibiotic choice has direct patient safety, cost, and outcome benefits.

Aim: To increase cefazolin usage from 28% to 50% for CMH non-spine orthopedic surgical patients with a non-severe PCN-allergy for whom antibiotic prophylaxis is indicated by May 31, 2019.

Methods: We implemented a provider-driven referral system, utilizing a pharmacist for our first PDSA cycle. The orthopedic nurse practitioner or surgeon would identify a patient with a PCN allergy during the pre-operative visit, then place an ADR referral in Cerner or send a secure e-mail to the pharmacist. The pharmacist reviewed the patient's ADR history and determined the true severity of the reported antibiotic allergy.

Results: PDSA #1 identified 14 patients with reported PCN allergies that would affect antibiotic selection for surgical prophylaxis. The pharmacist was able to clarify by gathering a history from the family and primary care physicians that 9 out of 14 of these patients had a low-risk PCN-allergy allowing them to safely receive cefazolin. 8 of the 9 receiving cefazolin tolerated well. 1 out of 9 reportedly had tachycardia during the infusion that self-resolved. 5 PCN-allergy histories could not be clarified and therefore they received an alternative.

Conclusions: Nine patients successfully received cefazolin surgical prophylaxis because of the provider-driven referral system that allowed time to clarify the severity and type of PCN allergy. Prior to this system, all 17 of the identified patients would have received a cefazolin alternative based on their ADR profile.

Next Steps: Hundreds of children are seen each week in CMH orthopedic clinics, therefore, we expect our referral number will continue to increase. A process map (Figure 1) outlining the referral, clinic, and same-day-surgery flow was developed and multiple opportunities for improvement were identified. Our root-cause-analysis found the multitude of hand-offs and allergy verification steps contribute to the confusion. Additionally, there is a lack of knowledge related to antibiotic choices amongst providers and families. PDSA #2 is aimed at improving the identification of penicillin-allergic patients in the orthopedic clinic prior to surgery.

Figure 1: Process Map

Opportunities for "failure" during the process:

1. Handoff between referring provider and surgical service
2. Documentation/history of allergy by clinic RN/MA
3. Identification of the ADR during the pre-operative visit
4. Notification of pharmacist by medical provider
5. Pharmacist contacting family
6. Family recall/screening
7. Pharmacist updating banner bar, family
8. History by pharmacist sufficient
9. Pharmacist contacts surgical team
10. Documentation/history of allergy by operative RN
11. Anesthesiology evaluation of patient
12. Antibiotic decision can be made by multiple providers
13. Antibiotic can be ordered by multiple providers
14. Patient allergies verified in OR
15. Patients allergies and drug selected verified at time out
16. Patient monitored by anesthesia
17. Surgery completed and patient sent to PACU