

communicate recommendations effectively to their peers, and gain further understanding of the rationale for antimicrobial stewardship. Recommendations are co-formulated with the ID Pharmacist and ID Attending Physician, and documented as an ASP Note in the electronic health record. Additionally, the residents disseminate recommendations via page and verbal communication to their peers. The purpose of this study was to evaluate the response of the primary care teams to guidance formulated and communicated by the residents while on this clinical elective.

**Methods.** Recommendations by the medicine residents participating on the ASP elective from January 2018 to July 2018 were reviewed. Response to the recommendations was categorized as accepted, not accepted, or partially accepted with alternative change. Recommendations were considered as accepted if changes were made by the primary team within 24 hours from time of the ASP note. Responses were further reviewed based on the following medical services: medicine (including hematology/oncology), surgery, and intensive care (ICU).

**Results.** A total of 124 recommendations were reviewed for response. 11 of the patients were excluded as changes either occurred prior to the documentation of the ASP note, or proposed changes did not pertain to antibiotic management. Ninety-four of the included interventions were accepted. Medicine, surgery, and ICU services accepted 84%, 82.4%, and 83.3% of recommendations, respectively. The services did not accept 5%, 11.8%, and 11.1% of recommendations, and partial acceptance with alternative changes was 11%, 5.8%, and 5.6%, respectively.

**Conclusion.** Recommendations formulated and communicated by residents participating in the ASP Elective rotation resulted in a high degree of acceptance. The acceptance rates did not differ significantly between the medical services. The addition of the ASP Elective has demonstrated a benefit to the ASP program at Olive View-UCLA Medical Center, and other medical residency training programs should consider implementation of such an elective rotation to enhance stewardship efforts and medical resident education.

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#### 1094. Safety of Administering Cefazolin vs. Other Antibiotics in Penicillin Allergic Patients with Anaphylaxis for Surgical Prophylaxis

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**Session:** 135. Antibiotic stewardship: Surgical Prophylaxis  
Friday, October 4, 2019: 12:15 PM

**Background.** Approximately 10% of patients report a history of penicillin allergy. Recent literature suggests cross-reactivity between cephalosporins and penicillins are due to side-chain similarities. Since cefazolin has a unique side-chain from other  $\beta$  lactams, it can be safely administered in penicillin-allergic patients for surgical prophylaxis. Since October 2018, our hospital updated all surgical prophylaxis preprinted orders to use cefazolin in penicillin-allergic patients, except in those with histories of cefazolin-specific allergy or delayed skin reactions (e.g., Stevens-Johnson syndrome). This study aims to retrospectively determine outcomes and safety of cefazolin as compared with other antibiotics for surgical prophylaxis in penicillin-allergic patients with histories of anaphylaxis prior to implementation of cefazolin preprinted orders.

**Methods.** All patients with reported anaphylactic reactions to penicillins prescribed surgical prophylaxis from October 9, 2017 to October 9, 2018 were included. Patients were stratified based on antibiotic received (i.e., cefazolin, clindamycin, vancomycin, other antibiotic) and a retrospective chart review was performed to assess for outcomes and safety.

**Results.** One-thousand-seventy-three prescriptions for prophylactic antibiotics were identified. Of these, 223 cases met inclusion with histories of anaphylaxis to penicillins: 72 (32%) cefazolin, 70 (31%) clindamycin, 34 (15%) vancomycin, and 47 (21%) other antibiotics. General and orthotrauma surgeries used the most cefazolin in penicillin-allergic patients, while gynecology clindamycin and thoracics vancomycin. Amongst those receiving cefazolin, no critical incidents of allergic reactions were reported and the rates of adverse events, such as pruritus, hives and rash, did not differ between any antibiotic group.

**Conclusion.** Cefazolin appears to be a safe option for surgical prophylaxis in patients with history of penicillin anaphylaxis. No differences in incidences of allergic reactions, complications or surgical delays were reported, as compared with alternate antibiotics. Further larger studies are needed to confirm our findings and determine rates of adverse events associated with the various antibiotic regimens.

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#### 1095. Prevalence and Characteristics of Self-Reported Antibiotic Allergies Across a Multi-Hospital Healthcare System

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**Session:** 135. Antibiotic stewardship: Surgical Prophylaxis  
Friday, October 4, 2019: 12:15 PM

**Background.** Collaborations between medication safety and antimicrobial stewardship programs (ASP) have not been well described despite many overlapping best practice initiatives. In partnership with medication safety, the ASP at Houston Methodist (HM) reviews patient safety events submitted by hospital staff and identified a best practice opportunity in allergy reporting practices. Our objective was to benchmark self-reported antibiotic allergies among hospitalized patients and compare the prevalence and characteristics among hospital settings.

**Methods.** We evaluated the prevalence of self-reported antibiotic allergies in the electronic medical record for adult patients admitted to HM entity including 1 flagship referral center (933-beds) and 6 community-based hospitals (1,379-beds) in January 2019. Antibiotics were grouped by class into penicillins, sulfas, cephalosporins, tetracyclines, macrolides, quinolones, and others. Point-prevalence rates were calculated using the total patient count as the denominator.

**Results.** There were 4,730 patients admitted to HM in January 2019 of which 85% ( $n = 4,029$ ) self-reported 9,186 active drug allergies. There were 2,353 (49.7%) individuals who self-reported 3,665 antibiotic allergies, of which 987 (21%) reported an allergy to  $\geq 2$  antibiotic classes. The prevalence rate for a penicillin allergy was highest at 26.1% ( $n = 1,235$ ), followed by allergy to sulfa 15.9% ( $n = 751$ ) and quinolones 7.9% ( $n = 411$ ). Antibiotic allergies were most prevalent in patients aged 70–79 (11%,  $n = 518$ ) and 60–69 (10%,  $n = 495$ ). Antibiotic allergies were higher among females (61.6%;  $n = 1,679/2,724$ ) compared with males (40.7%;  $n = 662/1,305$ ) ( $P = 0.002$ ). There was no difference in prevalence rates between community-based hospitals and the flagship institution ( $P = 0.51$ ).

**Conclusion.** We identified an antibiotic allergy point prevalence rate of 49.7% among hospitalized patients, including a 26.1% rate to penicillin, across our 7-hospital system. This analysis provides a road map to deploy system-wide efforts to improve antibiotic detailing in patients regardless of the hospital setting.

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#### 1096. Reducing Unnecessary Postoperative Antibiotic Prophylaxis

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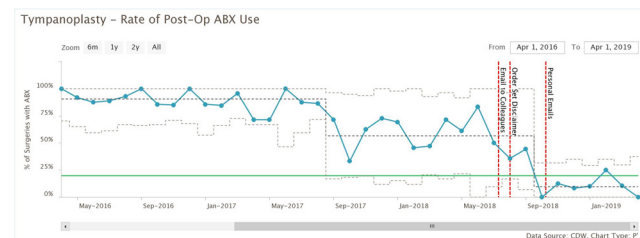
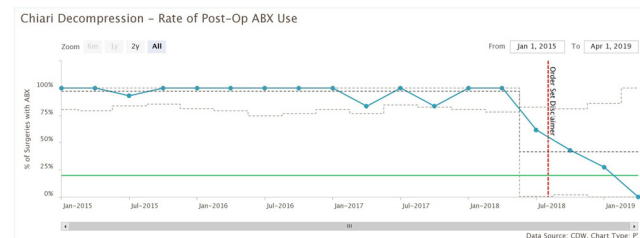
**Session:** 135. Antibiotic stewardship: Surgical Prophylaxis  
Friday, October 4, 2019: 12:15 PM

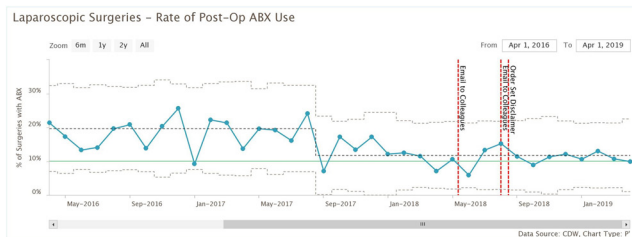
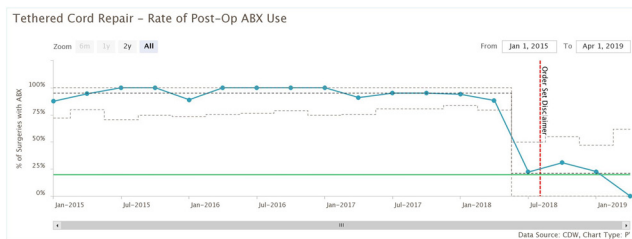
**Background.** National guidelines for the prevention of surgical site infections (SSI) recommend against antibiotic prophylaxis following wound closure for clean and clean-contaminated surgical procedures. Prolonged antibiotic prophylaxis can lead to antibiotic resistance and adverse drug events without reducing SSI rates. The objective was to reduce the rate of antibiotic prophylaxis following surgical incision closure for specified procedures in the Divisions of Neurosurgery (NRS), Otolaryngology (OTO), and General Surgery (GS) at Children's Hospital of Philadelphia (CHOP).

**Methods.** We identified all NRS, OTO, and GS procedures conducted at CHOP from July 1, 2016 to June 20, 2017. Collaborative meetings between surgical quality improvement team leads and the antimicrobial stewardship program (ASP) were convened to identify procedures most suitable for the intervention, including Chiari decompressions and tethered cord repair (NRS); tympanoplasty and tracheostomy (OTO); and laparoscopic and thoracoscopic procedures (GS). The intervention, started in March 2018, included (1) education of surgeons on perioperative prescribing guidelines, (2) order set modification, and (3) individualized monthly audit with feedback reports of inappropriate postoperative prescribing (via email copying all surgeons within the division). We monitored rates utilizing SPC charts of postoperative antibiotic use (defined as administration within 24 hours of procedure end) and evaluated SSI rates pre and post-intervention with a Poisson regression.

**Results.** Following the intervention, postoperative antibiotic use reached special cause resulting in a mean decline for laparoscopy (19.6% to 11.7%), thoracoscopy (35.6% to 17.9%), tympanoplasty (90.5% to 11.4%), tethered cord repair (95% to 25.5%), and Chiari decompression (97% to 45.9%). There was no mean shift in postoperative antibiotic use for tracheostomy (25.5%). 30-day SSI rates did not change pre- and post-intervention ( $P = 0.36$ ).

**Conclusion.** A quality improvement initiative conducted to implement national guidelines recommending against postoperative antibiotic prophylaxis showed a significant reduction in postoperative antibiotic prophylaxis without a concomitant rise in SSI rates.





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### 1097. An Antimicrobial Stewardship Intervention to Optimize Cefazolin Dosing for Surgical Prophylaxis

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**Session:** 135. Antibiotic stewardship: Surgical Prophylaxis  
Friday, October 4, 2019: 12:15 PM

**Background.** Guidelines for antimicrobial prophylaxis in surgery recommend cefazolin dose be adjusted based on patient weight. Adults weighing  $\geq 120$  kg should receive a 3 g dose, all other adult patients should receive a 2 g dose pre-operatively. To promote guideline adherence, an antimicrobial stewardship pharmacist-driven dose optimization intervention was implemented.

**Methods.** Retrospective, pre (February 1, 2017–March 31, 2017)/post (February 1, 2018–March 31, 2018) study evaluating the impact of a pharmacist-driven cefazolin dose optimization intervention at a large health system. An alert within the electronic health record notified pharmacists during order verification when cefazolin dose from a surgical prophylaxis order set did not match weight-based recommendations. All patients with cefazolin orders for surgical prophylaxis were included; pediatric and pregnant patients were excluded.

**Results.** Pre-group included 9,830 patients, post-group 10,025 patients. In both groups, the mean age was 58 years, mean weight 87 kg, and 8% of patients weighed  $\geq 120$  kg. Approximately 21% of patients were seen at the academic medical center, 8% at ambulatory surgery centers, and the remainder amongst 10 community hospitals. Most common surgical procedure types were orthopedic (26%), general surgery (21%) and urologic (10%). Primary cefazolin dose was 2 g in 89.8% vs. 88.7%, followed by 3 g 6.6% vs. 6.9% and 1 g in 3.9% vs. 4.4%, pre- and post-intervention, respectively. Overall adherence to weight-based cefazolin dosing was 92.2% pre-group and 92.4% post-group. In patients weighing  $\geq 120$  kg, adherence improved from 62% (514/827) to 71% (582/817) post-intervention,  $P < 0.001$ . Adherence was better both pre- and post-intervention when an order set was used (pre: order set 95.0% vs. no order set 85.9%,  $P < 0.001$ ; post: order set 96.4% vs. no order set 84.8%,  $P < 0.001$ ). There were no differences between surgical services or hospital locations. Investigation of guideline nonadherent cases found order sets without updated dosing recommendations and allowed for targeted education efforts.

**Conclusion.** Overall adherence to cefazolin weight-based dosing recommendations for surgical prophylaxis was high, especially with the use of order sets. Pharmacist-driven dose optimization intervention improved guideline adherence in patients weighing  $\geq 120$  kg.

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### 1098. Perioperative Antibiotic Stewardship for Interventional Radiology Cases Improves Antibiotic Decision-Making

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**Session:** 135. Antibiotic stewardship: Surgical Prophylaxis  
Friday, October 4, 2019: 12:15 PM

**Background.** Appropriate periprocedural antibiotic prophylaxis is critical to optimize in order to reduce excessive antibiotics exposure for patients and to minimize

the risk for procedure-related infection. Wrong antibiotic or excess antibiotics increase the risk for development of antimicrobial resistance, *Clostridium difficile* infection, adverse side effects. Incorrect or missed antibiotic can put the patient at risk for an infection.

**Methods.** Interventions included education of vascular and interventional radiology (IR) consult RN and physicians regarding updated institutional antimicrobial prophylaxis guidelines for vascular and IR procedures, creation of a consulting template that incorporated ongoing antibiotics. Review of recent cultures was incorporated into workflow and consult evaluation. Handoff between the IR RN and IR attendings was expanded to include a review of antimicrobials.

**Results.** All IR cases were reviewed for antibiotic administration for 3 months pre- and post-intervention. In the pre-intervention timeframe, 23 of 290 procedures (7.9%) were associated with inappropriate antibiotic administration, further delineated as 6 cases where no antibiotics were given, 7 cases of inappropriate antibiotics administered, and 10 cases where extraneous antibiotics were administered. Of the 39 total procedures where antibiotics were indicated, 17 (43.6%) were associated with antibiotic errors. In the post-intervention period, only 9 of 309 total procedures (10.3%) were associated with inappropriate antibiotic administration: missed antibiotics in 3 cases, inappropriate antibiotics in 4 cases, and unnecessary antibiotics in 2 cases. Of the 32 cases where antibiotics were indicated, only 7 (21.9%) were associated with antibiotic errors.

**Conclusion.** Incorporating current antibiotics and review of culture data in a preoperative review and template for patients who need a surgical procedure helps guide appropriate antibiotic decision-making and greatly decreases administration of unnecessary antibiotics.

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### 1099. The Correlation Between Antimicrobial Utilization and Resistance in a Medical Intensive Care Unit

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**Session:** 135. Antibiotic stewardship: Surgical Prophylaxis  
Friday, October 4, 2019: 12:15 PM

**Background.** The relationship between antimicrobial utilization and the incidence of antimicrobial-resistant pathogens can be obscured by a lack of longitudinal data. We used 9 years of antimicrobial utilization data combined with a unique metric of antimicrobial resistance to examine this relationship.

**Methods.** The medical intensive care unit (MICU) at UVMC has 22 beds. The unit's size and location did not change during the study. Since 2010, defined daily doses (DDD) in the MICU for ceftazidime, ceftriaxone, cefepime, ciprofloxacin, levofloxacin, piperacillin-tazobactam, meropenem, and vancomycin were measured. Concurrently, a database of positive cultures acquired in MICU, whether colonization or infection, was built for 6 selected organisms: *Clostridioides difficile*, methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant enterococci, ceftazidime-resistant Gram-negative bacilli, fluoroquinolone-resistant *Pseudomonas aeruginosa* (QRPA), and *Stenotrophomonas maltophilia*. The occurrence of these 6 organisms/1,000 patient-days is termed "resistance index." Data for both metrics were collected in the same way, by the same person, throughout. The relationship between these 2 measures was analyzed with simple linear regression.

**Results.** From 2010 to 2018, the use of 8 broad-spectrum antibiotics fell in a linear fashion from 12.11 to 4.39 DDD/100,000 patient-days. The resistance index for the 6 multidrug-resistant organisms in MICU also fell in parallel from 6.5 to 1.5/1,000 patient-days (figure,  $r = 0.9$ ,  $P = 0.001$ ). For the 2 quinolones specifically, use fell from 2.26 to 0.18 DDD/100,000 patient-days, while the occurrence of QRPA fell from 1.5 to 0/1,000 patient-days (figure,  $r = 0.84$ ,  $P = 0.004$ ).

**Conclusion.** These longitudinal data, collected consistently over 9 years, clearly demonstrate a significant correlation between broad-spectrum antibiotic use and the occurrence of multidrug-resistant organisms in a MICU. A steep, linear decline in antibiotic use was correlated with a parallel fall in these 6 organisms. These data demonstrate that sustained, meaningful reductions in antimicrobial utilization in a MICU can result in significant reductions in the incidence of antimicrobial-resistant pathogens.

