

reduction in both groups for piperacillin-tazobactam and meropenem while at the same time, an increased use of first and third-generation cephalosporins was observed.

**Conclusion.** While the process measures demonstrated a change in the treatment plan in 1 out of 3 patients reviewed, this did not translate into a significant change in antibiotic utilization as compared with the control groups. This may be related to the comparably small proportion of patients reviewed by ASP given that rounds occurred only once a week, and were cancelled 28 times within a one year period due to limited Medicine clinician availability. There also could have been cross-contamination between the two study arms with faculty and trainees who received the intervention while on the intervention team continuing their learned practice while on a control team. Process measures are an important means to measure the impact of ASPs, as antibiotic utilization is not a sensitive metric and may not reliably reflect improvement in antibiotic management at the individual patient level.

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#### 749. Embracing Handshake Stewardship: Utility of Collaborative, Prospective Audit and Feedback Rounds in an Intensive Care Unit at Royal University Hospital, Saskatoon, Saskatchewan

Shaqil Peermohamed, MD, FRCPC<sup>1</sup>; Justin Kosar, BSc., BSP<sup>2</sup> and Bryan Evans, MD<sup>1</sup>;  
<sup>1</sup>Department of Medicine, University of Saskatchewan, Saskatoon, SK, Canada,  
<sup>2</sup>Department of Pharmacy, Royal University Hospital, Saskatoon, SK, Canada

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**Background.** Up to 50% of antimicrobial use in hospitals has been shown to be inappropriate and is associated with the development of antimicrobial resistance, prolonged hospital stay, as well as increased rates of *Clostridium difficile* infection and patient mortality. Prospective audit and feedback is a core strategy of antimicrobial stewardship programs (ASP) with relevance in intensive care units given large volumes of antimicrobial use and higher proportion of broad-spectrum antimicrobial usage. Introduction of collaborative, prospective audit and feedback rounds as part of a novel antimicrobial stewardship program can be used to optimize antimicrobial usage and quality of patient care.

**Methods.** Collaborative, prospective audit and feedback rounds were performed three times per week in a 17-bed intensive care unit at Royal University Hospital, Saskatoon, Saskatchewan. Antimicrobial utilization was collected in monthly intervals during baseline and intervention periods and reported in daily defined doses per thousand patient days; antimicrobials were categorized on a five-point ordinal scale according to agent spectrum. ASP recommendations were recorded prospectively in themed categories. An anonymous survey of intensivists was also performed to determine their attitudes and perceptions towards ASP.

**Results.** One hundred seventy-eight patients were reviewed by ASP during a five-month intervention period. The most common recommendations included duration optimization (27.7%), de-escalation of therapy (25.9%) and discontinuation of therapy (17.0%), with an overall acceptance rate of 92.0%. While there was no significant change in overall antimicrobial usage, broad-spectrum antimicrobial usage decreased by 28.6% ( $P = 0.05$ ) and narrow-spectrum antimicrobial usage increased by 50.0% ( $P < 0.001$ ). Implementation of collaborative, prospective audit and feedback rounds was widely accepted amongst intensivists as an effective strategy to improve quality of patient care.

**Conclusion.** Collaborative, prospective audit and feedback rounds are an effective ASP strategy that encourages bi-directional exchange of information and education to optimize antimicrobial usage in an intensive care unit.

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#### 750. A Review of Antibiotic Prophylaxis for Interventional Radiology Procedures and Identification of Antimicrobial Stewardship Opportunities

Kati Shihadeh, PharmD<sup>1</sup>; Robert Tapia, CPhT<sup>2</sup>; Heather Young, MD<sup>3</sup> and Timothy C. Jenkins, MD<sup>2</sup>; <sup>1</sup>Acute Care Pharmacy, Denver Health Medical Center, Denver, Colorado, <sup>2</sup>Denver Health, Denver, Colorado, <sup>3</sup>Infectious Diseases, Denver Health Medical Center, Denver, Colorado

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**Background.** Antibiotics used for peri-procedural prophylaxis are dispensed by providers or nurses from automated dispensing machines in the interventional radiology (IR) suites. These antibiotics are administered without pharmacist review which skips a critical point in time for antimicrobial stewardship intervention. The purpose of this study was to evaluate antibiotic prophylaxis for IR procedures and identify opportunities for antimicrobial stewardship.

**Methods.** All patients who underwent an IR procedure and received antibiotic prophylaxis from April 2016 to April 2017 were identified. We performed a manual chart review to determine procedure type, antibiotic prophylaxis, concomitant systemic antibiotics, and antibiotic concordance with the Society of Interventional Radiology (SIR) guidelines.

**Results.** There were 410 IR procedures where the patient received a single prophylactic antibiotic dose; 261 were inpatient procedures. See Table 1 for procedure and antibiotic data. There were 74 patients (18%) who concomitantly received systemic antibiotics. There were 126 cases (31%) discordant with the SIR guidelines. Reasons for discordance include prophylaxis not recommended, inappropriate antibiotic selection, or patient already receiving an antibiotic with similar spectrum of coverage.

**Conclusion.** Antibiotics are frequently administered as prophylaxis for IR procedures. For many IR procedures, data to support prophylaxis is limited; however, there are opportunities for antimicrobial stewardship intervention which include optimizing

antibiotic selection and withholding prophylaxis when not indicated or when patients are receiving systemic antibiotics.

Table 1

Procedure	No. of procedures, n = 410	Routine prophylaxis recommended (y/n), antibiotic	Antibiotic doses
Tunneled line or port placement	181	No consensus	CFZ 162 VAN 8 LVX 6 CRO 5
Genitourinary	59	Yes, no consensus	CRO 43 LVX 14 CFZ 2
Gastrointestinal or abscess drainage	55	Yes, no consensus	CRO 36 LVX 10 CFZ 9
Embolization or chemoembolization	44	Yes, no consensus	CRO 22 CFZ 18 LVX 2 VAN 2
Gastrostomy tube placement	40	Yes, CFZ	CFZ 30 CRO 7 LVX 2 VAN 1
Vascular	28	No, none	CFZ 23 CRO 4 LVX 1
Biopsy	3	No, none	CFZ 2 CRO 1

CFZ, cefazolin; CRO, ceftriaxone; LVX, levofloxacin; VAN, vancomycin.

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#### 751. The Impact of a Pharmacist Driven 48-hour Antibiotic Time Out during Multi-disciplinary Rounds on Antibiotic Utilization in a Community Non-teaching Hospital

Logan Vasina, PharmD, BCPS<sup>1</sup>; Matthew Dehner, PharmD, BCPS<sup>1</sup>; Angie Wong, PharmD<sup>1</sup>; Shiva Bojak, PharmD, BCPS, BCCP<sup>1</sup>; Sharan Dhoot, PharmD<sup>1</sup>; David Shaw, MD<sup>1</sup>; Kanu Jain, MMM<sup>2</sup>; Steven Gardner, MD<sup>1</sup> and Raymond Chinn, MD, FIDSA, FSHEA<sup>1</sup>; <sup>1</sup>Sharp Memorial Hospital, San Diego, California, <sup>2</sup>Sharp HealthCare, San Diego, California

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**Background.** An antibiotic time out (ATO) at 48–72 hours is a critical component of antimicrobial stewardship programs to improve judicious antibiotic use. It is a strategy to prompt clinicians to re-evaluate antibiotic appropriateness including the need for de-escalation and discontinuation. Sharp Memorial Hospital is a tertiary community hospital with 437 beds and 48 Intensive Care Unit (ICU) beds. In May 2016, an ATO program was initiated in the ICU along with the implementation of multidisciplinary daily Medical ICU rounds 5 days a week led by an intensivist.

**Methods.** We conducted a pre- and post-intervention study to assess the impact of an ATO on utilization of targeted antibiotics (see Table 1). Pharmacists received mandatory education on the components of an ATO, a reference guidebook, and completed a baseline competency prior to ATO implementation. An on demand report was used to identify patients on antibiotic day > 2. A form prompting review of indication, culture results, de-escalation, treatment duration and proton-pump inhibitor appropriateness was completed as part of the daily workflow. Interventions were discussed during rounds or by contacting the physician. Metrics included days of therapy (DOT) per 1,000 patient days, and intervention numbers, types, and acceptance rates (AR) during two 9-month periods: pre- and post-implementation.

**Results.** There were 829 interventions during the post-implementation period with a 96% AR compared with 83 during the pre-intervention period with a 94% AR. Antibiotic discontinuations and de-escalations comprised 52% of accepted interventions. There was a significant reduction in the use of vancomycin and quinolones with no change in anti-pseudomonal  $\beta$ -lactam use (see Table 1).

Table 1. DOT per 1,000 patient days

	July 2015– March 2016	July 2016– March 2017	P-value
Vancomycin IV	122.29	103.05	0.0001
Levofloxacin, ciprofloxacin	70.07	41.50	0
Cefepime, piperacillin-tazobactam, aztreonam, meropenem	257.13	249.83	0.3626

**Conclusion.** A pharmacist driven ATO with physician support during multidisciplinary daily rounds reduced antibiotic use and could be expanded house-wide. This

strategy could serve as a model to improve antimicrobial stewardship in community, non-teaching hospitals.

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### 752. What's Next? Sustaining Hospital-Initiated Nursing Home Antimicrobial Stewardship Programs

Christina B. Felsen, MPH<sup>1</sup>; Grant Barney, BS<sup>1</sup>; Elizabeth Dodds Ashley, PharmD, MHS, FCCP, BCPS<sup>2</sup> and Ghinwa Dumyati, MD, FSHEA<sup>1</sup>; <sup>1</sup>NY Emerging Infections Program, Center for Community Health, University of Rochester Medical Center, Rochester, New York, <sup>2</sup>Duke University Medical Center, Durham, NC

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**Background.** The core elements provide a framework for nursing homes (NH) to establish antibiotic stewardship programs (ASP). We report on implementation and sustainability of ASP through a hospital-NH partnership.

**Methods.** Since 2014, a hospital-based team (HBT) assisted 9 NH in Monroe County, NY in implementing ASP. Enrollment was staggered; data are currently available from 2 NH: Facility X (470 beds, full-time medical director and Infection Preventionist (IP)) and Facility Y (288 beds, part-time medical director and IP). The HBT analyzed antibiotic data to develop initial interventions focusing on reducing urinary tract infection (UTI) treatment and quinolone use. Activities included (1) regular presentation of antibiotic days of therapy (DOT), urine culture rates and treatment appropriateness; (2) coaching on interpretation and use of data to expand interventions; (3) creation of citywide guideline for diagnosis and treatment of common infections; and (4) education of nurses, providers, and families.

**Results.** The HBT provided drug expertise and support throughout the project; however, involvement of NH staff varied. The Facility X IP assumed responsibility for the review and feedback of urine culture data and education and the medical director educated clinicians and families on treatment guidelines. Facility Y's ASP was led by the medical director and focused mainly on education of clinicians. Facility X saw significant reductions in all metrics in 2016. Facility Y significantly reduced their quinolone use and urine culture rate; however, this did not translate into a reduction in DOT for UTI (Table 1).

Table 1. Rates per 1,000 resident days

Facility	X			Y		
	2014	2016	Rate Ratio (RR) (95% Confidence Interval (CI))	2014	2016	RR (95% CI)
UTI DOT	11.6	8.8	0.77 (0.71-0.82)	13.6	12.7	0.94 (0.87-1.01)
Quinolone DOT	17.6	9.8	0.56 (0.52-0.59)	21.8	12.0	0.55 (0.51-0.59)
Urine Cultures	5.7	2.7	0.48 (0.43-0.54)	5.1	3.0	0.59 (0.51-0.68)

**Conclusion.** Hospital expertise can aid NH in implementing ASP core elements and changing prescribing practices. Ownership by NH staff, leadership support, and a multidisciplinary approach are key for NH ASP success. Both NH achieved improvement, however, Facility X has greater potential for sustainability due in part to a full-time IP champion that made data actionable and fostered collaboration between disciplines.

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### 753. Antimicrobial Stewardship Program for Broad-Spectrum Oral Antibiotic Use in a Pediatric Emergency Department: an Interrupted Time-Series Analysis

Kahoru Fukuoka, MD<sup>1,2</sup>; Junichi Suwa, PharmD, MS<sup>3</sup>; Hiroshi Higuchi, N/A<sup>3</sup>; Kotaro Araki, MD<sup>1</sup>; Takemi Murai, MD, PhD<sup>1</sup>; Mihoko Isogai, MD<sup>1</sup>; Yuta Aizawa, MD, PhD<sup>1</sup>; Takayo Shoji, MD<sup>1</sup>; Kenta Ito, MD<sup>1</sup>; Tetsuji Kaneko, MS<sup>2</sup>; Yoshihiko Morikawa, MD<sup>2</sup> and Yuho Horikoshi, MD<sup>1</sup>; <sup>1</sup>Infectious Diseases, Tokyo Metropolitan Children's Medical Center, Tokyo, Japan, <sup>2</sup>Clinical Research Support Center, Tokyo Metropolitan Children's Medical Center, Tokyo, Japan, <sup>3</sup>Pharmacy, Tokyo Metropolitan Children's Medical Center, Tokyo, Japan, <sup>4</sup>Microbiology, Tokyo Metropolitan Children's Medical Center, Tokyo, Japan

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**Background.** Oral third-generation cephalosporins are often inappropriately prescribed at outpatient clinics in Japan for mild infections by viruses and bacteria susceptible to agents with a narrower spectrum despite the absence of any recommendations for the use of these drugs as a first-line treatment in the existing guidelines. Our aim was to evaluate an antimicrobial stewardship program (ASP) targeting outpatient use of oral third-cephalosporins at an emergency department.

**Methods.** Patients visiting the emergency department (ED) at Tokyo Metropolitan Children's Medical Center in Japan between March 2010 and May 2016 were included. The first period (pre-intervention) between March 2010 and September 2010 had no ASP; the second period (intervention 1) between October 2010 and March 2013 had an ASP with consultations with an infectious diseases' physician and a no-antibiotic policy for the common cold; and the third period

(intervention 2) between April 2013 and May 2016 included an ASP with the requirement for permission to prescribe oral third-generation cephalosporins. We compared the number of prescriptions for third-generation cephalosporins prescriptions among the three periods. Antibiotic use was calculated by the number of prescriptions per 1,000 ED visits.

**Results.** In total 232,548 patients were included. Oral antibiotics were prescribed for 13,227 cases (5.7%). Boys numbered 7,440 (66%), and the median age was 54 months (IQR: 27-98 months). After interventions 1 and 2, the use of oral third-generation cephalosporins declined from 19 per 1,000 ED visits in the pre-intervention period to 6.6 per 1,000 ED visits during intervention 1 (-4.0; 95% CI -6.3 to -1.7, P = 0.001) and 0.10 per 1,000 ED visits during intervention 2 (-0.31; 95% CI -1.8 to 1.2, P = 0.675).

**Conclusion.** The ASP at our ED was effective in decreasing the prescription of oral third-generation cephalosporins.

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### 754. Don't Ask, Don't Tell: Quality of β-Lactam Allergy Assessment in Patients with Methicillin-Susceptible *Staphylococcus aureus* (MSSA) Infections at a Tertiary-Care VA Medical Center

Ukwen Akpoji, Pharm.D.<sup>1</sup>; Usha Stiefel, MD<sup>2</sup>; Federico Perez, MD<sup>3</sup>; James Fernandez, MD<sup>2</sup>; Christopher Burant, PhD<sup>4</sup> and Sharanie Sims, Pharm.D., BCPS (AQ-ID)<sup>5</sup>; <sup>1</sup>Pharmacy, Louis Stokes Cleveland Department of Veterans Affairs Medical Center, Cleveland, Ohio, <sup>2</sup>Case Western Reserve University, Cleveland, Ohio, <sup>3</sup>Louis Stokes Cleveland VA Medical Center, Cleveland, Ohio, <sup>4</sup>Louis Stokes Cleveland Department of Veterans Affairs Medical Center, Cleveland, Ohio

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**Background.** β-Lactams (BL) are optimal therapy for MSSA infections; however allergies to BL are reported frequently and may alter antibiotic selection for these infections. Limited data exist evaluating the frequency at which a new BL allergy history (AH) is taken when patients present with MSSA infections.

**Methods.** We conducted a 10-year retrospective review of patients treated for MSSA infections with report of BL allergy in the allergy section of the electronic medical record (EMR). Acquisition of new AH on initiation of empiric or definitive MSSA antimicrobial therapy was reviewed. Standard allergy characterization questions assess (1) age at BL reaction, (2) recollection of reaction, (3) timing from BL to reaction, (4) route of administration, (5) rationale for BL, (6) prior BL tolerance, (7) confounding medications, and (8) symptom resolution. A new AH was considered inappropriate if 0/8 items were addressed. Types of infection, types of allergic reaction, BL agents, adverse events and treatment failure rates were also analyzed.

**Results.** Providers seeing 142 MSSA-infected patients with EMR-based BL AH did not gather any new AH 59% of the time (83/142). Of those, 36% (30/83) of patients had an "unknown" AH in the EMR, yet no new AH was taken prior to MSSA therapy selection. When a new AH was taken, previous BL exposure (29%), recall of reaction (41%), and symptoms (83%) were the most asked questions. The likelihood of exploring past BL exposure (predictor of ability to tolerate current BL) increased from 17 to 42% when 2 vs. 3 questions were assessed, respectively. Most interestingly, new provider-verified symptoms differed from prior documentation in the allergy section of the EMR 65% of the time. The most common MSSA infections treated were skin infections (34%) and bacteremia (32%). Overall, no significant differences in treatment failures and adverse events were found between patients treated with BL and non-BL therapy, perhaps due to heterogeneity of infection types.

**Conclusion.** In ~40% of cases, new BL allergy histories were not obtained prior to initiating treatment of MSSA infections, despite our data suggesting AH reassessment uncovers new, clinically relevant information. Routine incorporation of better AH can enhance antimicrobial stewardship programs.

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### 755. Promoting Judicious Antibiotic Use: Results of an Outpatient-Based Randomized EMR-generated intervention study

Ana Stachel, MPH, CIC<sup>1</sup>; Adam Szerencsy, DO<sup>2</sup>; Claudia Pulgarin, MA MS<sup>3</sup>; Natalie Fucito, RN<sup>4</sup> and Vinh Pham, MD<sup>5</sup>; <sup>1</sup>Infection Prevention and Control, NYU Langone Medical Center, New York, New York, <sup>2</sup>Mcit Clinical Informatics, NYU Langone Health System, New York, New York, <sup>3</sup>Population Health, NYU School of Medicine, New York, New York, <sup>4</sup>NYU Langone Health System, New York, New York

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**Background.** According to the CDC, up to 50% of antibiotic (abx) prescriptions are not needed or inappropriate—often used too long or too broadly. Repercussions include multidrug resistance, adverse reactions, and increased incidence and mortality from *Clostridium difficile*. A JAMA study demonstrated that IDSA guidelines can influence abx prescribing patterns positively for genitourinary infections.

In this electronic age, interventions include providing direct access to guidelines through a Best Practice Alert (BPA) embedded within electronic medical records (EMR). This assists clinicians when recommending abx. The study's goal was to improve compliance with guidelines when treating uncomplicated UTIs at outpatient sites by using targeted education and Clinical Decision Support (CDS).

**Methods.** Outpatient sites were randomized with matching into two groups: BPA intervention group (IG) (71 sites; 4,555 visits) or control group (CG) (56 sites; 2,078 visits). The BPA listed the appropriate abx regimens according to guidelines. A second