leveraged the predictable nature of these complex associations to infer patient-specific antibiotic sensitivities. Various base-learners, including k-NN (k-nearest neighbors) and gradient boosting machine (GBM), were used to train an ensemble model for confident prediction of antimicrobial susceptibilities. Base learner selection and model performance evaluation was performed carefully using a variety of standard metrics, namely accuracy, precision, recall, F1 score, and Cohen κ. **Results:** For validating the performance on MIMIC-III database harboring deidentified clinical data of 53,423 distinct patient admissions between 2001 and 2012, in the intensive care units (ICUs) of the Beth Israel Deaconess Medical Center in Boston, Massachusetts. From ~11,000 positive cultures, we used 4 major specimen types namely urine, sputum, blood, and pus swab for evaluation of the model performance. Figure 1 shows the receiver operating characteristic (ROC) curves obtained for bloodstream infection cases upon model building and prediction on 70:30 split of the data. We received area under the curve (AUC) values of 0.88, 0.92, 0.92, and 0.94 for urine, sputum, blood, and pus swab samples, respectively. Figure 2 shows the comparative performance of our proposed method as well as some off-the-shelf classification algorithms. **Conclusions:** Highly accurate, patient-specific predictive antibiogram (PSPA) data can aid clinicians significantly in antibiotic recommendation in ICU, thereby accelerating patient recovery and curbing antimicrobial resistance.
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Poster Presentation

Patterns of Oral Antibiotic Use and Excess Duration at Hospital Discharge

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Background: Antimicrobial stewardship (AMS) interventions have predominantly involved inpatient antimicrobial therapy. However, for many hospitalized patients, most antibiotic use occurs after discharge, and unnecessarily prolonged courses of therapy are common. Patient transition from hospitalization to discharge represents an important opportunity for AMS intervention. We describe patterns of antibiotic use selection and duration of therapy (DOT) for common infections including discharge antibiotics. **Methods:** This retrospective cross-sectional analysis was derived from an IRB-approved, multihospital, quasi-experiment at a 5-hospital health system in southeastern Michigan. The study population included patients discharged from an inpatient general and specialty practice ward on oral antibiotics from November 2018 through April 2019. Patients were included with the following diagnoses: skin and soft-tissue infections (SSTIs), community-acquired pneumonia (CAP), hospital-acquired pneumonia (HAP), respiratory viral infections, acute exacerbation of chronic obstructive pulmonary disease (AECOPD), intra-abdominal infections (IAIs), and urinary tract infections (UTIs). Other diagnoses were excluded. Data were extracted from medical records including antibiotic indication, selection, and duration, as well as patient characteristics. **Results:** In total, 1,574 patients were screened and 800 patients were eligible for inclusion. The most common antibiotic indications were respiratory tract infections, with 487 (60.9%) patients. These included 165 AECOPD cases (20.6%) and 200 CAP cases (25%) with no multidrug resistant organism (MDRO) risk factors; 57 patients (7.1%) with MDRO risk factors; HAP in 7 patients (0.9%); and influenza in 58 patients (7.2%). Also, 205

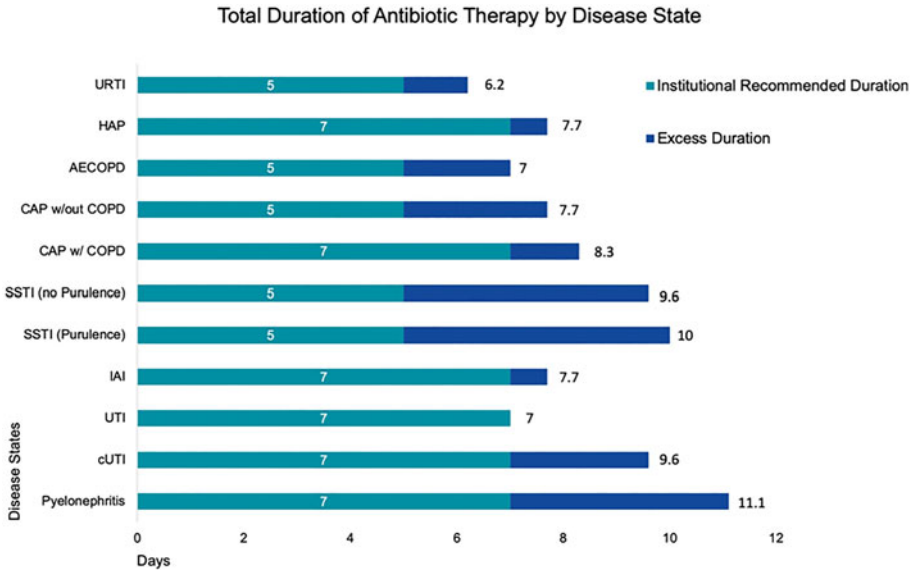

Fig. 1

(25.6%) patients were diagnosed with UTIs: 71 with cystitis (8.9%), 86 (10.8%) with complicated UTI (cUTI), and 48 (6%) with pyelonephritis. Furthermore, 125 patients (15.6%) were diagnosed with SSTI: 59 (7.4%) purulent and 66 (8.3%) nonpurulent. 31 (3.9%) patients had an IAI. The most commonly used antibiotics were cephalosporins in 536 patients (67%), azithromycin in 252 patients (31.5%), and fluroquinolones and tetracyclines in 231 patients (28.9%). Fluroquinolones were the most frequent antibiotic prescribed at discharge in 210 patients (26.3%). Figure 1 displays the average DOT relative to specific indications. The median duration of total antibiotic therapy exceeded institutional guideline recommendation for multiple conditions, including AECOPD (7 days vs recommended 5 days), CAP with COPD (8.3 vs 7 days), CAP without COPD (7.7 vs 5 days), and pyelonephritis (11 vs 7–10 days). Also, 269 (33.6%) patients received unnecessary therapy; 218 (27.3%) of these were due to excess duration. **Conclusions:** Among a cross-section of hospitalized patients, the average DOT, including after discharge, exceeded the optimal therapy for many patients. Further understanding of patterns and influences of antibiotic prescribing is necessary to design effective AMS interventions for improvement.

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Point Prevalence Surveys and Customized Interventions Are Good Strategies to Improve Antimicrobial Use: The Brazilian Experience

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Background: Although antimicrobial stewardship is recommended by Brazilian government, data regarding prescription practices in the country are scarce. **Objective:** To describe the impact of 2 point-prevalence surveys and customized interventions on antimicrobial consumption among 8 hospitals in 3 regions of Brazil. **Method:** In 2017 and 2018, 8 tertiary-care Brazilian hospitals conducted the Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS). All enrolled hospitals were provided the 2017 results. The group discussed intervention strategies by WhatsApp and e-mail. Hospitals customized interventions, including feedback to prescribers, discussion with pharmacists, and antimicrobial use data in accreditation process. A web-based program was used for data entry, validation, and reporting of details on AMC prescriptions. The Global-PPS was developed by the University of Antwerp and was funded by bioMérieux. The 1-day prevalences in 2017 and 2018 are presented as risk ratios. The main outcomes are whole antimicrobial use in hospitals and intensive care units (ICUs). Prevalence of infections caused by multidrug-resistant organisms (MDROs) were reported. **Results:** Overall, 1,716 patients were evaluated, of whom 420 (52.5%) and 429 (46.8%) were using antimicrobials in 2017 and 2018, respectively ($P = .02$). In 33 ICUs, 170 patients (61.4%) and 204 patients (56.8%) were on antimicrobials, in 2017 and 2018, respectively ($P = .20$). Significant decreases of overall use were observed for vancomycin (from 11% to 7%; $P = .01$), meropenem (from 12% to 9%; $P = .04$), and linezolid (from 1.5% to 0.33%; $P = .01$). There was no significant increase in any singular drug or class of drugs. Within ICUs, vancomycin use decreased significantly (from 19% to 11%; $P = .005$), linezolid use decreased significantly (from 2.9% to 0.3%; $P = .01$), colistin use decreased significantly (from 4.3% to 1.7%; $P = .05$), and metronidazole use decreased significantly (from 6.5% to 2.8%; $P = .03$). We observed a nonsignificant decrease of infections caused by MDROs across the whole hospital (from 8.7% to 6.6%; $P = .10$) and in the ICUs (from 15.2% to 12.3%; $P = .30$). The most frequent infectious diagnoses were pneumonia (27%), intra-abdominal sepsis (14%), skin and soft-tissue infection (SSTI) (9.4%), urinary tract infection (9.1%), and sepsis and septic shock with no identified focus (SSNIF) (7.4%). There was a significant increase in SST (from 7.6% to 11.4%; $P = .03$) and a decrease in SSNIF (from 10.7% to 4.1%; $P = .00002$). In 2018, there were significantly fewer antimicrobial prescriptions for healthcare-acquired infections (from 52.6% to 43.6%; $P = .0007$) and more antimicrobial prescriptions for community-acquired infections (from 27.4% to 34.6%; $P = .003$). We detected no difference for medical or surgical prophylaxis. **Conclusions:** Feedback of prescription practices might have had an impact on local policies of antimicrobial use, as demonstrated by an overall decrease is antimicrobial use and a decrease in the ICU.

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Profile of Nursing Homes Enrolled in the National Health Safety Network: Focus on Interfacility Communication

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Background: A robust infection prevention infrastructure is critical for creating a safe resident environment in nursing homes. The