

### 1078. Use of a Precision Antibiotic Therapy (PAT) Prediction Model to Identify Multidrug-Resistant (MDR) *Enterobacteriaceae*

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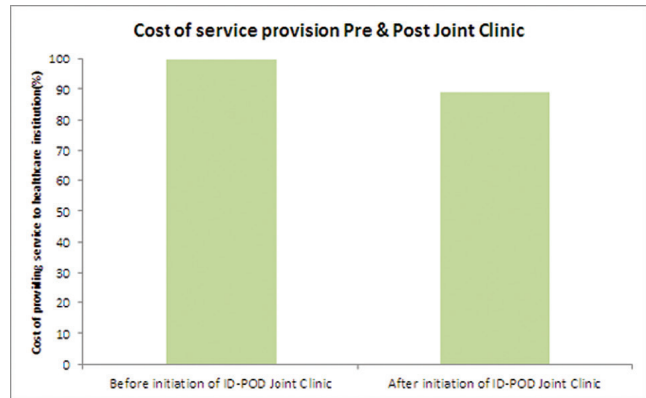
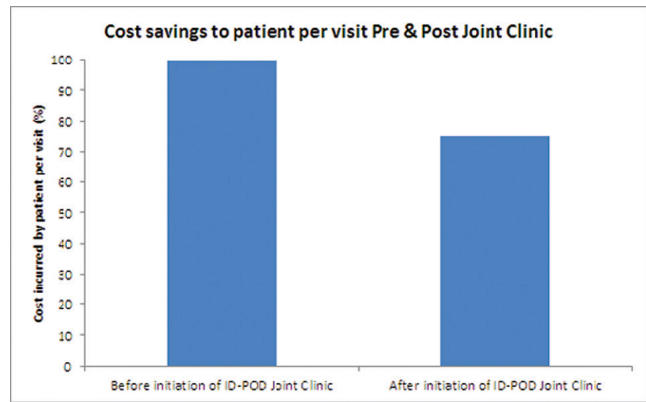
**Background.** Emergence of multidrug-resistant (MDR) *Enterobacteriaceae* complicates the selection of empiric antibiotic therapy. Software called Precision Antibiotic Therapy (PAT) (Teqqa, LLC; Jackson, WY) operationalizes a predictive model using patient factors to make real-time, personalized predictions of antibiotic susceptibility for each antibiotic, allowing prescribers to choose empiric therapy for patients at risk for resistant infections. The purpose of this study was to determine the performance of PAT software in identifying MDR *Enterobacteriaceae* bloodstream infections (BSI) as well as to determine optimal thresholds of predicted antibiotic susceptibility to choose a broader-spectrum antibiotic.

**Methods.** We conducted a retrospective cohort study including 475 unique patients with BSIs caused by *Enterobacteriaceae* from January 1, 2016 through December 31, 2016. First-line antibiotic therapy for BSI was defined as cefepime, piperacillin-tazobactam, levofloxacin, or aztreonam. Susceptibilities predicted by PAT were compared with known susceptibilities determined by routine laboratory testing. PAT thresholds for broadening antibiotics were assessed when predicted susceptibilities were 80%, 85%, 90%, and 95% using receiver-operating characteristic (ROC) curves. Performance characteristics were calculated for each threshold. Brier score calculations were then used to compare the accuracy of PAT predictions using the optimized predicted susceptibility threshold, to that of aggregate institutional susceptibility data.

**Results.** ROC curve analysis demonstrated an area under the curve of 0.82 for the 95% threshold. The sensitivity for the PAT prediction utilizing the 95% threshold was 91.7% with a specificity of 74.3%. The Brier score for the 2016 antibiogram to determine antibiotic therapy was 0.085, whereas the Brier score using PAT software was 0.071, representing a 16% improvement in accuracy.

**Conclusion.** PAT software demonstrated excellent capability to discriminate between *Enterobacteriaceae* BSIs resistant and susceptible to first-line therapy. A predicted susceptibility threshold of 95% should be used to indicate a need for escalation of empiric antibiotic therapy using PAT.

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### 1079. Joint Consultation Clinic by Infectious Diseases Specialists and Podiatry team (ID-POD) Compliments the Care of Diabetic Patients with Foot Infections by Reducing Cost and Decreasing Outpatient Clinic Visits

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**Background.** Management of diabetic foot infections (DFI) is challenging and involves multidisciplinary teams to improve outcomes (1). Appropriate wound care of patients with DFI plays an important role in successfully curing infections and promote wound healing. In Singapore, Infectious Diseases (ID) specialists help in the management of DFI by recommending appropriate antibiotics for infected wounds while wound debridement are managed by Podiatrists (POD). When patients are hospitalized multidisciplinary teams including Vascular Surgery review patients. In the outpatient setting patients have multiple appointments including ID and Endocrinology etc. The time spent and costs incurred by patients for traveling to multiple appointments is considerable. A joint ID-POD clinic was initiated to reduce the cost and inconvenience for patients.

**Methods.** A joint weekly clinic was initiated in October'16 and the data was analyzed upto May'17. Finance was involved in deriving costs. The service costs for consultations payable by patients before and after the initiation of the joint clinic were compared.

**Results.** First 6 months experience of initiating the joint ID-POD clinic is reported. 35 unique patients had a total of 88 visits. 1/3rd of the patients had more than 2 visits to the joint clinic. For each visit to the joint clinic the patient paid 25% less compared with having separate clinics. The hospital lowered the service cost for the new clinic by 11%. This was done by minimizing the time involvement of the ID physician.

**Conclusion.** Joint ID-POD clinic for managing diabetic patients with foot infections revealed several advantages. Hospital outpatient visits for each patient decreased by 50% for those requiring care of both ID and POD, without compromising care. With the consolidation of care each individual patient had a cost savings of 25% for the joint consultation. This joint clinic while making it convenient for patients has revealed significant cost savings to patients especially for those requiring multiple visits. We recommend hospitals with high prevalence of Diabetes and Diabetic foot infections to consider joint ID-POD clinics to reduce hassle and increase saving for patients.

### 1080. Opportunities in the Acute Care Setting for Infectious Diseases/Hospitalist Patient Co-Management

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**Background.** In an inpatient setting, Infectious Diseases (ID) physician care may lead to lower mortality rates and readmissions. When consultation is performed earlier in the admission, outcomes may even be better. The model of individual consultative care that relies on primary services calling specialists to give recommendations can lead to missed opportunities for optimal diagnostic testing and antimicrobial utilization. Having ID specialists involved in the care of the hospitalized patient from the time of admission creates a unique opportunity for timely intervention that could have long-ranging effects.

**Methods.** Patients admitted to four of the non-teaching hospitalist services at Geisinger Medical Center over two separate weeks included automatic ID evaluation within 24 hours of admission. The ID physician reviewed the chart and records of each admission to determine whether the patient was being treated for an infection. Any potential ID-related interventions identified upon initial evaluation were recorded by the ID physician. Patients were excluded if formal ID consultation was requested.

**Results.** A total of 85 patients were admitted during the study and 84 were included for review. Forty-five (53.6%) were admitted for a total of 48 infection-related reasons and another 17 (20.2%) were found to have incidental infection-related findings. Seven patients had requests for formal ID consultation placed (8.3%). Of the remaining primary ID diagnoses on admission, 33 were accurate by ID physician assessment (68.8%) and empiric therapy was appropriate in 29 (60.4%). Of the incidental infection-related diagnoses, 12 (70.5%) were considered accurate and empiric therapy was appropriate in 12 (70.5%). Among primary ID diagnoses, 60 diagnostic testing opportunities and 25 potential therapeutic improvements were identified (Figures).

**Conclusion.** Despite the limitations of relying on medical records alone, when done in real time, a large number of opportunities exist to optimize diagnostic testing and antimicrobial use in the acute care setting. As healthcare moves away from fee-for-service models to population health, the concept of an ID physician/hospitalist co-management model of inpatient care should be explored further.