

**Conclusion:** Weekly laboratory monitoring was associated with therapy modifications and documented ADRs in a small number of patients receiving beta-lactam agents as OPAT. This supports current guideline recommendations for laboratory monitoring, even for beta-lactam agents, which are considered relatively safe. Further investigation into the cost-effectiveness of this approach is warranted.

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### 603. Evaluating the Effects of Centers for Medicare & Medicaid Services Sepsis Core Measure in a Community Hospital

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**Session:** P-23. Clinical Practice Issues

**Background:** Sepsis is the leading cause of morbidity and mortality in hospitals, accounting for 30% of deaths in the emergency department. In 2001, Rivers et al. found that early goal-directed therapy (EGDT) led to significant mortality benefits, which ultimately prompted United States Centers for Medicare and Medicaid Services (CMS) to mandate EGDT in hospitals through its implementation of sepsis core measures. CMS core measures are intended to facilitate the broad implementation of evidence-based treatment standards, and while voluntary, non-compliance is associated with negative consequences to both quality and financial metrics for participating hospitals. However, while quality measures are implemented to ultimately improve patient care, its effects on the healthcare system can also include negative unanticipated consequences. This study seeks to characterize the effect of the CMS sepsis core measure on sepsis identification, antimicrobial utilization, and nd specific prescribing patterns.

**Methods:** This is a retrospective cohort review of 175 randomly selected patients greater than and equal to 18 years of age with admitting diagnosis of sepsis, severe sepsis, and septic shock from January 2013 to December 2018. Medical charts were reviewed for relevant data.

**Results:** Comparing ED antibiotic prescribing patterns between pre-and post-Sepsis CMS Core Measures, there was no statistical difference in total antibiotics usage and the initiation of broad antibiotics. There was a decreased time to the first antibiotic, an increase in receiving Normal Saline boluses post-Sepsis CMS Core Measures.

#### **Conclusion:**

1. No significant changes were seen in ED antibiotic prescribing behaviors with regard to volume and spectrum
2. ED time to antibiotic administration was significantly faster after the implementation of CMS Core Measures. Also, there was a significant positive shift in time to fluid bolus, fluid selection, and fluid volume
3. Significantly decreased ICU length of stay after implementation of CMS Core Measures possibly associated with above behavior changes
4. No outcomes benefits (mortality, hospital length of stay) realized after implementation of CMS Core Measures

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### 604. Factors Associated with Adverse Drug Reactions Leading to Discontinuation of Vancomycin in Outpatient Parenteral Antimicrobial Therapy

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**Session:** P-23. Clinical Practice Issues

**Background:** Over 250,000 patients receive outpatient parenteral antimicrobial therapy (OPAT) in the United States each year. Vancomycin is commonly used in OPAT but has a high rate of discontinuations due to adverse drug reactions (ADRs). Being able to predict the occurrence of these ADRs and assess their impact could improve the overall quality of OPAT services when utilizing vancomycin.

**Methods:** This was a retrospective chart review of all adult University of Utah Health (UUH) patients who received vancomycin OPAT and had planned follow-up with UUH infectious disease (ID) providers between October 25, 2018 and July 31, 2019. Patients were excluded if they were less than 18 years of age, pregnant, did not have planned follow up with UUH ID physicians, or were on any form of renal replacement therapy. The primary outcome assessed was discontinuation of vancomycin due to ADR, as documented by the ID provider. Type of ADR leading to discontinuation and 30-day unplanned readmission were also assessed.

**Results:** One hundred fifty-eight patients met inclusion criteria (n=158). The mean age of patients was 55 years with a median Charlson comorbidity score of 3. Most patients utilized a non-UUH infusion service (116, 73% vs 42, 27%) and utilized vancomycin as their sole antibiotic (83, 53%). The majority of patients were being treated for orthopedic infections (78, 49%). Twenty-eight patients discontinued vancomycin OPAT due to an ADR (18%). The most common ADR leading to discontinuation was acute kidney injury (10, 36%). Variables associated with ADRs leading to discontinuation included utilization of UUH home infusion services (54% vs 21%,  $P < 0.001$ ) and initial vancomycin plasma concentrations obtained less than 7 days after discharge (92% vs 71%,  $P < 0.001$ ). The overall 30 day readmission rate was 10% and the rate among patients who experienced an ADR leading to discontinuation was higher than those who did not (25% vs 8%,  $P < 0.001$ ).

**Conclusion:** The overall rate of discontinuation of vancomycin OPAT due to ADR in the UUH population is similar to what has been described in previous literature. The higher rate of unplanned readmission in the population of patients who experienced ADRs warrants further study. The results of this study will be utilized for future quality improvement interventions at our institution.

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### 605. Factors Underlying Antifungal Price Trends in the United States

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**Background:** Antifungal drugs are used to treat conditions ranging from topical dermatologic disease to life-threatening systemic infections. Given their widespread use, understanding factors that affect antifungal pricing will help clinical and policy-related decisions. The purpose of this study was to identify factors associated with price trends among antifungal drugs.

**Methods:** Antifungal drug products available in the United States were identified using the Food and Drug Administration (FDA) Orange Book database. Multiple characteristics related to how a drug may be priced were identified using a variety of sources, including the number of FDA indications (IBM Micromedex), quantity of professional guideline recommendations and use as prophylaxis (Infectious Diseases Society of America guidelines for treatment of fungal infections), and route of administration. Wholesale acquisition cost per unit was identified for each drug from the first date listed through 2019 using the Medi-Span and First Databank databases. Statistical analysis was performed using R (version 3.6.3). Price trajectories over time observed on 138 antifungal drugs were clustered into three groups by the shape of their trajectory using the R package KmlShape (Genolini 2016). Clusters were characterized by stable prices, moderate price increases, and extreme price increases over time. Relationships between cluster membership and drug characteristics were assessed using Fisher's Exact Test and Likelihood Ratio Tests. All tests were conducted at the 5% level of significance.

**Results:** The majority (n=116) of antifungal drugs were characterized by moderate price increase and an additional n=6 exhibited extreme price increases over time. Few (n=16) were stable. Associations were identified between drug characteristics and extreme price increase cluster membership. These included a fewer number of FDA indications (p=0.0028) and atypical route of administration (p=0.0025). No association was identified between cluster membership and quantity of guideline recommendations, or use as prophylaxis.

**Conclusion:** Nearly 90% of antifungal drugs exhibited at least moderate price increases over time. Extreme price increases were associated with a fewer number of FDA indications and atypical route of administration.

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### 606. HIV Homecare: Understanding its Impact for Lost-to-Follow-Up Populations

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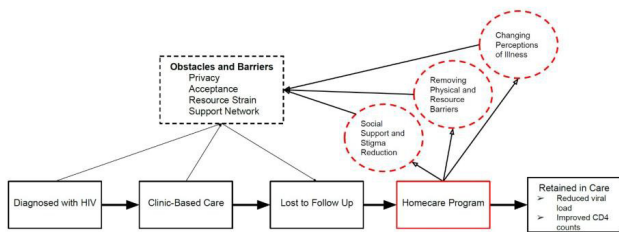
**Session:** P-23. Clinical Practice Issues

**Background:** Maintaining people living with HIV (PLWH) in clinical care is a global priority. In the metro-Detroit area of Michigan, approximately 30% of PLWH are out of care. To re-engage lost-to-follow-up patients, the Wayne State University Physician Group – Infectious Disease clinic launched an innovative Homecare program in 2017. In addition to home healthcare delivery, the program included links to community resources and quarterly community meetings. In the first year of Homecare, 28 of 34 participants became virally suppressed at least once. We aimed to understand reasons why people who left clinic-based treatment were able to become virally suppressed in this program. We included data from PLWH and their healthcare workers.

**Methods:** We used a mixed-methods design, including (1) semi-structured interviews with PLWH and healthcare workers, and (2) a validated Likert scale questionnaire rating illness perception before and after Homecare. Data were collected from 15 PLWH in metro-Detroit and two healthcare workers responsible for program delivery. Semi-structured interviews focused on obstacles to clinic-based care, support networks, and illness perceptions. Interview data were transcribed and analyzed using a grounded theory approach. A fully coded analysis was used to create a conceptual framework of factors contributing to Homecare's success. Means in eight categories of the brief illness perception questionnaire (BIPQ) were compared using paired T-tests.

**Results:** The Homecare program offered (1) social support and stigma reduction through strong relationships with healthcare workers; (2) removal of physical and resource barriers such as transportation; and (3) positive changes in illness perceptions. PLWH worked towards functional coping strategies, including improvements in emotional regulation, acceptance of their diagnosis, and more positive perspectives of control. BIPQ showed significant changes in six domains before and after Homecare.

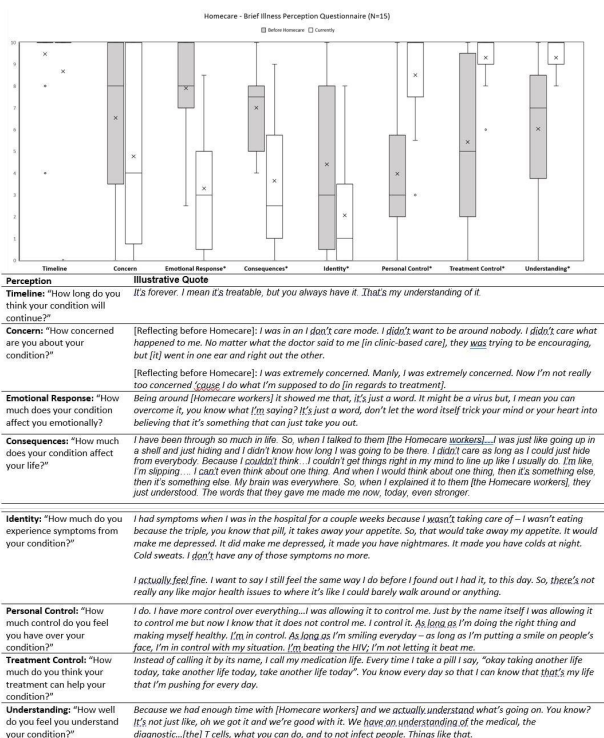
## Homecare Conceptual Framework



### General

Characteristics	Units	Homecare Participants (N=15)
<b>General</b>		
Age	Median (IQR)	42.3 (31-52)
Male	n (%)	12 (80)
Number of Years Living with HIV	Median (IQR)	10 (6-18)
Number of Days in Homecare	Median (IQR)	631 (460-702)
<b>Physical Barriers to Clinic-Based Care</b>		
Lack of transportation	n (%)	11 (73)
Work Obligations	n (%)	6 (40)
Childcare responsibilities	n (%)	2 (13)

### Joint Display: Brief Illness Perception Questionnaire



**Conclusion:** Homecare offers an innovative system for successfully re-engaging and maintaining lost-to-follow-up PLWH in care. These findings have implications for HIV control efforts and could inform the development of future programs for difficult to reach populations.

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## 607. Identifying Intervention Opportunities to Prevent Readmissions during OPAT

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**Session:** P-23. Clinical Practice Issues

**Background:** Patients receiving outpatient parenteral antimicrobial therapy (OPAT) experience high rates of unplanned readmissions. To inform interventions that may reduce risk of unplanned readmissions during OPAT, we examined the frequency and reasons for readmission in a large cohort of OPAT patients.

**Methods:** We analyzed data on all patients enrolled in UNC's OPAT program from February 2015-February 2020. Patients were evaluated by an infectious diseases (ID) physician prior to OPAT enrollment, discharged with >14 remaining days of prescribed therapy, and received care coordination and systematic monitoring by an ID pharmacist. We abstracted EHR data into a REDCap database to ascertain information on each patient's OPAT course and readmission details: length of stay, primary ICD-9-CM/ICD-10-CM diagnosis code associated with readmission, and reason for readmission from clinical notes. Diagnosis codes and notes were adjudicated and summarized by a multidisciplinary team.

**Results:** Among 1,165 OPAT courses, 19% resulted in at least one readmission during therapy, lasting for a median length of stay of 5 days. Among those patients who were readmitted during OPAT, the median time from OPAT start to readmission was 17 days (interquartile range, IQR: 8-29 days). 66% of readmissions preceded the scheduled follow-up appointment during OPAT (median time to scheduled follow-up was 27 days, IQR: 15-35 days). 55% of readmissions were unrelated to OPAT diagnosis. Based on ICD-9-CM/ICD-10-CM code classifications, the most common infectious diseases-related reasons for readmission were worsening OPAT infection (18%), OPAT-related adverse drug reaction (12%), and new infection (11%).

**Conclusion:** One-fifth of OPAT courses resulted in readmission during therapy. Half of readmissions were associated with OPAT or other infection, and half were for other reasons. Earlier post-discharge follow-up by a multidisciplinary team (including primary care providers, case management, and OPAT) might prevent infection-related readmissions for OPAT patients. Future work should also address the need for enhanced care coordination with non-infectious disease providers to manage OPAT patients.

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## 608. Impact of Implementing Pharmacist Review and Monitoring of Outpatient Parenteral Antimicrobial Therapy

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**Session:** P-23. Clinical Practice Issues

**Background:** Given current efforts to increase the safety of outpatient parenteral antimicrobial therapy (OPAT) programs nationwide, this project sought to determine whether pharmacist managed OPAT review and monitoring improves adherence to standard of care laboratory monitoring recommendations.

**Methods:** A single-center, retrospective review of patients > 18 years of age who received OPAT from University Health System was conducted. Patients who received OPAT between October 2018 and December 2018 served as the historical control group. After a pharmacist transitions of care program was implemented, patients who received OPAT between October 2019 and December 2019 were included in the intervention group. Patients were excluded if they received less than 7 days of OPAT, completed therapy prior to discharge, or died while inpatient. The primary endpoint was adherence to laboratory monitoring recommendations > 75% of the duration of planned OPAT. Only patients followed by the OPAT clinic were included in this analysis. Recommendations provided in the 2018 Infectious Diseases Society of America OPAT guidelines were used to define appropriate lab monitoring. Secondary endpoints included 30-day readmissions.

**Results:** A total of 409 patients were included in this study: 198 patients in the pre-implementation group and 211 patients in the post-implementation group. In patients with OPAT clinic follow-up, the post-implementation group was significantly more likely to receive monitoring adherent to standard of care laboratory monitoring recommendations > 75% of the duration of planned OPAT: 42/161 (26.1%) vs. 98/176 (55.7%), OR 3.6 (95% CI 2.2-5.6, p = 0.0001). There was no difference in 30-day readmission rates between groups in the overall population. Patients in the post-implementation group with OPAT clinic follow up had lower 30-day infectious disease-attributed readmissions: 18/161 (11.2%) vs. 14/176 (8.0%), p = 0.31.

**Conclusion:** Implementation of a transitions of care pharmacist significantly improved adherence to laboratory monitoring recommendations for patients receiving OPAT and numerically reduced 30-day infectious disease-attributed readmissions.

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## 609. Implementation and Post-implementation Analysis of a Pilot Program for Inpatient Review of Outpatient Parenteral Antimicrobial Therapy Prior to Discharge

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**Background:** The Infectious Diseases Society of America OPAT (outpatient parenteral antimicrobial therapy) guidelines state that effective OPAT programs require a multidisciplinary team<sup>1</sup>. Currently within the health system, there is no formal OPAT program in place, and OPAT prescribing is not limited to any specialty. This project aimed to pilot a pharmacist-driven program across five hospitals.

**Methods:** Adult patients with OPAT ordered between February 1 and May 1, 2020 were included. Patients were excluded if the OPAT was prescribed by infectious diseases (ID) providers or if patients were on OPAT prior to hospital admission. An alert was generated in the electronic health record (EHR) when an order for an