

Figure 1: Proportion of patients receiving early antibiotics by SIRS score

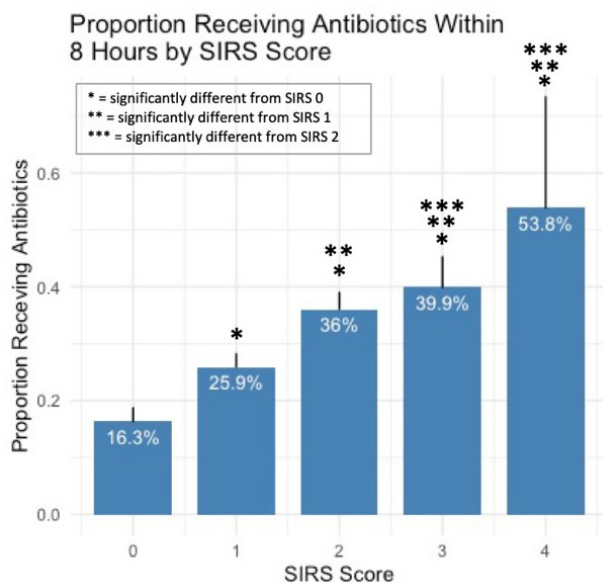


Table 1: SIRS as a predictor of bacteremia

Parameter	OR ± SE	P-value
As individual criteria (AUC=0.57):		
Fever	1.8 ± 0.29	0.01
Tachycardia	1.4 ± 0.22	0.03
Tachypnea	1.0 ± 0.15	0.77
Leukocytosis	1.2 ± 0.17	0.12
As composite score (AUC=0.55):		
SIRS positive (≥2)	1.5 ± 0.21	0.003

Table 2: Best predictive model of bacteremia

Parameter	OR ± SE	P-value
Temperature (continuous)	1.1 ± 0.06	0.01
Heart Rate (continuous)	1.01 ± 0.003	0.02
Systolic Blood Pressure (continuous)	1.0 ± 0.004	0.68
Diastolic Blood Pressure (continuous)	0.99 ± 0.007	0.09
Respiratory rate (continuous)	1.0 ± 0.01	0.49
Leukopenia	1.1 ± 0.33	0.80
Leukocytosis	0.88 ± 0.169	0.52
Severe Neutropenia	1.6 ± 0.82	0.37
Moderate Neutropenia	1.2 ± 0.47	0.76
Neutrophilia (ANC >8.0)	1.7 ± 0.33	0.008
Age	1.0 ± 0.01	0.86

AUC=0.61

Conclusion: Clinicians still use SIRS criteria to determine the need for eAnb. However, SIRS criteria are poor predictors of bacteremia in solid tumor pts, who frequently manifest them due to complications of cancer or cancer-directed therapy rather than infection. Furthermore, patients who are SIRS negative may be bacteremic. More reliable models are needed to guide judicious use of Anb in the solid tumor population.

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199. Evaluating long-term care pharmacy dispense data to monitor antibiotic use in U.S. nursing homes

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Session: P-7. Antimicrobial Stewardship: Special Populations

Background: Automated reporting of antibiotic use (AU) in nursing homes (NHs) may help to identify opportunities to improve antibiotic prescribing practices and inform implementation of stewardship activities. The majority of U.S. NHs contract with long-term care (LTC) pharmacies to dispense prescriptions and provide medication monitoring and reviews. We investigated the feasibility of leveraging LTC pharmacy electronic dispensing data to describe AU in NHs.

Methods: We analyzed all NH antibiotic dispenses and monthly resident-days in 2017 reported by a large LTC pharmacy. The dispense-level data included facility and resident identifiers, antibiotic class and agent, dispense date and days of therapy (DOT) dispensed. We identified NH antibiotic courses, inclusive of both antibiotic starts and continuations from hospital-initiated courses, by collapsing dispenses of the same drug to the same resident if the subsequent dispense was within three days of the preceding

end date. The course duration was the sum of DOT for all dispenses in the course. The AU rate was reported as DOT and courses per 1,000 resident-days.

Results: AU was described in 326,713 residents admitted to 1,348 NHs (9% of U.S. NHs), covering 38.1 million resident-days. There were 576,228 dispenses for a total of 3.3 million antibiotic DOT at a rate of 86 DOT/1,000 resident-days. After collapsing dispenses, 324,306 antibiotic courses were defined at a rate of 9 courses/1,000 resident-days. During the year, 45% of residents received an antibiotic. The most frequently prescribed classes by DOT and courses were cephalosporins, penicillins, urinary anti-infectives and quinolones (Fig. 1). The top agents by DOT were levofloxacin (12%), sulfamethoxazole/trimethoprim (12%) and cephalexin (11%). Most course durations were 1–7 days (54%) or 8–14 days (35%) (Fig. 2). Long-term antibiotic courses (> 30 days) contributed to 5% of courses and 30% of overall DOT. The mean duration per course was 7.5 days when courses > 30 days were excluded.

Figure 1. Distribution of antibiotic courses and days of therapy by antibiotic class for 324,306 antibiotic courses and 3.3 million days of antibiotic therapy dispensed to 1,348 nursing homes from a long-term care pharmacy in 2017

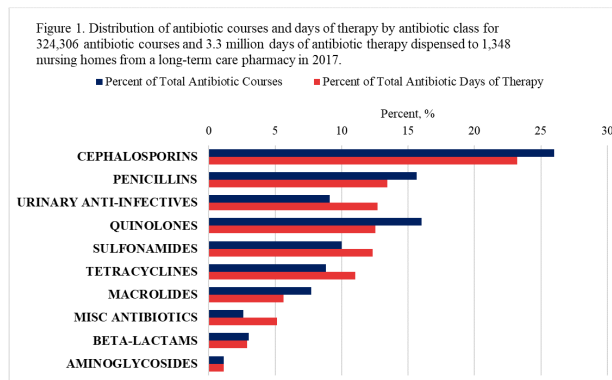
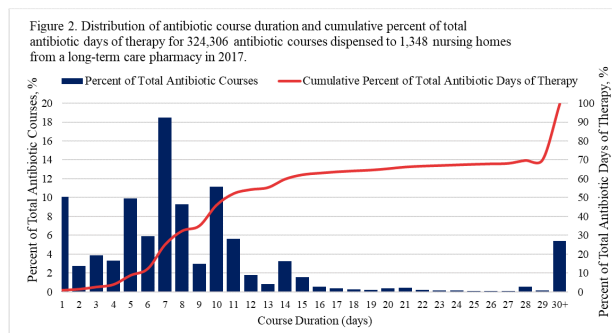


Figure 2. Distribution of antibiotic course duration and cumulative percent of total antibiotic days of therapy for 324,306 antibiotic courses dispensed to 1,348 nursing homes from a long-term care pharmacy in 2017



Conclusion: LTC pharmacy dispenses may be an accessible data source to report NH AU rates and prescribing patterns by antibiotic class and agent. Further evaluation of data sources for facility- and national-level AU reporting in NHs is needed to support stewardship implementation.

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200. Frequency and Characteristics of Patients Switched from Intravenous to Oral Antibiotic Therapy on Discharge to Nursing Homes

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Session: P-7. Antimicrobial Stewardship: Special Populations

Background: Determining eligibility for intravenous (IV) to oral (PO) antibiotic conversion is challenging in patients transitioning to nursing homes (NHs) due to atypical infection presentation, increased diagnostic uncertainty, and multimorbidity. Understanding current practice and patient characteristics influencing prescriber behavior is necessary to provide effective antibiotic stewardship in this vulnerable population. We compared the frequency and characteristics of patients discharged with IV antibiotics to those switched from IV to PO therapy.

Methods: This was a retrospective cohort study of Oregon Health & Science University Hospital patients treated with IV antibiotics and discharged to a NH from 1/1/2016-12/31/2018. We focused on IV to PO antibiotic switch within 48 hours of

discharge. Using a repository of electronic health record data, we collected patient demographic, diagnosis, length of stay, and treatment duration data.

Results: Among 2,410 patients discharged to a NH on antibiotics, 1,483 (61.5%) received an IV antibiotic within 48 hours of discharge. IV to PO switch occurred in 46.7% of patients prior to discharge, and these patients had fewer baseline comorbidities (Table 1). Of those continuing IV antibiotics, 96.1% were prescribed a different PO medication at discharge indicating potential to take PO medications. Cephalosporins (45%) and penicillins (22%) were the most commonly prescribed IV antibiotics, with IV to PO conversion rates of 26% and 46%, respectively. The median (interquartile range) outpatient duration of therapy was 21 (12–33) days for IV antibiotics and 7 (4–10) days for PO antibiotics. Osteomyelitis diagnosis was more frequent among IV therapy patients; pneumonia and urinary tract infections were more frequent in IV to PO switch patients. IV to PO switch patients were less likely to experience a hospital stay > 7 days or receive an infectious disease consult ($p < 0.001$).

Table 1. Comparison of Patient and Treatment Characteristics among IV and Oral Antibiotic Prescriptions on Discharge

Variable	Discharge Antibiotic Route		P Value
	IV (n=791)	Oral (n=692)	
Patient Characteristics			
Charlson Comorbidity Index; Median (IQR)	2 (0-3)	2 (1-3)	0.07
Cancer	119 (15%)	141 (20%)	0.007
Cerebrovascular disease	115 (15%)	121 (18%)	0.12
Dementia	36 (5%)	85 (12%)	<0.001
COPD	191 (24%)	181 (26%)	0.37
Liver disease	137 (17%)	83 (12%)	0.004
Kidney disease	154 (19%)	150 (22%)	0.29
Treatment-related Characteristics			
Length of Hospital Stay > 7 days	576 (73%)	217 (32%)	<0.001
ID consult order	267 (34%)	46 (7%)	<0.001
Surgical DRG	542 (69%)	234 (34%)	<0.001
Prevalent Diagnoses			
Pneumonia	40 (5%)	90 (13%)	<0.001
Urinary tract infection	16 (2%)	77 (11%)	<0.001
Osteomyelitis	111 (14%)	28 (4%)	<0.001

Conclusion: The proportion of patients discharged to a NH on IV antibiotics remains high, even among patients able to tolerate PO medication. Continuing IV therapy was associated with longer treatment durations, hospital stays, and broad spectrum regimens, while patients with IV to PO switch had a higher comorbidity burden at baseline.

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201. Healthcare utilization outcomes of patients prescribed fluoroquinolones on discharge from the hospital to nursing homes

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Session: P-7. Antimicrobial Stewardship: Special Populations

Background: Fluoroquinolones (FQs) are frequently prescribed in nursing homes (NHs) despite concerns regarding broad spectrum antibiotic selective pressure, increased risk of *Clostridioides difficile* infection, and other adverse events. NH antibiotics are also frequently initiated in hospitals prior to NH admission. We quantified the frequency and outcomes of patients prescribed FQs on discharge from the hospital to NHs.

Methods: This was a retrospective cohort study of adult (age ≥ 18 years) inpatients prescribed a FQ on discharge from Oregon Health & Science University Hospital (OHSU) to a NH between 1/1/2016 and 12/31/2018. Study data were collected from a repository of electronic health record data. The outcome of interest was a composite of 30-day hospital readmission or emergency department (ED) visit to OHSU. Associations were quantified using odds ratios (ORs) and 95% confidence intervals (CIs).

Results: Among 9,546 patients discharged to a NH, 2,410 (25%) were prescribed at least one antibiotic and 423 (17.6%) were prescribed a FQ. Of these patients, 36.9% were age ≤ 65, 53% were male, 11.6% received a specialty infectious diseases consultation, 34.8% had a surgical diagnosis, and 49.7% had a hospital length of stay > 7 days. The most prevalent comorbidities were cancer (30.5%), chronic obstructive pulmonary disease (29.6%), and renal disease (26%). The most prevalent FQs prescribed were ciprofloxacin (56.7%), levofloxacin (40.2%), and moxifloxacin (3.1%). Duration of NH therapy > 7 days occurred in 37.6% of patients. The most common infectious diagnoses were bloodstream infection and endocarditis (39%), pneumonia (17%), and urinary tract infection (14.2%). Of patients prescribed a FQ, 276 (65.3%) had an ED visit or hospital admission to index facility within 30 days of discharge. Patients who were ≤ 65 years old (OR 2.3, 95% CI 1.4–3.5), male (OR 1.6, 95% CI 1.1–2.5), had comorbid renal disease (OR 1.8, 95% CI 1.1–2.9), or osteomyelitis as infectious diagnosis (OR 2.4, 95% CI 1.0–5.7) were more likely to have a 30-day ED visit or hospital admission.

Conclusion: Patients prescribed FQs on discharge to NHs frequently returned to the hospital for an ED visit or inpatient admission within 30 days of discharge.

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202. Implementation of an Outpatient Parenteral Antimicrobial Therapy (OPAT) Collaborative for Patients with Staphylococcus aureus or Gram-Negative Bacilli Bacteremia Requiring Home Infusion: The PANTHIR Program

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Session: P-7. Antimicrobial Stewardship: Special Populations

Background: *Staphylococcus aureus* (SA) and Gram-negative bacilli (GNB) bacteremia often require prolonged treatment courses due to high morbidity and mortality risk. Outpatient parenteral antibiotic therapy (OPAT) has emerged as a preferred delivery method. Few data have been published regarding the follow-up and adverse event rates among OPAT patients. We describe outcomes in patients with SA or GNB bacteremia transitioning from an academic medical center to home infusion, prompting the implementation of the Parenteral Antimicrobial Therapy Transitions to Home Infusion Review (PANTHIR) program.

Methods: A retrospective chart review of adult patients with SA or GNB bacteremia at the University of Minnesota Medical Center requiring home infusion represent a 26-month period. Baseline outcomes, including 30-day hospital readmissions and adverse drug events (ADEs), were calculated. The PANTHIR program was launched as an interdisciplinary collaborative with an infectious diseases (ID) provider, pharmacists, and home infusion specialists. Core program elements include inpatient identification, ID pharmacist review, care plan documentation and communication, and OPAT program measures.

Results: The retrospective cohort included 69 patients. 23.2% experienced a hospitalization within 30 days of discharge and 26.1% experienced an ADE (Table 1). The mean duration of therapy was 22 days. No patient received aminoglycosides and one required vancomycin. A primary goal was to improve the continuity of care for potentially life-threatening bacteremia during the vulnerable inpatient to outpatient transition. Electronic health record functionality allowed for creation of an OPAT navigator for infectious diseases (ID) pharmacist transition plan documentation, electronic communication with designated provider and home infusion pharmacist, and retrieval of focal data points for ongoing program evaluation. 28 patients have been enrolled in the PANTHIR program with outcomes data collection underway.

Table 1. Retrospective data among University of Minnesota Medical Center patients hospitalized with SA or GNB bacteremia requiring home infusion on discharge.

30-day unplanned hospitalizations (n=69)		30-day ED visits (n=69)		Total (%) ADE (n=69)	Mild (%) ADE (n=69)	Moderate (%) ADE (n=69)	Severe (%) ADE (n=69)
Total (%)	OPAT-related (%)	Total (%)	OPAT-related (%)				
16 (23)	4 (5.8)	21 (30)	8 (12)	18 (26)	8 (12)	8 (12)	2 (3)

Conclusion: Hospital readmission rates and ADEs are frequent among patients with SA or GNB bacteremia requiring OPAT via home infusion. An ID pharmacist-directed program in collaboration with an ID provider is feasible for OPAT transitions and may serve as a roadmap for other institutions.

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203. Opportunities for Antimicrobial Stewardship in Febrile Neutropenia

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Session: P-7. Antimicrobial Stewardship: Special Populations

Background: Emerging evidence suggests antibiotics may be safely discontinued before neutropenia resolves in patients without identifiable infection. We estimated the volume of encounters and antibiotic use for future stewardship interventions shortening FN treatment duration.

Methods: This retrospective cohort study used electronic health records from inpatient encounters on the hematologic malignancies ward at Duke University Hospital from 5/21/2018 to 12/31/2019 where patients received at least one antibiotic for an indication of "neutropenic fever." The primary outcome was length of therapy (LOT) of broad Gram-negative (GN) agents, including cefepime, piperacillin-tazobactam, meropenem, or aztreonam. FN LOT was counted by calendar day, starting with the first day of administration of a broad GN agent and ending with antibiotic discontinuation or hospital discharge. Encounters with at least one positive blood culture (positive cohort) were compared to those with no positive blood cultures (negative cohort) to assess if culture positivity was associated with differences in FN LOT. We included the first FN LOT from each encounter in the negative cohort and the FN LOT associated with the first positive blood culture in the positive cohort. We used descriptive statistics and a Gaussian density function to calculate the percent of encounters exceeding FN LOT of 14 days and the percent of broad GN agent days.

Results: We evaluated 15,678 GN antibiotic administrations from 471 unique FN encounters. Blood culture results were available for 443 encounters— 122 (27.5%) in