598. Correlation of International Classification of Diseases (ICD) codes to initial provider-selected antibiotic indications in hospitalized adult patients within the Duke Antimicrobial Stewardship Outreach Network (DASON)

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Background: Provider-selected antibiotic indications are a measure to help track antibiotic use, and facilitate stewardship activities. International Classification of Diseases 10th version (ICD-10) codes have been widely used in the medical field for a variety of purposes, including billing for reimbursement, disease epidemiology, administration, and research. The ability of these codes to accurately describe the true disease diagnosis has been questioned. The purpose of this study is to provide insight into correlation between ICD-10 codes and provider-selected antibiotic indications recorded upon antibiotic order entry.

Methods: This multicenter, retrospective cohort study was performed using data from 17 hospitals in the DASON network. Antibiotic orders during calendar year 2019 for inpatients ≥ 18 years of age that included an indication for use were extracted from the DASON antimicrobial stewardship assessment portal. Orders with the antibiotic indication category of prophylaxis (medical or surgical) and other were excluded. The primary outcome was agreement between antibiotic indication and any discharge ICD-10 code from the same hospital admission. Secondary analyses stratified results by antibiotic and indication. Descriptive statistics were used to describe outcomes.

Results: A total of 246,999 unique antibiotic orders were identified in 180,109 admissions. After removing prophylaxis (n=75,124) and other (n=36,359), 135,516 orders were included. Most orders did not have an ICD-10 code matching the prescriber indication (92,237 [68%]). All indications except HEENT (18% mismatch) and genitourinary infections (46% mismatch) lacked a corresponding diagnosis code in more than 50% of cases (Table 1). Urinary tract infections (93%), bloodstream infections (90%), and central nervous system infections (80%) showed the highest rates of mismatch among indications (Table 1).

Table 1: Correlation of ICD-10 Codes to Provider Selected Indications

Clinical Indication	N	Match - n (%)	Mismatch - n (%)
Pneumonia	32648	14023 (43.0)	18625 (57.0)
Skin or Soft Tissue Infection	30878	12303 (39.8)	18575 (60.2)
Urinary Tract Infection	27349	1939 (7.1)	25410 (93.9)
Intra-abdominal Infection	15681	6579 (42.0)	9102 (58.0)
Blood Infection	9226	877 (9.5)	8349 (90.5)
Sepsis	8179	3085 (37.7)	5094 (62.3)
Bone or Joint Infection	5280	1530 (29.0)	3750 (71.0)
Clostridium difficile	1805	847 (47.0)	958 (53.0)
HEENT	1531	1249 (81.6)	282 (18.4)
Neutropenic Fever	1247	402 (32.2)	845 (68.8)
CNS infection	1066	209 (19.6)	857 (80.4)
Cardiovascular	371	130 (35.0)	241 (65.0)
Tuberculosis/NTM	183	67 (36.6)	116 (63.4)
Genitourinary	72	39 (54.2)	33 (45.8)

Conclusion: We observed a high rate of mismatch between antibiotic indications and ICD-10 codes. Provider-selected antibiotic indications at the time of empiric treatment may be more reflective of diagnostic differential but is a poor indicator of ultimate patient diagnosis.

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599. Dalbavancin Utilization in Rural Healthcare Setting: A Single Center Three Years' Experience

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Background: Dalbavancin is a second generation lipoglycopeptide, approved by the Food and Drug Administration (FDA) for treatment of acute bacterial skin and skin structure infections (ABSSSI). The weekly dosing of Dalbavancin has encouraged its off-label use to treat other severe infections, especially in patients deemed to be poor candidates for intravenous antimicrobial therapy through a long-term intravenous catheter.

Methods: Single center retrospective chart review of 33 patients who were planned to receive Dalbavancin between March 2015 and March 2019 at a rural medical center in New Hampshire.

We reviewed demographics, indications, microbiological, intravenous drug use status and compliance data.

Results: Dalbavancin therapy was planned for 25/33 patients (75.75%) specifically due to safety concerns around use of a peripherally inserted central catheter (PICC) in Persons Who Inject Drugs (PWID). All 25 patients (75.75%) were actively injecting at the time of the infection with 16/33 patients (48.48%) receiving or newly enrolled in medication assisted treatment. The planned duration of therapy was not completed in 15/33 patients (45.45%) and all were PWID. 11/33 patients (33.3%) were lost to follow up. Additionally, 6 patients experienced insurance coverage issues or difficulty having peripheral access placed. The average driving distance between home and infusion suite was 47 miles.

Methicillin Resistant *Staphylococcus aureus* (19/33) and Methicillin Susceptible *Staphylococcus aureus* (8/33) were the most commonly treated organisms and the average pathogen-directed therapy duration prior to starting Dalbavancin was 15 days.

Conclusion: Despite recent data suggesting that Dalbavancin therapy for PWID has good compliance rates in urban settings, our experience suggests that the same principle might not be true in rural settings as the non-compliance and loss to follow up rates were very high.

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600. Decreased Hospital Readmission After Programmatic Strengthening of an Outpatient Parenteral Antimicrobial Therapy (OPAT) Program

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Background: Although it is recommended that an OPAT program should be managed by a formal OPAT team that supports the treating physician, many OPAT programs face challenges in obtaining necessary program staff (i.e nurses or pharmacists) due to limited data examining the impact of a dedicated OPAT team on patient outcomes. Our objective was to compare OPAT-related readmission rates among patients receiving OPAT before and after the implementation of a strengthened OPAT program.

Methods: This retrospective quasi-experiment compared adult patients discharged on intravenous (IV) antibiotics from the University of Illinois Hospital before and after implementation of programmatic changes to strengthen the OPAT program. Data from our previous study were used as the pre-intervention group (1/1/2012 to 8/1/2013), where only individual infectious disease (ID) physicians coordinated OPAT. Post-intervention (10/1/2017 to 1/1/2019), a dedicated OPAT nurse provided full time support to the treating ID physicians through care coordination, utilization of protocols for lab monitoring and management, and enhanced documentation. Factors associated with readmission for OPAT-related problems at a significance level of $p< 0.1$ in univariate analysis were eligible for testing in a forward stepwise multinomial logistic regression to identify independent predictors of readmission.

Results: Demographics, antimicrobial indications, and OPAT administration location of the 428 patients pre- and post-intervention are listed in Table 1. After implementation of the strengthened OPAT program, the readmission rate due to OPAT-related complications decreased from 17.8% (13/73) to 6.5% (23/355) (p=0.001). OPAT-related readmission reasons included: infection recurrence/progression (56%), adverse drug reaction (28%), or line-associated issues (17%). Independent predictors of hospital readmission due to OPAT-related problems are listed in Table 2.

Table 1. OPAT Patient Demographics and Factors Pre- and Post-intervention

Patient Demographics	Pre-intervention N=73	Post-intervention N=355	p-value
Age, years, median (IQR)	57 (46-66)	52 (43-60)	.068
Male sex	45 (61.6%)	184 (51.8%)	.126
Antimicrobial Indications			
Bone and joint infection	41 (56.2%)	133 (37.5%)	.003
CNS infection	13 (17.8%)	34 (9.6%)	.041
Skin/ soft tissue infection	6 (8.2%)	29 (8.2%)	.989
Genital/ urinary tract infection	2 (2.7%)	36 (10.1%)	.043
Intra-abdominal infection	2 (2.7%)	34 (9.6%)	.055
Endocarditis	1 (1.4%)	11 (3.1%)	.700
Pneumonia	0	4 (1.1%)	>0.999
Other	8 (11%)	74 (20.8%)	.051
OPAT Administration Location			
Home	44 (60.3%)	190 (53.5%)	.291
Skilled nursing facility	22 (30.1%)	57 (16.1%)	.005
Subacute rehabilitation facility	7 (9.6%)	105 (29.6%)	<.001
Infusion center	0	1 (0.3%)	>0.999

Table 2. Factors independently associated with hospital readmission in OPAT patients

Risk factor	Readmitted N=36	Not Readmitted N=392	Univariate Analysis p-value	Multivariate Analysis Odds ratio (95% CI)
Enrollment in strengthened OPAT program	23 (63.9%)	332 (84.7%)	0.001	0.327 (0.152 – 0.702); p=0.004
Vancomycin, n (%)	18 (50%)	114 (29.1%)	0.009	2.57 (1.26 – 5.27); p=0.01
OPAT treatment duration, days, median (IQR)	35.5 (15.75-41.75)	25 (12-36)	0.005	0.991 (0.982 – 0.999); p=0.027

Conclusion: An OPAT program with dedicated staff at a large academic tertiary care hospital was independently associated with decreased risk for readmission, which provides critical evidence to substantiate additional resources being dedicated to OPAT by health systems in the future.

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601. Disparities in Diabetes Care: Smoking Cessation among Women and Minorities Living with HIV at an Urban Academic Medical Center

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Background: People living with HIV (PLWH) and diabetes mellitus are at increased risk of developing significant medical complications such as atherosclerotic cardiovascular disease. Disproportionate rates of diabetes and HIV among minority groups raise the issue of how demographic disparities may impact care. The American Diabetes Association (ADA) 2020 guidelines for diabetes care recommend optimal glycemic levels (A), blood pressure control (B), lipid reduction (C), and smoking cessation (N), commonly referred to as ABC or ABCN criteria. This quality assessment project examines diabetes management in PLWH by gender, race/ethnicity, and BMI, in a predominantly minority-serving clinic, as assessed by rates of guideline adherence to the above metrics.

Methods: This project was reviewed and approved by the Rutgers IRB. Patients from an HIV registry of University Hospital Infectious Disease Outpatient clinic in Newark, NJ were reviewed for a diagnosis of diabetes and both a clinic visit and an A1c score recorded between 2/1/2019 and 1/31/2020. Achieving glycemic target was defined as HbA1c < 7.5 for patients < 65 and HbA1c < 8 for patients > 65. Target adherence criteria also included a blood pressure average of < 140/90 over this period and an LDL-c of < 100 mg/dL. Non-smoking status includes both former and never smokers.

Results: Of 1035 patients reviewed, a total of 172 met criteria. Adherence rate for achieving goal HbA1c was 61.6% (95% CI 54.2-68.6, n=172). Blood pressure and LDL-c adherence rates were 65.1% (95% CI 57.7-71.8, n=172) and 67.4% (95% CI 60.1-74.0, n=172), respectively. ABC and ABCN rates were 24.4% (95% CI 18.6-31.4, n=172) and 18.6% (95% CI 13.5-25.1, n=172). The overall smoking rate, as well as the rates in the female subgroup, those with BMI 18.5-24.9, and the non-Hispanic black subgroup were significantly higher than the national average (P< 0.05).

Table 1: Demographic Data of PLWH and Diabetes

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	n=172
Age, mean (SD), years	57.8 (10.0)
Gender, n (%)	
Male	85 (49.4)
Female	87 (50.6)
Race, n (%)	
Non-Hispanic white	4 (2.33)
Non-Hispanic black	126 (73.3)
All Hispanic	35 (20.4)
Other	7 (4.10)
BMI (kg/m^2), n (%)	
18.5-24.9	38 (22.1)
25.0-29.9	56 (32.6)
30.0-34.9	35 (20.4)
≥35.0	43 (25.0)
PMHx, n (%)	
Hypertension	147 (85.5)
Smoking Status, n (%)	
Never	75 (43.6)
Former	48 (27.9)
Current	49 (28.5)

Percentages may not equal 100 due to rounding

Abbreviations: BMI = body mass index; PMHx = past medical history; SD = standard deviation

Table 2: Adherence to ABCN Criteria in Diabetes Care by Demographics for PLWH from 2/1/2019 – 1/31/2020

Table 2: Adherence to ABCN Criteria in Diabetes Care by Demographics for PLWH from 2/1/2019 – 1/31/2020

	Goal HbA1c n=172 % (95% CI)	LDL-C < 100 mg/dL n=172 % (95% CI)	BP < 140/90 n=172 % (95% CI)	Non-Smoking Status n=172 % (95% CI)	Meeting ABC Criteria n=172 % (95% CI)	Meeting ABCN Criteria n=172 % (95% CI)
Total	61.6 (54.2-68.6)	67.4 (60.1-74.0)	65.1 (57.7-71.8)	71.5 (64.4-77.7)	24.4 (18.6-31.4)	18.6 (13.5-25.1)
Gender						
Male	63.5(52.9-73.0)	64.7(54.1-74.0)	63.5 (52.9-73.0)	75.3 (65.2-83.2)	25.9 (17.8-36.1)	22.4 (14.8-32.3)
Female	59.8 (49.3-69.5)	70.1 (59.8-78.7)	66.7 (56.3-75.7)	67.8 (57.4-76.7)	23.0 (15.4-32.9)	14.9 (8.94-23.9)
Race/Ethnicity						
Non-Hispanic black	63.8 (55.1-71.6)	69.3 (60.8-76.7)	61.4 (52.7-69.4)	66.9 (58.4-74.5)	24.4 (17.8-32.6)	16.5 (11.1-24.0)
All Hispanic	51.4 (35.6-67.0)	54.3 (38.2-69.5)	74.3 (57.9-85.8)	85.7 (70.6-93.7)	25.7 (14.2-42.1)	25.7 (14.2-42.1)
BMI (kg/m^2)						
18.5-24.9	76.3 (60.8-87.0)	65.8 (49.9-78.8)	57.9 (42.2-72.1)	60.5 (44.7-74.4)	26.3 (15.0-42.0)	18.4 (9.22-33.4)
25.0-29.9	58.9 (45.9-70.8)	64.3 (51.2-75.6)	66.1 (53.0-77.1)	73.2 (60.4-83.0)	25.0 (15.5-37.7)	23.2 (14.1-35.8)
30.0-34.9	48.6 (33.0-64.4)	71.4 (55.0-83.7)	80.0 (64.1-90.0)	71.4 (55.0-83.7)	28.6 (16.3-45.1)	20.0 (10.0-35.9)
≥35.0	62.8 (47.9-75.6)	69.8 (54.9-81.4)	58.1 (43.3-71.6)	79.1 (64.8-88.6)	18.6 (9.74-32.6)	11.6 (5.07-24.5)
National*	64 (58-69)	57 (51-62)	70 (64-75)	85 (82-88)	25 (20-31)	23 (17-29)

Abbreviations: HbA1c = hemoglobin A1c; ABC = hemoglobin A1c, blood pressure, low-density-lipoprotein cholesterol; ABCN = hemoglobin A1c, blood pressure, low-density-lipoprotein cholesterol, non-smoker; BMI = body mass index; BP = blood pressure; LDL-C = low-density-lipoprotein cholesterol. * National adherence rates based on Kazemian et. al 2019[1]

References:

1. Kazemian P, Shebl FM, McCann N, Walensky RP, Wexler DJ. Evaluation of the Cascade of Diabetes Care in the United States, 2005-2016. *JAMA Intern Med*. 2019;179(10):1376–1385. doi:10.1001/jamainternmed.2019.2396

Conclusion: For diabetic PLWH, smoking cessation requires improvement, particularly in female, normal BMI, and non-Hispanic black subgroups. These findings, in addition to a majority overweight patient population, highlight the need for increased education and interventions aimed at nutritional counseling and risk factor mitigation among all patient subgroups.

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602. Do These Labs Really Matter? Searching for the Benefit of Laboratory Monitoring in Outpatient Parenteral Antimicrobial Therapy (OPAT)

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Background: Weekly laboratory monitoring is routinely performed for patients treated with Outpatient Parenteral Antimicrobial Therapy (OPAT). However, minimal evidence exists to guide this practice.

Methods: This was a single-center, retrospective cohort study to assess the value of laboratory monitoring in patients being treated with beta-lactam OPAT. This study included adult patients discharged from University of Utah Health (UUH) between January 1, 2018, and July 31, 2019, on beta-lactam OPAT with follow-up care with a UUH Infectious Diseases (ID) Provider. Patients discharged to a skilled nursing facility or long-term acute care hospital, or who received OPAT for a duration less than 7 days, were excluded. The primary aim was to describe how often abnormal laboratory values led to a therapy modification or documented adverse drug reaction (ADR) for patients receiving beta-lactam OPAT. Abnormal laboratory values were defined by consensus criteria for clinical significance (e.g., RIFLE criteria for kidney injury). Therapy modification and ADR occurrence was determined by chart review for UUH ID Provider documentation.

Results: A total of 346 patients were included; two hundred seventy-four (79%) had abnormal laboratory values during OPAT. Of these, 12 patients had a modification to their OPAT due to abnormal laboratory values. The most common therapy modification due to abnormal laboratory values was a change of antibiotic (9/12). Two hundred thirteen of 274 patients (78%) with abnormal laboratory values were maintained on their OPAT regimen without a modification. Of the 67 therapy modifications observed, 55 (82%) were due to reasons other than abnormal laboratory results (Table 1).

Abnormal laboratory values meeting criteria for clinical significance and possible ADR were observed in 469 instances. Of these, 43 (9%) were considered ADRs by the ID provider (Table 2).

Table 1 describes therapy modifications for patients on beta-lactam OPAT

Table 1. Therapy Modifications in Beta-Lactam Outpatient Parenteral Antimicrobial Therapy

Outcome	Total Patients (n = 346)	Abnormal Laboratory Results (n = 274)	No Abnormal Laboratory Results (n = 72)
Therapy modification due to labs	12 (3.5%)	12 (4.4%)	0 (0%)
Therapy modification not due to labs	55 (16%)	49 (18%)	6 (8%)
No therapy modification	279 (81%)	213 (78%)	66 (92%)

Table 2 describes documented ADRs in the presence of abnormal labs for patients on beta-lactam OPAT

Table 2. Adverse Drug Reactions in Beta-Lactam Outpatient Parenteral Antimicrobial Therapy

Outcome	Abnormal Lab Indicating Potential Outcome (n = 274)	Documented ADR in Presence of Abnormal Labs
Nephrotoxicity – n, %	70 (26%)	19/70 (27%)
Hepatotoxicity – n, %	97 (35%)	10/97 (10%)
Leukopenia – n, %	69 (25%)	5/69 (7%)
Leukocytosis – n, %	110 (40%)	4/110 (4%)
Thrombocytopenia – n, %	31 (11%)	2/31 (6%)
Eosinophilia – n, %	82 (30%)	3/82 (4%)
Neutropenia – n, %	10 (4%)	0/10 (0%)