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

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Background

- Many OPAT programs face challenges in obtaining necessary program staff due to limited data examining the impact of a dedicated OPAT team on patient outcomes [1,2].
- **Objective**: compare OPAT-related readmission rates among patients receiving OPAT before and after the implementation of an infectious disease (ID) physician & registered nurse (MD/RN)-led OPAT program.

Methods

Study Design:

- Retrospective quasi-experiment comparing 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.

Definitions of Intervention Groups:

- Pre-intervention group (1/1/2012 to 8/1/2013): individual physicians coordinated OPAT [3].
- Post-intervention group (10/1/2017 to 1/1/2019): dedicated OPAT nurse provided full time support to the treating physicians through care coordination and communication. In addition, a dedicated ID physician oversaw the program. The ID physician lead developed protocols for lab monitoring and management, and enhanced documentation standards.

Data Analysis:

- Factors associated with readmission for OPAT-related problems at a significance level of p< 0.1 in univariate analysis were tested in a forward stepwise multinomial logistic regression to identify independent predictors of readmission.

Results

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

- After implementation of the MD/RN-led 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**: infection recurrence/progression (56%), adverse drug reaction (28%), or line-associated issues (17%).

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 infectious disease physician oversight and dedicated staff at a large academic tertiary care hospital was independently associated with decreased risk for OPAT-related readmission.
- This provides critical evidence to substantiate additional resources being dedicated to OPAT by health systems in the future.

References

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