

# Impact of a health-system specialty pharmacy on medication adherence in post-kidney transplant patients

Adina Petrosan, PharmD; Elizabeth Cohen, PharmD; Mitchell DelVecchio, PharmD; Martha Stutsky, PharmD; Kristen Belfield, PharmD

## Background

- After kidney transplant, patients are initiated on a complicated medication therapy plan, including six to seven new medications, many of which are multiple tablets, making adherence a challenge. Non-adherence to post-transplant medication can cause an increased risk of rejection.
- At Yale New Haven Transplant Center (YNHTC), patients are given the option to receive their medications through Outpatient Pharmacy Services, a health-system specialty pharmacy. The health-system specialty pharmacy helps promote adherence through refill reminder calls, pharmacist-led counseling and free same day delivery in the state.

## Objectives

- Determine the impact of a Yale New Haven Health system specialty pharmacy, on patient's medication adherence using Proportion of Days Covered (PDC)
- Identify any secondary outcomes that may impact a patient's medication adherence such as third party payer, pre-transplant medication adherence questionnaire, transplant education assessment scores, and number of post-transplant readmissions

## Methods

- A retrospective, single center, chart review
- **Inclusion criteria:** Kidney transplant patients who were transplanted between January 2017 and June 2017
- **Exclusion criteria:** Actively enrolled in a research study, deceased within one year of transplant, or had incomplete medical records
- Adherence was assessed by calculating the PDC
 
$$\text{Proportion of Days Covered} = \left( \frac{\text{Number of days in period "covered"}}{\text{Number of days in period}} \right) \times 100\%$$
- Divided into **three** groups:
  - Patients who use a health system specialty pharmacy
  - Patients who use both a health system specialty pharmacy and an outside pharmacy
  - Patients who use an outside pharmacy only
- **Primary outcome:** Average PDC for patients using health-system specialty pharmacy versus other pharmacies
- **Secondary outcomes:** Pre-transplant medication adherence questionnaire, transplant education assessment scores, and number of post-transplant readmissions
- Statistical tests: T-tests, linear regression, and ANOVA tests were used to calculate statistical significance

## Results

Figure 1: Patient Exclusion

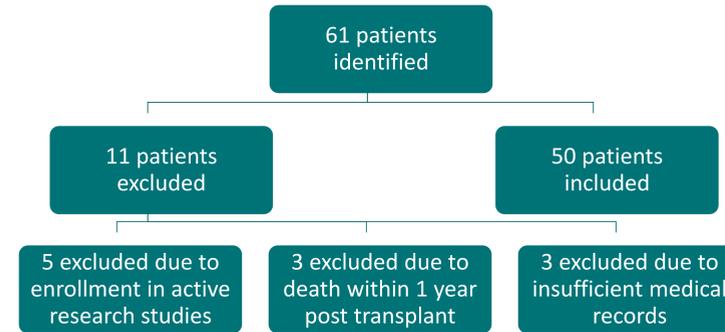


Figure 2: Number of Patients Enrolled

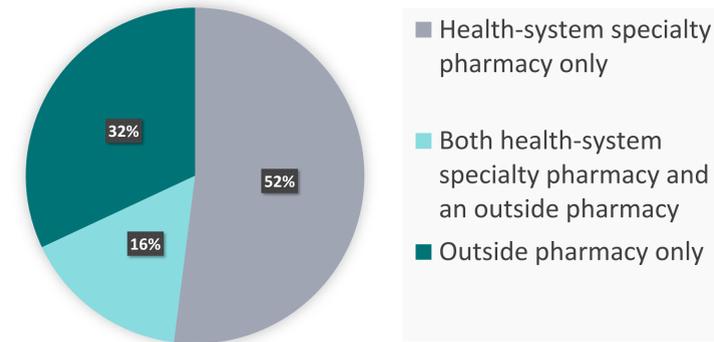


Figure 3: Average Adherence Rate (PDC) vs. Pharmacy<sup>3</sup>

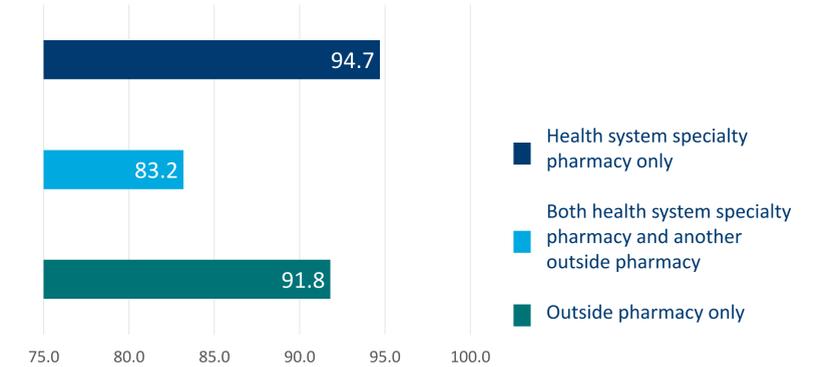


Table 1: Baseline Characteristics

Patient characteristic	Health system specialty pharmacy only (n=26) n (%)	Both health-system specialty pharmacy and an outside pharmacy (n=8) n (%)	Outside pharmacy only (n=16) n (%)
Male	17 (65.4)	2 (25)	12 (75)
Race			
Caucasian	14 (53.8)	3 (37.5)	8 (50)
Asian	1 (3.8)	1 (12.5)	3 (18.8)
Hispanic	3 (11.5)	0 (0)	1 (6.2)
African American	8 (30.8)	4 (50)	4 (25)
Age (average in years)	53	47	56
Primary payer			
Private insurance	7 (26.9)	2 (25)	5 (31.3)
State/Federal insurance	19 (73)	6 (75)	11 (68.7)
Highest education level			
Some high school	2 (7.7)	0 (0)	1 (6.3)
Completed high school	7 (26.9)	0 (0)	4 (25)
Some college	8 (30.8)	4 (50)	6 (37.5)
Completed college	4 (15.4)	0 (0)	4 (25)
Post-graduate degree	5 (19.2)	2 (25)	0 (0)
Vocational training	0 (0)	2 (25)	1 (6.3)
Readmissions (average)	0.38	0.75	0.88
Pre-transplant adherence questionnaire (average)	7.05	7.39	7.20
Transplant education assessment scores (average)	9.42	9.57	9.07

Table 2: Average Medication Adherence Rate vs. Secondary Outcomes

Patient characteristic	Average medication adherence rate (%)	P-value
Gender		0.32 <sup>1</sup>
Male	92.6	
Female	91.0	
Third party payer (private vs. state/federal)		0.31 <sup>1</sup>
Private	90.7	
State/Federal	92.4	
Highest education level		0.34 <sup>3</sup>
Some high school	99.8	
Completed high school	95.1	
Some college	93.5	
Completed college	88.6	
Vocational training	84.6	
Post-graduate degree	86.8	
Donor type		0.38 <sup>3</sup>
DDKT	92.2	
LRKT	95.8	
LUKT	89.8	

Table 3: Secondary Outcomes

Patient Characteristic	P-value
No. of readmissions in one year post transplant	0.53 <sup>2</sup>
Pre-transplant adherence questionnaire	0.84 <sup>2</sup>
Transplant education assessment scores	0.81 <sup>2</sup>
Age	0.31 <sup>2</sup>

P values calculated using the following statistical tests: 1=two-tailed t-test, 2= linear regression, 3= ANOVA

## Discussion

The proportion of days covered was significantly lower for patients who use a health system specialty pharmacy and another pharmacy compared to either a health system specialty pharmacy alone or another pharmacy alone, with a p value of 0.045. Secondary endpoints studied, pre-transplant medication adherence questionnaire, transplant education assessment scores, and number of post-transplant readmissions, were not significant.

## Conclusion

- A health system specialty pharmacy does impact the one-year medication adherence rate of patients who are post-kidney transplant.
- A patient's medication adherence rate may be related to the use of multiple pharmacies versus one single pharmacy, rather than use of a specific pharmacy.
- Secondary outcomes, such as third party payer, pre-transplant medication adherence questionnaire, transplant education assessment scores, and number of post-transplant readmissions have no significant impact on medication adherence in post-kidney transplant patients.

## Future Directions

Further studies to investigate this relationship should be conducted.

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