Poster: 4025

A Model of Pharmacist-Implemented Medication Adherence Improvement in an Outpatient Population Diagnosed with HIV

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Background & Significance

Poor adherence to antiretroviral therapy (ART) among patients with acquired human immunodeficiency virus (HIV) infection is linked to poorer outcomes, including viral rebound and treatment resistance. Depending on the ART regimen, consequences of poor adherence can be notable even at 95% adherence and lead to reduced therapeutic options and increased cost.[1] In 2006, it was reported that only 55% of HIV patients in North America were at least 80% adherent to their ART regimen, by contrast, roughly 77% of patients in sub-Saharan Africa were adherent.[2] However, a recent study performed in Korea suggests that adherence in developed nations may have improved over the last decade with the most recent estimates showing roughly 70% of HIV patients in Korea achieve ≥95% adherence as compared to 53% in 2009.[3] Interestingly, the odds of poor adherence was roughly double for those with National Medical Aid, an insurance assistance program similar to Medicaid. However, recent reports show the US HIV viral suppression rate is the lowest among high-income countries, 54%.[5]

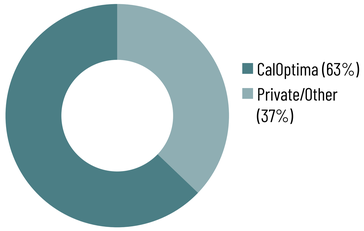
Improving ART adherence has benefits that extend beyond reduced risk of viral rebound and resistance. Adherent patients are expected to have greater quality of life and increased survival. Not only that, but adherence to even very expensive regimens is likely to result in cost-effective benefits.[4] Thus, ART adherence improvement represents a potential cost effect way to improve HIV outcomes and patient quality of life.

Top 10 Used and Unmet Support Services among HIV Patients in Los Angeles County[6]	Utilized	Unmet Need
Service	Weighted % (95% CI)	Weighted % (95% CI)
Medicine through the AIDS Drug Assistance Program (ADAP)	64.5 (56.5–72.5)	21.6 (17.3–26.0)
Dental Care	57.7 (52.8–62.5)	8.7 (6.2–11.1)
HIV case management services	41.5 (35.2–47.8)	6.0 (3.8–8.1)
Transportation assistance	36.0 (30.2–41.8)	5.7 (3.8–7.6)
Mental health services	30.6 (27.2–33.9)	5.7 (3.8–7.6)
Public benefits (including Supplemental Security Income (SSI) or Social Security Disability Insurance (SSDI))	28.6 (24.2–33.0)	5.5 (3.6–7.4)
Counseling about how to prevent the spread of HIV	27.1 (21.0–33.2)	3.7 (1.8–5.7)
Meal or food services	22.4 (18.3–26.5)	3.5 (1.9–5.1)
Adherence support services	19.9 (15.1–24.7)	3.4 (2.1–4.7)
HIV peer group support	18.7 (15.6–21.8)	2.3 (1.2–3.5)

Study Objectives

This survey of experience aims to address the effectiveness of pharmacist lead interventions to improve adherence among Medicaid insured patients with HIV in Orange County, California. Since Medicaid insured patients may be at particular risk for non-adherence and adherence support services rank in both the top 10 most used services and top 10 unmet needs of HIV patients in a major Californian county, this study may provide foundational evidence to improve ART adherence among a major segment of HIV patients.

Patient Insurance Providers



Race	N (%)
Asian	1 (2.7)
African American	2 (5.4)
Caucasian	28 (75.7)
Latino	6 (16.2)
Sex	
Female	2 (5.4)
Male	35 (94.6)

Figure 1: The figure and table depict the patient composition treated by MichRx Pharmacist Consulting Services, Inc. Almost two thirds of treated pateints are insured by CalOptima, Orange County's Managed Medicaid Program. Of those insured by CalOptima, most are Caucasian males.

Methods

A cohort of CalOptima insured patients with HIV receiving in-person clinical pharmacist care, including medication therapy management (MTM) and counseling services, from MichRx Consulting's HIV pharmacist specialist following physician referral were interviewed. Responses regarding ART adherence were collected at each visit and analyzed by longitudinal general linear modeling using maximum likelihood estimation parameter selection. Final models were adjusted for a combination of number of visits and pharmacist interventions, race, and viral load at diagnosis. Mean changes from baseline were assessed by Welch's t-test.

References:
1. Schaecher KL. The Importance of Treatment Adherence in HIV. *Am J Manag Care*. 2013;19(12 suppl):S231-S237
2. Mills EJ, Nachega JB, Buchan I, et al. Adherence to antiretroviral therapy in sub-Saharan Africa and North America: a meta-analysis. *JAMA*. 2006;296(6):679-690.
3. Kim J, Lee E, Park BJ, Bang JH, Lee JY. Adherence to antiretroviral therapy and factors affecting low medication adherence among incident HIV-infected individuals during 2009–2016: A nationwide study. *Sci Reports*. *2018*;8:3133
4. Gebille SJ, *et al*. Projecting the cost-effectiveness of adherence interventions in persons with human immunodeficiency virus infection. *Am J Med*. 2003;115(8):632-641.
5. Henry J. Kaiser Family Foundation. HIV Viral Suppression Rate in U.S. Lowest Among Comparable High-Income Countries. https://www.kff.org/hivaids/slide/hiv-viral-suppression-rate-in-u-s-lowest-among-comparable-high-income-countries/ (March 20, 2019).
6. Division of HIV and STD Programs, Los Angeles County Department of Public Health, An Epidemiologic Profile of HIV in Los Angeles County, 2015: 1-127.

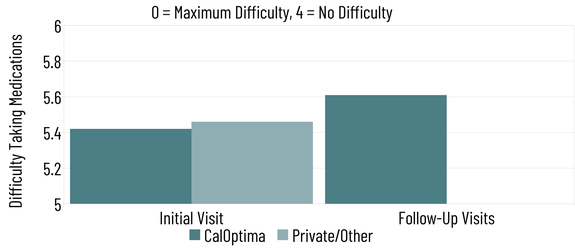
Results & Conclusion

A total of 37 CalOptima insured patients made a total of 88 visits with a pharmacist specialist from MichRx Consulting for MTM and counseling services (01/2016-10/2018). Between the first and last visit, the mean adherence score improved by 32.2% (p<0.001). A significant positive interaction between number of pharmacist interventions and visits leading to improved adherence (p=0.017) was observed. Patients having a viral load of 20,000 copies/ml or more at diagnosis had poorer adherence scores than those who did not (p=0.009). Other metrics, including the number of days in the previous week when patients missed a dose and time since the last missed dose were also improved by pharmacist-patient interaction. On average, between the first and last visits patients had approximately 1 fewer days per week when a dose was missed, this was significant (p=0.003). Similarly, the time since the last dose was missed improved by 16.8% over the same time (p=0.002). Both improvements were linked to pharmacist interventions (p=0.014 and p=0.008, respectively).

Self-reported difficulty taking medications on time was considered as a possible cause for impaired adherence. Analysis of patient responses indicated that by the final visit patients reported having no difficulty taking their HIV medication on time. This corresponds to an average score improvement of almost 0.5 points on a scale from 0 to 4 (p=0.001), where 0 is "highest difficulty" and 4 is "no difficulty". African Americans reported having the most difficulty taking their HIV medications with an average difficulty score that was 1.67 points lower than Asian patients (p=0.007), Asian patients being the racial group reporting the lowest difficulty taking their HIV medications. Neither Caucasians nor people of Latino ethnicity reported significantly different difficulty scores as compared to Asians (p=0.5737 and p=0.2583, respectively).

Adherence Counseling	N (%)
Initial Visit (37 total)	17 (45.9)
Follow-Up Visits (51 total)	6 (11.8)
Barrier Removal	
Initial Visits (37 total)	6 (16.2)
Follow-Up Visits (51 total)	**23 (45.1)**
Medication Change	
Initial Visits (37 total)	10 (27.0)
Follow-Up Visits (51 total)	3 (5.9)

Days Adherent Previous Week



Difficulty Taking Medication

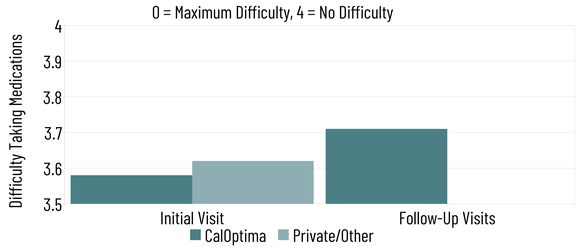


Figure 2: The two bar graphs above demonstrate the slight, though significant, improvement in adherence and reduction in barriers to medication adherence. The table of Pharmacist made interventions at the top right also shows the number of interventions of various types made at the initial and the followup visits. The initial visits with patients tend to focus on adherence counseling and reinforcing the importance of adherence as well as addressing any adverse drug reactions and optimizing therapy. In this table Adherence Counseling refers to counseling specifically about the importance of a patient remaining adherence to their treatment or reinforcing this concept. Barrier Removal interventions include communication with insurance carrier, clarification of benefits, help identifying and applying for assistance programs (e.g. co-pay assistance or housing assistance), strategies for reducing side effects or missed doses, communicating with patient physician, providing risk mitigation strategies, etc. Finally, Medication Change represents interventions such as switching a medication, adding a medication, or adjusting the dose of an existing medication.

Based on this small single site survey of experience, early pharmacist involvement in the clinical care of patients with HIV has huge potential for adherence and overall care improvement, even after physician intervention. Furthermore, the greatest benefit of pharmacist contact may be felt in both high risk populations, for example those with higher viral loads at diagnosis, and in addressing the health disparities affecting African Americans.

In addition, it is apparent that the pharmacist made interventions at initial visits focus on reinforcing adherence and addressing inappropriate or sub-optimal pharmacotherapy while later visits primarily focus on perceived barriers to adherence and treatment.