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# Adherence to Antiretroviral Therapy and Healthcare Utilization Trends in Commercially Insured Patients With HIV

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During the Academy of Managed Care Pharmacy Nexus 2019, real-world data were presented assessing the impact of long-term adherence to daily, oral antiretroviral therapy (ART) on healthcare resource utilization (HRU) among commercially insured patients with HIV. The following is a summary of the data presentation.

## HIV AND ANTIRETROVIRAL THERAPY ADHERENCE

Today's modern ART regimens are highly effective and well-tolerated for patients with HIV. Maintaining consistent adherence to ART helps keep HIV at undetectable levels, prevent transmission of the virus, avoid the development of treatment resistance, and maintain a healthy immune system.<sup>1,2</sup> Published research on the effect of ART adherence on HRU in the US population is currently limited to short-term follow-up, typically 1 year. Moreover, the impact of sustained adherence over longer time frames has not been fully explored. To address this gap, Garriss et al. retrospectively studied the impact of ART adherence over time on HRU in commercially insured HIV patients over 4 years.<sup>3</sup>

## ANALYSIS OF ADHERENCE TO ANTIRETROVIRAL THERAPY AND HEALTHCARE UTILIZATION TRENDS

Administrative claims from the Optum Research Database from 2011 to 2017 were evaluated in adult patients with HIV-1 and receipt of a complete ART regimen within the study period. To be included in the analysis, patients needed to be enrolled continuously for at least 3 months before and 12 months after their first ART regimen fill date within the study period. The study population (N = 15,153) had a median age of 45 years, was predominately male (88%), and most were from the Southern region of the US (53%).<sup>3</sup> Adherence to ART was assessed by calculating the proportion of days covered (PDC) and assigning patients to 1 of 4 distinct adherence categories: 1) low (PDC <80%), 2) moderate (PDC 80% to <90%), 3) high (PDC 90% to <95%), and 4) very high (PDC ≥95%).<sup>3</sup> HIV-related and all-cause HRU was quantified according to the number of outpatient (OP) visits, emergency room (ER) visits, and inpatient (IP) visits. HRU was compared statistically across the very high and low ART adherence groups at year 1 and cumulatively over 4 years in the subset of patients with follow-up over that time.<sup>3</sup>

**Table.** Percentage of Patients by Proportion of Days Covered Category<sup>3</sup>

PDC Category	Year 1 N = 15,153	Year 4 N = 3,818
Low, <80%	3080 (20%)	1228 (32%)
Moderate, 80% to <90%	2556 (17%)	688 (18%)
High, 90% to <95%	3272 (22%)	1056 (28%)
Very High, ≥95%	6245 (41%)	846 (22%)

PDC indicates proportion of days covered.

In the first year of follow-up, 41% of patients had very high adherence, 22% had high adherence, 17% had moderate adherence, and 20% had low adherence. Regardless of adherence levels, more than 95% of patients had at least 1 HIV-related OP visit, while more than 98% of patients had at least 1 all-cause OP visit.<sup>3</sup> The proportion of patients with at least 1 HIV-related IP stay was significantly greater for patients with low adherence (6.8%) compared with patients with very high adherence (2.9%) ( $P < .0001$ ).<sup>3</sup> Similar trends were observed for patients with at least 1 ER visit (12.8% and 7.7%, for the low adherence and very high adherence groups, respectively).<sup>3</sup>

The 4-year data revealed that the percentage of patients with very high adherence dropped from 41% in year 1 to 22% by year 4, while the percentage of patients with low adherence increased from 20% in year 1 to 32% during that period.<sup>3</sup> Although the percentage of patients with moderate adherence was relatively unchanged over 4 years (17% at year 1 and 18% at year 4), the percentage of patients in the high adherence category increased from 22% at year 1 to 28% at year 4 (Table).<sup>3</sup>

The proportion of patients with HIV-related ER and IP visits was significantly higher in patients with low adherence at year 1,

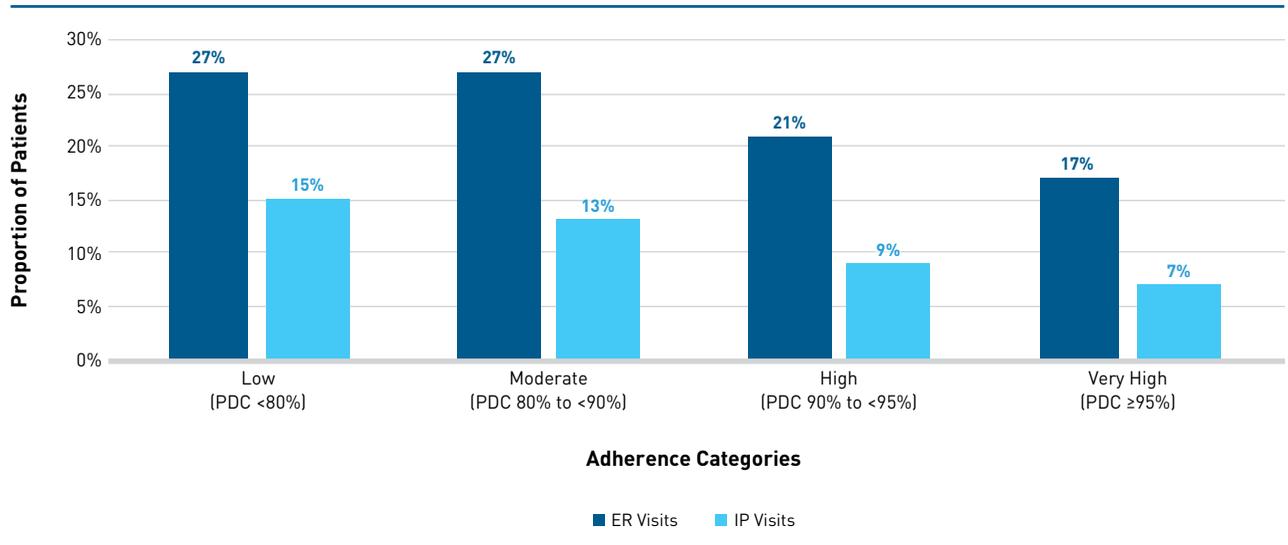
The proportion of patients with HIV-related ER and IP visits was significantly higher in patients with low adherence at year 1, which became more pronounced over 3 additional years of observation.

which became more pronounced over 3 additional years of observation.<sup>3</sup> Corresponding to decreased adherence over time, the 4-year data show a higher percentage of HIV-related ER visits among patients in the low adherence groups compared with those in the very high adherence group (27% vs 17%, respectively;  $P < .0001$ ). HIV-related IP visits were also higher in the low adherence group compared with the very high adherence group (15% vs 7%;  $P < .0001$ ) (Figure).<sup>3</sup>

### KEY TAKEAWAYS

These study results indicate that adherence to ART regimens may decrease over time, with less than half of patients achieving very high levels of adherence as early as 1 year after initiating therapy and even fewer maintaining those levels. Moreover, the percentage of patients with low adherence increased over time, which subsequently increased the likelihood of resource intensive HRU. Therefore, maintaining high ART adherence is essential for optimal management of patients with HIV. •

**Figure.** Cumulative HIV-related ER and IP Visits by Adherence Category at 4-Year Follow-Up<sup>3</sup>



ER indicates emergency room; IP, inpatient; PDC, proportion of days covered.

# Ask the Author: Q&A With Cindy Garris, MS, and Julie Priest, MSPH

## What are the clinical implications of sub-optimal adherence to ART?

Poor adherence to ART can result in virologic failure and development of resistance, which may limit treatment options and increase risk of transmission to others.<sup>1</sup> If the virus is not adequately suppressed with therapy, patients are at risk of compromised immune systems, leading to more complex and costly HIV-related conditions or mortality.<sup>2</sup>

## Prior to this study, what was known about HIV treatment adherence in relation to economic outcomes among commercially insured HIV patients? What knowledge gap or unmet need does this study address?

It is well known from prior studies that higher adherence to ART is associated with lower HRU.<sup>4-6</sup> It is also well known that regimen formulations (eg, pill burden, dose frequency, etc.) can affect adherence. Our study documents that despite the availability of modern, once-daily regimens, patients still struggle with maintaining high adherence over time. Our study also provides further evidence of the impact that adherence can have on the larger drivers of healthcare costs, such as ER visits and hospitalizations. Our data showed that patients with HIV who had moderate or low adherence tended to have more ER visits and hospitalizations compared to those with higher adherence, which became more pronounced over time.

## Why is real-world evidence important, particularly when evaluating HIV treatment adherence?

Adherence reported in clinical trials may not be generalizable to real-world settings. In trials, patients are often seen more frequently, are monitored more closely in alignment to trial protocols, and offered proactive interventions to ensure optimal adherence. In the real world, patients generally see medical providers less frequently and sub-optimal adherence may not be detected and addressed until virologic failure occurs. Our study results suggest that there is room for improvement in adherence to ART.

## Based on the results of this study, what additional research should be considered?

This study was conducted in a commercially insured population and this type of longer-term assessment of adherence and HRU should be replicated in other insured populations.<sup>6</sup> For example, Medicaid is the largest provider of benefits for patients with HIV. This population, historically, has had lower documented adherence to ART rates than those with commercial insurance.<sup>6</sup> The implications of lower adherence over time would be important to understand

in this population. The DHHS [Department of Health and Human Services] guidelines support tailoring the regimen to the individualized patient.<sup>1</sup> As this study shows, adherence challenges still exist for some patients despite the availability of tolerable, once-daily

“Our data showed that patients with HIV who had moderate or low adherence tended to have more ER visits and hospitalizations compared to those with higher adherence, which became more pronounced over time.”

medication options. HIV treatment adherence is a multi-factorial issue. In addition to medication characteristics, there are other contributing factors, such as addiction, mental health comorbidities, stigma, and housing instability that can impact adherence.<sup>7</sup>

Additional research and patient support is warranted due to the complexity and critical importance of high adherence in patients living with HIV. •

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## REFERENCES

1. Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. AIDSinfo website. [aidsinfo.nih.gov/contentfiles/lvguidelines/AdultandAdolescentGL.pdf](https://aidsinfo.nih.gov/contentfiles/lvguidelines/AdultandAdolescentGL.pdf). Updated July 10, 2019. Accessed August 30, 2019.
2. Al-Dakkak I, Patel S, McCann E, et al. The impact of specific HIV treatment-related adverse events on adherence to antiretroviral therapy: a systematic review and meta-analysis. *AIDS Care*. 2013;25(4):400-414.
3. Data on file. ViiV Healthcare Group of Companies. Research Triangle Park, NC.
4. Zhang, S, Rust G, Cardarelli K, et al. Adherence to highly active antiretroviral therapy impact on clinical and economic outcomes for Medicaid enrollees with human immunodeficiency virus and hepatitis C coinfection. *AIDS Care*. 2015;27(7):829-835.
5. Kangethe A, Polson M, Lord TC, Evangelatos T, Oglesby A. Real-world health plan data analysis: key trends in medication adherence and overall costs in patients with HIV. *J Manage Care Spec Pharm*. 2019;25(1):88-93.
6. Dunn K, Lafeuille M, Jiao X, et al. Risk factors, health care utilization, and costs associated with nonadherence to antiretrovirals in Medicaid-insured patients with HIV. *J Manage Care Spec Pharm*. 2018;24(10):1040-1051.
7. Almeida-Brasil CC, Moodie EEM, McLinden T, et al. Medication nonadherence, multitabular regimens, and food insecurity are key experiences in the pathways to incomplete HIV suppression. *AIDS*. 2018;32(10):1323-1332.



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