Original Work

The Impact of a Pharmacist Driven Intervention on Appropriate Statin Prescribing in Patients Living with HIV: A Population Health Perspective

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The AIDS Resource Center of Wisconsin (ARCW), re-branded as Vivent Health, is a National Committee for Quality Assurance (NCQA) level 3-recognized patient-centered medical home. The patient-centered medical home is a model of care that encompasses five functions and attributes: comprehensive care; patient-centered care; coordinated care; accessible services; and quality and safety. Within Vivent Health, the clinical pharmacy team manages chronic diseases for patients living with HIV under collaborative practice agreements in a primary care clinic-based setting. These services currently include the management of hypertension, diabetes mellitus type 2, anticoagulation, and tobacco cessation. Notably, at the time of this study, initiation and management of HMG-CoA reductase inhibitor (statin therapy) was not currently included in the pharmacist scope of practice at Vivent Health.

Pharmacist participation in the multidisciplinary team has led to improved adherence and medical outcomes for patients.[1] Additionally, there is data to support a pharmacist's role in improving statin prescribing patterns in the outpatient setting. One study demonstrated a significant gap closure in statin therapy in patients with diabetes after community pharmacist-to-prescriber intervention.[2]

Abstract

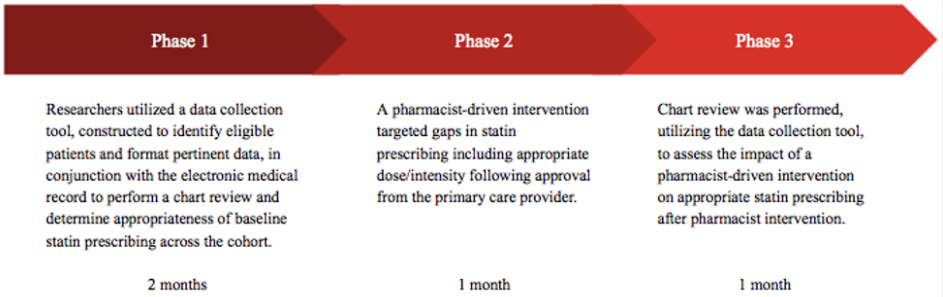
Background: Within ARCW (re-branded as Vivent Health), the pharmacy team manages conditions for patients via collaborative practice agreements. The aim of this study is to evaluate the impact of a pharmacist-driven statin management protocol for patients living with HIV.

Methods: This study occurred over 5 months across Vivent Health's four Wisconsin-based medical clinics. Eligible patients were > 21 years old, HIV+, and eligible for statin therapy based on 2013 ACC/AHA guidelines. In phase one, researchers used a data collection tool in conjunction with the electronic medical record (Epic) to perform a chart review and determine appropriateness of baseline statin prescribing. In phase two, a pharmacist-driven intervention targeted gaps in statin prescribing. Finally, chart review was performed to assess the impact of a pharmacist-driven intervention on appropriate statin prescribing.

Results: Of the 1,600 patients considered, 554 individuals met inclusion criteria. Only 66% of patients eligible for statin therapy were prescribed a statin at baseline (349/554). Twenty-seven (7.7%) of the patients receiving statin therapy were flagged for recommendation of a dose adjustment. Providers were agreeable to initiate or adjust therapy in 111 of the 214 eligible patients. Following the intervention, 72% of patients were prescribed guideline-recommended statin therapy (401/554) ($p < 0.05$).

Conclusion: Improvement in rates of appropriate statin prescribing in patients living with HIV was demonstrated via a pharmacist-driven intervention. The results of this study could be used to further support pharmacist involvement on multidisciplinary teams by demonstrating improvement in quality and clinical outcomes with pharmacist intervention.

FIGURE 1. Description of Phases and Study Progression



In this randomized control trial, patients who received medications from a large retail chain and had > 2 prescription fills for antidiabetic agents were identified within the Electronic Quality Improvement Platform for Plans and Pharmacies (EQuIPP). Primary care prescribers of patients were contacted by pharmacist via phone and fax to obtain a prescription for an appropriate statin. The number of statins prescribed was statistically significant between the intervention and control groups.[2]

Due to the advancement of effective antiretroviral treatment regimens (ART), the population of people living with HIV is aging and subsequently requires more ongoing management of chronic diseases. In 2017, the majority of people living with HIV in Wisconsin were over 50 years old.[3] Additionally, people living with HIV are twice as likely to develop cardiovascular disease (CVD) as their HIV-negative counterparts, underscoring the importance of cardiovascular prevention strategies. The underlying mechanism driving increased CVD risk is not clear, but likely involves a combination of factors, including the proinflammatory effects of the virus itself; side effects of ART including progressive atherosclerosis and elevated triglycerides; and the burden of traditional risk factors for cardiovascular disease, such as smoking, gender, and age.[4,5] Furthermore, HIV infection is being studied as an independent risk factor for CVD that might require earlier and more aggressive prevention interventions. There is a trial underway, titled "Evaluating the Use of Pitavastatin to Reduce the Risk of Cardiovascular Disease in HIV-Infected Adults (REPRIEVE)," to assess the impact of pitavastatin use on coronary outcomes in patients with HIV.[6]

Based on the 2013 ACC/AHA guidelines, patients with a history of clinical atherosclerotic cardiovascular disease (ASCVD); those diagnosed with diabetes mellitus type 2 (DMII); those with an LDL > 190; and/or those with a 10-year calculated ASCVD risk of > 7.5% should be prescribed statin therapy.[7] The 2019 update to the ACC/AHA Primary Prevention of CVD Guideline identified these same benefit groups, but described HIV diagnosis as an additional risk factor for statin initiation.[8,9]

A statin management protocol implemented by a pharmacist as a population health measure in a clinic-based setting is a novel idea published in the literature. The aim of this study was to evaluate the impact of a pharmacist-driven statin management intervention in people living with HIV. It was hypothesized that a higher proportion of patients would be prescribed appropriate statin therapy after pharmacist intervention.

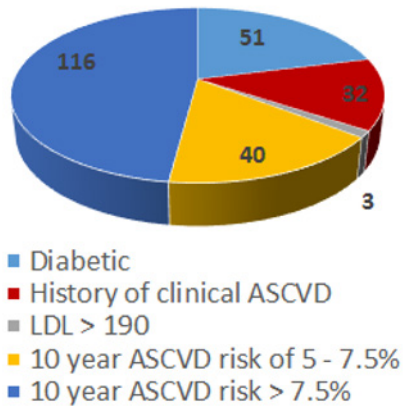
Methods

This self-control, single centered study occurred over four months, January through April 2019, across Vivent Health's four Wisconsin-based medical clinics. A data collection tool was created in conjunction with the electronic health record (Epic) to identify patients eligible for statin initiation. Data collected included the presence of statin indication, statin prescribed, and potential interacting agents (Supplement, Table 1).

Eligible patients were those over 21 years of age, living with HIV, and with an indication for statin therapy based on 2013 ACC/AHA guidelines. Patients were included in the cohort based on at least one of the following: calculated 10-year ASCVD risk > 5%, history of clinical ASCVD based on ICD-10 codes documented in the electronic health record, DMII documented in problem list, or most recent LDL > 190 based on most recent date of collection (Supplement, Table 2). At the time of project protocol and data collection tool creation (October 2018), 2013 guidelines were the newest and most widely accepted update in the literature. An ASCVD risk of > 5% was chosen based on a risk-benefit discussion recommended at this threshold, outlined in the ACC/AHA guidelines in addition to HIV infection identified as a complicating risk factor. Patients were excluded if they were being seen for pre-exposure prophylaxis (PrEP); had a contraindication to statin therapy, including history of rhabdomyolysis; or had advanced renal failure (Supplement, Table 3). The Institutional Review Board approved the study for exemption via Concordia University Wisconsin and required no oversight.

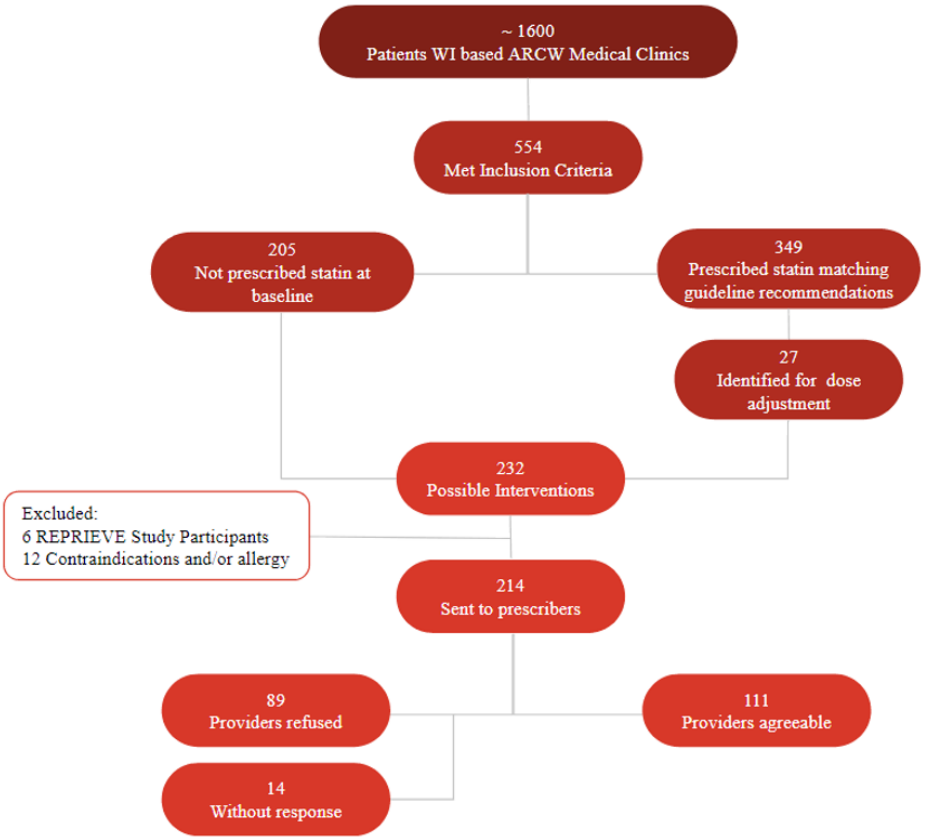
In phase one, researchers used the data collection tool to perform a chart review and determine the appropriateness of statin prescribing at baseline. In phase two, a pharmacist-driven intervention targeted gaps in statin prescribing following approval of the primary care providers. Researchers contacted primary care providers electronically with the pre-approved protocol and a corresponding list of patients under their care who could benefit from initiation or adjustment of statin therapy (Supplement, Figure 1). In phase three, researchers performed chart

FIGURE 2. Indication for Initiation of Statin Therapy for Eligible Patients not Prescribed a Statin at Baseline



ASCVD = Atherosclerotic Cardiovascular Disease

FIGURE 3. Patient Flow Diagram



REPRIEVE = Randomized Trial to Prevent Vascular Events in HIV

review to assess the impact of a pharmacist-driven intervention on appropriate statin prescribing compared to baseline (Figure 1). The baseline cohort was frozen at the beginning of the study to reflect the same group patients following the targeted intervention for a per protocol analysis. A chi-squared test was used.

The primary objective of this study was to determine the impact on the number of patients prescribed guideline-recommended statin therapy after pharmacist intervention. The secondary objective was to determine whether there was a cost benefit to Vivent Health, based on script capture in the dispensing outpatient pharmacy and improvement in Star Ratings, a Medicare assessment of performance and quality that impacts reimbursement.

Results

Of the 1,600 patients reviewed, 554 were eligible for statin therapy. Sixty-three percent were prescribed a statin at baseline (349/554). Patients with a calculated 10-year ASCVD risk score of > 7.5% made up the largest cohort of patients not prescribed a statin at baseline; patients with an LDL > 190 accounted for the smallest cohort (Figure 2). Twenty-seven patients already prescribed statin therapy were identified as potentially benefiting from a dose adjustment (7.7%). All medication dose changes were associated with a drug-drug interaction between statins and ART.[9] Of the 232 possible interventions (205 not on a statin and 27 dose adjustments), 214 advanced to phase two of the study. There were six exclusions for trial enrollment (REPRIEVE) and 12 subjects with allergy and/or contraindication (Figure 3).

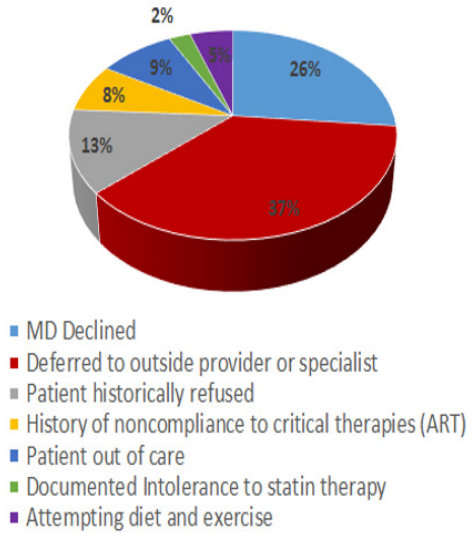
Providers were agreeable to initiate or adjust statin therapy in 111/214 patients (52%); 14 did not respond. The major reasons for refusal were most often a lack of provider-pharmacist relationship, and the patient receiving primary care and/or being seen by a specialist at an outside institution (Figure 4). After pharmacist intervention, 401/554 (72%) of eligible patients were prescribed statin therapy, a 9% increase from baseline accounting for 52 additional patients ($p < 0.05$).

Star Ratings associated with Vivent Health's outpatient pharmacy also showed improvement. Data collected from Prescribe Wellness showed that 89.6% of patients were 80% or more adherent to their statins at baseline. (Prescribe Wellness is a cooperation with over 10,000 community pharmacies whose role is to enhance patient medication adherence and outcomes through payor and refill data monitoring.) Following pharmacist-led intervention, 91% of patients were 80% or more adherent to their statins, suggesting that the majority of patients prescribed statin therapy had received the original prescription. The overall star rating improved from 3.2 to 5.0 over 5 months during the study interval.

Discussion

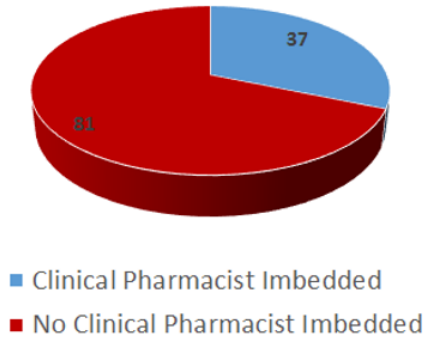
Improvement in rates of appropriate statin prescribing in patients living with HIV is possible via a pharmacist-driven statin management protocol. Patients receiving primary care management from an outside provider or cardiologist was the most common documented reason for refusal of statin initiation by providers. Patients at Vivent Health have the option to be seen for HIV care only, or HIV in

FIGURE 4. Documented Reason for Refusal of Statin therapy Initiation in Eligible Patients Provided by Primary Care Provider



ART = Antiretroviral therapy

FIGURE 5. Proportion of Provider Responses That Were Refused or Without Response Based on Presence of Clinical Pharmacist



addition to primary care management. For those being seen for HIV care only, there is a need for improved medication reconciliation and/or communication for best practice recommendations with outside providers and specialists moving forward.

Another large barrier to statin initiation was lack of routine pharmacist-provider relationship. Two of Vivent Health's campuses have a clinical pharmacist team imbedded in the care team, who has direct interaction with primary care and infectious disease providers on a regular basis. Two clinics do not have a pharmacist who has regular, in-person engagement with the clinical pharmacy team. Proportionally, the majority of refusals came from sites without a clinical pharmacist imbedded (Figure 5). This discrepancy demonstrates that a multidisciplinary team approach can improve patient outcomes and access to care.

Limitations of this analysis include the electronic health record-generated 10-year ASCVD risk score. An under-reported risk is possible due to missing components in the electronic health record, such as LDL. In addition, scores could change over the course of the study, with fluctuations in metrics like blood pressure control and smoking status.

The results of this study could be used to support pharmacists in other ambulatory care and population health settings, increasing their utility and promoting collaborative care by demonstrating improvement in outcomes with pharmacist intervention, including quality metrics.

Population health is an emerging role for clinical pharmacists, in addition to the more prevalent face-to-face ambulatory care services.

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PR *This article has been peer-reviewed. The contribution in reviewing is greatly appreciated!*

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Supplemental

TABLE 1. Data Included in Data Collection Tool and Retrieved from Electronic Health Record

Medical Record Number	Patient name	Date of Birth	Age
Gender	Race	Y/N clinical ASCVD	LDL for those > 190
Y/N diagnosis of diabetes	ASCVD Risk for those > 5%	Statin currently active in medication list*	Kinetic booster currently active in medication list**
Y/N allergy documented	Y/N contraindication documented	Smoking status	Most recent blood pressure
Vivent Health clinic location	Name of primary care provider	Name of preferred pharmacy	

Medication codes identified in the electronic health record:
**Statins: 1153*
***Kinetic boosters: 574877, 582702, 583084, 583821, 588222, 596867, 166359, 164471, 583457, 586387, 593789, 176935, 225256, 475556, 553459, 560479, 591300*
ASCVD: atherosclerotic cardiovascular disease; LDL: low-density lipoprotein

TABLE 2. ICD - 10 Codes for Clinical Atherosclerotic Cardiovascular Disease (ASCVD)

I20	Angina
I21.9	Acute MI, unspecified
I24.8-9	Acute IHD, unspecified
I25.10	Chronic IHD, unspecified
I25.2	Old MI
I25.8	Other forms of chronic IHD
I25.82	Chronic total occlusion of coronary artery
I25.84	Coronary atherosclerosis
I65.xx	Precerebral artery stenosis or occlusion (includes CA stenosis)
I66.xx	Cerebral artery stenosis or occlusion (includes strokes)
I67.89	Other cerebrovascular disease
I70.xx	Atherosclerotic PAD
I71	Peripheral aortic aneurysm and dissection
I73.9	Other PVD, unspecified
I74.x	Arterial embolism/thrombosis
I75	Atheroembolism
Z95.1, Z98.61	S/PCABGand S/PPTCA/PCI

CA = Carotid Artery; IHD = Ischemic heart disease; MI = Myocardial infarction; PAD = Peripheral artery disease; PVD = Peripheral vascular disease;

TABLE 3. Exclusions for statin initiation ICD-10 Codes

M62.82	Rhabdomyolysis
N17	Acute renal failure
N18.5	End stage renal disease (CKD stage V)
N19	Renal failure unspecified

CKD = Chronic Kidney Diseases

Supplemental Cont.

FIGURE 1. Communication/Protocol Electronically Sent to Providers

"Good Afternoon (Medical Provider),

With much time and assistance, I am excited to have designed a tool to help identify patients eligible for statin therapy based on ACC/AHA guidelines. We pulled data from EPIC to determine patients who may be eligible for statin initiation or adjustment. The patient's charts were then reviewed for appropriateness of therapy including dose/intensity.

1. A list of patients that could benefit from statin initiation or dose adjustment will be provided directly to the documented primary care physician (PCP) for the opportunity to review.
2. Following PCP review, the clinical pharmacy team will reach out to approved patients to discuss risk vs benefit of statin initiation or adjustment.
   a. Patient education to include:
      i. Indication: cardiovascular protection
      ii. Administration: once at same time each day, with or without food, etc
      iii. Adverse effects -
         1. Common: diarrhea, stomach upset, cold symptoms
         2. Serious: muscle/joint pain; contact doctor
         3. Review s/sx of allergy; seek emergency attention
      iv. Interactions:
         1. avoid grapefruit juice
         2. make ARCW provider aware of any new or change to medication
3. If agreed upon by the patient, a prescription order will be placed with the patients preferred pharmacy for a 90-day supply. Education will be provided and documented.
4. Ongoing fills will be managed and approved at the discretion of the PCP.
   The provider could consider assessing a fasting lipid panel (FLP) 3 months after initiation or adjustment, then once every 3 - 12 months thereafter.

I am hopeful this collaboration will aid in our joint effort to provide our patients with continued increased quality and access to care.

Please see the list of patients under your care who may benefit from statin initiation or dose adjustment attached."