

# Pharmacy Integration

Crossing the Chasm between Pharmacy and Clinic Operations

*Improving Patient Safety and Quality by  
Integrating Pharmacy into Clinic Operations*

## Executive Summary

Almost 70% of Medicare beneficiaries in America today are living with two or more chronic conditions. And 36.4% have four or more conditions. These patients face a plethora of challenges in managing their conditions, ranging from **limited access to care to fragmentation of care and poor continuity of care**, all of which lead to poor patient outcomes and high healthcare costs.

Two critical determinants of health outcomes in this patient population are medication optimization and medication adherence. The former ensures that the patient’s medication regimen is safe, accurate, effective and appropriate for optimal management of their condition. Adherence ensures the medications are taken as directed.

Pharmacists have historically played a role in improving adherence to set patients up for therapeutic success. However, owing to the operational silos that exist between clinical and pharmacy operations, their capacity for significant impact in this area has been limited, and their role in medication optimization has been negligible. When operational silos are removed through **pharmacy integration**, it positions the pharmacist as a key member of the care team, helps coordinate care and eliminates duplication of resources and services for the patient, all of which translates to increased patient safety and improved quality of care, ultimately resulting in improved patient outcomes.

**Pharmacy integration** removes operational and functional silos between pharmacy and clinic. It is achieved through a three-step process, which includes (1) granting pharmacists access to the clinic’s electronic medical record; (2) establishing a shared communication platform between pharmacy and clinic; and (3) executing a collaborative practice agreement to expand the pharmacists’ scope of work. Collectively, these steps lead to seamless, real-time communication and information exchange between pharmacists and the clinic care team, which ultimately positions the patient for therapeutic success.

## Shifting the Paradigm

At VillageMD, we partner with primary care physicians to improve health outcomes for patients living with chronic conditions. Among our Medicare population, an estimated 76% take more than three prescriptions a day, and over 23% take more than 10 medications a day to manage their chronic conditions.



In 2015, prioritizing patient safety and health outcomes, our Village Medical Houston practice began the process of integrating its on-site pharmacy into its clinic operations. Pharmacists were given full access to the patient’s Electronic Medical Record (EMR), a common messaging and phone system was established between pharmacy and clinic, and Collaborative Practice Agreements and Delegated Authority were executed to expand the pharmacists’ scope of work. This whitepaper summarizes the cumulative positive

impact these interventions had on patient outcomes, as seen by improvements in medication adherence measures. It also outlines the various steps involved in pharmacy integration and the difference between an integrated pharmacy and a co-located pharmacy.

## RESULTS OF PHARMACY INTEGRATION

### Demonstrated Improvement in Medication Adherence and Optimization Over Five-Year Period

Five-year medication adherence data derived from EQuIPP™ demonstrated steady, year-over-year improvement and superior performance against industry benchmarks, for all three CMS Star Quality measures related to medication adherence.

- **Medication Adherence for Cholesterol (MAC)** increased from 85% in 2015 to 90.3% in 2019, which was nearly 10 percentage points ahead of the 2019 industry benchmark of 80.6%, as measured across all pharmacies in Texas.
- **Medication Adherence for Diabetes (MAD)** increased from 84.6% to 87.4% over the five-year period, ending 2019 almost 8 percentage points ahead of all pharmacies in Texas.
- **Medication Adherence for Hypertension (MAH)** grew from 84.8% to 88.6%, compared to the 2019 industry benchmark of 81.3%.

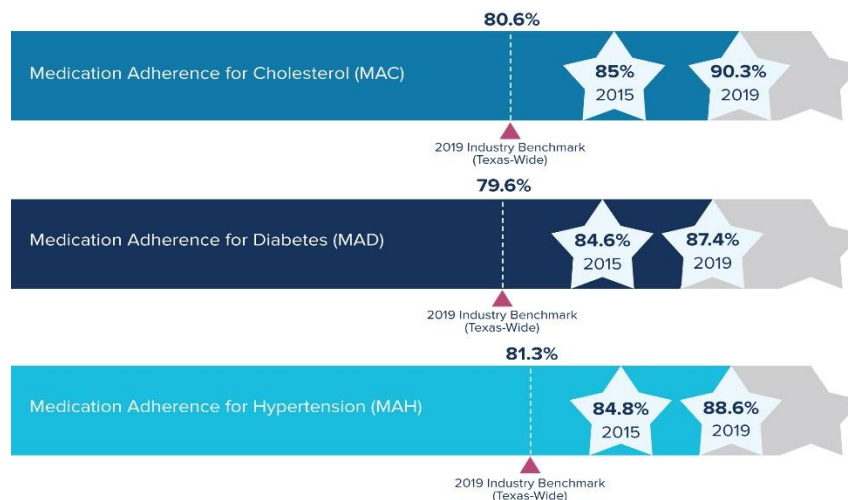


Figure 1: Integrated Pharmacy-driven improvement in medication adherence rates for Village Medical Houston patients (2015-2019)

### Successful Initiation of Therapies in Diabetic Patients

With increased access and visibility to the patient's chart, pharmacists were able to recommend beneficial therapies such as statin addition for diabetic patients, or optimal dosing on therapies such as angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) for patients with uncontrolled hypertension. The recommendations were coupled with physician education on the beneficial therapies. As a result, **Statin Use in Patients with Diabetes (SUPD)**, another CMS Star Quality measure, which stood at 75% in 2015, peaked at 90.7% at the end of 2019 – far outperforming competitors, who averaged 78.4%

# Pharmacy Integration

according to EQuIPP™ data. With better insights into the patient’s disease progression, the pharmacists were able to drive the patient contact with enhanced visibility and authority.

## Improved Clinical Outcomes

While a direct correlation cannot be established between pharmacy integration and improved clinical outcomes, owing to multiple confounding factors at the clinic level, it was nonetheless observed that three-year HgbA1c levels among patients enrolled in the Village Medical pharmacy saw a greater reduction (14%) in values as compared retrospectively to a control cohort utilizing other pharmacies, which saw a 7% reduction. These values were measured between quarter 1 and quarter 12 over the three-year period.

For VillageMD, pharmacy integration helped achieve several key objectives:

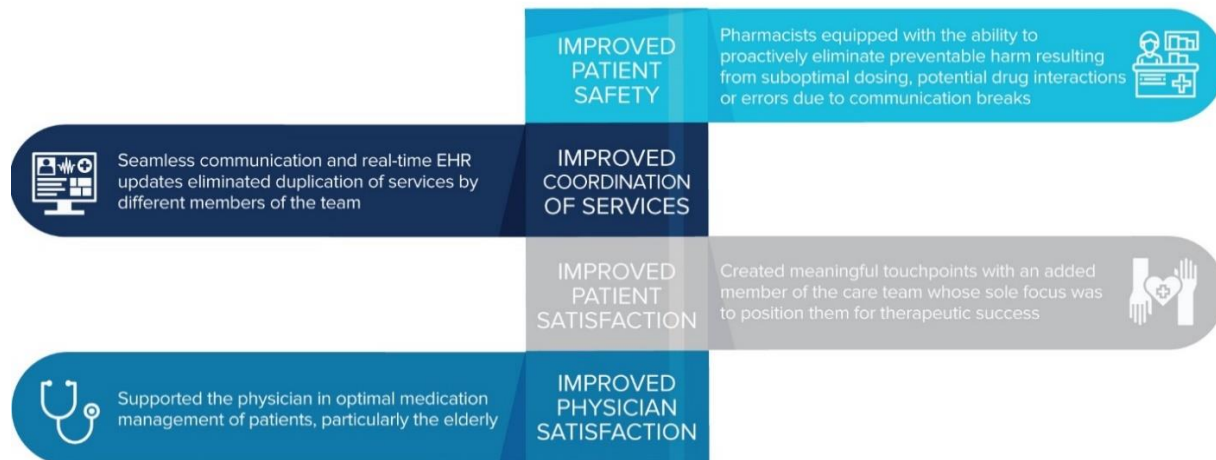


Figure 2: Key objectives achieved through pharmacy integration

The achievement of the above four objectives resulted in overall **improvement in the quality of care** provided to patients as demonstrated by the achievement of **five stars across four heavily weighted CMS Star Quality measures in 2019.**

Moving forward, VillageMD continues to seek opportunities to further integrate pharmacy into its clinical operations, through embedding pharmacists in regular Population Health meetings with the physicians and clinic staff, incorporating pharmacists into care management workflows, providing pharmacy consults prior to discharge through bedside medication delivery programs, and offering virtual pharmacy consults and pharmacist-driven post-discharge medication reconciliation to optimize post-acute outcomes.

“As the nexus of healthcare, primary care is uniquely positioned to remove siloes within the health system. When we integrate pharmacy into clinic operations, we optimize medication regimens and improve medication adherence. This leads to improved health outcomes.”

- Dr. Clive Fields, CMO



## Introduction

As of April 2020, the CDC reports that six in 10 Americans live with at least one chronic condition such as heart disease, diabetes, cancer or a respiratory condition. In 2017, the National Council on Aging reported that 80% of older adults have at least one chronic condition. A total of 68.4% of Medicare beneficiaries have two or more chronic diseases, and 36.4% have four or more. These staggering statistics point to a disturbing story about America's health.

Patients living with chronic ailments face many challenges, including **poor access to care**, due to affordability, accessibility or availability of health services; **poor continuity of care**, due to minimal supervision and touchpoints between office visits; and **fragmentation and poor coordination of care**, as patients consult multiple specialties with minimal coordination and communication between providers. **The cumulative effect of these challenges is poor patient outcomes and high healthcare costs.**

A critical determinant of health outcomes that straddles access, care coordination and continuity of care is medications, particularly among those with chronic conditions such as hypertension, CHF, diabetes and COPD. Specifically, there are two essential facets: **medication optimization** and **medication adherence**, both of which are key to therapeutic success.

### Medication Optimization

Medication optimization ensures the patient's medication regimen is safe, effective and appropriate to manage their condition, eliminating the probability of harm caused by suboptimal dosing, overmedication, incorrect medication, drug interactions or potential adverse drug events. A regimen is compromised when dosage, frequency or the class of medication prescribed are not appropriate for the patient, when the patient is prescribed more medication than necessary (overmedication), when drugs interact with each other leading to preventable drug-drug interactions, or when drugs cause harm or injury to the patient resulting in an adverse drug event (ADE). All these scenarios can lead to suboptimal medication regimens. Some examples are described on the right panel.

An elderly patient seeks medical attention from multiple providers who do not communicate with each other. In this scenario, the patient is likely to have multiple drug prescriptions that will need to be reviewed and reconciled to prevent overdosing, drug-drug interactions and overmedication.

When patients transition between sites of care after an acute episode (e.g., an inpatient setting or a post-acute facility), their post-acute drug regimen may differ from their pre-acute medication list. To prevent a readmission, their pre- and post-drug regimens need to be reconciled in a timely manner.



### Medication Adherence

Medication adherence ensures patients take their medications as directed. While all medications are prescribed under the principle and assumption of adherence, patients may face challenges and obstacles that prevent them from being adherent. This is especially so among patients who are on multiple medications. The reasons for poor adherence range from lack of knowledge and poor education about the regimen to the inability to afford medications. Owing to the high prevalence of these factors, poor medication adherence is relatively common<sup>1</sup>.

Studies in the last decade have shown a high correlation between medication optimization, medication adherence, patient outcomes and total healthcare spend<sup>2,3</sup>. The findings on medication adherence have influenced patient safety and outcomes measures, so much so that adherence to hypertension, diabetes and cholesterol medications is heavily weighted in the 2020 CMS Star Quality measures.

## DID YOU KNOW?

Medication non-adherence may increase with disease progression.<sup>4</sup>

## The State of Pharmacy Today

The majority of pharmacists today provide some form of medication counseling to patients, with the intent to optimize medication regimens and improve adherence. However, this is often based on claims-based medication lists that may not be reconciled against the patient's latest medications endorsed by their provider. Pharmacists lean heavily on information gathered during the patient interview, with little insight into the patient's documented history of illness, allergies and recent hospitalizations. This additional information, which resides in the patient's chart, paints a more complete picture of healthcare needs and improves recognition of risks for potential adverse drug events (ADEs) or drug-related problems (DRPs). Absent this information, pharmacists are limited in their ability to (1) eliminate any medication-related preventable harm to the patient, (2) identify missing therapies that could benefit the patient, or (3) engage the patient in better medication adherence, particularly in the ambulatory elderly population.

### Leading Causes of Nonadherence Among Patients living with Chronic Conditions:

- Lack of knowledge and poor education about the medication regimen
- Affordability of medications cannot be overlooked, especially for patients living with multiple co-morbidities
- Low health literacy can lead to poor understanding of medication regimens and thus failure to adhere to them
- Lack of support at home and other competing priorities
- Long breaks between office visits with minimal contact with the physician or care team can deprioritize medications
- Patients may experience side effects due to drug interactions, allergies, or even suboptimal dosing between office visits

VillageMD Care Management teams are trained to identify these causes of non-adherence, and address them

Limited real-time access to patient data is a direct result of today's pharmacies and clinics operating in silos, with little to no communication or information exchange between them. As a result, **pharmacists do not have access to the right information to position patients for therapeutic success**, and providers, who are often rushed during office visits, are unable to leverage the skills of the pharmacist to deliver better care to the patient. This leads to medication misuse, medication nonadherence, delay in therapies and abandonment, and ultimately patient outcomes suffer.

## DID YOU KNOW?

In a study evaluating the effect of ambulatory care pharmacy-based transitional care services, 30-day and 180-day readmissions were reduced by 28% and 32% respectively, compared to the control group in a neighboring hospital.

*The study was conducted in 2013 by Synergy Pharmacy Solutions (SPS) in Bakersfield, California, for recently discharged members of the Kern Health Systems (KHS) managed Medicaid health plan who were classified as high-risk based on their healthcare utilization, medical history, and social history.<sup>5</sup>*

## Shifting the Paradigm through Pharmacy Integration: A New Era in Patient Safety

At VillageMD, we partner with primary care physicians to improve health outcomes for patients living with chronic conditions. Among our Medicare population, an estimated 76% are on more than three prescriptions a day, and over 23% are on more than ten medications a day to manage their chronic conditions.

In 2015, prioritizing patient safety and health outcomes, our Village Medical Houston practice began the process of integrating its on-site pharmacy into its clinic operations, creating a co-located, **integrated pharmacy**. The ensuing results highlight the critical role pharmacists play in patient outcomes, and the importance of pharmacy integration in shifting the paradigm of chronic condition management.

**Pharmacy integration** removes operational and functional silos between pharmacy and clinic. It is achieved through a three-step process, which includes (1) granting pharmacists access to the clinic’s electronic medical record; (2) establishing a shared communication platform between pharmacy and clinic; and (3) executing a collaborative practice agreement to expand the pharmacists’ scope of work. Collectively, these steps lead to seamless, real-time communication and information exchange between pharmacists and the clinic care team, which ultimately positions the patient for therapeutic success.

The **key structural improvements entailed within the pharmacy integration process** are summarized in Figure 3.

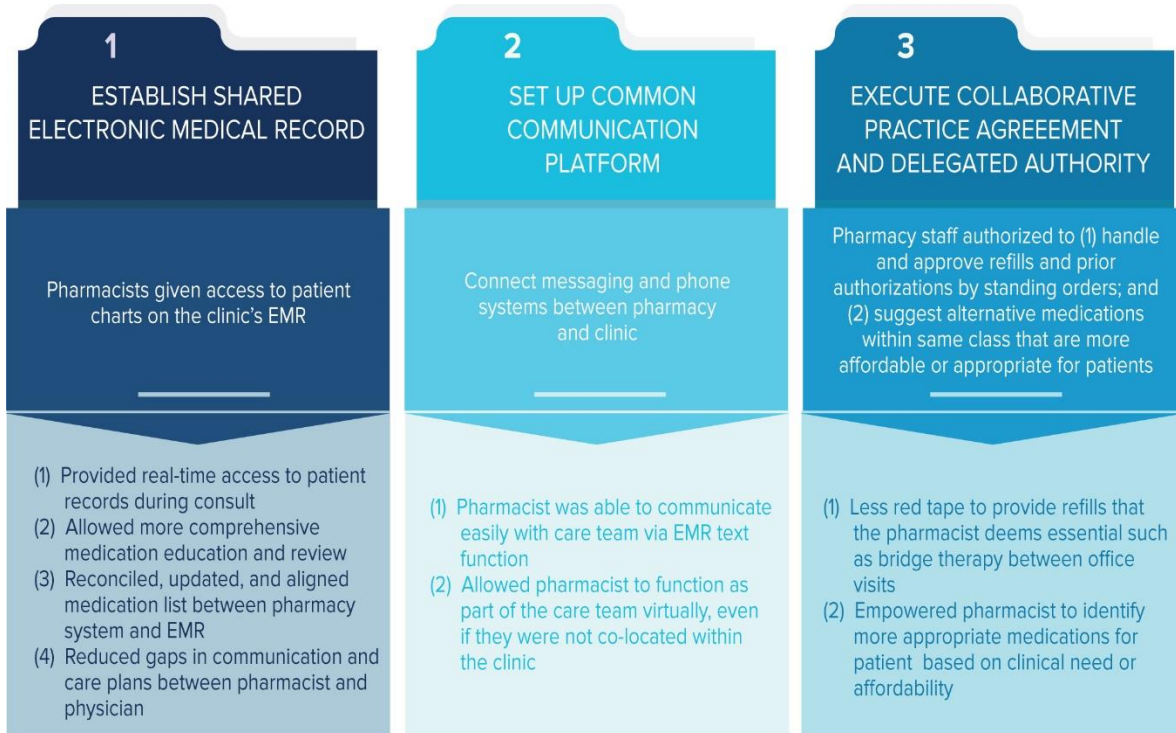


Figure 3 Steps to pharmacy integration



## Pharmacy Integration: Impact and Outcomes

Real-time access to the Electronic Medical Record (EMR) provided an optimized and enhanced view of the patient during the consult. The common messaging and phone system structurally connected pharmacists to the rest of the care team, enabling easy communication and alerts. The CPA and Delegated Authority increased the pharmacists' authority, empowering them to make medication-related recommendations they deemed necessary for the well-being of the patient. This enabled them to function at the top of their licensure, as the resident medication expert. Collectively, these interventions helped position pharmacists as key members of the integrated care team. All this, when supplemented by information obtained during the conversation with the patient, **allowed pharmacists to drive the conversation with increased visibility and authority** and set the table for a more beneficial exchange for the patient.

## Improved Services through Integration

Before integration, VillageMD pharmacists were providing a portfolio of services to help patients with their medications. These included services such as **Medication Therapy Management (MTM)\***, **Medication Synchronization** and **Medication Packaging**. These services were designed to help patients adhere to treatment and meet their therapy goals. When done well, an MTM serves as a patient safety intervention. **Medication Synchronization** coordinates medication refills so the patient can pick up a 30-day or 90-day supply of all their medications at the same time each month. Pharmacy integration allowed the same services to be delivered, but in a more informed and effective manner that optimized the patient contact and positioned the patient for therapeutic success. The benefits of pharmacy integration are summarized in Figure 4.

Additionally, the pharmacy packaged chronic-condition medications into blister packs, replacing traditional pill bottles. Medications for each designated time of the day were packed together in one blister pack. For patients with complex medication regimens or cognitive impairment, blister packs have been shown to enhance medication adherence<sup>7</sup>.

*\*Village Medical pharmacists follow a standardized MTM protocol through OutcomesMTM™.*

How often do providers add on additional therapy based on worsening labs, when patients were in fact nonadherent to the original therapy? The pharmacist is skilled in identifying non-adherence and can reduce “pill burden” by helping the patient improve adherence to the original therapy. However, this can only happen when the pharmacist has access to the patient’s chart and provider notes, which is what pharmacy integration enables.

- David Koon,  
Director of Pharmacy



## Benefits of Pharmacy Integration

Pharmacists help patients optimize medications and improve adherence. Integration equips them to deliver these services in a more informed and effective manner.

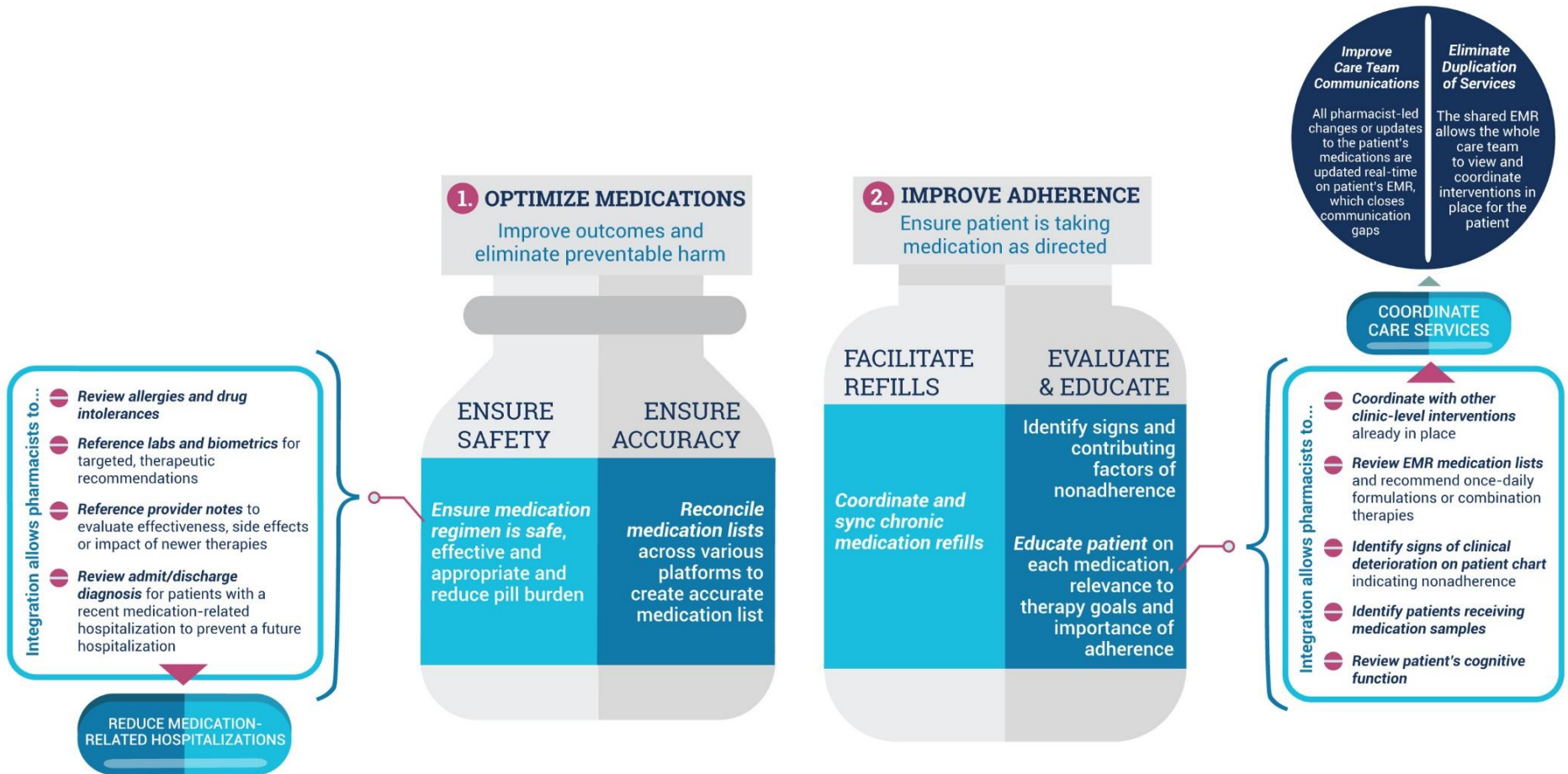


Figure 4: The benefits of pharmacy integration. For a detailed listing of benefits, refer to Tables 1 and 2.

# Pharmacy Integration

Table 1: How pharmacy integration improves pharmacists' ability to optimize medications: Detailed View

## HOW PHARMACY INTEGRATION CAN IMPROVE PHARMACISTS' ABILITY TO OPTIMIZE MEDICATIONS: DETAILED VIEW

	TRADITIONAL PHARMACIST ACTIVITIES	WITH A SHARED EMR, THE PHARMACIST HAS ACCESS TO...	AS A RESULT, THE PHARMACIST CAN NOW...
Ensure Accuracy	Create updated medication list by reconciling previous medication fills at pharmacy	Medication list on the EMR <i>(This list includes payor claims and has also been confirmed by patient and provider during medication review in-clinic)</i>	Reconcile pharmacy medication list against medication list on the EMR, for a more complete and accurate final list of medications
Ensure Safety	Ensure medication regimen is safe, effective and appropriate (right medication, right frequency, right dosage); reduce pill burden	Patient's list of allergies and drug intoler-	Review patient's list of allergies and drug intolerances when recommending an alternative medication
		Patient's labs and biometrics	Reference patient's labs and biometrics for more targeted, appropriate and clinically relevant therapeutic recommendations to manage their condition. Examples: A diabetic patient whose A1C has increased in the last 3 months, despite adherence, might benefit from an increased dosage or add-on therapy. On the contrary, a nonadherent patient with worsening labs would benefit from adherence counseling for their original therapy before additional therapy is prescribed
		Provider notes about medication adjustments	Reference provider notes from most recent office visit to evaluate effectiveness, side effects or impact of newer therapies and suggest alternatives. Example: recent weight gain or edema
		Admit/discharge diagnoses	Review provider notes and admit/discharge diagnosis for patients with a recent medication-related hospitalization (e.g., Adverse Drug Event or Drug Related Problem), to prevent a future hospitalization

Pharmacy integration includes structural and operational improvements to ensure seamless communication between pharmacy and clinic.

The improved information exchange, cross-communication and care coordination enable the pharmacist and the clinic staff to function as a cohesive team to ultimately help patients achieve better outcomes.

# Pharmacy Integration

Table 2: How pharmacy integration improves medication adherence: Detailed View

## HOW PHARMACY INTEGRATION CAN IMPROVE PHARMACISTS' ABILITY TO IMPROVE ADHERENCE: DETAILED VIEW

	TRADITIONAL PHARMACIST ACTIVITIES	WITH A SHARED EMR, THE PHARMACIST HAS ACCESS TO...	AS A RESULT, THE PHARMACIST CAN NOW...
Facilitate Refills	Coordinate and sync chronic medication refills so all refills are aligned, and patient can pick them up all on same day	<p>Provider-endorsed list of medications</p> <p>Last appointment date and potential need for another appointment</p>	<p>Ensure all medications are accounted for, and reduce pill burden if appropriate</p> <p>Help coordinate patient's next appointment visit before running out of medications, as well as authorize and dispense bridge refills</p>
	Encourage 90-day supply of medications to minimize lapses	Provider notes about patient's social support, loneliness and social isolation factors	Identify signs that patient may benefit from more frequent touchpoints and therefore schedule 30-day refills instead of a 90-day supply. Example: social worker note that indicates patient is isolated and would benefit from more frequent connections with care team
	Enroll patients in medication packaging upon request of the patients	Provider and CM case referrals for High risk and nonadherent patients	Upon the request of other care teams, proactively outreach to High risk or nonadherent patients who may benefit from medication packaging
Evaluate and Educate	Educate patient on each medication, relevance to therapy goals and importance of adherence; simplify complex instructions (often with minimal insight into original indication for use)	Provider notes about clinical progression or deterioration	Identify signs of clinical deterioration on patient chart that might indicate nonadherence or provide insights into decreasing refill metrics. Example: a recent hospitalization
	Identify signs and contributing factors of nonadherence; troubleshoot barriers	Insights about use of medication samples	Identify patients receiving medication samples from the provider; this alerts the pharmacist to inquire about affordability barriers and explore more affordable options for the patient
		Patient's cognitive function status	Review patient's cognitive function status to inform adherence counseling. Example: PHQ-9 results (depression screening)
		Provider-endorsed medication list	Review EMR medication lists and make recommendations to provider for once-daily formulations or combination products to reduce complexity of regimen and reduce pill burden
	Other clinic-level interventions in place (e.g. care management)	Review and coordinate with other clinic-level interventions already in place to help the patient with their condition management. Example: A social worker may already be assisting the patient with medication affordability. Or if a patient is receiving care at home, talk to the patient about delivery services	



## Results

### Sustained Improvement in Medication Adherence

Using data derived from the EQuIPP™ performance information management platform, the following medication adherence measures were tracked over a five-year period to evaluate the impact of pharmacy integration. The unit of Proportion of Days Covered (PDC) was used to measure adherence.

*NOTE: EQuIPP™ (Electronic Quality Improvement Platform for Plans and Pharmacies) provides unbiased, standardized and benchmarked performance data to health plans and pharmacy organizations.*

MEASURE	DEFINITION
Medication Adherence for Cholesterol (MAC)	Measure demonstrates the percentage of Medicare Part D beneficiaries 18 years or older who adhere to their prescribed statin drug therapy
Medication Adherence for Diabetes (MAD)*	Measure demonstrates the percentage of Medicare Part D beneficiaries 18 years or older who adhere to their prescribed drug therapy across classes of diabetes medications
Medication Adherence for Hypertension (MAH)**	Measure demonstrates the percentage of Medicare Part D beneficiaries 18 years or older who adhere to their prescribed hypertension therapy

Figure 5 Medication adherence measures.

\*MAD: Classes of medications include biguanides, sulfonylureas, thiazolidinediones, Dipeptidyl peptidase 4 (DPP-4) inhibitors, incretin mimetics and meglitinides.

\*\*MAH: Therapies include renin angiotensin system (RAS) antagonists [angiotensin converting enzyme inhibitor (ACEI), angiotensin receptor blocker (ARB) or direct renin inhibitor medications].

In each of the three categories, medication adherence showed a positive trendline over the five-year period and showed year-over-year consistent superiority to benchmark data gathered across other pharmacies (includes all pharmacies in the state of Texas that participate in EQuIPP™). Furthermore, CMS Star Quality measures reached five stars across all three adherence measures in 2019, four years after integration commenced. Also, important to note, as with most integration efforts, is that there is a certain lead time that should be accounted for before positive results can be sustained. This is exhibited in the fluctuation of MAC and MAH in the early phase of the five-year period. This lead time is defined by the



speed at which workflows are integrated and the relationship between pharmacy and care team is established. In 2019, Medication Adherence for Cholesterol (MAC) among VillageMD pharmacy patients was at 90.3%, compared to 85.1% in 2015. The 2019 result was almost 10 percentage points higher than the benchmark, as measured across all pharmacies in the state of Texas using EQuipp™.

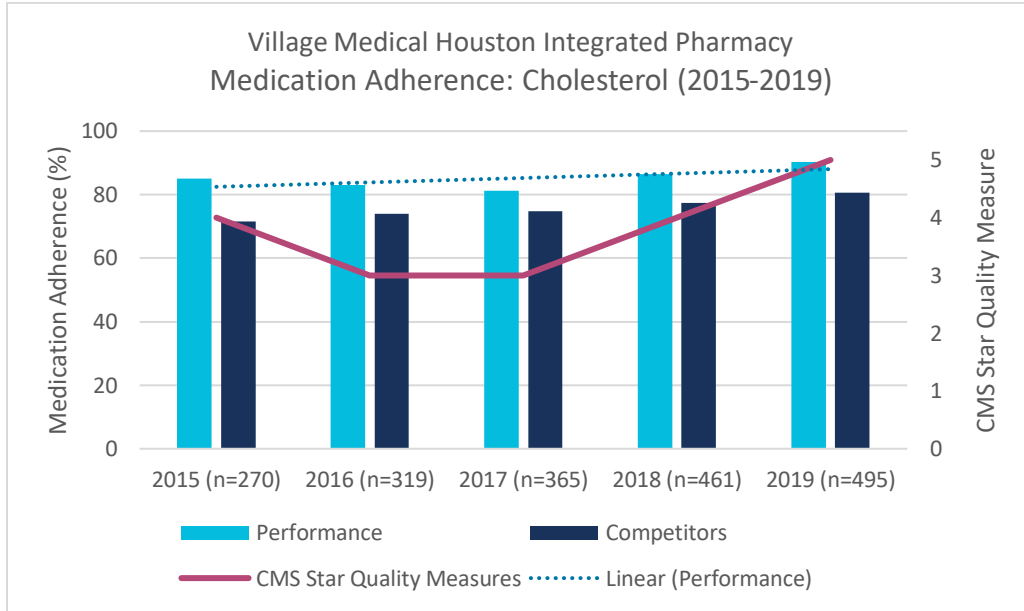


Figure 6: Medication Adherence for Cholesterol (MAC) measures the percentage of patients 18 years or older who adhere to their prescribed statin therapy.

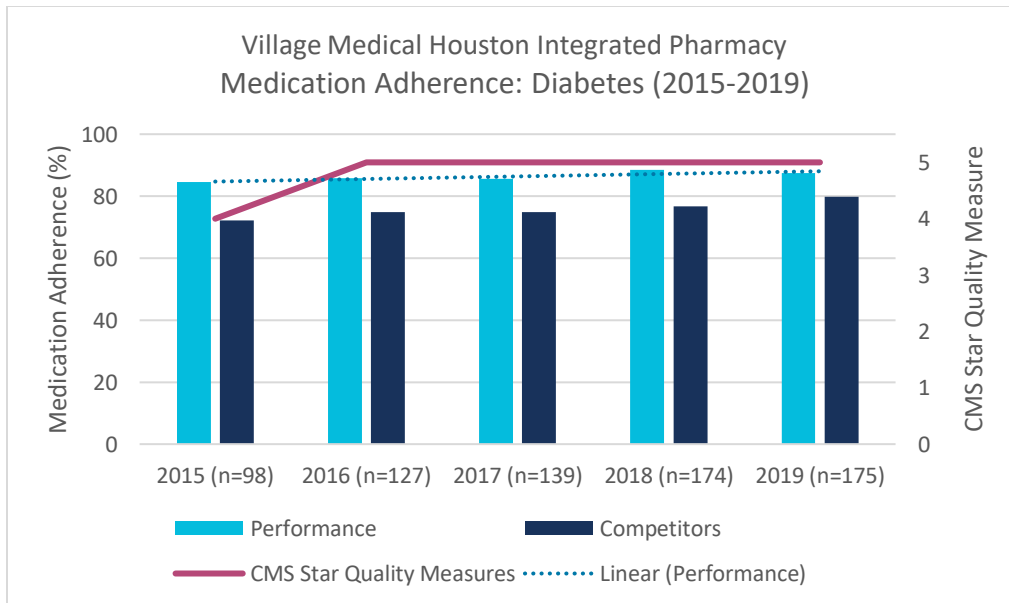


Figure 7: Medication Adherence for Diabetes (MAD) measures the percentage of patients 18 years or older who adhere to their prescribed drug therapy across classes of diabetes medications.

# Pharmacy Integration

Long-term, sustained increase in adherence to hypertension (MAH) and diabetes medications (MAD) was also observed among patients. VillageMD’s performance in these areas also far exceeded that of industry benchmarks.

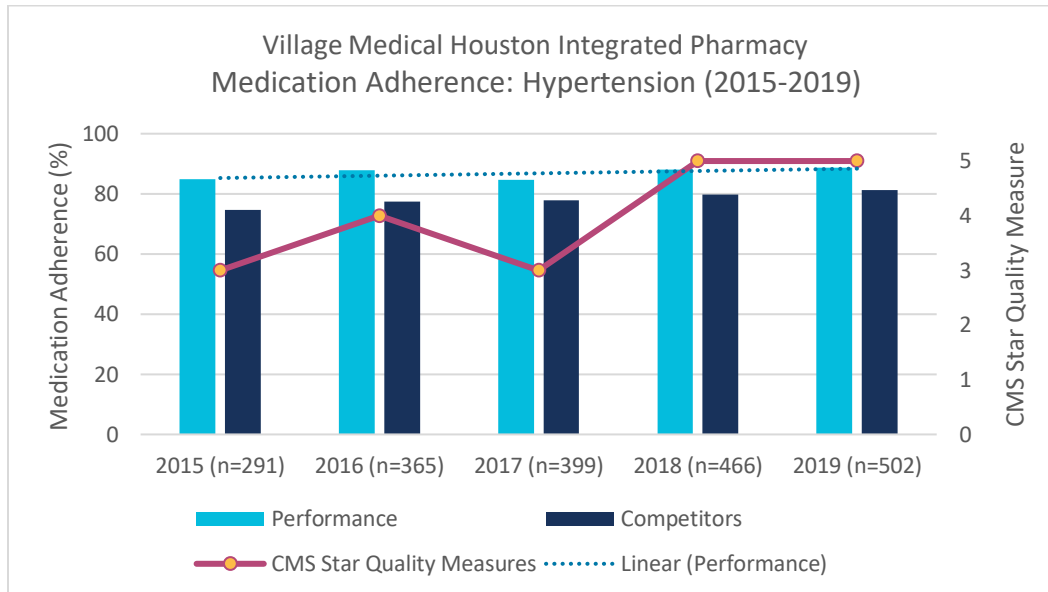


Figure 8: Medication Adherence for Hypertension (MAH) measures the percentage of patients 18 years or older who adhere to their prescribed hypertension therapy.

## Pharmacy Integration and Co-location: Not the Same Thing

Co-location occurs when a clinic and pharmacy share a physical space together. This layout facilitates patient access to pharmacy services during an office visit, and vice versa, and encourages communication between the provider and pharmacist. However, co-location is not the same as an Integrated Pharmacy. It connects the pharmacist and the clinic care team virtually, so that they are all working off the same clinical information and operating on the same data connectivity platform. Integration does not require co-location, though it can be optimized through co-location.

## Village Medical Houston: Co-located, Integrated Pharmacy

VillageMD’s practice in Texas has clinics in Houston and the surrounding areas. The Village pharmacy, while co-located with one of the clinics (Memorial Village), made its services available to all patients within all the VillageMD clinics, upon integration. However, as a result of the vast geographic spread, only 12% of the total attributed population availed of the services, as many long-time patients preferred to fill their prescriptions at pharmacies closer to their residences. For the other seven clinics, patients were unaware of the service unless they were informed by their providers. Since 2017, owing to the improvements brought about by integration, the pharmacy has observed a steady increase in patients.

## Medication Optimization through Pharmacy Integration

With increased access and visibility to the patient chart, pharmacists were able to recommend beneficial therapies such as statin addition for diabetic patients, or optimal dosing on therapies such as angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) for patients with uncontrolled hypertension. Coupled with pharmacist-led physician education on the importance of such therapies for patients, VillageMD observed a steep increase in **Statin use in Patients with Diabetes (SUPD)**. Across five years, statin use in patients increased steadily, reaching almost 91% in 2019, compared to the benchmark coverage of 78.4% across other pharmacies.

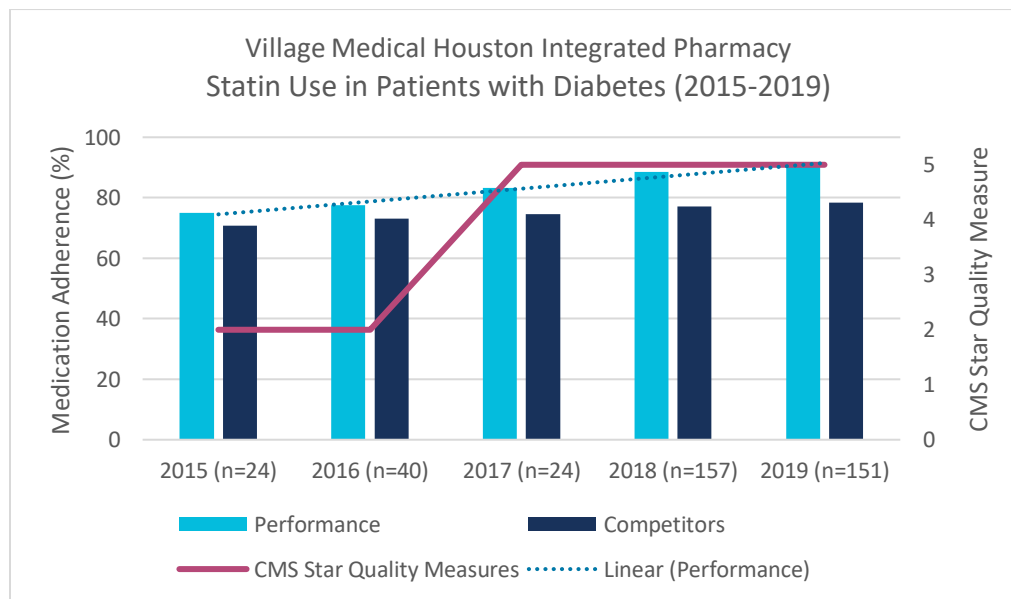


Figure 9: Statin Use in Patients with Diabetes (SUPD) measures the percentage of patients 40-75 years old dispensed at least two diabetes medication fills who received a statin medication fill.

## Impact on Clinical Outcomes

VillageMD provides a portfolio of interventions to improve clinical outcomes. These include evidence-based medication management and team-based care at the clinic level, rigorous panel management to ensure right care at the right time, care management outreach for individuals in need of additional high-touch care support, transitional care services to establish patients stably in a new care setting, and referral management to ensure coordinated care across multiple specialists. Any combination of these, in addition to optimal medications and medication adherence, can lead to improved clinical outcomes as measured through HgbA1C levels, systolic and diastolic pressure, and lipid levels, or through safety and utilization measures such as ADK, EDK and ADEs.

Owing to these multiple confounding factors, many of which are outside the scope of pharmacy, a direct correlation between pharmacy integration and improved clinical outcomes cannot be definitively established. Nonetheless, an attempt was made to retrospectively compare HgbA1C trends among a cohort of patients receiving all the same services listed above, with the only difference being enrollment in the integrated pharmacy. The cohort of patients receiving care at the Village Medical Houston

pharmacy saw a steady decrease in HgbA1C levels over a three-year period, beginning with HgbA1C levels at 8.49% in Q1 2017, and concluding Q4 2019 with an average HgbA1C of 7.31% (a 14% reduction over 12 quarters) as compared to a control cohort that utilized an outside pharmacy. This cohort presented an average HgbA1C level of 8.04% in Q1 of 2017, reducing to a level of 7.47% in Q4 of 2019 (a 7% reduction over 12 quarters).

**Improving Adherence: One Patient at a Time**

Patient's Conditions: Diabetes, Hypothyroidism, GERD, Osteoarthritis, Peripheral Vascular Disease, Cholecystitis, Hyperlipidemia, Morbid Obesity, Low Back Pain

Age: 74 years old

# of Daily Medications: 15 medications

Challenge Identified during MTM: Patient had too many medications to coordinate throughout the day, which led to medication nonadherence

Intervention: Patient was given medpack to help coordinate medications after identifying barrier to adherence. Also recommended statins based on high cholesterol values showing in patient chart.

Outcomes: Patient's Medication Possession Ratio (MPR) for Metformin (diabetes medication) improved from 46.15 percent in Jan 2017 to 99.17 percent in Jan 2020 after the blister packaging. Following the statin prescription, patient's Total Cholesterol value improved by 25 percent and LDL values improved by 34 percent, over a 2-month period.

Figure 10 Improving adherence: one patient at a time

## Empowering Pharmacists to Perform at Top of Licensure

Pharmacists in the integrated structure have reported feeling more empowered to support their patients. Patients who once struggled with affording medications, coordinating refills and tracking multiple daily medications have expressed relief and reduced anxiety, in addition to exhibiting improved adherence. Their trusted relationship with their pharmacist has offered them a one-stop-shop for all their medication needs. Increased pharmacist engagement has also alleviated the burden for patient caregivers, who are often faced with the challenge of filling the communication gaps between patient and provider, and refilling prescriptions from multiple pharmacies. Providers in the clinic setting have shared their relief to have additional support and a “second set of eyes” to ensure optimal medication management of their patients, particularly the elderly.

The addition of an integrated pharmacy has been invaluable to my practice. My patients enrolled in their services have a much higher adherence rate for their chronic medications, because of the direct real-time communication between the pharmacist and the physician. With access to the EMR, my pharmacist can now help reduce medication errors, suggest safer alternatives and less expensive options, and help navigate potential drug-drug interactions or potential side effects — so much more than just filling a prescription! Integrated pharmacy has added another vital member to my patient's care team and helped truly fulfill our comprehensive patient care team model.

- Dr. Caroline Carter, Primary Care Provider, Village Medical Houston



## **One Small Step for Pharmacy. One Giant Leap for Patient Safety and Quality of Care**

With better insights into the patient's condition, the pharmacists were able to drive the patient contact with enhanced visibility and authority. For VillageMD, pharmacy integration achieved several key objectives:

- **Improved patient safety** by equipping pharmacists with the ability to proactively eliminate preventable harm resulting from suboptimal dosing, potential drug interactions or errors due to communication breaks
- **Improved coordination of services** across the care team by enabling seamless communication and real-time EHR updates. This eliminated duplication of services by different members of the team.
- **Improved patient satisfaction** by creating meaningful touchpoints with an added member of the care team whose sole focus was to position them for therapeutic success
- **Improved physician satisfaction** by supporting the physician in optimal medication management of patients, particularly the elderly

The above resulted in overall **improvement in the quality of care** provided to patients, as demonstrated by the achievement of **five stars across four heavily weighted CMS Star Quality measures in 2019**.

Moving forward, VillageMD continues to seek opportunities to further integrate pharmacy into its clinical operations, through embedding pharmacists in regular Population Health meetings with the physicians and clinic staff, incorporating pharmacists into care management workflows, providing pharmacy consults prior to discharge through bedside medication delivery programs, and offering virtual pharmacy consults and pharmacist-driven post-discharge medication reconciliation to optimize post-acute outcomes.

## Bibliography

1. Osterberg L, Blaschke T. Adherence to medication. *N Engl J Med*. 2005 Aug 4;353(5):487-97. PMID: 16079372.
2. Roebuck MC, Liberman JN, Gemmill-Toyama M, Brennan TA. Medication adherence leads to lower health care use and costs despite increased drug spending. *Health Aff (Millwood)*. 2011;30(1):91-9.
3. DiMatteo RM, Giordani PJ, Lepper HS, Croghan TW. Patient adherence and medical treatment outcomes: a meta-analysis. *Med Care*. 2002;40(9):794-811.
4. Osterberg L, Blaschke T. Adherence to medication. *N Engl J Med*. 2005 Aug 4;353(5):487-97. PMID: 16079372.
5. *The American Journal of Managed Care*; March 2017 – Published on: March 15, 2017; Impact of a Pharmacy-Based Transitional Care Program on Hospital Readmissions
6. Shah S, et al. *J Pharm Technology* 2017 Jun; 33(3): 114-120. doi: 10.1177/8755122517702171.
7. Lau DT, Nau DP. Oral antihyperglycemic medication nonadherence and subsequent hospitalization among individuals with type 2 diabetes. *Diabetes Care*. 2004;27(9): 2149-53.
8. Tarn DM, Paterniti DA, Kravitz RL, Heritage J, Liu H, Kim S, et al. How much time does it take to prescribe a new medication? *Patient Educ Couns*. 2008;72(2):311-9
9. Cutler RL, Fernandez-Llimos F, Frommer M, et al. Economic impact of medication non-adherence by disease groups: a systematic review. *BMJ Open* 2018; 8:016982. doi:10.1136/bmjopen-2017-016982
10. Smith M, Giuliano MR, Starkowski MP. In Connecticut: improving patient medication management in primary care. *Health Aff (Millwood)*. 2011;30(4):646-54.
11. Isetts BJ, Brummel AR, de Oliveira DR, Moen DW. Managing drug-related morbidity and mortality in the patient-centered medical home. *Med Care*. 2012;50(11):997-1001.
12. Ramalho de Oliveira D, Brummel AR, Miller DB. Medication therapy management: 10 years of experience in a large integrated health care system. *J Manag Care Pharm*. 2010;16(3):185-95
13. Isetts BJ, Schondelmeyer SW, Artz MB, Lenarz LA, Heaton AH, Wadd WB, et al. Clinical and economic outcomes of medication therapy management services: the Minnesota experience. *J Am Pharm Assoc (2003)*. 2008;48(2):203-11
14. Jorgenson D, Dalton D, Farrell B, Tsuyuki R, Dolovich L. Guidelines for pharmacists integrating into primary care teams. *Canadian Pharmacists Journal (Ott)*. 2013 Nov; 146(6): 342-352
15. Giberson S, Yoder S, Lee MP. *Improving Patient and Health System Outcomes through Advanced Pharmacy Practice. A Report to the U.S. Surgeon General*. Office of the Chief Pharmacist. U.S. Public Health Service. Dec 2011.

*Authors*

David Koon, PharmD, *Director of Pharmacy*  
Prasanga Lokuge, *Vice President, Clinical Strategy*  
Clive Fields, MD, *Chief Medical Officer*