The Outcomes of Implementing and Integrating Comprehensive Medication Management in Team-Based Care: *A Review of the Evidence on Quality, Access and Costs, December 2022*

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Each year in the United States, over $528 billion is wasted and 275,000 lives are lost due to non-optimized medication use.[1] Misuse, underuse or overuse of medications can lead to treatment failure, adverse effects and toxicity causing significant morbidity or mortality. With over 80% of Americans now taking one or more medications per week, and rates of hospital admissions resulting from medication-related problems continuing to rise, a strategy must be implemented to ensure that we "get the medications right" for all patients.[2,3] Comprehensive medication management (CMM) is a patient-centered approach to optimizing medication use and improving patient health outcomes. It is delivered by a clinical pharmacist working in collaboration with the patient and other health care providers. The CMM patient care process ensures each patient's medications (whether prescription, nonprescription, alternative, traditional, vitamins or nutritional supplements) are individually assessed to determine that each medication has an appropriate indication, is effective for the medical condition and achieving defined patient and clinical goals, is safe given the comorbidities and other medications being taken, and that the patient is able to take the medication as intended and adhere to the prescribed regimen.[4]

Integration of CMM into existing patient care processes ensures a "whole health" focused approach. The value of CMM lies in the ability of medication optimization to facilitate achievement of the goals defined as the quadruple aim of health care: improving the quality of care, reducing health care costs, improving both patient and health care provider experience.[5]

This document summarizes key findings from published studies evaluating the value of CMM in supporting the quadruple aim. The studies selected have integrated CMM into team-based care in a myriad of different health care systems spanning the spectrum from individual provider offices with privately insured patients to non-profit value-based payment health care systems and government run health care systems. Regardless of the location, findings are consistent that when CMM is integrated into team-based care, therapeutic goals are achieved, costs decrease and the patient and provider experience improves. Importantly, as we strive to achieve health equity, the fifth element of the new quintuple aim of health care, new research has demonstrated the ability of CMM to help in reaching that goal.[6] Clinical pharmacists have already demonstrated the value of CMM in increasing patient access to health care, and work is underway to develop processes for identifying and addressing social determinants of health that may adversely impact the ability to achieve medication optimization. The document will continue to evolve as the integration of CMM into health care expands and the data on its value continues to grow.

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I. Summary of Data on Improved Quality of Care and Reduced Costs after Implementing CMM

CMM results in over $1 million savings in Texas primary care clinics during incentive payment program

- A one-year observational study of 3,280 adult patients participating in a Texas delivery system incentive-based payment reform program revealed significant cost savings in those receiving CMM. Patients were eligible for the CMM program if they were receiving more than four medications and had been diagnosed with at least one chronic disease (diabetes, hypertension, heart failure, COPD or asthma). A clinical pharmacist reviewed the patients' records and created action plans for 290 patients with a total of 311 medication-therapy problems (MTPs). Two physicians conducted independent reviews of the pharmacist's recommendations to establish inter-rater reliability of the MTPs, with agreement on a final count of 301 MTPs in 280 patients.
    - **Better care:** Of the identified problems, recommendations for 150 (49.8%) were fully implemented by the primary care team, with the other 129 (42.8%) partially implemented. The majority were categorized as related to medication safety/adverse drug reactions (56.8%), with the second most common category being medication indication (34.9%).
    - **Reduced costs:** Resolution of MTPs resulted in an estimated cost savings of $1,143,015 in 2016 US dollars. The largest portion of this cost avoidance was achieved through the prevention of 62 hospital admissions.

Chung TH, Hernandez RJ, Libaud-Moal A, et al. The evaluation of comprehensive medication management for chronic diseases in primary care clinics, a Texas delivery system reform incentive payment program. BMC Health Services Research. 2020; 20:671. doi: 10.1186/s12913-020-05537-3.

Retrospective analysis of economic and utilization outcomes of CMM in a large Medicaid plan using a novel artificial intelligence platform

- In this observational study, the authors used mixed-effects regression models to assess savings and associated economic impact of a modified CMM program. This program incorporated the principles of CMM, including its holistic approach, but it did not involve embedment in a clinic with the team and patient. Instead, the pharmacists interacted with patients by phone; assisted with their care by an advanced artificial intelligence platform that created a patient profile; and provided clinical decision support. Pharmacists provided recommendations via fax or by phone to providers for a total of 2,150 Medicaid members ages 40-64 years with an average of 10 medications for chronic conditions. Cost and utilization data were compared from 2017 and 2019 to capture the impact of the addition of CMM in 2018.
    - **Better care:** A total of 7,485 interventions were made with 46,090 recommended actions. The majority of recommended actions (84.6%) were to stop the medication because it was either not needed or duplicate therapy. The next most common action (32.3%) was to change a medication dose to optimize therapy.
    - **Reduced costs:** The authors found a statistically significant decrease in the total cost of care of 19.3% ($p < 0.001$) or $554 per patient per month. Medication costs alone decreased by 17.3% ($p < 0.001$) or $192 per patient per month.

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- There was a 15.1% decrease in emergency department visits, a 9.4% decrease in hospitalizations and a 10.2% decrease in days of hospital admission (all results statistically significant).
- Assessing the savings in light of the cost of program implementation and maintenance, the authors reported a 12.4:1 return on investment.

Kessler S, Desai M, McConnell W, et al. Economic and utilization outcomes of medication management at a large Medicaid plan with disease management pharmacists using a novel artificial intelligence platform from 2018 to 2019: a retrospective observational study using regression methods. Journal of Managed Care and Specialty Pharmacy. 2021; Sep;27(9):1186-1196. doi: 10.18553/jmcp.2021.21036.

Real-world impact of a pharmacogenomics-enriched CMM program

- A novel program incorporating pharmacogenomics (PGx) into CMM services has recently shown to be valuable in moving patients closer to their treatment goals when compared to standard care. Patients in the Kentucky's Teachers' Retirement System were offered the opportunity to enroll in the PGx-CMM program, with the results from the 5,288 who enrolled compared to a group of 22,387 patients who chose to continue standard care over the initial 32-months of the program. The characteristics of the two groups were similar at baseline, however the patients who chose to enroll in the PGx-CMM program were on more medications.
  - **Better care:** A total of 4,716 medication therapy problems were identified in the PGx-CMM group resolved through 3,228 medication action plans made by the pharmacist.
  - **Reduced costs:** When compared to the patients receiving standard care, participants in the PGx-CMM group experienced an average reduction of $7000 in direct medical charges. The authors also noted a positive shift in healthcare utilization away from acute care (emergency department use or hospitalization) and towards greater use of primary care options.

Jarvis JP, Peter AP, Keogh M, et al. Real-world impact of a pharmacogenomic-enriched comprehensive medication management program. Journal of Personalized Medicine. 2022;12(3):421. doi: 10.3390/jpm12030421.

Positive impact of CMM on diabetes outcomes in Federally-Qualified Health Centers (FQHCs)

- This retrospective study highlights the results from 8 FQHCs participating in the *BD Helping Build Healthy Communities* program that used the funding to support integration of CMM services. These centers provided care for diverse patients populations in sites throughout the US: Arizona, California (San Marcos and Los Angeles), Florida, Indiana, Mississippi, New Jersey and Puerto Rico. Within the CMM services provided, patient education and instructions for self-monitoring were emphasized.
  - **Better care:** A total of 2,502 patients were included in the study, with a primary outcome of change in hemoglobin A1c (A1c) at 6 months and a secondary outcome of change in systolic blood pressure (SBP).
    - A statistically significant reduction in A1c was documented between baseline and the 6-month follow-up (9.4 vs 8.2, $p < 0.01$), as well as a statistically significant reduction in SBP (140.8 vs 130.2 mm Hg, $p < 0.05$).
    - Patients demonstrated sustained reductions in both A1c and SBP beyond 6 months, with a reduction in A1c still present at the 24-month evaluation.

Pastakia SD, Clark A, Lewis K, et al. The impact of clinical pharmacist led comprehensive medication management on diabetes care at Federally Qualified Health Centers within the BD Helping Build Healthy Communities program. Journal of the American College Clinical Pharmacy. 2022;5:273-282. doi.org/10.1002/jac5.1679.

Healthcare utilization and outcomes in cardiovascular patients receiving CMM services

- This quasi-experimental three-year non-randomized clinical study evaluated the impact of CMM services in older patients (ages 65-80 years) with established cardiovascular disease. Patients could self-refer to a pharmacist providing CMM serves or could be referred by their physician or other health-care providers. Patients receiving usual care (not referred or electing to have CMM) served as the control group. Parameters compared included blood pressure, A1c, LDL, TC and healthcare utilization.
  - **Better care:** Patients in the CMM group achieved statistically lower systolic and diastolic blood pressures (mean change -9.02 mm Hg and -4.99 mm Hg, respectively, both $p < 0.001$). Total cholesterol and LDL were also significantly lower in the CMM group compared to controls. While the mean A1c declined to a greater extent in the CMM patients, the difference compared to controls was not statistically significant.
  - **Reduced costs:** The number of hospital admissions was 3.35 higher in the control group (95% CI 1.16-10.00). Unplanned primary care visits were 2.34 times more frequent in the controls (95% CI 1.52-3.57).

Brajkovic A, Bosnar L, Gonzaga do Nascimento MM, et al. Healthcare utilization and clinical outcomes in older cardiovascular patients receiving comprehensive medication management services: A nonrandomized clinical study. International Journal of Environmental Research and Public Health. 2022;19:2781. doi: 10.3390/ijerph19052781.

Best practices: improving patient outcomes and costs in an ACO through comprehensive medication therapy management

- Since 1998, pharmacists at the Fairview Health System have cared for more than 20,000 patients and resolved more than 107,000 medication-related problems which, if left unresolved, could have led to hospital readmissions and emergency department visits. Fairview Pharmacy Services utilized 23 CMM pharmacists (approximately 18 full-time equivalents) working in 30 locations, who conduct pharmacotherapy workups as part of the medication optimization services.
  - **Better care:**
    - Approximately 27% of patients needed additional drug therapy and medication dosages increased.
    - Thirteen percent of the drug therapy problems were the result of unnecessary drug therapy and inappropriately high dosages.
  - **Reduced costs:** Fairview MTM showed a 12:1 ROI when comparing the overall health care costs of patients receiving services to patients who did not receive those services.
    - Total health expenditures decreased from $11,965 to $8,197 per person ($n = 186$, $p < 0.0001$).
    - Pharmacist-estimated cost savings to the health system over the 10-year period were $2,913,850 ($86 per encounter), and the total cost of CMM was $2,258,302 ($67 per encounter), for an estimated ROI of $1.29 for every dollar spent.

Brummel A, Lustig A, Westrich K, Evans MA, Plank GS, Penso J, Dubois RW. Best Practices: Improving Patient Outcomes and Costs in an ACO Through Comprehensive Medication Therapy Management. J of Managed Care and Specialty Pharmacy. 2014. (20): 12.

Budget impact analysis of a pharmacist-provided transition of care program

- Synergy Pharmacy Solutions (SPS) initiated a pharmacist-provided transition of care program for adult members of Kern Health Systems (KHS) managed Medicaid health plan who were classified as high risk using the Johns Hopkins Adjusted Clinical Groups (ACG) predictive model. High-risk patients admitted to participating hospitals were referred to the SPS TOC program and contacted via telephone within two to four days after discharge. Once a referred patient agreed to participate, the SPS team provided CMM.
  - **Reduced costs:** A budget impact analysis was conducted using a decision-tree model developed and built from the payer perspective. This tool was used to evaluate the impact of the program expansion to additional participating hospitals on total health care costs, including inpatient, outpatient, medication and emergency department costs, in six-month increments up to two years.
    - The budget impact model showed that in the first six months, the CMM program resulted in cost avoidance of over $4.3 million in total health care costs to the plan, which corresponded to $3 per member per month.
    - By the end of year two, the savings reached over $4 per member per month, for a total of $25.6 million.

Ni W, Colayco D, Hashimoto J, Komoto K, Gowda C, Wearda B, McCombs J. Budget Impact Analysis of a Pharmacist-Provided Transition of Care Program. Journal of Managed Care & Specialty Pharmacy. Feb 2018.

Comprehensive medication management results in improved care and cost savings in mental health system

- Psychiatric patients have multiple risk factors for chronic medical conditions and their need for multiple medications increases the risk of adverse events, drug interactions and poor adherence. This retrospective study of CMM assessed the quality of the service provided and patient outcomes within a mental health system through initial and follow-up visits focused on chronic medical conditions and psychiatric therapy.
  - **Better care:** Complex patients were referred to the CMM clinic with a mean of 13.7 medications and 10.1 medical conditions per patient. Providers found an average of 5.6 medication-related problems per patient, the most common being adverse drug reactions, unnecessary medications, inappropriate doses and poor adherence. Overall, clinical status improved in 52% of patients.
  - **Reduced costs:** The service projected a net cost avoidance of $90,484 over 2.25 years, or $586.55 per patient from avoidance of hospitalization or emergency department visits (33.7%) and savings in medication costs (66.3%). This resulted in an ROI of $2.80 per dollar spent.
  - **Improved patient experience:** A patient satisfaction survey indicated that 93% of patients felt the service was "extremely" or "very helpful", noting the positive changes made to their medication regimens. The majority of patients (89%) would refer friends or family for a medication review.

Cobb CD. Optimizing medication use with a pharmacist-provided comprehensive medication management service for patients with psychiatric disorders. Pharmacotherapy. 2014;34:1336-1340. doi.org/10.1002/phar.1503.

Medication therapy management: 10 years of experience in a large integrated health care system

- Assessment of the clinical, economic and humanistic outcomes of 10 years of experience with medication optimization within Minnesota's Fairview Health Services utilizing medication therapy management (a precursor to CMM). Data from 33,706 patient encounters were included in the evaluation.

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- **Better care:** 85% of patients had at least one medication therapy problem identified. Of those, 29% had 5 or more problems identified. The most frequent issues were the need for an additional medication (28.1%) and adjustment of a subtherapeutic dose (26.1%). Fifty-five percent of patients not at goal at the time of enrollment in the program improved after their medication regimens were optimized.
- **Reduced costs:** The program produced an average cost savings per encounter of $86. Average cost to provide the service was $67 per encounter, producing an estimated return on investment of $1.29 per $1 spent in administrative cases.
- **Improved patient experience:** 95.3% of patients surveyed gave a rating of agree or strongly agree to the statement that their overall health and well-being had improved as a result of the service.

Ramalho de Oliveira D, Brummel AR, Miller DB. Medication therapy management: 10 years of experience in a large integrated health care system. Journal of Managed Care Pharmacy 2010;16(3):185-95. doi: 10.18553/jmcp.2010.16.3.185.

The effect of clinical pharmacist-led comprehensive medication management on chronic disease state goal attainment in a patient-centered medical home

- A retrospective comparison study of the effect of pharmacist-led CMM on achievement of chronic diabetes treatment goals. This study took place in 11 clinics within a primary care network designated as a patient-centered medical home and affiliated with a large academic medical center. Achievement was defined as reaching a combined goal of a hemoglobin A1c < 8%, blood pressure < 140/90, and placement on statin therapy for dyslipidemia.
  - **Better care:** 40% of patients receiving CMM reached the combined treatment goal versus only 12% of patients in the control group ($p < 0.001$) over the 13-month study. Patients receiving CMM also had significantly greater improvement in individual assessments of A1c, blood pressure and use of a statin from their baseline to the completion of the study.

Prudencio J, Cutler T, Roberts S, Marin S, Wilson M. The Effect of Clinical Pharmacist-Led Comprehensive Medication Management on Chronic Disease State Goal Attainment in a Patient-Centered Medical Home. Journal of Managed Care & Specialty Pharmacy, 24 (5): 423-429. 2018. doi: 10.18553/jmcp.2018.24.5.423.

Comprehensive medication management leads to improvements in diabetes, hypertension and dyslipidemia

- In 2008, Brazil's Ministry of Health established the Nucleo de Apoio a Saude da Familia (Family Support Teams), multidisciplinary teams consisting of pharmacists, nutritionists, physical therapists and social workers, to support the primary care physician and nurse. After implementation of CMM services, treatment goals were assessed using a quasi-experimental study design in 1,057 patients covered by five clinical pharmacists over a 2-year period.
  - **Better care:** The mean difference from initial to final values showed statistically significant improvement for A1c (-0.8 +/- 0.4), systolic and diastolic blood pressure (-3.3 +/- 1.5 and -1.4 +/- 1.0), low-density lipoprotein cholesterol (-19.5 +/- 6.0) and total cholesterol (-21.0 +/- 7.3).

Santos BD, Nascimento MMGD, de Oliveira GC, et al. Clinical impact of a comprehensive medication management service in primary health care. Journal of Pharmacy Practice 2019;0897190019866309. doi:10.1177/0897190019866309.

Comprehensive medication management prevents drug interactions in older adults

- The frequency of clinically significant drug interactions was assessed in patients over 60 receiving CMM services. Beers criteria (reflecting potentially serious interactions) and the Dumbreck systematic review of United Kingdom's national drug interaction guidelines were used to define drug interactions in patients. The majority of patients had three or more health problems, 94% were taking more than two medications and 55% were taking more than five medications.
  - **Better care:** Clinicians providing CMM identified and prevented or resolved 22 drug interactions in 20 patients using the Beers criteria (4.9%) and 210 interactions in 111 patients using the UK national guidelines (27%). Disease states most strongly associated with a drug interaction were diabetes, heart failure and central nervous system diseases.

Santos TOD, Nascimento MMGD, Nascimento YA, et al. Drug interactions among older adults followed up in a comprehensive medication management service at primary care. Einstein (Sao Paulo). 2019 Aug 22;17(4):eAO4725. doi: 10.31744/einstein_journal/2019AO4725.

Assessment of the clinical utility of pharmacogenetic guidance in a comprehensive medication management service

- The evaluation of a collaborative pilot program aimed to demonstrate the benefit of incorporating pharmacogenetic information into CMM services. The pre- and post-interventional study evaluated 24 Hispanic patients who had a traditional CMM visit with a pharmacist prior to having pharmacogenetic testing. Genotyping was then performed to evaluate genetic variance in drug metabolizing enzymes. The pharmacist then incorporated the new pharmacogenetic information into the patient's management.
  - **Better care:** 129 medication-related problems were identified on the first visit, with a median of five conditions per patient and three recommendations made for changes in the medication regimen per patient. Genotyping revealed variants with the potential to affect the safety and/or effectiveness of one or more current medications in 96% of patients, with a median of three variants per patient.
  - **Better care:** Over 20% of the medications used in this patient cohort were affected by one or more of the variants. Using this information, the pharmacist was able to identify 22 additional medication-related problems, increasing the median number to six, and revised the medication action plans for all of the patients to incorporate the pharmacogenetic information.

Rodríguez-Escudero I, Cedeño JA, Rodríguez-Nazario I, et al. Assessment of the clinical utility of pharmacogenetic guidance in a comprehensive medication management service. Journal of the American College of Clinical Pharmacy. 2020;3:1028–1037. https://doi.org/10.1002/jac5.1250

II. Summary of Data on Improved Quality of Care, Patient and Provider Experience, and Patient Access to Care after Implementing CMM

Veterans give their experience with clinical pharmacists providing CMM high marks

- Evaluation of patient experience is an important component of assessing health care quality. Clinical pharmacists in Veterans Health Administration (VHA) facilities operate as advanced practice providers, seeing patients independently for CMM services under their scope of practice.

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- **Improved patient experience:** In a 9-month assessment conducted in 2021, patient experience surveys were sent to randomly selected veterans via email to evaluate a recent outpatient health care encounter a VA clinical pharmacist. A total of 743 Veteran surveys were completed with a response rate of 20%.
  - For individual domains of patient experience, the percentage of respondents selecting scores of 4 or 5 on a 5-point Likert scale were 94.4% for ease and simplicity of getting to the appointment, 91.9% for quality, 94.9% for employee helpfulness (provider willingness to listen and provide explanations), 95% for patient satisfaction and 91.9% for confidence and trust in the facility.
  - Results demonstrate that veterans' experiences with clinical pharmacists providing CMM were highly positive in every patient experience domain.

McFarland MS, Tran M, Ourth HL, Morreale AP. Evaluation of patient experience with Veterans Affairs clinical pharmacist practitioners providing comprehensive medication management. Journal of Pharmacy Practice. 2022 Aug 4;8971900221117892. doi:10.1177/08971900221117892.

Effect of an integrated clinical pharmacist on the drivers of primary care provider burnout

- Family medicine and internal medicine providers at Mayo clinic facilities in Minnesota and Wisconsin participated in a cross-sectional quality improvement survey to assess the perceived efficacy of the integration of clinical pharmacists into the clinic team. A total of 119 providers (physicians, nurse practitioners and physician assistants) responded to the survey. The majority had worked with an integrated clinical pharmacist for 2 to 5 years.

  - **Better care:** 91% of providers were extremely satisfied with the clinical pharmacy services in their clinic, with 90% agreeing that clinical pharmacists help patients make progress towards their health care goal, improve quality measures and assist with effective management of the patient panel. The most commonly reported collaborative activities were curbside consults, chronic disease management and CMM.

  - **Improved provider experience:** More than 95% of providers indicated that pharmacists were critical members of the health care team. They also strongly agreed that working with clinical pharmacists decreased their workload and allowed them to find greater meaning in their work. Providers believed the integration of clinical pharmacists into their clinics gave them more time to focus on the aspects of their work that were more professionally fulfilling.

Haag JD, Yost KJ, Kosloski KA, et al. Effect of an integrated clinical pharmacist on the drivers of provider burnout in the primary care setting. Journal of the American Board of Family Medicine. 2021;34:553-560. doi: 10.3122/jabfm.2021.03.200597.

Assessing the impact of integration of clinical pharmacists into teams on access to care for rural veterans

- This observational study evaluated team perceptions on the success of a program to integrate the VA clinical pharmacy specialists (CPS) providing CMM. Using a mixed methods evaluation, the CPS and their clinical team members were surveyed using the medication use process matrix (MUPM) as well as semi-structured interviews. The study reflected team interactions during 496,323 patient encounters from October 2017 to March 2020. A total of 124 CPS and 1,177 other clinical team members responded to the self-administered web-based questionnaire. An additional 22 interviews were completed with CPS and other clinicians.

  - **Improved provider experience:** The evaluation indicated good integration of the CPS in the primary care teams, as perceived by the other team members.

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- Both primary care team members and the CPS agreed on the high level of contributions provided in all 5 domains of the MUPM, with mean scores of 2.3 to 2.9 on a scale of 0 to 3.
- Findings from the interviews supported the perception that the majority of providers believed the CPS are making substantial contributions to patient care. Provider interviews highlighted the important role the CPS plays by providing CMM to relieve provider burden of care.
- The study also found that CPS reported higher job satisfaction when compared to previous data, citing less burn out and better role fit.

McCullough MB, Zogas A, Gillespie C, Kleinberg F, Reisman JI, Ndiwane N, Tran MH, Ourth HL, Morreale AP, Miller DR. Introducing clinical pharmacy specialists into interprofessional primary care teams: Assessing pharmacists' team integration and access to care for rural patients. Medicine (Baltimore). 2021 Sep 24;100(38):e26689. doi: 10.1097/MD.0000000000026689. PMID: 34559093; PMCID: PMC8462613.

Perceptions of integration of the clinical pharmacist into the PCMH model by the PCMH team

- Integration of CMM by a clinical pharmacist in a Department of Veterans Affairs facility was rated by the primary care team (physicians, nurses and staff) for seven domains.
  - **Better care:** 80% of responses rated the ability of the pharmacist to evaluate medication therapy and monitor the effectiveness and safety of medication therapy as a highly positive benefit.
  - **Improved access to care:** 87% of physicians and nurse practitioners responded that CMM integration by a clinical pharmacist increased access to their clinic by decreasing the time patients had to wait for primary care services.
  - **Improved provider experience:** 93% of physicians and nurse practitioners responded that CMM integration by a clinical pharmacist improved their job satisfaction.

McFarland S, Lamb K, Hughes J, Thomas A, Gatwood J, Hathaway J. Perceptions of Integration of the Clinical Pharmacist into the PCMH Model by the PCMH Team. Journal for Healthcare Quality. 2017. doi:10.1097/JHQ.0000000000000114.

Primary care providers believe that comprehensive medication management improves their work-life

- Part of a larger study of CMM implementation in Minnesota and North Carolina, this series of structured interviews was conducted with 16 primary care providers (PCPs) to identify the impact of CMM on their work life. Responses were then categorized to develop common themes.
  - **Better care:** Participants reported increased satisfaction that their patients were receiving better care and highlighted increased achievement of quality measures.
  - **Improved provider experience:** In addition to citing a decreased workload, PCPs reported a decrease in mental exhaustion related to the reassurance of having a clinical pharmacy colleague and enhanced opportunities for professional learning. This beneficial impact of team-based clinical pharmacist-provided CMM aligns with previously identified methods for decreasing burnout and engagement among primary care providers.

Funk K, Pestka D, McClurg M, Carroll J, Sorensen T. Primary Care Providers Believe That Comprehensive Medication Management Improves Their Work-Life. Journal of American Board of Family Medicine. 2019; 32(4): 462-473. doi: 10.3122/jabfm.2019.04.180376.

Pharmacists providing CMM gain increased efficiency in patient access through use of telemedicine

- This retrospective review evaluated the efficiency of the Tennessee Valley patient-aligned care team (PACT) clinical pharmacy specialists (CPS) providing CMM using patient encounter data, and it reviewed objective patient metrics to evaluate if the quality of care had been compromised during the COVID-19 pandemic. Data collection focused on the number of clinic encounters (in person, by phone or via telehealth), patient accountability to appointments, the number of disease states managed, insulin use, A1c and blood pressure in patients from 2019 and 2020.

  - **Improved access to care:** The total number of PACT CPS encounters increased 32% in 2020, and the number of unique patients increased by 12%.
    - There was a statistically significant increase in telephone visits from 5,230 to 18,715 (accounting for 32% of visits to 87%) while in-person visits decreased from 9,099 to 1,093 (accounting for 56% of all visits to only 5%). Video visits increased but remained a relatively uncommon method of patient encounter.
    - Rates of cancelled appointments and patients not showing up for their appointments also significantly decreased between 2019 and 2020.

  - **Sustained outcomes:** The goal of the study was to identify any negative impact on the quality of care caused by the transition to virtual patient visits.
    - There was no difference in the average change in A1c, with an average reduction of 0.57% in the 2019 cohort and 0.58% in the 2020 cohort ($p = 0.94$).
    - Average reductions in systolic (SBP) and diastolic blood pressures (DBP) also showed no significant change with average reductions in SBP being 3.1 mmHg and 3.2 mmHg ($p = 0.968$) in 2019 and 2020, respectively, and a mean reduction in DBP of 1.1 mmHg in 2019 and 2 mmHg in 2020 ($p = 0.3$). Markers for both diabetes and hypertension showed no negative impact on the conversion to phone and video visits during the pandemic.

Thomas AM, Baker JW, Hoffman TJ, Lamb K. Clinical pharmacy specialists providing consistent comprehensive medication management with increased efficiency through telemedicine during the COVID19 pandemic. Journal of the American College of Clinical Pharmacy. 2021;4: 934-938. doi: 10.1002/jac5.1494.

Optimizing the primary care clinical pharmacy specialist: increasing patient access and quality of care within the Veterans Health Administration

- The Department of Veterans Affairs has integrated the PCMH model as the delivery method of primary care since 2010. The VA Clinical Pharmacy Specialists (CPS) Provider practicing CMM in primary care is a large component of the ability for the VA to increase access and the quality of care for veterans. Currently, there are more than 1,850 CPS practicing CMM in primary care. In fiscal year 2019, patient aligned care team CPS documented 2,561,124 CMM interventions during 1,248,635 patient care encounters.

  - **Improved access to care:** VA Primary Care CPS demonstrated that 27% of primary care return appointments could be averted to a CPS.

  - **Better care:** Multiple studies performed within the VA have shown improvement in specific quality indicators:
    - Significant reduction in median A1c values to 7.7% (interquartile range [IQR] (0.5); $p < 0.001$) from a baseline A1c of 10.0% (IQR + 0.7).

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- Significant reductions in median systolic blood pressure (SBP) and diastolic blood pressure (DBP) from a baseline of 142/83 (IQR + 10 for SBP and 8 for DBP) to 134/79 (IQR + 7 for SBP and 7 for DBP; $P < 0.001$).
- CPS coordinated follow-up post-COPD discharge from a hospital or an emergency department (ED) within 30 days. Patients had a 0% composite readmission rate to the ED or hospital for a COPD exacerbation within 30 days of discharge.

McFarland MS, Nelson J, Ourth H, Groppi J, Morreale A. Optimizing the primary care clinical pharmacy specialist: Increasing patient access and quality of care within the Veterans Health Administration. J Am Coll Clin Pharm. 2020;3:494-500.

Impact of comprehensive medication management on hospital readmission rates

- The Fairview Health System implemented a formal care transitions process that included referrals to outpatient services provided by CMM pharmacists to determine whether or not a CMM visit with a CMM pharmacist within 30 days of hospital discharge decreased readmissions at 30 days post discharge when compared with patients who did not receive a CMM visit. In total, 1,291 hospitalizations had a CMM visit within 30 days of discharge.
  - **Better care:** At 30 days post discharge, patients who received a CMM visit had a significantly lower rate of readmissions compared to the comparator cohort (4.2% lower, $p < 0.001$).
  - **Improved access to care:** 60% of patients received their CMM visit within seven days of hospital discharge.

Budlong H, Brummel A, Rhodes A, Nici H. Impact of Comprehensive Medication Management on Hospital Readmission Rates. Population Health Management 2018. 21(5): 395-400.

Endnotes

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Medication Optimization Use Case

MINNESOTA HEALTH FAIRVIEW ▪ Minneapolis-St. Paul, Minnesota	
Focus Area	Chronic disease model that incorporates the clinician providing CMM services into a primary care patient population. The chronic disease therapy model focuses on outcomes seen when the clinician provides CMM care for common primary care conditions such as cardiovascular disease, diabetes, etc.
At-a-Glance	■ **Organization Type:** Integrated Health System ■ **Launch Date:** 1997 ■ **Payment and Funding Sources:** ▪ CMM is a covered service for all Medicaid patients, Fairview employees, PreferredOne/ ClearScript members. ▪ Contracts with other commercial, managed Medicaid and Medicare payors.
Organization Details	Fairview is an integrated health system with 360,000 health plan members, more than 34,000 employees and more than 5,000 system providers. It consists of the following: ▪ 12 hospitals and medical centers ▪ 3,519 licensed beds ▪ 2,071 staffed beds ▪ 56 primary care clinics ▪ 100+ specialties ▪ 90+ senior housing locations ▪ 36 retail pharmacies
Brief History of CMM Program, Scope of Services	Started in 1997 as a partnership with the University of Minnesota and Fairview. The program matured in 2006 when Medicare Part D and Minnesota Medicaid required plans to offer medication therapy management (MTM) benefits to members. Positive return on investment, provider and patient satisfaction scores and improvement in quality outcomes led to expansion of the program. CMM has become a required element in care delivery re-design in primary care clinics and is now being included as part of Fairview's ACO and risk-managed payor contracts.

Results & Achievements

Focus on the Quadruple Aim

- *Better Outcomes*
- *Cost Savings*
- *Patient Satisfaction & Engagement*
- *Clinician Satisfaction*

Better Outcomes

- The percentage of diabetes patients optimally managed was significantly higher for CMM patients compared to the year prior (21.49% vs.45.45%, P < 0.01). The HbA1c showed a mean reduction of 0.54%. Patients who opted in for CMM had higher Charlson scores, more complex medication regimens and a higher percentage of diabetes with complications.
- Exposure to face-to-face CMM services resulted in improvement of medication adherence with statins, ACEI/ARBs and B-Blockers.
- State of MN diabetes pilot increased from 16% to 42% meeting all goals in a 12-month period.
- 59.7% asthma patients cared for by CMM clinicians achieved the MN community measure for optimal asthma care vs. the state average of 16% in 2011.
- Using a risk-adjusted rate the CMM group has experienced approximately 20% fewer readmissions than might be expected, given their increased level of risk.

Cost Savings

- An average 12:1 ROI in terms of reduced overall health care costs. Overall health care cost reduction of 31.5% after one year of medication therapy management.
- An employer analysis showed that each $1 of medication therapy management billed costs would approximate an average $8.98 savings for total health care costs on all enrolled members.

Patient Satisfaction & Engagement

- 95% of patients agreed or strongly agreed that their overall health and well-being had improved because of CMM.
- Research has shown that patients feel that the CMM clinician is a resource for care/education, that they are more accessible and that they help to coordinate care.

Clinician Satisfaction

- 95% of providers surveyed were confident in the recommendations of the Fairview CMM clinician.
- 92% of providers agreed or strongly agreed that having an CMM clinician at their clinic has helped their patients improve their health and make progress towards their clinical goals.

Patient Success Story	Anita was used to being active. She worked locally for 35 years until back surgery and a hip replacement caused her to retire. A diagnosis of diabetes during a hospital stay last December sent her health into a downward spiral. The problem began when she tried to renew the diabetes medication after a post-hospital rehabilitation stay. Because of mobility limitations, Anita was not able to see her physician and went without her medication for several months. *"Talking to Brittany and getting my medications straightened out has been important," says Anita. "I don't think it would have been possible without her help."* "Brittany has been a lifesaver in many ways," says Anita, 67-year-old Fairview patient. Anita's multiple chronic diseases and related complications had created barriers to care and landed her in the hospital. She needed specialized help to get her health back on track. That's where Dr. Brittany Symonds, medication therapy management clinical pharmacist, stepped in. She serves as part of a network team that came together to help Anita. *"My blood sugar went sky high," says Anita. "I ended up back in the hospital."* For Anita, multiple factors conspired to create what Dr. Symonds called "a perfect storm." Barriers to care included medication cost and mobility issues preventing Anita from visiting her doctor. Dr. Brittany Symonds worked with Anita by phone, reducing the number of clinic visits needed, and helped her find less expensive medications through a mail-order source. Anita calls medication therapy management "one of the best things Fairview instituted. If I hadn't had Brittany, I don't think I'd have my diabetes under control and feel as well as I do today." Additional stories at: https://www.fairview.org/services/medication-therapy-management/patient-stories
Team-Based Care Strategy	■ **Interprofessional Team Roles:** ▪ Triage nurses, care coordinators (social work and RN case managers), inpatient nursing staff trained on CMM and when to refer patients ■ **Role of the Clinician:** ▪ Scope of Advanced Practice: Collaborative practice agreement covering 20+ chronic disease states ■ **Care Delivery Modality:** ▪ In-person, phone and video visits. Extensive communication via MyChart (EHR communication) when needed ▪ 60-minute initial (new) patient visits/30-minute return visits ▪ Patients average two visits/year with pharmacist
Patient Referral Criteria	■ **Eligible Patients:** All patients are eligible for CMM services. ■ **Populations of Focus:** Diabetes, hypertension, hyperlipidemia, smoking cessation, COPD, heart failure, asthma, transplant, HIV and CF patients in specialty locations (among other specialties). Transitions of care, special focus on mental health discharges.

Size of CMM Program	**Number of:** ■ **Pharmacists:** 45 ▪ Pharmacist FTE: 30.2 in direct pt care ■ **Practice Sites:** 55 ■ **Resident Pharmacists:** 5 PGY-1 ■ **Student Pharmacists/Interns:** 2 ■ **Support Staff:** ▪ 3 coordinators: scheduling, coding, billing, recruitment calls ▪ 1 business supervisor ▪ 3 CMM supervisors ▪ 1 CMM Operations Lead ■ **Unique patients served (2019):** ▪ 12,798 patients ▪ 26,460 visits
Program Success Factors	■ **Expanded Roles and Responsibilities of the Pharmacist** ▪ Broad collaborative practice agreements ▪ Consistent care process and follow-up ■ **Convenient Patient Access and Simple Program Entry** ▪ Multiple care delivery modalities (e.g., in-person, telemedicine) ■ **Demonstrate Efficiency & Effectiveness of Cross-Setting Team-Based Care** ▪ CMM eases primary care workload ■ **Demonstrate & Articulate CMM's Value** ▪ Consistently high patient and provider satisfaction scores ▪ Continued ROI studies with positive results ▪ Meaningful, experiential learning opportunities for advanced pharmacy practice experience students
Next Steps, Future Goals	■ Resourcing clinics without a CMM clinician on-site ■ Payment structures to support CMM services

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Developed by the Best Practices and Innovative Solutions Subgroup of the GTMRx Practice and Care Delivery Transformation Workgroup	

Clearly Defined Roles and Responsibilities Help CMM Program to Deliver Services Efficiently

AT A GLANCE

RiverStone Health Clinic
Billings, MT

Person in charge: Amy Moser, Pharm.D., BCACP, CPP

Organization type: FQHC, Level 3 patient-centered medical home

Year CMM Launched: 2010

Payment sources: Medicaid, some private insurers

Funding sources: Primarily through the FQHC contract with some support from the HRSA 340B medication discount program.

Number of pharmacists: 3 (1.5 FTEs)

Number of CMM sites: 1

Unique CMM patients served in 2019: 317

Can patients self-refer? Yes

Collaborative Practice Agreements: For diabetes, hypertension, dyslipidemia, ASCVD risk reduction, COPD, asthma, smoking cessation, thyroid disorders and GERD. They also provide services for high-risk for readmission hospital discharges and integrated behavioral health team.

Fully integrated into a medical home practice, the CMM pharmacists at RiverStone Health Clinic are part of a clinical team that identifies and resolves patients' unmet needs.

Bringing clinical pharmacy skills to that team—and being fully integrated into the medical home—leads to better outcomes and higher satisfaction for its underserved community.

Patients may be referred to the clinical pharmacists by any member of the patient care team in the clinic for CMM. Referrals are based on an assessment of needs, not a particular diagnosis. Clinical pharmacists are part of the team that identifies patients for CMM. Patients can self-refer (usually for follow-up) if they have a primary care provider at the clinic, but they are almost always initially referred by a staff member. Regardless of how a patient is referred, each receives comprehensive medication management.

Staffing and training

Three pharmacists, accounting for 1.5 FTE, are supported by one or two students (generally accounting for 1.5 FTEs). As part of a medical home team, the clinical pharmacists have access to staff who help with scheduling, pre-visit planning and other issues. The team of pharmacists hope to be able to add a pharmacy tech position to the CMM program.

Access innovation on the horizon

RiverStone consists of a centrally located clinic and several satellite sites. Any patient is eligible for CMM services, and these visits are conducted via telemedicine for patients of the satellite sites.

"It is critical for patients to understand and agree with their treatment in order to achieve good outcomes."

Measuring impact

The CMM program at RSH Clinic tracks identified drug therapy problems. Having collaborative practice agreements in place for several common disease states allows for over 90% of drug therapy problems to be resolved by the pharmacists at the CMM visit.

Success factors

RSH has identified four factors crucial to the success of their program:

1. **The ability to identify and meet a patient's needs:** This is fundamental to the program's success.
2. **The pharmacists' skill set:** Pharmacists offer a unique skill set that complements the rest of the clinical team.
3. **Clearly defined roles and responsibilities:** The pharmacy team understands the role and function of each team member.
4. **Appropriate funding:** CMM is supported as part of the PCMH and funded through various channels. The clinic has a contract with University of Montana School of Pharmacy to support student advanced pharmacy practice experience. It receives Medicaid and private insurance payments for the visits conducted by the clinical pharmacists, and our physicians and administrators value the contribution of pharmacists on the team. Positions are supported through the clinic's federal grant funding for FQHCs.

Lessons learned

1. **They need us.** Clinical pharmacists are an important part of the care team. We are able to spend more time with the patient to ensure they really understand how to use their medication correctly to get the best outcomes.
2. **Clinical pharmacists make a unique contribution to the team.** Since clinical pharmacists are trained to be medication experts, they are uniquely qualified to identify and resolve drug therapy problems, such as drug interactions or adverse reactions.
3. **Patients must be part of the decision-making process.** It is critical for patients to understand and agree with their treatment in order to achieve good outcomes. We feel it is most helpful to meet the patient where they are at and then help them move forward toward their goals.

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