



Commentaries Pharmacotherapy/Pharmaceutical Care

## Pharmacist-led medication therapy management: Impact on healthcare utilization and costs

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### ABSTRACT

The implementation of pharmacist-led medication therapy management (MTM) has emerged as a pivotal strategy in modern healthcare, demonstrating considerable potential to revolutionize patient care, healthcare utilization, and cost-effectiveness. Pharmacist-led MTM is a patient-centric approach, utilizing pharmacists' expertise to optimize medication usage and enhance patient outcomes. Through meticulous medication reviews, personalized medication plans, and continuous patient engagement, MTM addresses medication-related issues, tailors care strategies, and ensures adherence, resulting in improved therapeutic outcomes and reduced healthcare utilization and costs. Studies across diverse healthcare domains consistently illustrate the tangible benefits of pharmacist-led MTM. Reported outcomes include marked reductions in hospital visits, hospital readmissions due to medication-related issues, and substantial enhancements in medication adherence rates. Notably, in chronic conditions such as diabetes and cardiovascular diseases, pharmacist-led interventions not only improve clinical outcomes but also exhibit a positive return on investment for employers, underlining its cost-saving potential. Pharmacist-led interventions in human immunodeficiency virus management, hypertension, and other chronic diseases have demonstrated significant clinical improvements, including reduced hospitalizations and improved patient adherence to medication use. By actively addressing medication-related challenges, providing patient education, and ensuring medication adherence, pharmacists play a pivotal role in optimizing healthcare utilization and cost-effectiveness. The integration of MTM into chronic disease management and transitional care pathways emphasizes its transformative capacity in healthcare delivery. Pharmacist-led MTM consistently demonstrates its ability to mitigate drug-related problems, minimize unnecessary medication use, and enhance overall patient care, offering a promising avenue toward improved healthcare outcomes and cost savings.

**Keywords:** Healthcare costs, Healthcare utilization, Medication therapy management, Pharmacist

### INTRODUCTION

There is an increasing recognition of the invaluable role of medication therapy management (MTM) by pharmacists in improving health outcomes.<sup>[1]</sup> The U.S. government introduced MTM through the passage of the Medicare Modernization Act in 2003 to tackle the rising issues of adverse drug events and escalating medication costs.<sup>[2]</sup> Pharmacist-led MTM is a strategy that, by utilizing pharmacists' understanding of medications and patient accessibility, has the potential to transform healthcare delivery positively.<sup>[3]</sup> Pharmacist-led MTM improves patient care while at the same time lowering healthcare costs by offering individualized recommendations on medication usage.<sup>[4]</sup> The term MTM refers to a thorough and patient-centered strategy that makes

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use of pharmacists' knowledge to optimize drug use and enhance patient outcomes. It entails a thorough examination of a patient's prescription schedule, the identification of medication-related issues, and the development of a care strategy tailored to specific requirements.<sup>[5]</sup>

Pharmacist-led MTM has garnered considerable attention due to its promising outcomes in reducing healthcare costs and improving healthcare utilization.<sup>[6]</sup> A study in America showed a 16% decrease in visits to hospitals and an 80% decrease in readmissions to the hospital for medication-related issues in the sample of patients who got the intervention from a ward-based pharmacist.<sup>[7]</sup> Similarly, another study by Torres-Robles *et al.* (2022) showed that pharmacist-led interventions improved medication adherence rates by 51.8%, which they attributed to the use of core components of an intervention, diligent inspection of the therapy provided, and continual follow-up.<sup>[8]</sup> These findings highlight the tangible benefits of pharmacist-led MTM in reducing adverse events and improving patient adherence, ultimately leading to cost savings and improved healthcare utilization.

In this commentary, we will explore the significant impact of pharmacist-led MTM programs on both healthcare costs and utilization, while making evident that pharmacist-led MTM holds immense promise for transforming the healthcare sector.

## MTM

Medication use can be optimized, and patient outcomes can be improved, through the use of pharmacist-led MTM. It operates within the purview of licensed pharmacists and certified healthcare professionals, with a focus on inter-professional collaboration and streamlined patient care.<sup>[6]</sup> MTM focuses on the provision of individualized patient therapy plans to improve therapeutic outcomes and reduce medication-related issues. The creation of the MTM core elements in 2005 (version 1.0) and 2008 (version 2.0) provides a foundational framework for implementing effective MTM.<sup>[5,9]</sup> These key elements include medication therapy review (MTR), a personal medication record (PMR), a medication action plan (MAP), and intervention and/or referral, along with documentation and follow-up.<sup>[9]</sup> The MTR, which thoroughly evaluates a patient's drug list, medical history, adherence, and concerns, is at the heart of MTM.<sup>[10]</sup> The MAP, which falls within the purview of the pharmacist, identifies, and addresses medication-related problems. After that, a PMR is then created, which provides the patient with a comprehensive inventory of their medications for improved self-management.<sup>[11]</sup> Pharmacists recommend interventions to address identified medication-related problems and may refer patients to other healthcare providers when needed.<sup>[4]</sup> Effective clinical documentation supports the assessment of

clinical outcomes, ensures continuity of care, and enhances the potential for reimbursement. Follow-up visits by the patient guarantee continuing medical assistance and medication administration. These follow-up visits may help identify any medication use barriers, which may impact medication adherence. This methodical approach encourages teamwork, patient empowerment, and improved medication outcomes, all of which ultimately lead to improved healthcare use, delivery, and cost savings.<sup>[4]</sup> It could impact healthcare costs and utilization. The term cost refers to the financial considerations for healthcare provision. Some healthcare costs include counseling fees, medication fees, the cost of emergency room and hospitalization visits, the cost of laboratory tests, the cost of medical procedures, and advanced care fees.<sup>[10]</sup> Pharmacist-led MTM initiatives have been shown to result in heightened patient education and counseling regarding medication usage, alongside the identification and resolution of medication-related issues.<sup>[6]</sup> In addition, MTM fosters the promotion of appropriate medication selection, dosage optimization, and integration into care transitions and chronic disease management pathways.<sup>[3]</sup>

## IMPACT OF MTM ON HEALTHCARE UTILIZATION

The myriad impacts of pharmacist-led MTM services are reflected in healthcare utilization. Results from a study conducted by De Oliveira *et al.* on the diabetes care outcomes following MTM showed that the MTM program led to enhanced optimal diabetes management within the selected clinical setting.<sup>[10]</sup> This indicated that the pharmacist-led MTM services improved healthcare utilization. Maeng *et al.* conducted a retrospective cohort study to determine the impact of a pharmacist-led diabetes MTM on utilization, cost, and outcomes and discovered that MTM not only had a direct impact but also affected these parameters.<sup>[12]</sup> In addition, the researchers recommended that pharmacist-led MTM be recognized and considered as a crucial component of a multidisciplinary team involved in diabetes management. This reflects the integration of MTM into care transition and chronic disease management. A comprehensive study evaluated the impact of MTM on patients with cardiovascular diseases, with a focus on economic and clinical outcomes. The evaluation leveraged pre- and post-retrospective cohort studies, and interesting findings emerged. The study showed improved blood pressure goals from 55% to 70% and body mass index value enhancements as the clinical outcomes of the study.<sup>[13]</sup> Economically, MTM services yielded a positive return on investment for self-insured employers. This study demonstrated how the MTM practice could impact healthcare costs and utilization by enhancing patient education and counseling on medication use. Increased patient understanding led to improved medication

compliance, leading to better clinical outcomes and cost optimization.<sup>[13]</sup> Patients in a pharmacist-led MTM program experienced lower rates of inpatient admissions and lower medical costs.<sup>[12]</sup> Ultimately, studies have shown that MTMs could help resolve drug-related problems and improve patient's compliance with medications and quality of life as well. Through such interventions, pharmacists significantly contributed to the healthcare delivery system.<sup>[14]</sup> In light of the Collaborative Drug Therapy Management in the United States, pharmacists are permitted to request tests and administer medication in collaboration with physicians.<sup>[15]</sup> A systematic review done by Rendrayani *et al.* showed that pharmacists had considerable knowledge and positive attitude towards MTM showing that pharmacists are well-placed to carry out this service.<sup>[16]</sup> In the practice of anti-retroviral therapy (ART), a study conducted by Urano *et al.* revealed that pharmacists' active involvement led to improved T-lymphocyte CD4 biomarker levels and lowered ART medication errors.<sup>[17]</sup> In addition, pharmacists' active participation in ART therapy led to reduced hospitalization, human immunodeficiency virus (HIV)-RNA viral load levels, and gastrointestinal bleeding. Patient education led to reduced medication adverse effects (renal dysfunction and relapse) which were noted previously during the patient's self-administration.<sup>[17]</sup> In a nutshell, pharmacist interventions in MTM are expected to improve HIV management and clinical outcomes, sustain adherence, and optimize healthcare utilization. Treatment failures associated with anti-hypertensive treatment have been attributed to several factors, such as complicated regimens, limited understanding of the disease state, polypharmacy, and lack of social support. Matthews and Kumari evaluated the effect of pharmacist counseling on the adherence and compliance of patients with hypertension.<sup>[18]</sup> The results showed that pharmacist-led MTM intervention groups saw significantly lower blood pressure than the usual care groups. In the pharmacist-led MTM intervention groups, the patients received education on hypertension, lifestyle modifications including salt restrictions, diet, for example, (dietary approach to reducing hypertension), increased physical exercise, smoking cessation, and alcohol avoidance. A high positive correlation was observed between improved quality of life and patient counseling by the clinical pharmacist – the quality of life of the patients increased due to enhanced patient counseling. Pharmacist interventions led to improved quality of life and identified and resolved medication-related problems, thereby reducing associated costs.<sup>[18]</sup>

## IMPACT OF MTM ON HEALTHCARE COSTS

Rising healthcare costs present challenges to achieving improved therapeutic outcomes; however, several studies have reported lower healthcare costs as a result

of pharmacist-led MTM.<sup>[19-26]</sup> Results from Nightingale *et al.* showed that a pharmacist-led MTM was practical and successful in lowering drug-related issues and enhancing the medication safety of older cancer patients.<sup>[26]</sup> According to the study, 46% of pharmacist suggestions were implemented, leading to a 20.5% reduction in medication-related problems within 60-day follow-up periods.<sup>[26]</sup> Chronic diseases often necessitate lifelong medication adherence for effective management by patients. Pharmacists play a crucial role in proactive healthcare teams, facilitating patient adherence to therapy and the control of chronic medical conditions, thereby improving chronic care.<sup>[27]</sup> Murali *et al.* evaluated 104 patients and showed a significant improvement in anti-diabetic therapy compliance following MTM. Adherence rates increased from 37.5% to 59.5%.<sup>[21]</sup> Strict adherence to medication can be achieved by pharmacists-led MTM interventions, which would reduce the severity of diseases, hospital admissions, and, hence, healthcare costs.

In a systematic review done by Renaudin *et al.*, it was revealed that a decrease in emergency room visits and readmissions due to drug-related problems following pharmacist-led medication reviews. These findings underscore the potential for cost reduction associated with MTM.<sup>[28]</sup> Minimizing polypharmacy and mitigating inappropriate prescription drugs are crucial in reducing healthcare system costs particularly for older patients.<sup>[29]</sup> Studies on HIV patients have demonstrated the benefits of MTM and its advantages in increasing medication adherence, decreasing contraindicated therapy, reducing polypharmacy, and eliminating excessive antiretroviral medicine refills.<sup>[22,24,25]</sup> The results of these studies were similar to those of Whitman *et al.*, which reported a reduction of polypharmacy through pharmacist-led MTM.<sup>[30]</sup> Joshi *et al.* illustrated that the MTM clinic prevented 2.10 myocardial infarctions, 6.11 strokes, and 2.11 amputations for every 1000 patients treated,<sup>[23]</sup> which demonstrates a decrease in costs and an enhanced humanistic outcome. Bechtol *et al.* reported decreased spending on emergency room visits and hospital stays attributed to pharmacist-led MTM,<sup>[20]</sup> highlighting its role in reducing drug-related adverse events, unnecessary medication use, polypharmacy, improved medication adherence, and enhancing treatment cost-effectiveness.

## CONCLUSION

Pharmacist-led MTM in various healthcare settings reported favorable clinical outcomes for blood pressure, cholesterol and diabetes control, anticoagulation, asthma, and chronic obstructive pulmonary disease management. Positive outcomes for medication optimization/management, medication adherence, patient satisfaction, and medication knowledge have also been reported. Published studies have reported associations between MTM services and reduced

adverse drug events, fewer hospital readmissions, lower healthcare costs, and improved appropriate medication use.

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## REFERENCES

- Jarab AS, Al-Qerem W, Mukattash TL, *et al.* Pharmacists' knowledge and attitudes toward medication therapy management service and the associated challenges and barriers for its implementation. *Saudi Pharm J.* 2022;30(6):842-848. doi: 10.1016/j.jsps.2022.03.008
- Somma McGivney M, Meyer SM, Duncan-Hewitt W, *et al.* Medication therapy management: Its relationship to patient counseling, disease management, and pharmaceutical care. *J Am Pharm Assoc.* 2007;47(5):620-628. doi: 10.1331/JPhA.2007.06129
- Haag JD, Davis AZ, Hoel RW, *et al.* Impact of pharmacist-provided medication therapy management on healthcare quality and utilization in recently discharged elderly patients. *Am Heal Drug Benefits.* 2016;9(5):259-267.
- Meng Q, Sun L, Ma Y, *et al.* The impact of pharmacist practice of medication therapy management in ambulatory care: An experience from a comprehensive Chinese hospital. *BMC Health Serv Res.* 2023;23(1):1-9. doi: 10.1186/s12913-023-09164-6
- Ferreri SP, Hughes TD, Snyder ME. Medication therapy management: Current challenges. *Integr Pharm Res Pract.* 2020;9:71-81. doi: 10.2147/IPRPS179628
- Erku DA, Ayele AA, Mekuria AB, *et al.* The impact of pharmacist-led medication therapy management on medication adherence in patients with type 2 diabetes mellitus: A randomized controlled study. *Pharm Pract (Granada).* 2017;15(3):1026. doi: 10.18549/PharmPract.2017.03.1026
- Miller DE, Roane TE, Mclin KD. Reduction of 30-day hospital readmissions after patient-centric telephonic medication therapy management services. *Hosp Pharm.* 2016;51(11):907-914. doi: 10.1310/hpj5111
- Torres-Robles A, Benrimoj SI, Gastelurrutia MA, *et al.* Effectiveness of a medication adherence management intervention in a community pharmacy setting: A cluster randomised controlled trial. *BMJ Qual Saf.* 2022;31(2):105-115. doi: 10.1136/bmjqs-2020-011671
- Burns A. Medication therapy management in pharmacy practice: Core elements of an MTM service model (version 2.0). *J Am Pharm Assoc.* 2008;48(3):341-353. doi: 10.1331/JPhA.2008.08514
- De Oliveira DR, Brummel AR, Miller DB. Medication therapy management: 10 Years of experience in a large integrated health care system. *J Manag Care Spec Pharm.* 2020;26(9):1057-1066. doi: 10.18553/jmcp.2020.26.9.1057
- Hohmeier KC, Wheeler JS, Turner K, *et al.* Targeting adaptability to improve Medication Therapy Management (MTM) implementation in community pharmacy. *Implement Sci.* 2019;14(1):99. doi: 10.1186/s13012-019-0946-7
- Maeng DD, Graham J, Bogart M, *et al.* Impact of a pharmacist-led diabetes management on outcomes, utilization, and cost. *Clin Outcomes Res.* 2018;10:551-562. doi: 10.2147/CEOR.S174595
- Wittayanukorn S, Westrick SC, Hansen RA, *et al.* Evaluation of medication therapy management. *J Manag Care Pharm.* 2013;19(5):385-395a.
- Li N, Song JF, Zhang MZ, Lv XM, *et al.* Impact of medication therapy management (MTM) service model on multimorbidity (MMD) patients with hypertension: A pilot RCT. *BMC Geriatr.* 2023;23(1):10. doi: 10.1186/s12877-023-03725-4
- Snyder ME, Earl TR, Gilchrist S, *et al.* Collaborative drug therapy management: Case studies of three community-based models of care. *Prev Chronic Dis.* 2015;12:140504. doi: 10.5888/pcd12.140504
- Rendrayani F, Alfian SD, Wahyudin W, *et al.* Pharmacists' knowledge, attitude, and practice of medication therapy management: A systematic review. *Healthcare.* 2022;10(12):2513. doi: 10.3390/healthcare10122513
- Urano K, Ishibashi M, Matsumoto T, *et al.* Impact of physician-pharmacist collaborative protocol-based pharmacotherapy management for HIV outpatients: A retrospective cohort study. *J Pharm Heal Care Sci.* 2020;6(1):9. doi: 10.1186/s40780-020-00165-9
- Mathews AS, Kumari S. Impact of pharmacist led hypertension management. *Asian J Pharm Clin Res.* 2022;15(5):23-26. doi: 10.22159/ajpcr.2022.v15i5.43630
- Renaudin P, Boyer L, Esteve M, *et al.* Do pharmacist-led medication reviews in hospitals help reduce hospital readmissions? A systematic review and meta-analysis. *Br J Clin Pharmacol.* 2016;82(6):1660-1673. doi: 10.1111/bcp.13085
- Bechtol R, Pinto SL, Partha G, *et al.* Improving the economic and humanistic outcomes for diabetic patients: Making a case for employer-sponsored medication therapy management. *Clinecon Outcomes Res.* 2013;5:153. doi: 10.2147/CEOR.S40735
- Murali AB, Boban B, Shanmughan AK, *et al.* Medication therapy management (MTM): An innovative approach to improve medication adherence in diabetics. *Drug Metab Pers Ther.* 2016;31(3):151-155. doi: 10.1515/dmpt-2016-0016
- March K, Mak M, Louie SG. Effects of pharmacists' interventions on patient outcomes in an HIV primary care clinic. *Am J Heal Pharm.* 2007;64(24):2574-2578. doi: 10.2146/

ajhp070048

23. Joshi M, Pham C, Deng H, *et al.* Long-term cost-effectiveness of a pharmacist-led medication therapy management clinic (MTMC) for type 2 diabetes management. *Value Heal.* 2022;25(7):S386. doi: 10.1016/j.jval.2022.04.516
24. Hirsch JD, Rosenquist A, Best BM, *et al.* Evaluation of the first year of a pilot program in community pharmacy: HIV/AIDS Medication therapy management for medical beneficiaries. *J Manag Care Pharm.* 2009;15(1):32-41. doi: 10.18553/jmcp.2009.15.1.32
25. Cantwell-McNelis K, James CW. Role of clinical pharmacists in outpatient HIV clinics. *Am J Heal Pharm.* 2002;59(5):447-452. doi: 10.1093/ajhp/59.5.447
26. Nightingale G, Hajjar E, Pizzi LT, *et al.* Implementing a pharmacist-led, individualized medication assessment and planning (iMAP) intervention to reduce medication related problems among older adults with cancer. *J Geriatr Oncol.* 2017;8(4):296-302. doi: 10.1016/j.jgo.2017.04.005
27. Isetts BJ, Schondelmeyer SW, Artz MB, *et al.* Clinical and economic outcomes of medication therapy management services: The Minnesota experience. *J Am Pharm Assoc.* 2008;48(2):203-214. doi: 10.1331/JAPhA.2008.07108
28. Renaudin P, Boyer L, Esteve M, *et al.* Do pharmacist-led medication reviews in hospitals help reduce hospital readmissions? A systematic review and meta-analysis. *Br J Clin Pharmacol.* 2016;82(6):1660-1673. doi: 10.1111/bcp.13085
29. Gnjidic D, Tinetti M, Allore HG. Assessing medication burden and polypharmacy: Finding the perfect measure. *Expert Rev Clin Pharmacol.* 2017;10(4):345-347. doi: 10.1080/17512433.2017.1301206
30. Whitman A, DeGregory K, Morris A, *et al.* Pharmacist-led medication assessment and deprescribing intervention for older adults with cancer and polypharmacy: A pilot study. *Support Care Cancer.* 2018;26(12):4105-4113. doi: 10.1007/s00520-018-4281-3

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