

A Comprehensive Review of Medication Therapy Management in Chronic Disease

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ABSTRACT

Medication errors constitute a substantial global challenge, particularly prevalent among patients managing multiple chronic conditions. Medication Therapy Management (MTM) has emerged as an effective, pharmacist-led strategy to mitigate these errors and optimize therapeutic outcomes. Encompassing comprehensive medication reviews, personalized action plans, and continuous follow-up, MTM offers significant clinical and financial benefits. Evidence consistently demonstrates that MTM improves medication adherence, reduces adverse drug events (ADEs), and lowers healthcare costs, especially in the management of chronic diseases such as diabetes mellitus, cardiovascular disease, and hypertension. Pharmacists play a pivotal role in identifying drug-related problems, enhancing disease control, and promoting patient satisfaction. The increasing global burden and associated costs of chronic illness underscore the imperative to expand pharmacist-provided MTM services within interdisciplinary care teams. This review highlights the benefits of MTM in enhancing health outcomes and delivering cost-effective care.

Keywords: Chronic Disease Management, Healthcare Cost Reduction, Medication Therapy Management (MTM), Pharmacist-led Interventions.

I. INTRODUCTION

Medication errors represent a pervasive global concern, potentially occurring at any stage of the medication use process [1]. Although their frequency varies regionally, medication errors are particularly prevalent in patients receiving polypharmacy [2]. Consequently, Medication

Therapy Management (MTM) services have emerged as a highly effective strategy to mitigate these issues. MTM has demonstrated significant improvements in patient care, especially for individuals with complex health needs such as diabetes, cardiovascular disease, hypertension, and respiratory conditions [3]. MTM is defined by the American Pharmacists Association as “a service or group of services that optimize therapeutic outcomes for individual patients” and consists of 5 core elements: (a) a comprehensive or targeted medication therapy review (CMR); (b) creation or formulation of a personal medication record; (c) development of a medication-related action plan; (d) implementation of the action plan through interventions and referrals; and (e) documentation and follow-up [4]. Beyond comprehensive reviews, MTM optimizes dosing regimens by integrating patient medical and drug histories with ongoing drug monitoring [5-6]. Patients receiving MTM services demonstrated significant therapeutic and safety advantages over individuals undergoing conventional care. These benefits included reductions in blood pressure, HbA1c, and LDL, along with adjustments to the treatment regimen that minimized adverse events and reduced healthcare expenditures [7-8]. Other healthcare professionals acknowledge pharmacists' crucial role in minimizing medication errors, a role that could be further enhanced through the implementation of MTM services [9-10]. Studies indicate that medication error rates are lower in interdisciplinary rounding teams that include pharmacists compared to those without [11-12]. Furthermore, research demonstrated that clinical pharmacists' medication reviews reduced the occurrence of potential drug-drug interactions and

the use of inappropriate medications [13-14]. Consequently, both patient health and healthcare costs improved. Additionally, MTM services were linked to high patient satisfaction [15]. From a clinical perspective, pharmacists have identified and solved problems associated with unnecessary medication therapy, incorrect medication selection and/or dosing, drug-drug interactions, adverse drug reactions, and low medication adherence [15]. Chronic diseases pose significant public health challenges due to their escalating prevalence, driven by demographic shifts and health behaviours, and the considerable strain they impose on individuals [16]. These long-lasting conditions, including cardiovascular diseases, cancer, diabetes, and respiratory ailments, frequently lead to long-term limitations and increased care requirements [17]. Consequently, the onset of a chronic disease represents a profound health event, significantly impacting a patient's well-being as they adapt to their new health status [18-19]. Chronic illnesses impact numerous life domains, with the burden of the condition, daily limitations, lifestyle adjustments, and increased medical needs potentially causing emotional, psychological, financial, and time-related stress [18-20].

Pharmacists' MTM services have also generated cost savings for patients. Substituting expensive medications with more affordable alternatives reduces expenses for both individuals and the healthcare system. The provision of comprehensive medication and health management services offers a greater return on investment compared to traditional care models [21]. MTM services have demonstrated significant clinical and financial benefits globally. Therefore, supporting pharmacists in providing MTM would be advantageous for both patients and the healthcare system. The World Health Organization reported that in 2008, preventable major diseases—specifically cardiovascular disease, cancer, chronic respiratory diseases, and diabetes—accounted for 63% of global deaths [22]. In 2011, it was estimated that the global cost of chronic diseases would reach \$47 trillion by 2030 [23]. Beyond an aging demographic, the increasing prevalence of chronic diseases is also attributable to numerous individual behavioural, lifestyle, and community-level risk factors that influence prevention and management strategies [25].

METHODOLOGY

We conducted a structured literature review to better understand how Medication

Therapy Management (MTM) can reduce medication errors and improve outcomes for people living with chronic diseases.

SEARCH STRATEGY

We explored three major databases—PubMed, Scopus, Google Scholar—for studies published between 1982 and 2025. Our search combined terms like “MTM,” “medication errors,” “chronic disease,” “clinical pharmacists,” and “medication adherence.”

INCLUSION AND EXCLUSION CRITERIA

We included:

- Peer-reviewed studies published in English
- Research focused on adults with chronic conditions (e.g., diabetes, hypertension, cardiovascular disease)
- Studies examining the effect of MTM on clinical outcomes, medication safety, adherence, or healthcare costs

We excluded:

- Studies involving only children
- Opinion-based or non-data-driven publications

DATA EXTRACTION AND ANALYSIS

From each study, we gathered information on MTM practices and outcomes such as blood pressure, HbA1c, LDL cholesterol, medication error rates, and patient satisfaction. We reviewed the data to identify patterns, benefits, and common findings across the literature.

CONTEXTUAL CONSIDERATIONS

This review was shaped by the growing challenges of chronic disease and medication-related harm, particularly among patients managing multiple prescriptions. MTM has emerged as a promising approach, enabling pharmacists to work closely with patients to enhance safety, reduce costs, and support improved health outcomes.

ETHICAL CONSIDERATIONS

Since all sources were publicly available, no ethical approval was required.

DIABETES

Diabetes mellitus is a chronic, devastating disease that, despite recent advances in medical care and management, still precipitates substantial morbidity and long-term complications [26]. It is a growing chronic disease with a global prevalence of 415 million, and this figure is expected to be

more than 642 million by the year 2040 [27]. The high prevalence and chronicity of diabetes underscore the critical need for dedicated disease state management. Effective screening, management, regular monitoring, and consistent follow-up are recognized approaches to enhance diabetes control [28]. Medication adherence, lifestyle changes, and consistent blood glucose monitoring are key elements for improved health outcomes in diabetes, and health education and counselling play a vital role in influencing these factors [29-30]. Over the past decades, evidence has consistently shown that Medication Therapy Management (MTM) is linked to lower mortality and morbidity rates, as well as an improved health-related quality of life [31]. Despite the known benefits of proper medication management, irrational medicine use is on the rise, with over half of prescriptions and dispensing practices being inappropriate. Furthermore, more than half of patients do not take their medications as prescribed [32]. Health and economic losses negatively impact the healthcare system [33]. To address this issue, a collaborative, interdisciplinary healthcare model involving all healthcare provider specialties is gaining traction as an effective strategy for enhancing medication adherence and overall patient well-being [34]. Globally, pharmacists are increasingly involved in patient care and disease state management beyond simply dispensing medications. Medication Therapy Management (MTM), a core pharmacist service, offers a valuable approach to improve adherence to antidiabetic treatments and overall health. Moreover, clinical pharmacists, with their in-depth drug knowledge and patient-centered approach, are uniquely capable of educating patients, detailing treatment plans, ensuring implementation, and monitoring medication therapies, which ultimately translates to better health outcomes [35-42]. Research indicates that including pharmacists in an interdisciplinary healthcare team and involving them in every step of the medication use process results in significant benefits, such as improved disease state management, more effective pharmacotherapy, better patient adherence, and an enhanced health-related quality of life [43].

CARDIOVASCULAR DISEASE

Cardiovascular disease (CVD) remains a leading global health challenge, affecting an estimated 523 million people and causing approximately 19 million deaths worldwide in 2020, a 32% share of all global fatalities and an

18.7% increase from 2010 [44-45]. In the United States, CVD affects approximately 82.6 million adults [46], with stroke alone causing 162,890 deaths in 2021 and Black adults facing a twofold higher mortality risk compared to White adults [47]. Escalating CVD healthcare costs prompt insurers and self-insured employers to seek cost-reduction strategies [48-49], leading some health plans to integrate pharmacist-provided Medication Therapy Management (MTM) services [50-59].

Research consistently demonstrates that pharmacist involvement in patient care significantly improves clinical outcomes for chronic diseases, particularly CVD. Pharmacist-provided MTM services enhance cardiovascular health by reducing blood pressure, improving lipid levels, and increasing therapeutic goal attainment. Furthermore, MTM services yield substantial healthcare savings by decreasing CVD-related emergency department visits and hospitalizations, thus lowering morbidity and mortality, and demonstrating a positive return on investment [59-73]. One notable study [59] evaluated MTM's impact on CVD patients from the perspective of self-insured employers. This research revealed significantly lowered overall medical costs and improved various clinical indicators (e.g., LDL cholesterol, blood pressure, HbA1c), alongside concurrent reductions in hospital days and emergency department visits. The study concluded with significant economic and clinical benefits derived from MTM for CVD patients when comparing recipients to non-recipients.

HYPERTENSION

Hypertension is defined as blood pressure 130/80 mmHg and affects almost half of US adults (116 million), of whom a majority do not have their blood pressure under control (92.1 million) [74]. In addition to raising blood pressure, hypertension harms the kidneys, brain, and blood vessels, contributing to significant comorbidities and complications. Lifestyle adjustments can help lower blood pressure before requiring pharmacological intervention [75-76]. Hypertension can be divided into primary and secondary forms. Primary (essential) hypertension accounts for the vast majority (>90%) of cases; here, poor diet and insufficient physical activity are significant and potentially reversible environmental causes. A specific, sometimes remediable cause of hypertension can be identified in approximately 10% of adults with hypertension, termed secondary hypertension. With accurate diagnosis and

treatment of the underlying cause in secondary hypertension, patients can often achieve normal blood pressure or significantly better control, which subsequently decreases their cardiovascular disease risk [77]. Secondary hypertension is commonly attributed to primary aldosteronism, renal parenchymal disease, or renovascular issues. Furthermore, other cases may involve less common endocrine disorders or iatrogenic causes such as certain medications or alcohol [78].

In hypertension management, MTM's comprehensive approach empowers patients through personalized education on medication adherence and lifestyle modifications, addressing specific challenges in blood pressure control. The objective of MTM in hypertension is to minimize medication errors and enhance patient self-management of pharmacotherapy, thereby optimizing health outcomes. Given that polypharmacy is an increasingly recognized global challenge, MTM services are particularly beneficial for patients managing multiple medications [79-81].

RESPIRATORY DISEASE

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

Chronic obstructive pulmonary disease (COPD) is a common, preventable, and treatable condition characterized by persistent respiratory symptoms and airflow limitation [82]. COPD is becoming increasingly common worldwide each year, placing a significant social and financial strain on communities globally [83]. Older age, comorbidities, polypharmacy, and respiratory insufficiency often precipitate medication-related issues in COPD patients. Adherence to standard medication guidelines, ensuring patient comprehension of treatment plans, and consistent follow-up visits can significantly improve medication adherence and enhance treatment effectiveness. Ultimately, this approach prevents medication errors, reduces healthcare costs, and ensures optimal therapeutic outcomes [84-85]. A consistent pharmacy care plan, actively integrating MTM for COPD patients, is likely to enhance medication adherence and improve medication safety in the home setting. Furthermore, it aims to prevent medication misuse, reduce the incidence of adverse drug reactions, promote appropriate medication utilization in healthcare settings, and contribute to overall cost savings [86-88].

ASTHMA

Asthma presents with coughing, breathlessness, wheezing, and tightness in the chest, is associated with airway inflammation and occasionally airflow obstruction [89]. The use of bronchodilators or short-acting beta-agonists (SABA) for symptom relief, and inhaled corticosteroids (ICS), sometimes combined with long-acting beta-agonist (LABA) for management of persistent asthma, is recommended by the 2022 Global Initiative for Asthma (GINA) Report [90].

The primary risk factors for asthma exacerbations, increased hospitalizations, and mortality are identified as prolonged overuse of short-acting beta-agonists (SABA) coupled with the insufficient use of inhaled corticosteroids (ICS). Despite the importance of maintenance therapy, numerous studies indicate poor patient adherence. The underlying reasons for these barriers to adherence in asthma management are multifaceted [90-97]. When patients adhere more closely to their asthma medications, they achieve better symptom control and experience enhanced overall health. This increased adherence also mitigates future asthma exacerbations and lowers healthcare costs. Consistent use of asthma medications results in enhanced asthma control, better health, and a decreased likelihood of costly exacerbations and hospitalizations [98].

PARKINSONS DISEASE

Parkinson's disease (PD) is a neurodegenerative disorder characterized by motor symptoms, autonomic dysfunction, sensory disturbances, and other neurological impairments that compromise the patient's quality of life (QoL) [99-100]. The advancing nature of Parkinson's disease diminishes a patient's quality of life in physical, mental, social, and economic areas. Commonly cited factors in the literature that worsen QoL for PD patients include bradykinesia, tremor, rigidity, postural instability, gait disorder, pain, fatigue, depression, and sexual and cognitive problems [101-102]. Brazilian research indicates that mood disorders (primarily depression), disability, Parkinson's disease complications (dyskinesia and fluctuation), and education level are key factors determining quality of life in PD patients [100]. Parkinson's disease treatment can result in drug-related problems (DRPs). A DRP is defined as an actual or potential health problem or symptom linked to a patient's drug therapy [103]. Non-adherence is a prevalent medication-related issue in chronic diseases. In Parkinson's disease,

patient adherence to treatment is estimated at only 39%, thereby limiting therapeutic effectiveness [104]. Younger age, complex medication schedules (polypharmacy), higher levels of depression, and lower quality of life are associated with poorer adherence to antiparkinsonian treatment in Parkinson's patients [105-107]. Some research indicates that pharmacist involvement in multidisciplinary teams improves clinical outcomes for PD patients and is a valuable healthcare strategy. MTM service interventions improved or maintained PD patients' quality of life, especially their emotional well-being. MTM also decreased drug-related problems (DRPs), particularly treatment non-adherence. These outcomes represent clinical and humanistic benefits [108-110].

ACUTE KIDNEY INJURY

Defined as a common and complex clinical syndrome, acute kidney injury (AKI) frequently presents as a complication in hospital settings and stems from various underlying factors. Medically, the period between AKI and the development of chronic kidney disease (CKD) is termed acute kidney disease (AKD) [111-112]. Findings from a comprehensive systematic review show that approximately 33.6% of patients with acute kidney injury (AKI) progress to acute kidney disease (AKD). Additionally, survivors of AKI face an increased likelihood of future AKI events and negative reactions to medications [113-115]. In the management of acute kidney disease (AKD), pharmacists are essential in ensuring patient safety and optimal medication therapy. Their responsibilities are multifaceted, encompassing patient education on medications, precise drug dose calibration, and avoiding unnecessary nephrotoxic agents post-AKI. Furthermore, pharmacists cautiously reinstate crucial but potentially nephrotoxic drugs (e.g., ACEIs, ARBs) during acute illness. They also manage accompanying health issues and provide vigilant patient monitoring in collaboration with the wider care team [116-117]. The significant risk of adverse

renal outcomes and adverse drug reactions in individuals with a history of acute kidney injury (AKI) underscores the crucial role of effective Medication Therapy Management (MTM) [118-121].

CHRONIC KIDNEY DISEASE

The pharmacotherapy of patients with chronic kidney disease (CKD) is associated with a significant burden of medication-related problems (MRPs) and medication safety issues, which can be classified according to various criteria [122]. Examples of these issues are adverse drug reactions, drug interactions, incorrect dosing, and inadequate lab monitoring [123-124]. The likelihood of hypoglycemia increases in CKD patients as their glomerular filtration rate (GFR) decreases because their bodies clear insulin less effectively. Notably, glucose levels are not always monitored closely enough [125-127]. While the use of many hypoglycemic drugs is restricted in advanced CKD (stage 5) due to required dosage adjustments or contraindications, a broader variety of these agents could be safely utilized. This, however, necessitates diligent monitoring by clinicians possessing in-depth knowledge of their pharmacokinetic and pharmacodynamic profiles [125-127]. Preventing or delaying the progression of kidney disease and minimizing the occurrence of new end-stage renal disease (ESRD) cases represents the most impactful approach to decreasing future illness and the financial demands of ESRD care [128]. Pharmacists are essential for overcoming education and communication barriers that lead to medication-related problems (MRPs) and non-adherence in CKD patients, a population particularly vulnerable due to multiple conditions and medications. Pharmacists in primary care and community settings can significantly impact early CKD management, and nephrology clinical pharmacists can support this by promoting CKD-focused medication therapy management (MTM) in the community to prevent and slow disease progression [129].

Table 1. THE ROLE OF MEDICATION THERAPY MANAGEMENT IN ADDRESSING CHRONIC DISEASE CHALLENGES AND IMPROVING OUTCOMES

Chronic Disease	Key Challenges	MTM Impact	Clinical Outcomes	References
Diabetes Mellitus	High morbidity and long-term complications- Poor medication adherence- Inappropriate prescribing	Improves adherence, glycemic control, and patient education- Reduces irrational medicine use	↓ HbA1c levels, ↑ adherence, and fewer hypoglycemic episodes	[35, 36, 43]

Cardiovascular Disease	High global mortality (32% of all deaths)- Ethnic disparities in stroke outcomes- Rising healthcare costs	MTM improves medication use, therapeutic goals achievement- Pharmacists reduce ER visits and hospitalizations	↓ Blood pressure, ↓ LDL cholesterol, ↑ therapy targets met	[50–59, 59–73]
Hypertension	92.1 million Americans with uncontrolled BP- Poor lifestyle and dietary habits- Complex medication regimens	Pharmacists ensure proper use of antihypertensives- Personalized plans to address secondary hypertension	Improved BP control, better treatment compliance	[74, 79–81]
COPD	Medication errors due to polypharmacy- Poor adherence- Frequent hospitalizations	Ensures inhaler technique, guideline-based prescribing- Prevents misuse and adverse drug reactions	↑ Inhaler adherence, ↓ exacerbation rates	[84–88]
Asthma	Overuse of SABAs- Underuse of ICS- Poor symptom control	Enhances adherence via patient counselling- Encourages preventive ICS use	↑ ICS adherence, ↓ SABA overuse, ↓ hospitalizations	[90–98]
Parkinson's Disease	High treatment complexity- non-adherence (61%)- QoL decline from motor and non- motor symptoms	Reduces drug- related problems- Improves emotional well- being	↓ Drug-related problems, ↑ emotional well-being	[103–110]
Acute Kidney Injury	Progression to AKD- Drug toxicity risks- Lack of dose adjustments	Prevents nephrotoxic exposure- Facilitates safe drug re-initiation	↓ Risk of recurrent AKI and ADRs, ↑ medication safety, and monitoring	[113–121]
Chronic Kidney Disease	High risk of MRPs- Poor lab monitoring- Increased hypoglycemia risk	Tailor's therapy based on GFR- Prevents ESRD progression	↓ MRPs and hypoglycemia: ↑ early detection and therapy optimization	[122–129]

“↑” denotes an increase; “↓” denotes a decrease

TABLE 2. GLOBAL CHALLENGES IN IMPLEMENTING MEDICATION THERAPY MANAGEMENT (MTM)

CHALLENGE AREA	DESCRIPTION
Medication Errors	Medication mistakes continue to be a widespread concern—particularly for patients managing multiple prescriptions. These errors can lead to avoidable harm and hospital visits.
Limited Awareness of MTM	Many patients and even some providers are unaware of what MTM involves or how it can improve care, leading to missed opportunities for better outcomes.
Uneven Access to Services	MTM is not consistently available across all regions, especially in rural or under-resourced settings—leaving many patients without needed support.
Shortage of Trained Pharmacists	A lack of pharmacists trained in MTM, especially in low-income or remote areas, limits the reach and effectiveness of these services.

Fragmented Teams	Care	When doctors, pharmacists, and other care providers don't communicate effectively, important medication-related information can fall through the cracks.
Reimbursement Challenges		In many health systems, pharmacists are not adequately reimbursed for MTM services, making it difficult to provide these services consistently or at scale.
Low Patient Engagement		Patients may feel overwhelmed, unsure, or unmotivated to participate in MTM, particularly if they don't fully understand its benefits or feel disconnected from their care team.
Technology Barriers		Without shared electronic health records, pharmacists may lack access to key information needed for safe and effective medication management.
Growing Chronic Disease Burden		The rising number of patients with chronic illnesses increases the complexity of medication regimens and the demand for personalized MTM support.
Cost and Affordability		High out-of-pocket costs for medications or care can discourage patients from following treatment plans, making MTM's cost-saving benefits even more essential.

FUTURE DIRECTIONS IN MEDICATION THERAPY MANAGEMENT

Medication Therapy Management (MTM) continues to evolve as an essential service in modern healthcare, especially as chronic disease prevalence rises and healthcare systems seek value-based care models. Despite its demonstrated benefits, several barriers hinder the full integration of MTM, including reimbursement challenges, variability in training for clinical pharmacists, and limited patient awareness. Policies supporting collaborative practice agreements and provider status recognition for pharmacists are critical enablers of MTM scalability [130]. Moreover, the integration of digital health technologies presents new opportunities to enhance MTM effectiveness. Tools such as Electronic Health Records (EHRs), Clinical Decision Support Systems (CDSS), and remote patient monitoring can enable real-time medication tracking, flag drug-related problems, and facilitate pharmacist-patient communication. Telepharmacy and virtual MTM services, particularly in underserved and rural communities, can bridge the accessibility gap and expand the

reach of pharmaceutical care [131-132]. The integration of Electronic Health Records (EHRs) and Clinical Decision Support Systems (CDSS) will further enhance MTM by centralizing patient data and providing real-time guidance to pharmacists. Integrating human factors into healthcare, EHRs enhance communication and provide a unified "single source of truth" for patient health and treatment, thereby improving care coordination. The role of information technology has evolved from simply increasing information visibility and sharing to actively using data for patient care. Notably, advanced data analytics is becoming increasingly vital in strengthening patient safety [133]. Clinical Decision Support Systems (CDSS) are software tools integrated within Electronic Medical Records (EMRs) that analyse individual patient data against a computerized knowledge base to provide tailored assessments or recommendations, directly assisting clinicians in their decision-making. These systems guide appropriate practice and have been shown to improve adherence to evidence-based care and reduce medication and practice errors [134].

TABLE 3. APPROACHES OF MEDICATION THERAPY MANAGEMENT

Approach	What It Involves	How It Helps
1. Medication Review (CMR)	A full check of all your medications by a pharmacist.	Finds problems like duplicate drugs, side effects, or incorrect doses.
2. Personal Medication Record	A clear, updated list of everything you take.	Helps you and your care team stay on the same page.
3. Action Plan	A simple, personalized list of steps to manage your medications.	Keeps you informed and involved in your care.
4. Interventions & Referrals	Adjustments to your treatment and referrals if needed.	Prevents harmful interactions and improves your therapy.
5. Follow-Up & Monitoring	Ongoing check-ins to track progress and adjust as needed.	Keeps your treatment safe and effective over time.
6. Chronic Condition Support	Help managing long-term issues like diabetes or high blood pressure.	Leads to better control and fewer complications.
7. Adherence Support	Tools and coaching to help you take medications as prescribed.	Improves results and reduces hospital visits.
8. Cost & Therapy Optimization	Switching to safer or more affordable medications when possible.	Lowers your costs without compromising care.
9. Preventive Health Check	Identifying missing vaccines or screenings.	Keeps you ahead of potential health issues.
10. Team-Based Care	Working closely with doctors and nurses.	Ensures everyone's on the same page for your care.
11. Patient Education	Clear, supportive conversations about your health and medications.	Builds confidence and helps you take control of your health.

TABLE 4. IMPACT OF MEDICATION THERAPY MANAGEMENT

How It Helps	What That Means for You
Better Control of Ongoing Health Issues	MTM helps you manage conditions like high blood pressure, diabetes, or high cholesterol more smoothly.
Fewer Medication Mistakes	Pharmacists take a second look at your meds to catch any problems—like wrong doses or bad combinations.
Easier to Stay on Track	You get clear, friendly guidance to help you take your medications the right way, every day.
Fewer Side Effects	MTM helps prevent unpleasant reactions, so your treatment feels safer and more comfortable.
Care That Fits You Personally	Your medications are adjusted to fit you, not just a standard plan.
Lower Chance of Hospital Visits	Fewer medication problems mean fewer emergencies or return trips to the hospital.
More Preventive Care	Pharmacists help spot missing vaccines or checkups you might not know you need.

Feeling More Supported	You feel listened to, cared for, and more confident about your health.
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II. CONCLUSION

Medication Therapy Management (MTM) is a pivotal pharmacist-led intervention, demonstrably crucial for optimizing medication use and improving health outcomes in patients with chronic diseases such as diabetes, cardiovascular disease, and hypertension. This review consistently highlights MTM's efficacy in reducing medication errors, enhancing adherence, mitigating adverse drug events, and achieving significant clinical improvements alongside healthcare cost reductions. MTM also strengthens interprofessional collaboration, leveraging pharmacists' expertise to optimize therapeutic plans.

The escalating burden of chronic illness underscores the urgent need for wider integration of pharmacist- provided MTM services. Despite proven efficacy, challenges in reimbursement, training variability, and patient awareness persist. Future efforts should strategically focus on leveraging technology (e.g., AI, EHRs, CDSS), advocating for policy and reimbursement reforms, standardizing MTM delivery and training, and developing innovative patient engagement strategies.

In essence, expanding MTM's accessibility and integration is fundamental for transforming patient care, fostering healthier populations, and ensuring more sustainable healthcare systems globally.

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