

# Comprehensive Medication Management for Hypertension in the United States: A Scoping Review of Therapeutic, Humanistic, Safety and Economic Outcomes

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Emerging research has shown that pharmacist-led comprehensive medication management (CMM) can be an effective strategy for controlling hypertension. A synthesis of the evidence on the overall effects of CMM on clinical, quality, and economic outcomes could help inform and contribute to improvements in programming and practice. Presently, such a synthesis is limited in the literature. To address this gap, we conducted a scoping review of CMM effects on these outcomes, organized by 4 domains: therapeutic, humanistic, safety and economic. Using predefined search terms for articles on studies published between 2010 and 2024, we performed a literature search utilizing these terms to search the MEDLINE, Cochrane Library and CINAHL databases. For each of the identified studies, we applied a multi-stage screening process to extract data, chart results, and synthesize findings. The process took into account methodology of study design, patient population involved, CMM implementation, relevance of outcomes to clinical improvement, and factors that were deemed relevant to study selection. In total, 49 experimental, observational, and simulation-based studies were included in the scoping review. The synthesis focused on outcomes most frequently reported and those rigorously evaluated by the studies in the review. They included clinical measures of blood pressure reduction and control, frequency and duration of healthcare visits, and changes in medication therapy regimen and medication adherence. Overall, CMM interventions were found to have significantly favorable effects on systolic blood pressure reduction, hypertension control, and medication changes. Other outcomes, which showed positive effects, included self-reported patient experience and behaviors, emergency department visits, hospitalizations, mortality, and program costs and related savings from implementing a CMM program. Some results, however, were mixed. For example, a number of studies reported outcomes data without significance testing and many generally lacked consistent characterization of their programming and implementation processes. Future research and practice evaluations should include these elements in their documentation. Furthermore, a more consistent approach to implementing CMM in the field may lead to better support of program delivery fidelity, helping to optimize CMM, moving it from demonstrated efficacy to intervention effectiveness in the real world.

cardiovascular disease

blood pressure control

hypertension

pharmacist

comprehensive medication management

health and economic outcomes of optimal blood pressure management

program implementation and evaluation

Cardiovascular disease is the leading cause of death in the United States (U.S.), accounting for approximately 1 in 3 deaths annually [1]. Hypertension, which affects more than 48% of the U.S. population, is considered the most modifiable and preventable risk factor for cardiovascular disease [2]. This condition was the primary or contributing cause of nearly 700,000 deaths nationwide in 2022 alone [2]. Despite this, effective control of hypertension remains elusive across the country. Only 1 in 4 U.S. adults with diagnosed hypertension have their condition under control [2].

Antihypertensive medications are an essential tool for controlling hypertension and preventing cardiovascular disease [2][3]. However, both patients and providers need additional support to ensure that antihypertensive medication therapy is accessible and appropriately prescribed. Misuse, underuse and/or overuse can diminish medication effects or cause harm, leading to other health problems. Pharmacists are in a unique position to assist individuals with hypertension and reduce medication harm [3]. They can provide medication therapy expertise in collaboration with patients' provider care teams. The American College of Clinical Pharmacy (ACCP) has promoted a collaborative drug therapy management framework since the late 1990s. This framework describes how pharmacists and physicians can work together to optimize medication therapy for patients [3]. Pharmacist-led, team-based care interventions are growing in popularity, driven by the profession's nationwide doctoral-level training requirements, extensive clinical education, and opportunities for post-graduate residency training and board certifications.

The passage of the Medicare Modernization Act in 2003, Medicare Part D, required plans to offer Medication Therapy Management (MTM) to eligible beneficiaries [3]. MTM is a reimbursable drug benefit program in which a pharmacist conducts an annual one-time review of a patient's medication regimen to identify medication problems and advise providers and patients on how best to correct them [4]. While MTM activities do not fully address the principles outlined in the ACCP collaborative framework, the reimbursement of MTM served to legitimize pharmacist-provided services under Medicare and build the case to expand pharmacist roles in team-based care and related models of practice, including comprehensive medication management (CMM).

CMM is a patient-centered approach, in which pharmacists review not only the patient's medications but also their health history and behaviors to develop a personalized care plan and provide ongoing support to ensure adherence over time. According to ACCP, a CMM intervention includes four essential steps: (1) a thorough review of the patient's medical and medication history; (2) identification of medication related problems based on the patient's history and each medication's appropriateness, effectiveness and safety; (3) development and initiation of a care plan designed to optimize medication therapy for the patient; and (4) adjustment of the care plan as needed, informed by results from clinical follow-up and collaboration with healthcare providers [5].

While CMM is longitudinal, more comprehensive, and potentially a better fit than MTM for integrating within a team-based care model, the healthcare community is more familiar with Medicare-defined MTM and its narrower scope of practice [6]. The variability in state legislative provisions to support (or to not support) collaborative drug therapy reimbursements further complicates this landscape. For instance, clinicians and researchers alike often confuse

MTM nomenclature and terminology with those of CMM. In addition, the dynamic nature of CMM services lends itself to frequent variation in clinical practice settings, where the four essential steps of the model are not always operationalized in the same way as described in established frameworks or the literature.

Nonetheless, a growing body of literature points favorably to CMM's effects on chronic disease control. Studies have shown that participation in CMM could lead to improvements in health (e.g., blood pressure [BP], glycemic control [hemoglobin A1c], lipids), functional (e.g., medication safety, medication adherence), and economic (e.g., healthcare cost savings) outcomes [7][8][9]. Presently, there is limited synthesis of this evidence in the literature. Such a synthesis could offer invaluable insights into better ways to conduct hypertension management and prevention for healthcare providers, program implementers, and researchers.

This scoping review sought to address this gap by describing the scope and nature of studies that have examined the effects of CMM on a broad spectrum of outcomes, extending beyond traditional measures of BP control. Pharmacist-led, pharmaceutical interventions, such as CMM, have the potential to affect not only medication and disease management, but also healthcare utilization and expenditures, and—most importantly—patient behaviors and experience. Summarizing the effects of CMM on hypertension from this multidimensional perspective could help enhance our understanding and advance the application of this team-based care model in real-world practice. Furthermore, because CMM has not been defined consistently in the literature and is often used interchangeably with MTM, we believe a scoping review could be used to help clarify the distinction between CMM and other pharmacist-led interventions, as well as capture trends in outcomes and effects evaluated in CMM studies. This review conducted its synthesis of the evidence with this in mind, focusing on four domains of outcomes: therapeutic, humanistic, safety and economic.

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