

**THE EXPANDING ROLE OF PHARMACISTS IN PRIMARY CARE: A REVIEW
OF MODELS FOR CHRONIC DISEASE MANAGEMENT**Sk. Haseena Sulthana^{1,*}, P. Maitreya²¹Department of Pharmacy Practice, Sir C. R. Reddy College of Pharmaceutical Sciences, Eluru – 534007, Andhra Pradesh, India²Department of Pharmacy Practice, Sir C. R. Reddy College of Pharmaceutical Sciences, Eluru – 534007, Andhra Pradesh, India**ABSTRACT**

Objective: Primary care systems face mounting pressure from an aging population, rising persistent disease strain, and a shrinking primary care physician workforce. Pharmacists, among the most accessible and medication-expert members of the state care team, have shifted beyond the standard and traditional dispensing role toward direct, longitudinal patient care. This review synthesizes worldwide literature on pharmacist-delivered models of persistent disease management in primary care, the frameworks enabling expanded pharmacist functions, outcomes across significant and notable persistent conditions, and persistent barriers to integration.

Methods: Literature was searched in PubMed/MEDLINE, the Cochrane Library, Google Scholar, and grey literature to identify methodical and umbrella assessments, economic evaluations, and representative primary studies on pharmacist participation in ambulatory persistent disease management. This is a narrative review instead than an official ordered and methodical and orderly review.

Results: Pharmacist-led models, comprising collaborative and accommodating practice agreements, medication therapy management, thorough and comprehensive medication management within patient-centered medical homes, and independent or further prescribing, are consistently associated with improved and enhanced attainment of glycemic, blood-pressure, and lipid goals, modestly improved adherence, and reduced heart-failure readmissions, while effects on hard endpoints such as mortality continue less particular. Economic assessments favor pharmacist services as cost-effective or cost-saving, particularly for diabetes, hypertension, and anticoagulation management. Implementation is limited by irregular reimbursement, variable scope-of-practice legislation, and team role ambiguity.

Conclusion: The evidence foundation supports an expanded, team-based role for pharmacists in persistent disease management. Progress depends on harmonized reimbursement policy, uniform credentialing, interoperable condition information systems, and continued thorough and meticulous, outcomes-focused inquiry.

Keywords: pharmacist; primary care; persistent disease management; joint practice agreement; medication therapy management; patient-centered medical home; pharmacist prescribing; exhaustive and inclusive medication management.

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1. INTRODUCTION

Chronic non-communicable diseases; diabetes, hypertension, dyslipidemia, heart failure, and persistent respiratory disease; now account for the majority of morbidity, mortality, and state care expenditure in high- and middle-income countries. Effective long-term control of these conditions depends less on episodic diagnosis and more on sustained medication optimization, adherence support, and monitoring, activities that is tough and arduous to deliver within the time restrictions of a normal and usual and customary and conventional and customary physician office visit. At the identical time, primary care systems in the United States, United Kingdom, Canada, and elsewhere are confronting remarkable and significant and notable and extraordinary workforce shortages; completely a small minority of physicians finishing residency training in newest years have entered primary care practice, and national projections point to a substantial shortfall of primary care physicians within the subsequent decade.

Pharmacists represent one of the most accessible points of contact within the state care system. In several and varied countries, the majority of the population lives within a short distance of a community pharmacy, and pharmacists are often seen by patients more frequently than any other state expert. Building on this accessibility and on deep

pharmacotherapeutic proficiency, pharmacist functions have expanded significantly over the past three decades; from a product-focused, dispensing-centered profession toward one that increasingly delivers direct, longitudinal patient care for persistent conditions, working within official joint arrangements, embedded clinical teams, and, in a growing number of jurisdictions, as autonomous prescribers.

This review inspects the models through which pharmacists participate in persistent disease management in primary care, the evidence supporting their effectiveness, the economic case for their integration, and the structural hurdles that continue to restrict common and widespread and far-reaching adoption. The review is intended for pharmacy educators, primary care clinicians, state system managers, and policymakers seeking a consolidated overview of this swiftly advancing area of practice.

2. METHODS

This is a narrative review instead than an official organized and systematic and orderly review. Literature was identified through organized and orderly searches of PubMed/MEDLINE, the Cochrane Library, Google Scholar, and relevant grey literature, comprising reports from the Centers for Medicare & Medicaid Services (CMS), the U.S. Department of Veterans Affairs, the American Society of Health-System

Pharmacists (ASHP), the American Pharmacists Association (APhA), Health Affairs, and the Royal Pharmaceutical Society. Search conditions combined variations of “pharmacist,” “primary care,” “persistent disease management,” “joint practice agreement,” “medication therapy management,” “patient-centered medical home,” “independent prescribing,” and individual disease states (diabetes, hypertension, dyslipidemia, heart failure, persistent obstructive pulmonary disease, persistent kidney disease). Priority was given to ordered and methodical evaluations, umbrella evaluations, and big and substantial economic assessments, supplemented by representative primary studies demonstrating precise practice models.

Searches covered literature distributed between January 2005 and June 2026, with the search conclusive and definitive run on 30 June 2026. Searches were restricted to English-language publications. Systematic evaluations, umbrella reviews, meta-analyses, economic evaluations, and primary studies describing pharmacist-delivered persistent disease management models in ambulatory or primary care settings were eligible for inclusion; inpatient-only pharmacy studies separate to care changes, non-English-language publications, and conference abstracts without full-text availability were excluded. Approximately 340 records were screened by title and

abstract, of which 47 sources were selected for inclusion established on relevance and quality. Reporting of this narrative review was notified by the Scale for the Assessment of Narrative Review Articles (SANRA).

3. HISTORICAL EVOLUTION OF PHARMACIST ROLES IN PRIMARY CARE

The conceptual foundation for an expanded, patient-care-oriented pharmacist role is frequently tracked to the philosophy of “pharmaceutical care” articulated by Hepler and Strand in 1990, which reframed the pharmacist’s duty from precise and right product dispensing to the identification, resolution, and avoidance of drug-therapy issues in collaboration with other members of the state care team.[1] Over the succeeding three decades, this philosophy has been operationalized through a sequence of practice models, each growing the pharmacist’s clinical authority and range of direct patient interaction.

In the United States, early community-based presentation programs such as the Asheville Project and the Diabetes Ten City Challenge showed that self-insured employers and state plans could achieve quantifiable improvements in glycemic control and cost outcomes by embedding community pharmacists in structured, employer-sponsored diabetes and cardiovascular risk management programs.[2] The introduction

of Medicare Part D in 2006 standardized medication therapy management (MTM) as a required advantage for high-risk beneficiaries, producing a national system for pharmacist-delivered full and comprehensive and exhaustive and meticulous medication review.[3] In parallel, state pharmacy practice acts incrementally approved joint practice agreements (CPAs), official arrangements that permit pharmacists to commence, alter, or discontinue drug therapy under a physician-approved protocol; by the first 2020s, all fifty U.S. states permitted some form of joint practice.[4,5]

Internationally, the trajectory has shifted further toward pharmacist autonomy. The United Kingdom introduced additional prescribing in 2003 and independent prescribing in 2006, and by the mid-2020s the National Health Service was pursuing a vision of a fully prescribing-enabled community pharmacy workforce.[6] Selected Canadian provinces, comprising Alberta and Ontario, and the Australian state of Queensland have similarly approved

pharmacist independent prescribing for specified conditions, and a growing number of U.S. states; comprising Idaho, Montana, and Colorado; have embraced statutory frameworks permitting pharmacists to prescribe autonomously for specified minor and persistent conditions.[7,8] The COVID-19 pandemic further accelerated this trajectory, as pharmacists assumed expanded testing, immunization, and triage duties that demonstrated their capability for direct clinical care at scale.

4. CONCEPTUAL MODELS AND FRAMEWORKS FOR PHARMACIST-DELIVERED CHRONIC DISEASE MANAGEMENT

Pharmacist participation in persistent disease management is not a single, uniform intervention but a family of related practice models that differ in legal authority, setting, and degree of pharmacist autonomy. Table 1 summarizes the chief models discussed in this review; each is described in greater detail in the subsections that follow.

Table 1: Principal models of pharmacist-delivered chronic disease management in primary care.

Model	Description	Typical Setting	Pharmacist Authority
Collaborative Practice Agreement (CPA)	Formal, protocol-driven agreement with a prescriber authorizing the pharmacist to initiate, adjust, or discontinue therapy for defined conditions	Community pharmacy, ambulatory clinic, federally qualified health center	Dependent / delegated

Model	Description	Typical Setting	Pharmacist Authority
Medication Therapy Management (MTM)	Structured comprehensive and targeted medication reviews, typically mandated for high-risk Medicare Part D beneficiaries	Community pharmacy, health-plan-directed, telephonic	Advisory, with prescriber follow-up
Comprehensive Medication Management (CMM) in the PCMH	Pharmacist embedded within a primary care team, performing systematic medication assessment across all indications	Patient-centered medical home, family medicine clinic	Delegated / collaborative
Independent / Supplementary Prescribing	Pharmacist assesses, diagnoses within scope, and prescribes autonomously or under a clinical management plan	Community pharmacy, general practice (UK, Canada, Australia)	Autonomous / semi-autonomous
Transitions-of-Care and Home-Based Pharmacy Services	Pharmacist-led medication reconciliation and follow-up spanning hospital discharge into the primary care and home setting	Hospital-to-home, home-based primary care	Advisory / collaborative

Collaborative Practice Agreements

Collaborative practice agreements (CPAs) are official, voluntary arrangements between a pharmacist and one or more prescribers that authorize the pharmacist to perform expanded clinical activities; adjusting drug doses, ordering and interpreting laboratory tests, and initiating or discontinuing therapy; within a specified protocol.[4,5] All fifty U.S. states now permit some form of joint practice, and CPAs have become the chief vehicle through which pharmacists handle core persistent disease states such as hypertension, diabetes, and hyperlipidemia in ambulatory settings.[9]

A representative instance is the implementation of a CPA at El Rio Community Health Center in Arizona, where pharmacists received direct referrals from physicians and nurse practitioners for

diabetes, hypertension, and hyperlipidemia management; pharmacists could adjust medication regimens without further prior permission, with prescribers appearing as co-signers in the electronic state record. This model was associated with better and refined disease control and reduced overall costs of care.[3] Similarly, a pharmacist-driven collaborative and accommodating practice embedded in an urban, underserved federally qualified state center enhanced mean hemoglobin A1c from 9.8% to 8.4% among patients with type 2 diabetes, alongside exceptional and superior gains in statin and ACE-inhibitor/ARB application and tobacco-cessation counseling, with high contentment reported by both referring providers and patients.[10]

Employer- and health-plan-sponsored community programs provide some of the

longest-running evidence for this model. In the Patient Self-Management Program for Diabetes, 94% of enrolled patients accomplished the Health Plan Employer Data and Information Set (HEDIS) glycemic target, and in the Diabetes Ten City Challenge, 91% of participants attained the identical target, with overall screening and A1c testing rates enhancing to 97%.[2] A pharmacist-physician collaborative model tackling persistent kidney disease demonstrated that among patients with suboptimal baseline control, accomplishment of diabetes objectives rose from 23% to 67% and hypertension goals from 29% to 58% following pharmacist-led collaborative and accommodating management, with technology-enabled remote monitoring associated with a greater likelihood of reaching goals.[11]

Medication Therapy Management

Medication therapy management was officially codified as a required Medicare Part D advantage following the 2003 Medicare Modernization Act, targeting beneficiaries with numerous and manifold and varied persistent conditions, several Part D medications, and high medication expenditure.[12] Plan sponsors must offer an annual exhaustive and meticulous medication review (CMR) and quarterly aimed medication assessments (TMRs); approximately 94% of CMRs nationally is

delivered by pharmacists, indicating the significance of the profession to this program.[9] Evidence on the impact of MTM is diverse and assorted and diverse and heterogeneous but generally beneficial for process and intermediate outcomes. A retrospective cohort analysis of Medicare beneficiaries found that receipt of an exhaustive and meticulous and thorough medication review was associated with reduced application of expensive inpatient and emergency part services relative to matched non-recipients.[9] A community pharmacy-based study of better and refined MTM found that pharmacists identified significantly more medication-related issues than health-plan-directed assessments exclusively, especially around counseling essentials and laboratory monitoring, highlighting the pharmacist's role in surfacing problems that administrative claims-based targeting exclusively would miss.[13] At the identical time, application of MTM services by eligible beneficiaries remains persistently low, and inequalities in receipt and effectiveness of CMRs have been recorded across racial and ethnic groups, showing to entry obstacles that restrict the program's population-level impact.[12]

Comprehensive Medication Management within the Patient-Centered Medical Home

The patient-centered medical home (PCMH) model reorganizes primary care around a

structured and systematic and synchronized, team-based approach to population state, and pharmacists have increasingly been identified as core members of this team, delivering comprehensive and comprehensive medication management (CMM) alongside physicians, nurses, and care coordinators.[14-16] A well-documented case from a family medicine residency training program in North Carolina describes pharmacists and pharmacy residents offering direct patient care through pharmacotherapy, anticoagulation, and osteoporosis clinics fully integrated into a National Committee for Quality Assurance (NCQA)-recognized level III PCMH.[15]

A qualitative study of pharmacist integration into PCMHs functioning within federally qualified state centers in Texas found that successful integration depended on aligning pharmacist workflow with organizational essentials, especially for diabetes management among underserved populations, and identified full and comprehensive and whole and complete team integration, electronic state record entry, a physician or administrative champion, dedicated clinical space, and fitting equipment as consensus-based essentials for practice readiness.[17] Beyond ambulatory clinics, pharmacist medication review has moreover been extended into home-based primary care: a pilot program using a remote, corporate-based clinical pharmacist to

conduct comprehensive medication assessments for medically elaborate and delicate home-based primary care patients; with a median of seventeen medications and thirteen persistent conditions per patient; generated 175 medication recommendations over four months, with about one-third accepted by the treating practice, primarily involving deprescribing and dose optimization.[18]

Independent and Supplementary Prescribing

The most autonomous model of pharmacist practice is independent (or, in prior UK terminology, extra) prescribing, in which the pharmacist assesses the patient, makes a diagnostic or therapeutic decision within extent, and prescribes without requiring case-by-case prescriber permission. This model is most fully developed in the United Kingdom, where the National Health Service has articulated a vision for a fully prescribing-enabled pharmacy workforce, and is moreover established in Canada (notably Alberta and Ontario), the Australian state of Queensland, and a growing number of U.S. states, comprising Idaho, Montana, and Colorado.[7,8,6]

A scoping review of community pharmacist independent prescribing found growing evidence for its application in managing minor ailments and regular and recurring and common and widespread persistent

conditions, though it noticed persistent gaps in pharmacists' entry to diagnostic laboratory testing and in the compatibility of prescribing records with broader primary care systems.[19,20] A cross-national organized and systematic review characterized pharmacist prescribing models along a continuum from fully dependent (requiring oversight) to fully independent, noting that expansion has been driven by rising condition care demand, workforce shortages among broad practitioners, and the trust pharmacists earned during the COVID-19 pandemic.[20] Qualitative study among general-practice-based independent pharmacist prescribers in Northern Ireland emphasized that while the role has expanded meaningfully into persistent disease management and medicines optimization, pharmacists frequently describe persistent gaps in confidence for autonomous clinical decision-making, notably early in the transition from a collaborative to an independent prescribing identity.[21] Commentary from the Canadian Medical Association Journal similarly notes that growing pharmacist prescribing authority increases unresolved queries for physicians around communication protocols, liability, and role definition that need intentional practice redesign alternatively than incidental adaptation.[22]

Transitions-of-Care and Heart-Failure-Focused Models

A distinct but related model positions the pharmacist at the interface between hospital and ambulatory care, tackling the high rate of medication-related issues that contribute to first and starting readmission after discharge for heart failure and persistent obstructive pulmonary disease (COPD). A review of the pharmacist's role in heart failure changes of care found that organized medication reconciliation and discharge medication review, combined with post-discharge follow-up calls, were associated with enhanced and upgraded adherence with heart-failure core quality measures and declines in thirty-day and all-cause readmissions and associated costs.[23]

An often cited case embedded a clinical pharmacist within an accountable-care primary care clinic specifically to address a heart-failure readmission rate that exceeded national benchmarks; a pre/post analysis of 111 patients managed by the pharmacist over a ten-month period demonstrated better and refined outcomes, prompting the practice to extend the pharmacist's collaborative range to diabetes and other comorbidities given the lack of on-site specialists.[24] Within the U.S. Department of Veterans Affairs system, Clinical Pharmacy Practitioners functioning under a specified range of practice authority contribute to the management of conditions

closely tied to potentially preventable readmissions, comprising COPD, congestive heart failure, hypertension, and uncontrolled diabetes.[25]

5. EVIDENCE BY DISEASE STATE

Across disease states, the strongest and most uniform and unchanging evidence for pharmacist-led persistent disease management concerns intermediate physiologic outcomes; glycemic, blood-pressure, and lipid goal attainment; with comparatively weaker and more varied and assorted and mixed evidence for hard clinical endpoints such as significant and distinguished cardiovascular events and mortality, largely because most primary studies are short in span and were not statistically powered to detect differences in these less pervasive and far-reaching outcomes.[26] The later subsections outline disease-specific outcomes drawn from noteworthy and remarkable methodical and umbrella reviews.

Diabetes Mellitus

Diabetes is the most thoroughly examined persistent disease state in the pharmacist practice literature. An umbrella review synthesizing methodical and structured reviews and meta-analyses of community pharmacist-led interventions across seven persistent disease varieties found that, for diabetes specifically, interventions attained statistically exceptional and superior

decreases in hemoglobin A1c, total cholesterol, and low-density lipoprotein cholesterol.[27] A substantial methodical review conducted for the U.S. Department of Veterans Affairs, assessing sixty-five patient populations, found that pharmacist-led care increased the number and dose of medications prescribed and enhanced glycemic, blood-pressure, and lipid goal attainment relative to traditional and habitual care, with moderate-strength evidence, though effects on resource application, mortality, and clinical events were comparable between groups.[26]

Hypertension

Hypertension management under joint practice agreements has produced some of the most operationally mature pharmacist-led programs, incorporating barber-shop-based and community state center models that pair pharmacists with primary care prescribers to titrate antihypertensive therapy under protocol.[28] In the pharmacist-physician CKD collaborative described above, hypertension goal attainment enhanced from 29% to 58% following pharmacist participation, with greater improvement noted among patients who engaged with technology-enabled observation tools.[11] CPA-based hypertension management has more widely been associated with superior blood-pressure control compared with physician-only management in multiple and

multiple health-system assessments, alongside expanded point-of-care testing and immunization access.[4,5]

Dyslipidemia

Lipid management is often embedded within broader diabetes and cardiovascular risk-reduction collaborative practice models instead than managed as an isolated service line. Core disease-state protocols developed by state pharmacy associations for comprehensive and complete medication management explicitly designate hyperlipidemia, alongside hypertension, diabetes, and anticoagulation, as a fundamental and elementary and vital and crucial state for clinical pharmacist range of practice, indicating its weight to ambulatory cardiovascular risk reduction.[29] Reported outcomes across CPA and umbrella-review evidence consistently show strengthened statin application and LDL-cholesterol goal attainment among patients managed collaboratively by pharmacists.[27,11]

Heart Failure

Pharmacist participation in heart failure management spans both persistent ambulatory titration of guideline-directed medical therapy and transitions-of-care interventions targeting first and starting readmission. Community pharmacist-led interventions have been associated with enhanced medication adherence and reduced heart-failure readmission rates in the

umbrella-review literature.[27] Dedicated pharmacist-led transitions-of-care programs, comprising discharge medication reconciliation and structured post-discharge follow-up, have similarly demonstrated declines in thirty-day and all-cause readmissions.[23]

Asthma and Chronic Obstructive

Pulmonary Disease

Pharmacist interventions for asthma and COPD have generally concentrated on inhaler-technique education, adherence counseling, and identification of undertreated exacerbation risk. The umbrella review of community pharmacist-led persistent disease interventions reported enhanced and upgraded lung function among patients with respiratory conditions acquiring pharmacist-led care, alongside enhanced patient contentment and quality of life reported specifically for patients with asthma in a related methodical and systematic review of primary-care pharmacist roles.[27,30]

Chronic Kidney Disease and

Multimorbidity

Chronic kidney disease illustrates the value of pharmacist participation in medically sophisticated and multifaceted, multimorbid populations, where polypharmacy and renally modified dosing create substantial chance for medication-related detriment. The pharmacist-physician collaborative care model described previously, built around an

official joint drug therapy management agreement and technology-enabled observation, showed that patients with several and different pharmacist visits were substantially more expected to reach HEDIS-aligned diabetes and hypertension goals than those with limited engagement, reinforcing that intervention intensity and continuity; not merely pharmacist participation per se; drive outcome improvement.[11]

6. CLINICAL, ECONOMIC, AND HUMANISTIC OUTCOMES

Evaluations of pharmacist-led persistent disease management are typically organized around three outcome domains: clinical results (comprising intermediate physiologic measures and clinical events), resource-utilization and economic results, and humanistic results such as patient contentment and quality of life. A methodical and orderly and methodical review of primary care pharmacist interventions found that clinical results were reported far more often than either humanistic or economic results, with clinical results described in about two-thirds of included studies compared with about one-quarter reporting humanistic results and about one-tenth reporting economic results; a reporting inequality that probably understates the total and whole value proposal of pharmacist services.[30]

Clinical Outcomes

The most resilient and durable synthesis of U.S. clinical-outcome evidence remains the Department of Veterans Affairs-commissioned methodical review of sixty-five patient populations, which found that pharmacist-led care was associated with comparable rates of office visits, urging and immediate care and emergency unit visits, and hospitalizations compared with conventional and habitual care (moderate-strength evidence), comparable medication adherence (low-strength evidence), and equivalent mortality and notable and remarkable clinical events (low-strength evidence), but enhanced attainment of glycemic, blood-pressure, and lipid goals (moderate-strength evidence) (Figure 1).[26] The authors emphasized that most included studies were short-term and powered to detect changes in intermediate physiologic markers instead than clinical events, so the lack of a detectable mortality advantage should not be understood as evidence of no effect. More new and internationally comprehensive umbrella assessments reach widely concordant conclusions: community pharmacist-led interventions generate uniform and unchanging, statistically exceptional and superior improvements in disease-specific intermediate outcomes across diabetes, hypertension, dyslipidemia, heart failure, and respiratory disease, with the strength of evidence generally strongest for

education- and medication-management-focused interventions.[27]

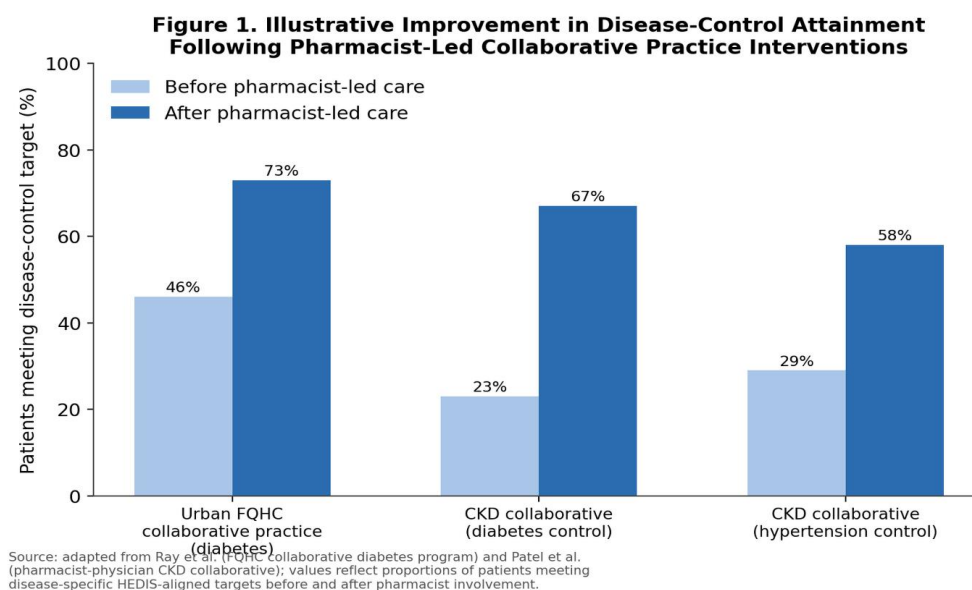


Fig. 1: Illustrative improvement in disease-control attainment following pharmacist-led collaborative practice interventions, drawn from a federally qualified health center diabetes collaborative and a pharmacist-physician chronic kidney disease collaborative.[10,11]

Economic Outcomes

Economic evidence for pharmacist services in persistent disease management is comparatively flexible and adaptive. A structured review of seventy-five economic assessments of pharmacist services found that fifty-seven were either cost-saving (primary and principal) or cost-effective against a standard willingness-to-pay threshold, with pharmacist management of hypertension, type 2 diabetes, and warfarin/INR monitoring identified as among the most cost-effective interventions.[31,32] A separate ordered and methodical review of forty-three economic reviews released between 2016 and 2020 similarly found that the massive and huge and enormous majority

of studies; across hospital, community, and primary care settings and in both developed and advancing countries; reported pharmacy services as cost-effective or cost-saving (Figure 2).[33]

At the level of individual programs, return-on-investment analyses have reinforced this pattern. A hospital-based analysis of pharmacist medication review calculated that evaded costs from prevented damaging and harmful and damaging drug events substantially exceeded the cost of pharmacist staffing, generating a return on investment of approximately 1.0 to 1.7 times the program's cost.[34] Within the U.S. Military Health System, a cost-benefit analysis executing established cost-avoidance methodology

validated a patient-centered medical home staffing model in which clinical pharmacists

generated recorded cost avoidance well in excess of salary costs.[35]

Figure 2. Proportion of Published Economic Evaluations Reporting Pharmacist Services as Cost-Effective or Cost-Saving

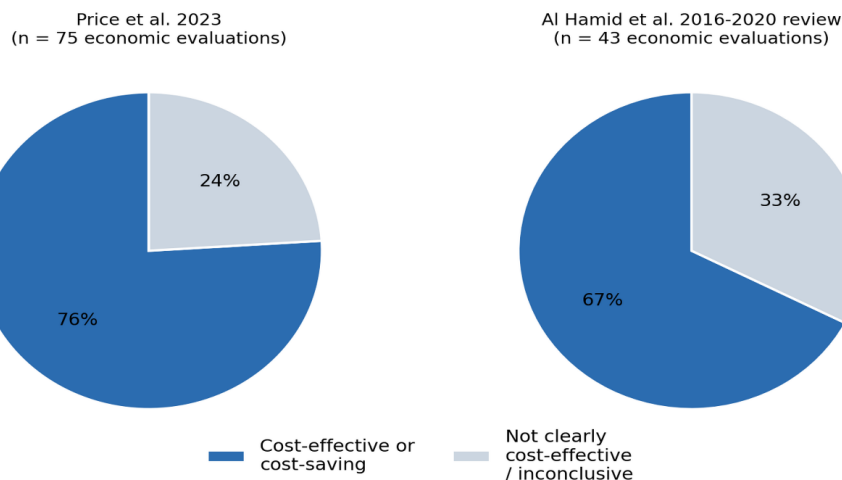


Fig. 2: Proportion of published economic reviews reporting pharmacist services as cost-effective or cost-saving, based on two independent systematic assessments of the economic-evaluation literature.[31,33]

Humanistic Outcomes

Patient and provider contentment with pharmacist-delivered persistent disease management are generally advantageous where measured, though it is the least frequently reported outcome domain. In the federally qualified condition center diabetes collaborative explained earlier, providers overwhelmingly rated the pharmacist-led service positively, and patients participating in structured and orderly contentment interviews and focus groups reported alignment between the program's goals and their own personal condition priorities, notably around nourishment education.[10] The Department of Veterans Affairs methodical review characterized the broader

evidence on patient fulfillment as diverse and assorted and insufficient in volume to support firm conclusions, highlighting a persistent gap in the literature that limits a total and whole description of the value pharmacists add beyond physiologic measures.[26]

7. INTERNATIONAL PERSPECTIVES

Although the fundamental reason for growing pharmacist functions; workforce shortages, rising persistent disease strain, and pharmacist accessibility; is broadly shared across condition systems, the specific legal and organizational models through which this expansion occurs differ considerably by country.

7.1 United States

The U.S. model is characterized by state-based regulatory authority, following in substantial variation in range of practice, and by a primarily delegated (cooperative practice agreement) instead than fully independent prescribing framework, although several states have begun to authorize autonomous prescribing for specified conditions.[7,8] Federal reimbursement structures, notably the absence of pharmacist recognition as a billable provider type under Medicare Part B, proceed a central constraint on scaling clinical pharmacy services nationally.[36]

7.2 United Kingdom

The UK has pursued the most centralized expansion of pharmacist prescribing authority, moving from extra to independent prescribing and articulating a National Health Service vision for a fully prescribing-enabled community pharmacy workforce; a 2026 scoping exercise involving stakeholder interviews concluded that a uniform and unchanging national framework for management and continued specialist development, instead than condition-specific credentialing exclusively, would best support safe scaling of pharmacist prescribing.[6,21]

7.3 Canada, Australia, and Other Jurisdictions

Selected Canadian provinces (notably Alberta and Ontario) and the Australian state

of Queensland have authorized pharmacist independent prescribing for specified conditions, with various and several Canadian provinces incrementally growing the eligible state list. Ireland has released a roadmap toward pharmacist prescribing for an expanded set of conditions, and multiple extra jurisdictions; comprising Poland, Switzerland, and Denmark; have introduced or extended prescribing rights to community pharmacists over the past five years, indicating a broader worldwide convergence around this model.[8,20]

7.4 Low- and Middle-Income Settings

In lower-resource settings, barriers to pharmacist integration are frequently structural alternatively than completely regulatory. A qualitative study of clinical pharmacy service integration in Tanzania identified a combination of external aspects (absence of supportive policy and workforce shortages), financial aspects (lack of monetary incentive structures and in-service training), and individual-level aspects (role ambiguity, limited confidence, and, at times, opposition from physicians) as jointly constraining expansion of pharmacist-delivered clinical services.[37] These results suggest that policy reform exclusively is insufficient without parallel investment in training system and interprofessional trust-building.

7.5 India and South Asia

India presents a distinct regulatory and demographic setting for pharmacist-delivered persistent disease management. Pharmacy practice in India is governed by the Pharmacy Act, 1948, which creates the Pharmacy Council of India (PCI) as the statutory body responsible for regulating pharmacy education and practice.[43] The Pharmacy Practice Regulations, 2015, released by the PCI, officially recognize clinical pharmacy functions, comprising patient counseling, medication history-taking, and involvement in ward rounds, as part of registered pharmacist practice, although they stop short of authorizing prescribing or therapy revision without physician direction.[44] The introduction of the Doctor of Pharmacy (Pharm. D) programme has been central to building a clinically oriented pharmacy workforce capable of persistent disease management, ward-based clinical pharmacy, and patient-centered pharmaceutical care, complementing the conventional Bachelor of Pharmacy curriculum.[45]

Community pharmacy practice in India remains mainly dispensing-focused, and official joint practice agreements similar and comparable to those in the United States, or independent prescribing similar and comparable to the United Kingdom, do not yet exist in Indian law. National

Accreditation Board for Hospitals & Healthcare Providers (NABH) accreditation standards for hospitals increasingly reference clinical pharmacy services, medication reconciliation, and pharmacovigilance as quality benchmarks, producing an indirect driver for expanded hospital-based pharmacist roles.[46] At the primary care level, the Ayushman Bharat Health and Wellness Centres initiative, which is enhancing sub-centres and primary condition centres across India, provides a potential platform for integrating pharmacists into frontline non-communicable disease screening and follow-up, although pharmacist staffing and role definition within these centres continue inconsistently executed across states.[47]

Taken together, India illustrates a setting in which the statutory and instructional foundation for clinical pharmacy practice is advancing, but structural integration of pharmacists into primary care persistent disease management, of the kind more established in the United States, United Kingdom, Canada, and Australia, remains at a previous stage of development.

8. BARRIERS AND FACILITATORS TO IMPLEMENTATION

Across condition systems, a uniform and unchanging set of themes emerges from qualitative and mixed-methods studies of pharmacist integration into primary care

teams. Table 2 summarizes commonly reported barriers and corresponding facilitators drawn from studies conducted in

the United States, Canada, Norway, and Tanzania.

Table 2: Commonly reported barriers to pharmacist integration into primary care teams and corresponding facilitators, synthesized from U.S., Canadian, Norwegian, and Tanzanian qualitative studies.[38,39,37,40]

Barrier	Corresponding Facilitator
Inconsistent or absent reimbursement for pharmacist clinical services, including lack of recognition as a billable provider under Medicare Part B	State and payer policy requiring reimbursement for pharmacist services; development of financial sustainability and revenue-modeling tools for practices
Role ambiguity and unclear job descriptions within multidisciplinary teams	Formal role definition, orientation programs, and documented scope-of-practice agreements at the outset of integration
Limited physician/provider trust or acceptance, particularly early in a pharmacist's tenure on a team	Sustained relationship-building, co-location, and demonstrated early clinical wins that build trust and respect over time
Inadequate access to clinical space, equipment, and electronic health record (EHR) integration	Dedicated clinical space, full EHR access, and administrative or physician champions who advocate for infrastructure investment
Workforce shortages limiting the supply of appropriately trained pharmacists	Structured postgraduate residency training and mentorship or peer-support networks for pharmacists new to clinical roles
Variable and fragmented state/national scope-of-practice legislation	Harmonized, consistent national or state frameworks for scope of practice and credentialing

Reimbursement and Financial Sustainability

Reimbursement is the most frequently and consistently cited obstacle to scaling pharmacist clinical services. As of late 2024, exclusively twenty-one U.S. states had laws broadly requiring condition plans to reimburse pharmacists as providers for services within their extent of practice, while a further category of states required narrower coverage limited to either Medicaid or commercial plans; at least forty-one states had some law requiring reimbursement for at

least one explicit, non-dispensing pharmacist service (Figure 3).[36]

A physician survey examining the integration of advanced practice pharmacists found that limited reimbursement (cited by 61% of respondents) and billing obstacles (52%) was the two most frequently identified hurdles to growing pharmacist functions, ahead of concerns about provider authorization or clinical space.[41] In response, instruments such as the Pharmacist Revenue and Integration Modeling Engine (PRIME) have been developed to help practices project the

financial viability of adding clinical pharmacist positions given uncertain and erratic and variable compensation pathways.[42]

Team Integration and Role Definition

Qualitative inquiry consistently identifies interpersonal and organizational aspects as equally vital and vital to official policy. A study of pharmacist integration into twenty-three primary care teams in Saskatchewan, Canada identified seven recurring themes; connections, trust, and respect; role definition; orientation and support;

pharmacist personality and experience; physical presence within the team; and numerous and manifold related organizational aspects; as jointly forming how successfully a new pharmacist role was normalized within an existing team.[38] A parallel Norwegian study executing normalization process theory to pharmacist integration into home-care teams reached comparable conclusions, further noting that workforce shortages among pharmacists themselves, not exclusively among physicians or nurses, constrained how fully the role could be operationalized.[39]

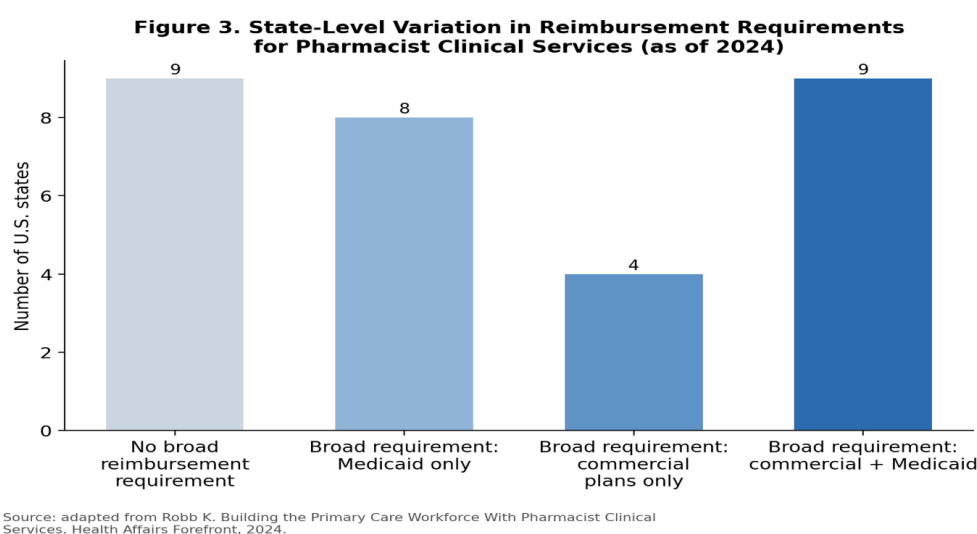


Fig. 3: State-level variation in reimbursement requirements for pharmacist clinical services as of 2024. Adapted from Robb K. Building the primary care workforce with pharmacist clinical services. Health Affairs Forefront, 2024.[36]

9. LIMITATIONS

This narrative review has various limitations inherent to its design. No official protocol was recorded in advance, and although the literature search followed a structured approach across various and several

databases, it was not comprehensive in the manner of an official methodical and organized review. Study choice and data extraction were performed without identical, independent screening, which increases the potential for option bias. No official risk-of-bias or quality assessment was applied to the

included primary studies, methodical and organized assessments, or economic reviews, and the review thus highlights breadth of coverage over systematic appraisal of individual sources. Findings should be understood as a synthesis of the available literature alternatively than as a quantitative or bias-adjusted approximation of effect.

10. FUTURE DIRECTIONS

Several converging trends are expected to shape the subsequent phase of pharmacist involvement in primary care persistent disease management.

- Reimbursement reform: persisted state-level and, potentially, federal action to recognize pharmacists as billable providers under public and commercial coverage is widely noted as the single highest-leverage policy change for scaling clinical pharmacy services.
- Expansion of independent prescribing: the trajectory in the UK, Canada, and a growing number of U.S. states signifies persisted movement toward pharmacist prescribing authority for a growing set of persistent and minor conditions, accompanied by building management frameworks for training and credentialing.
- Telepharmacy and remote observation: technology-enabled observation has already been displayed to improve the proportion of patients reaching diabetes

and hypertension goals within pharmacist-led collaboratives, and persisted investment in remote patient tracking, telehealth visits, and asynchronous medication review are expected to extend pharmacist reach into rural and underserved areas.[11]

- Workforce development: organized postgraduate residency training, interprofessional education, and mentorship programs will be required to extend the supply of pharmacists prepared for autonomous or near-autonomous persistent disease management functions.
- Outcomes inquiry: future studies should prioritize longer follow-up periods capable of detecting effects on hard clinical endpoints, more uniform and unchanging reporting of humanistic results, and standardized economic evaluation methodology (for case, adherence to the CHEERS reporting checklist) to enhance the comparability of the evidence foundation.

11. CONCLUSIONS

Pharmacists have increasingly presumed an expanded, clinically substantive role in the management of persistent disease within primary care, moving from a dispensing-centered profession toward direct, longitudinal patient care delivered through joint practice agreements, medication

therapy management, exhaustive and inclusive medication management within team-based medical homes, and, in a growing number of jurisdictions, independent prescribing.

The collected evidence foundation; spanning diabetes, hypertension, dyslipidemia, heart failure, and respiratory disease; consistently shows improved attainment of intermediate physiologic treatment objectives and profitable and useful economic returns, while evidence for effects on hard clinical endpoints remains comparatively underdeveloped due to the short length and modest scale of various primary studies. Realizing the complete and entire potential of pharmacist-delivered persistent disease management will need intentional policy action on reimbursement and range of practice, sustained investment in team-based workflow design and interprofessional trust-building, and a stronger commitment to thorough and meticulous, longer-term, and economically thorough and meticulous inquiry.

ABBREVIATIONS

ACE, angiotensin-converting enzyme; ARB, angiotensin-receptor blocker; CMM, thorough medication management; CMR, exhaustive and inclusive medication review; COPD, persistent obstructive pulmonary disease; CPA, joint practice agreement; EHR, electronic condition record; FQHC,

federally qualified condition center; HbA1c, glycated hemoglobin; HEDIS, Healthcare Effectiveness Data and Information Set; INR, global normalized ratio; LDL, low-density lipoprotein; MTM, medication therapy management; NABH, National Accreditation Board for Hospitals & Healthcare Providers; PCI, Pharmacy Council of India; PCMH, patient-centered medical home; SANRA, Scale for the Assessment of Narrative Review Articles.

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