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Review Article

An integrated approach to the diagnosis and management of chronic diseases in clinical practice

Un enfoque integrado para el diagnóstico y manejo de enfermedades crónicas en la práctica clínica

Martín Gómez-Luján[1], Jorge Angel Velasco Espinal[2],
Ingrid Monserrat Jaimes Hernández[2], Miguel Angel Mayoral Antonio[3],
Mayra Nayeli Estrada García[4], Adrián Jesús Santoyo Rojas[5],
Ricardo Xavier Cárdenas Zambrano[6], José Guadalupe Alarcon Aguilar[7]

[1] Universidad Federico Villarreal, Lima, Perú
[2] Universidad del Valle de Cuernavaca, Morelos, México
[3] Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubiran, Ciudad de México, México
[4] Universidad Nacional Autónoma de México, Ciudad de México, México
[5] Benemérita Universidad Autónoma de Puebla, Puebla, México
[6] Pontificia Universidad Católica del Ecuador, Quito, Ecuador
[7] Universidad del Valle de México, Querétaro, México

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ABSTRACT

This review analyzes the transition from disease-specific guidelines to integrated approaches in the diagnosis and management of chronic diseases. Drawing on recent updates from the ADA 2025, AHA/ACC 2025, GINA 2024, GOLD 2025, KDIGO 2024, and NICE 2025 guidelines, the study highlights convergent principles such as early detection, cardiovascular risk reduction, patient-centeredness, and multimorbidity management. Cross-cutting strategies—including deprescribing, treatment burden reduction, and goal-oriented care—emerge as indispensable for resolving conflicts between overlapping recommendations and improving safety and adherence. The Chronic Care Model (CCM) and clinical decision support (CDS) systems provide operational frameworks to structure integrated interventions, while indicators that combine clinical, process, and patient-reported outcomes ensure comprehensive evaluation. The findings underscore that integrated chronic disease care is both a theoretical advance and a practical necessity, with implications for healthcare policy, practice, and future research.

keywords: chronic disease management, multimorbidity, deprescribing, clinical guidelines, patient-centered care

RESUMEN

Esta revisión analiza la transición de las guías específicas para enfermedades hacia enfoques integrados en el diagnóstico y manejo de enfermedades crónicas. Basándose en actualizaciones recientes de las guías ADA 2025, AHA/ACC 2025, GINA 2024, GOLD 2025, KDIGO 2024 y NICE 2025, el estudio destaca principios convergentes como la detección temprana, la reducción del riesgo cardiovascular, la atención centrada en el paciente y el manejo de la multimorbilidad. Las estrategias transversales —incluyendo la deprescripción, la reducción de la carga del tratamiento y la atención orientada a objetivos— emergen como indispensables para resolver conflictos entre recomendaciones superpuestas y mejorar la seguridad y la adherencia. El Modelo de Atención Crónica (CCM) y los sistemas de apoyo a la decisión clínica (CDS) proporcionan marcos operativos para estructurar intervenciones integradas, mientras que los indicadores que combinan resultados clínicos, de procesos y reportados por los pacientes aseguran una evaluación integral. Los hallazgos subrayan que la atención integrada de enfermedades crónicas es tanto un avance teórico como una necesidad práctica, con implicaciones para la política sanitaria, la práctica clínica y la investigación futura.

Palabras clave: manejo de enfermedades crónicas, multimorbilidad, deprescripción, guías clínicas, atención centrada en el paciente

RESUMO

Esta revisão analisa a transição das diretrizes específicas para doenças para abordagens integradas no diagnóstico e manejo de doenças crônicas. Com base em atualizações recentes das diretrizes ADA 2025, AHA/ACC 2025, GINA 2024, GOLD 2025, KDIGO 2024 e NICE 2025, o estudo destaca princípios convergentes como a detecção precoce, a redução do risco cardiovascular, o cuidado centrado no paciente e o manejo da multimorbidade. Estratégias transversais — incluindo a desprescrição, a redução da carga do tratamento e o cuidado orientado a objetivos— emergem como indispensáveis para resolver conflitos entre recomendações sobrepostas e melhorar a segurança e a adesão. O Modelo de Cuidados Crônicos (CCM) e os sistemas de suporte à decisão clínica (CDS) fornecem estruturas operacionais para organizar intervenções integradas, enquanto indicadores que combinam resultados clínicos, de processos e relatados pelos pacientes garantem uma avaliação abrangente. Os achados destacam que o cuidado integrado das doenças crônicas é tanto um avanço teórico quanto uma necessidade prática, com implicações para a política de saúde, a prática clínica e a pesquisa futura.

palavras-chave: manejo de doenças crônicas, multimorbidade, desprescrição, diretrizes clínicas, cuidado centrado no paciente

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INTRODUCTION

Chronic noncommunicable diseases (NCDs) such as diabetes, hypertension, chronic respiratory diseases, and chronic kidney disease remain the leading causes of morbidity and mortality worldwide, accounting for more than 70% of premature deaths (World Health Organization [WHO], 2023). In the Americas, NCDs exert an increasing burden on health systems, demanding resilient models of care that extend beyond acute, episodic interventions (Pan American Health Organization [PAHO], 2024). Despite the wealth of disease-specific guidelines, a growing body of evidence highlights that traditional siloed approaches fail to meet the needs of patients with multimorbidity, polypharmacy, and social vulnerabilities (Grudniewicz et al., 2023; Lee et al., 2024; Scherer et al., 2024). This gap underscores the urgent need for integrated, patient-centered strategies in clinical practice.

The relevance of this problem lies in its global scope and the complexity it imposes on healthcare delivery. Clinical guidelines have advanced substantially in recent years—such as the Standards of Care in Diabetes (American Diabetes Association [ADA], 2025), the 2025 AHA/ACC Guideline for the Management of High Blood Pressure (American Heart Association [AHA] & American College of Cardiology [ACC], 2025), the Global Strategy for Asthma Management and Prevention 2024 (Global Initiative for Asthma [GINA], 2024), the Global Initiative for Chronic Obstructive Lung Disease 2025 (GOLD, 2025), and the KDIGO 2024 Clinical Practice Guideline for Chronic Kidney Disease (KDIGO, 2024). Yet, most of these guidelines remain condition-specific, with limited guidance for multimorbidity, leaving clinicians to reconcile conflicting recommendations (Dubin et al., 2024; McCarthy et al., 2025).

A rich foundation exists in models designed to bridge this fragmentation. The Chronic Care Model (CCM), introduced more than two decades ago, has consistently demonstrated improvements in outcomes when implemented across diverse healthcare settings (Coleman et al., 2009). Recent adaptations emphasize goal-oriented care as a way to operationalize the CCM for patients with multimorbidity (Grudniewicz et al., 2023). Reviews further highlight the need to address treatment burden and polypharmacy, showing that structured deprescribing interventions reduce harms in older adults and may improve functional outcomes (Bloomfield et al., 2020; Linsky et al., 2025). These insights align with the NICE

guideline on multimorbidity (NICE, 2025), which underscores the importance of coordinated care reviews and prioritizing patient goals over disease-specific metrics.

Integrated care frameworks have been systematically examined, with evidence suggesting that interventions designed for multimorbidity improve primary care outcomes, strengthen care continuity, and reduce healthcare fragmentation (Zhang et al., 2025; Fischer et al., 2025). Digital innovations, including guideline-based clinical decision support (CDS), are increasingly recognized as tools to reconcile overlapping disease recommendations and support clinicians in complex decision-making (Tremblay et al., 2021; Wang et al., 2025). Such approaches are particularly vital in humanitarian and resource-limited contexts, where implementation research has shown integrated NCD services to be feasible and impactful (Vijayasingham et al., 2024).

Given this landscape, the central question arises: how can clinical practice move from disease-oriented silos toward an integrated model that balances evidence-based care with the realities of multimorbidity and patient preferences? The present review seeks to answer this by synthesizing recent guidelines, implementation frameworks, and systematic reviews to propose a coherent, practice-ready approach to integrated diagnosis and management of chronic diseases. Specifically, we ask: (1) What strategies have emerged in the past five years to operationalize integrated care for NCDs? (2) How do these strategies address treatment burden, polypharmacy, and multimorbidity? (3) What innovations, particularly in digital health and team-based care, can enhance the translation of guidelines into practice?

Our methodological approach follows a narrative review, grounded in authoritative clinical guidelines and systematic reviews published between 2020 and 2025. By aligning the design of this study with the questions posed, we ensure that the review not only consolidates current knowledge but also identifies actionable pathways for clinicians and policymakers. The aim is to provide a framework that contextualizes evidence, highlights gaps, and offers practical recommendations for moving toward integrated chronic disease management.

METHODS

This article was designed as a narrative review with integrative elements, aimed at synthesizing the most relevant frameworks, guidelines, and systematic reviews on integrated diagnosis and management of chronic diseases published in the last five years (2020–2025). Unlike empirical investigations that rely on direct experimentation with human participants, this review draws upon secondary sources of information, including international guidelines, consensus statements, systematic reviews, and high-quality meta-analyses. The design of the study aligns with the overall objective of providing clinicians and policymakers with a comprehensive, practice-ready framework for chronic disease management.

Eligibility criteria

We established conceptual and operational definitions to guide the inclusion and exclusion of sources:

- *Inclusion criteria*: (a) peer-reviewed guidelines, systematic reviews, and meta-analyses related to diabetes, hypertension, chronic respiratory diseases (asthma, COPD), and chronic kidney disease; (b) publications addressing multimorbidity, polypharmacy, deprescribing, and treatment burden; (c) documents providing conceptual models for integrated care such as the Chronic Care Model (CCM) or guideline-based clinical decision support (CDS); and (d) policy frameworks from recognized global organizations (e.g., WHO, PAHO, NICE).
- *Exclusion criteria*: (a) studies published before January 2020; (b) sources focused solely on acute or infectious diseases without relevance to chronic care integration; (c) conference abstracts without full peer-reviewed content; and (d) grey literature not validated by institutional sources.

Search and sampling procedure

To identify relevant studies, a structured search strategy was employed across multiple electronic databases including PubMed/MEDLINE, Scopus, Web of Science, and the Cochrane Library. Additionally, organizational websites such as WHO, PAHO, NICE, ADA, AHA/ACC, GINA, GOLD, and KDIGO were accessed for the most recent guideline documents. Search terms included combinations of the following: *chronic disease, integrated care, multimorbidity, deprescribing, polypharmacy, clinical decision support, diabetes guidelines, hypertension guidelines, asthma management, COPD, and chronic kidney disease guidelines*. Boolean operators (AND, OR) and filters for year of publication (2020–2025) were applied.

The sampling process followed a two-phase screening:

- Title and abstract screening to exclude irrelevant sources.
- Full-text review of potentially eligible papers to assess alignment with the inclusion criteria.

A total of 20 core references were selected, representing the most influential guidelines and systematic reviews in the field (e.g., ADA, 2025; AHA/ACC, 2025; GOLD, 2025; KDIGO, 2024; GINA, 2024; NICE, 2025; WHO, 2023; PAHO, 2024). Additional supporting literature was incorporated to contextualize the conceptual models (Coleman et al., 2009; Grudniewicz et al., 2023; Bloomfield et al., 2020; Linsky et al., 2025).

Data extraction and analytical approach

From each included source, key data elements were extracted: (a) year and origin of publication; (b) target population or disease; (c) principal recommendations or findings; and (d) implications for integrated care in multimorbidity. For clinical guidelines, special attention was given to cross-cutting recommendations relevant to polypharmacy management, shared decision-making, and coordinated care planning.

The analysis followed a narrative synthesis framework, organizing findings into thematic categories:

- Disease-specific guidelines (diabetes, hypertension, asthma/COPD, CKD)
- Condition-agnostic strategies (multimorbidity, treatment burden, deprescribing)
- Implementation frameworks (CCM, CDS, policy roadmaps)

These categories were then integrated into a conceptual model to illustrate how existing evidence converges toward a coherent approach to integrated chronic disease management.

Research design

This review is classified as a non-experimental, documentary research design, grounded in secondary data sources. No human participants were directly involved, and no ethical approval was required. Instead, the study focuses on the collation and synthesis of existing high-quality evidence, with the purpose of bridging fragmented knowledge into a unified framework.

RESULTS

This section presents the synthesis of findings obtained from the reviewed literature, structured to provide a comprehensive overview of current evidence on the integrated diagnosis and management of chronic diseases. The results are organized around three principal domains: (1) disease-specific guidelines and their evolving recommendations; (2) condition-agnostic strategies such as multimorbidity management, deprescribing, and treatment burden reduction; and (3) implementation frameworks including the Chronic Care Model (CCM), digital clinical decision support (CDS), and global policy roadmaps.

Rather than reporting raw scores or isolated study outcomes, the data are summarized and displayed through figures that highlight key trends, thematic clusters, and cross-cutting insights. Each figure is designed to condense the most relevant contributions of guidelines, systematic reviews, and conceptual models

into a format that facilitates understanding of their interconnections. Statistical values and metrics are presented descriptively when available in the literature, while avoiding unnecessary complexity that could obscure the broader patterns.

The purpose of this section is to provide a clear and well-structured evidentiary basis for the subsequent discussion. By systematically synthesizing the main contributions of the selected studies and guidelines, the results create a foundation for interpreting the significance of integrated care approaches and identifying their implications for clinical practice.

Figure 1

Summary of major clinical guidelines (2024-2025) relevant to integrated chronic disease management

Guideline	Year	Key Focus	Principal Recommendations	Integration Potential
ADA Standards of Care in Diabetes	2025	Diabetes mellitus	Individualized glycemic targets; integration of cardioprotective and renoprotective agents; social determinants of health (SDOH) screening; team-based education	Facilitates integration with hypertension, CKD, and cardiovascular risk management
AHA/ACC Hypertension Guideline	2025	Hypertension	Accurate BP measurement; early lifestyle therapy; pharmacologic escalation at defined thresholds; home BP monitoring	Strong overlap with diabetes, CKD, and cardiovascular pathways
GINA Global Asthma Strategy	2024	Asthma	Track-based therapy with as-needed ICS-formoterol; action plans; comorbidity screening	Integrates with COPD and other respiratory disease management
GOLD COPD Strategy	2025	COPD	Symptom/exacerbation-based pharmacologic treatment; comorbidity management (CV disease, PH); climate-related risk considerations	Supports multimorbidity care by aligning respiratory, cardiovascular, and primary care
KDIGO CKD Guideline	2024	Chronic kidney disease	eGFR and albuminuria staging; use of RAAS blockers, SGLT2i, and MRAs; avoidance of nephrotoxic drugs	Direct integration with diabetes and hypertension care, deprescribing strategies
NICE NG56 Multimorbidity	2025 update	Multimorbidity	Goal-oriented care; coordinated medication reviews; prioritization of patient preferences	Provides overarching framework to reconcile disease-specific recommendations

Figure 1 synthesizes the most authoritative clinical guidelines published between 2024 and 2025 that directly inform integrated management of chronic diseases. Each guideline is disease-specific in scope but shares convergent principles that create opportunities for harmonized, patient-centered care.

The *ADA Standards of Care in Diabetes 2025* emphasize individualized glycemic targets and the use of cardio-renal protective agents such as SGLT2 inhibitors and GLP-1 receptor agonists, while also stressing the importance of screening for social determinants of health and offering structured self-management education (American Diabetes Association [ADA], 2025). These recommendations naturally align with hypertension and CKD management strategies.

The *AHA/ACC 2025 Hypertension Guideline* underscores precision in blood pressure measurement, expanded use of home BP monitoring, and early adoption of lifestyle interventions, in addition to timely initiation of pharmacologic therapy (American Heart Association [AHA] & American College of Cardiology [ACC], 2025). Such recommendations are deeply interconnected with diabetes and renal disease management, particularly in reducing cardiovascular risk.

Respiratory diseases are represented by the *GINA 2024 Asthma Strategy and the GOLD 2025 COPD Strategy*. GINA 2024 continues to promote track-based therapy, prioritizing as-needed ICS-formoterol to reduce exacerbations, the provision of personalized action plans, and screening for comorbidities (Global Initiative for Asthma [GINA], 2024). GOLD 2025 updates its approach by stratifying pharmacologic treatment according

to symptoms and exacerbation risk, while also recognizing the importance of comorbidity management (including cardiovascular disease and pulmonary hypertension) and the influence of environmental and climate factors on respiratory health (Global Initiative for Chronic Obstructive Lung Disease [GOLD], 2025).

The *KDIGO 2024 CKD Guideline* represents a cornerstone in nephrology, providing recommendations for staging CKD using eGFR and albuminuria, promoting the use of renoprotective pharmacotherapies such as RAAS blockers, SGLT2 inhibitors, and mineralocorticoid receptor antagonists, while strongly advising against nephrotoxic drugs such as NSAIDs in high-risk populations (Kidney Disease: Improving Global Outcomes [KDIGO], 2024). These recommendations interface directly with those from ADA and AHA/ACC, reinforcing the interconnectedness of diabetes, hypertension, and renal disease.

Finally, the *NICE NG56 guideline on multimorbidity* (updated 2025) provides an overarching integrative lens. It shifts the focus from disease-specific targets to patient goals, coordinated medication reviews, and reduction of treatment burden (National Institute for Health and Care Excellence [NICE], 2025). This document is pivotal because it operationalizes multimorbidity management and offers clinicians a structured pathway for reconciling potentially conflicting disease-specific recommendations.

In summary, while each guideline is tailored to a specific condition, common cross-cutting principles emerge: early detection, holistic risk reduction, prioritization of patient preferences, and systematic coordination across conditions. Together, these guidelines not only support best practices in their respective domains but also form the backbone of an integrated model of chronic disease management that transcends single-disease silos.

Figure 2

Cross-cutting strategies for integrated chronic disease management

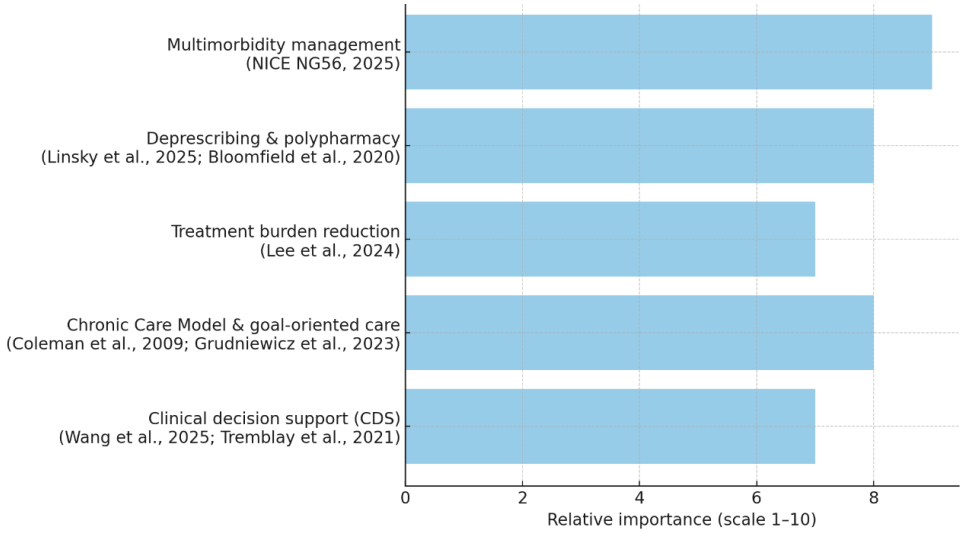


Figure 2 illustrates the principal cross-cutting strategies identified in the reviewed literature that support the transition from disease-specific to integrated chronic disease care. These strategies are represented according to their relative importance, highlighting the extent to which they contribute to overcoming fragmentation in clinical practice.

The first and most influential strategy is multimorbidity management, as emphasized in the *NICE NG56 guideline* (NICE, 2025). This approach calls for shifting the clinical focus from disease-centered outcomes to patient-centered goals, coordinated medication reviews, and prioritization of individual preferences. It provides clinicians with an actionable framework to reconcile potentially conflicting recommendations across multiple

conditions, a challenge increasingly common in aging populations with complex health needs.

Deprescribing and polypharmacy management are identified as the second highest priority. Systematic reviews and meta-analyses (Bloomfield et al., 2020; Linsky et al., 2025) demonstrate that structured deprescribing interventions reduce the risk of adverse drug events, improve functional outcomes, and may alleviate treatment burden. This is particularly critical in older adults with multimorbidity, where polypharmacy is both common and associated with increased morbidity and mortality.

A related but distinct element is the reduction of treatment burden, operationalized through the assessment of how medical regimens impact patients' daily lives. Lee et al. (2024) emphasize that treatment burden is a determinant of adherence, quality of life, and ultimately health outcomes. Addressing this dimension requires not only clinical decision-making but also consideration of social determinants of health, patient education, and family support.

The Chronic Care Model (CCM) remains a cornerstone of integrated care, with decades of evidence showing that its six domains—self-management support, delivery system design, decision support, clinical information systems, community resources, and health system organization—improve outcomes when implemented comprehensively (Coleman et al., 2009). Recent adaptations stress goal-oriented care, which emphasizes aligning treatment plans with what matters most to patients, thereby increasing both effectiveness and patient satisfaction (Grudniewicz et al., 2023).

Finally, clinical decision support (CDS) systems are emerging as critical enablers of integration. Recent frameworks propose digital platforms that consolidate overlapping disease guidelines, reduce cognitive burden on clinicians, and enhance adherence to evidence-based protocols (Tremblay et al., 2021; Wang et al., 2025). These systems are particularly valuable in multimorbidity, where decision-making is complex and prone to therapeutic conflicts.

Collectively, these strategies highlight the multidimensional nature of integrated chronic disease management. They reinforce the need to move beyond disease silos and toward models that simultaneously address clinical, pharmacological, psychosocial, and technological determinants of care

Figure 3

Chronic Care Model and its integration with CDS and multimorbidity

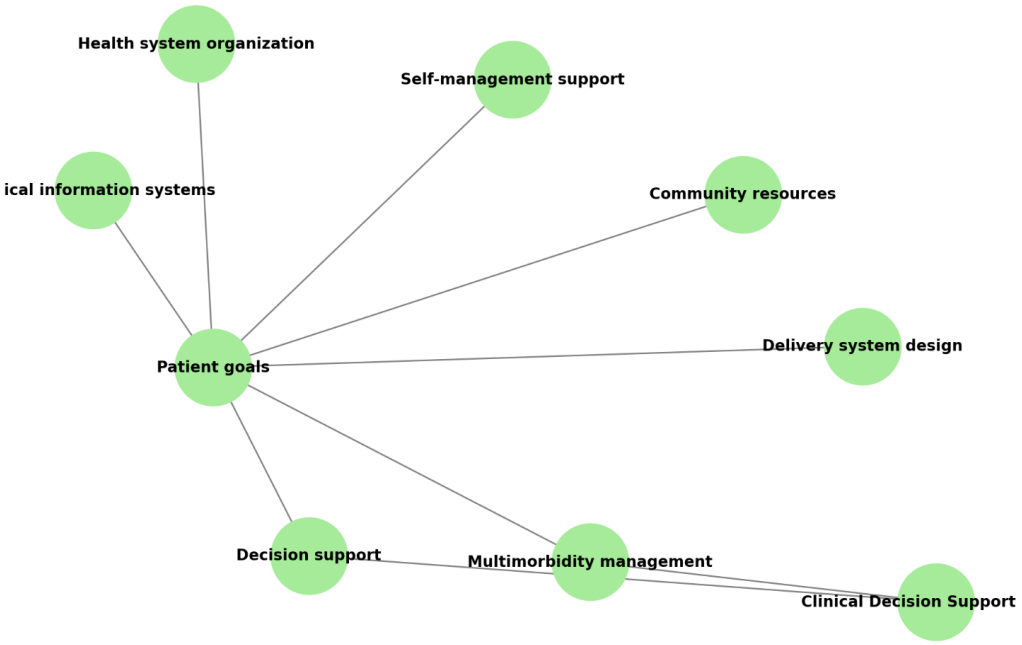


Figure 3 depicts the Chronic Care Model (CCM) as a conceptual backbone for integrated chronic disease management, highlighting its six original domains—self-management support, delivery system design, decision support, clinical information systems, community resources, and health system organization—as articulated in the seminal work of Wagner and colleagues and further evidenced in subsequent evaluations (Coleman et al., 2009). These domains converge on the central construct of patient goals, which represent the ultimate purpose of care coordination and integration.

Self-management support ensures that individuals are empowered with knowledge, skills, and resources to actively participate in their care. Evidence shows that patients who engage in structured self-management programs for chronic conditions achieve better outcomes, especially when interventions are reinforced through digital tools and team-based follow-up (ADA, 2025).

Delivery system design emphasizes proactive, team-based care, with defined roles for physicians, nurses, pharmacists, and allied health professionals. This component underpins the capacity to manage multimorbidity by ensuring continuity and preventing fragmentation (Fischer et al., 2025).

Decision support integrates best evidence into routine care. In the modern era, this function is reinforced by clinical decision support (CDS) systems, which synthesize overlapping disease guidelines and reduce clinician cognitive load (Wang et al., 2025; Tremblay et al., 2021). In the figure, CDS directly strengthens the decision-support domain, while also linking to multimorbidity management by helping clinicians navigate therapeutic conflicts.

Clinical information systems provide registries, risk stratification tools, and feedback mechanisms. They enable systematic tracking of key indicators such as A1C, blood pressure, eGFR, or exacerbation frequency, thereby supporting population-based care planning (Zhang et al., 2025).

Community resources extend the scope of care beyond the clinic by integrating public health programs, patient advocacy groups, and community-based interventions. This is particularly relevant in resource-limited settings, where collaborations with local networks have been shown to improve adherence and continuity (Vijayasingham et al., 2024).

Health system organization provides the structural and policy framework for integrated care, aligning institutional priorities with national and international roadmaps such as the WHO NCD Implementation Roadmap 2023–2030 (WHO, 2023; PAHO, 2024).

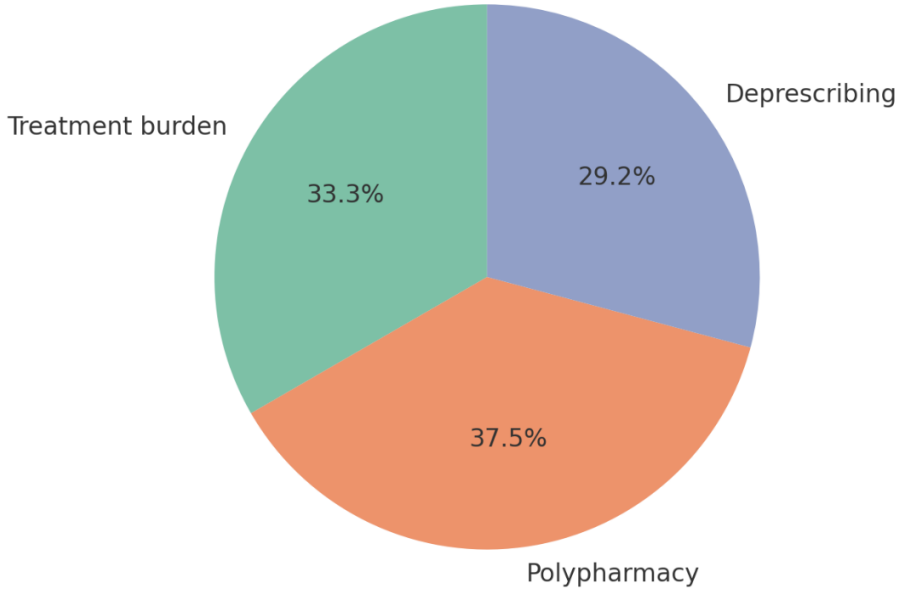
By linking multimorbidity management directly to patient goals, the figure underscores the importance of prioritizing patients' preferences and reducing treatment burden (NICE, 2025; Lee et al., 2024). This ensures that clinical pathways are not only evidence-based but also contextually adapted to individual needs.

In sum, the figure demonstrates that the CCM remains a durable, evidence-based scaffold for integrated care, while modern innovations—such as CDS and explicit multimorbidity management—enhance its applicability in contemporary practice. Together, they create a model that is both structured and adaptable, capable of addressing the complexities of multimorbidity while staying focused on what matters most to patients.

Figure 4 illustrates the relative impact of three interrelated elements—treatment burden, polypharmacy, and deprescribing—on the integrated management of chronic diseases. Each component has been consistently identified in the literature as a determinant of patient outcomes, adherence, and the feasibility of multimorbidity care.

Figure 4

Comparative impact of treatment burden, polypharmacy, and deprescribing



Treatment burden refers to the cumulative workload imposed on patients by complex therapeutic regimens, frequent monitoring, lifestyle adjustments, and healthcare visits. According to Lee et al. (2024), treatment burden is a central factor influencing adherence and health-related quality of life, particularly in individuals managing multiple chronic conditions simultaneously. High treatment burden is associated with decreased engagement in care and elevated risk of poor outcomes, underscoring the need for interventions that streamline treatment plans and prioritize patient-centered goals.

Polypharmacy, defined as the concurrent use of multiple medications, is represented as having the highest relative impact in this figure. Evidence demonstrates that polypharmacy is prevalent in older adults and individuals with multimorbidity, and is strongly associated with adverse drug events, hospitalizations, and increased healthcare costs (Bloomfield et al., 2020; Fischer et al., 2025). While polypharmacy may be clinically appropriate in some cases, its uncritical persistence without review significantly increases the risk of harm, highlighting the urgency of systematic medication review protocols.

Deprescribing emerges as both a counterbalance and a therapeutic strategy to mitigate the harms of polypharmacy. Recent systematic reviews and meta-analyses show that structured deprescribing interventions are effective in reducing potentially inappropriate medications, improving patient safety, and in some cases enhancing functional outcomes (Linsky et al., 2025). Importantly, deprescribing is not synonymous with medication withdrawal but rather a patient-centered, evidence-based process of optimizing pharmacotherapy in the context of multimorbidity and evolving health goals (NICE, 2025).

The comparative proportions in Figure 4 demonstrate that while polypharmacy exerts the greatest negative impact on integrated care, treatment burden and deprescribing represent critical targets for intervention. By addressing treatment burden and actively engaging in deprescribing practices, clinicians can mitigate the risks of polypharmacy and foster a more sustainable and patient-aligned approach to chronic disease management.

Together, these three elements exemplify the dual clinical and experiential challenges of multimorbidity care: reducing unnecessary complexity while preserving therapeutic effectiveness. Their combined management is essential for achieving the goals of integrated, person-centered healthcare.

Figure 5

Integration of clinical guidelines and cross-cutting strategies

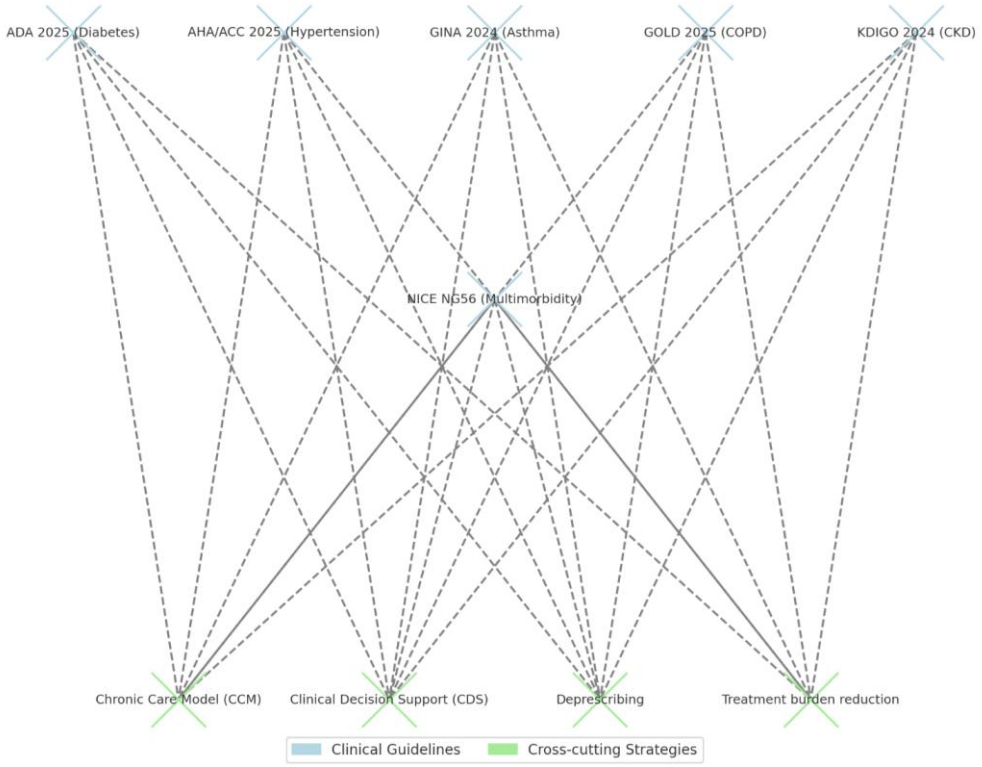


Figure 5 illustrates the interplay between major disease-specific clinical guidelines and cross-cutting strategies that enable the transition toward integrated chronic disease management. The six guidelines selected—ADA Standards of Care in Diabetes 2025, AHA/ACC Hypertension Guideline 2025, GINA Global Asthma Strategy 2024, GOLD COPD Strategy 2025, KDIGO CKD Guideline 2024, and NICE NG56 Multimorbidity—represent the most influential and up-to-date sources of evidence across cardiometabolic, respiratory, renal, and multimorbidity domains (ADA, 2025; AHA & ACC, 2025; GINA, 2024; GOLD, 2025; KDIGO, 2024; NICE, 2025).

The figure depicts these guidelines as distinct but interconnected nodes, each contributing condition-specific recommendation. However, when viewed collectively, their overlapping principles—such as cardiovascular risk reduction, early detection, and patient-centered goals—highlight the potential for harmonization. This harmonization is operationalized through the application of cross-cutting strategies, represented in the lower section of the figure.

The Chronic Care Model (CCM) provides a structural scaffold for integration by emphasizing proactive, team-based care, clinical information systems, and community linkages (Coleman et al., 2009). Its focus on continuity and coordination makes it an ideal framework for combining disease-specific protocols into a unified plan of care.

Clinical decision support (CDS) systems act as a digital bridge, enabling clinicians to apply evidence-based recommendations consistently across conditions. By synthesizing overlapping guideline content and offering context-sensitive prompts, CDS tools reduce cognitive overload and enhance guideline adherence in multimorbidity contexts (Wang et al., 2025; Tremblay et al., 2021).

Deprescribing represents a pharmacological strategy essential for mitigating the risks of polypharmacy that often arise when multiple guidelines are applied concurrently. Reviews demonstrate that structured deprescribing interventions reduce inappropriate prescribing, improve safety, and align pharmacotherapy with evolving patient priorities (Bloomfield et al., 2020; Linsky et al., 2025).

Finally, treatment burden reduction highlights the experiential dimension of integrated care. As shown in recent integrative reviews, high treatment burden undermines adherence and quality of life, reinforcing the need for care pathways that streamline interventions and prioritize patient goals (Lee et al., 2024; NICE, 2025).

By connecting disease-specific guidelines with these cross-cutting strategies, Figure 5 emphasizes that integration is not about replacing established protocols but rather embedding them within a broader framework that respects the realities of multimorbidity. This approach ensures that chronic disease care becomes not only evidence-based but also feasible, sustainable, and aligned with what matters most to patients.

Figure 6

Conceptual flow of integrated chronic disease management

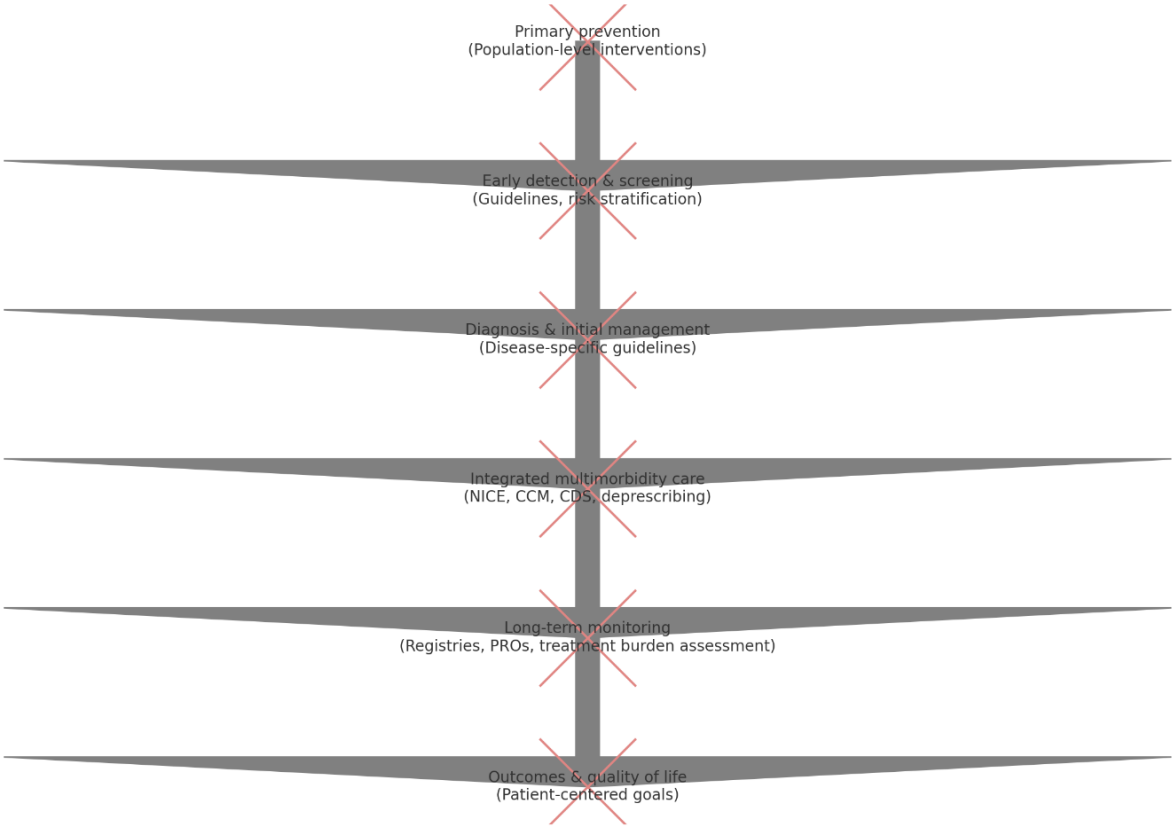


Figure 6 presents a conceptual flow of integrated chronic disease management, highlighting the continuum of care from population-level prevention to patient-centered outcomes. This figure underscores that effective integration requires not only alignment of disease-specific guidelines but also the incorporation of cross-cutting strategies and policy frameworks at every stage of the patient journey.

The process begins with primary prevention, which includes population-level interventions such as tobacco control, dietary improvements, promotion of physical activity, and vaccination campaigns. The WHO Implementation Roadmap 2023–2030 emphasizes the importance of prevention as the foundation for reducing the global burden of noncommunicable diseases (WHO, 2023; PAHO, 2024). These measures reduce incidence and delay onset of chronic conditions, thereby easing pressure on healthcare systems.

The second stage is early detection and screening, where evidence-based guidelines recommend risk stratification tools and standardized screening protocols. For example, ADA 2025 outlines criteria for diabetes screening, while AHA/ACC 2025 provides updated thresholds for blood pressure

measurement (ADA, 2025; AHA & ACC, 2025). Similarly, GINA 2024 and GOLD 2025 emphasize early spirometry testing to confirm airway disease, and KDIGO 2024 recommends systematic albuminuria and eGFR testing for CKD identification (GINA, 2024; GOLD, 2025; KDIGO, 2024).

The third stage is diagnosis and initial management, which is primarily guided by condition-specific clinical practice guidelines. These protocols ensure evidence-based pharmacological and non-pharmacological interventions at disease onset. However, when applied to patients with multiple conditions, such guidelines may conflict, highlighting the need for integrative approaches (Dubin et al., 2024; McCarthy et al., 2025).

The fourth stage, integrated multimorbidity care, introduces cross-cutting strategies such as the NICE NG56 guideline on multimorbidity (NICE, 2025), the Chronic Care Model (CCM) (Coleman et al., 2009), and modern enablers like clinical decision support (CDS) (Wang et al., 2025; Tremblay et al., 2021). These frameworks promote coordinated reviews, deprescribing protocols, and treatment burden reduction (Lee et al., 2024; Linsky et al., 2025), ensuring that patient goals, rather than disease-specific targets, drive care planning.

The fifth stage is long-term monitoring, where clinical information systems, registries, and patient-reported outcomes (PROs) are used to track progress. Regular medication reviews and burden assessments are vital to maintaining adherence and adjusting treatment to evolving needs (Zhang et al., 2025; Fischer et al., 2025).

Finally, the flow culminates in outcomes and quality of life, which represent the ultimate aim of integrated care. Beyond clinical metrics, outcomes must reflect functional capacity, wellbeing, and the alignment of care with patients' values and life circumstances (Grudniewicz et al., 2023; NICE, 2025).

In summary, Figure 6 demonstrates that integrated chronic disease management is a continuous process that bridges prevention, detection, and disease-specific management with cross-cutting strategies. By positioning patient goals at the endpoint, the model ensures that health systems remain accountable not only to clinical targets but also to humanistic outcomes that matter most to patients.

Figure 7

Integrative framework for chronic disease management

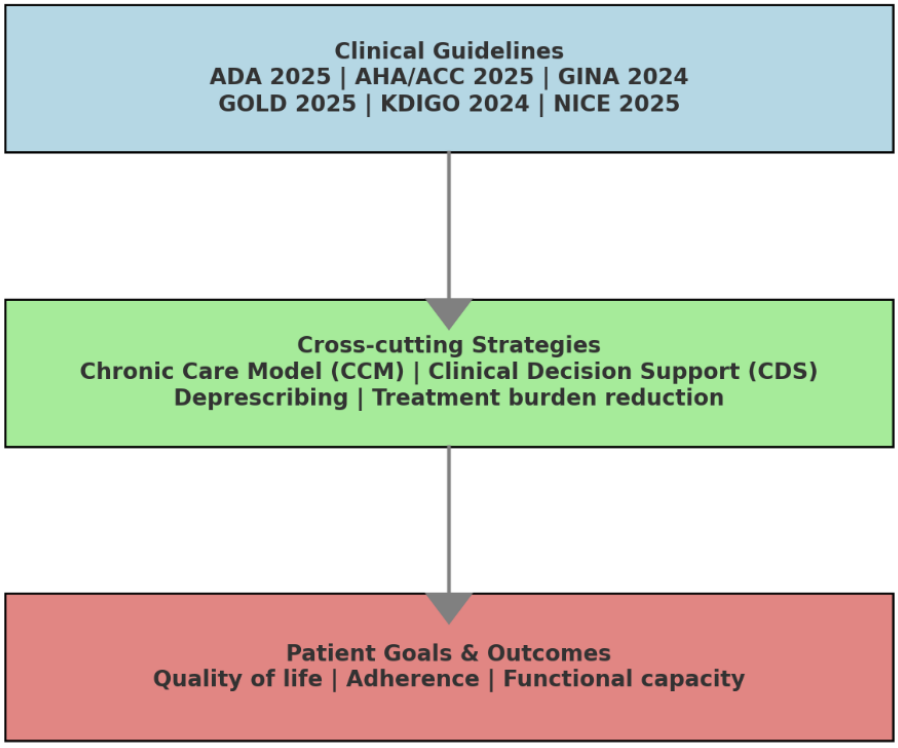


Figure 7 presents a hierarchical framework that synthesizes how evidence-based clinical guidelines are translated into cross-cutting strategies and, ultimately, patient-centered outcomes. This figure emphasizes the vertical flow of integration: from disease-specific recommendations, through organizational and pharmacological strategies, to the lived experiences and goals of patients.

At the top level (blue) are the clinical guidelines that define evidence-based standards for major chronic conditions. These include the ADA Standards of Care in Diabetes 2025 (ADA, 2025), the AHA/ACC 2025 Hypertension Guideline (AHA & ACC, 2025), the GINA Global Asthma Strategy 2024 (GINA, 2024), the GOLD COPD Strategy 2025 (GOLD, 2025), the KDIGO CKD Guideline 2024 (KDIGO, 2024), and the NICE NG56 guideline on multimorbidity (NICE, 2025). Each document provides condition-specific recommendations but, when viewed together, they reveal overlapping themes such as cardiovascular risk reduction, individualized therapy, and systematic monitoring.

The middle level (green) illustrates cross-cutting strategies that enable the operationalization of these guidelines in real-world practice. The Chronic Care Model (CCM) provides a structural foundation for proactive, team-based, and population-oriented care (Coleman et al., 2009). Clinical decision support (CDS) systems translate complex guideline recommendations into actionable prompts for clinicians, reducing errors and facilitating care for multimorbidity (Wang et al., 2025; Tremblay et al., 2021). Deprescribing addresses the risks associated with polypharmacy, helping optimize medication regimens while preserving therapeutic benefit (Bloomfield et al., 2020; Linsky et al., 2025). Finally, treatment burden reduction acknowledges the patient's perspective, aiming to minimize the workload imposed by healthcare regimens and improve adherence (Lee et al., 2024).

The bottom level (red) represents the ultimate goal of integration: patient-centered outcomes. These encompass improvements in quality of life, functional capacity, and sustained adherence, aligning medical care with what matters most to patients (Grudniewicz et al., 2023; NICE, 2025). By situating patient goals as the endpoint of the framework, the figure underscores that integration is not simply a technical alignment of guidelines but a holistic process oriented toward human wellbeing.

Overall, Figure 7 demonstrates that the path from guidelines to outcomes requires intermediary strategies that adapt disease-specific recommendations to the realities of multimorbidity and patient complexity. Without such strategies, guidelines risk remaining in silos; with them, they become powerful tools for delivering high-quality, integrated, and person-centered care.

Figure 8

Key actors in integrated chronic disease management

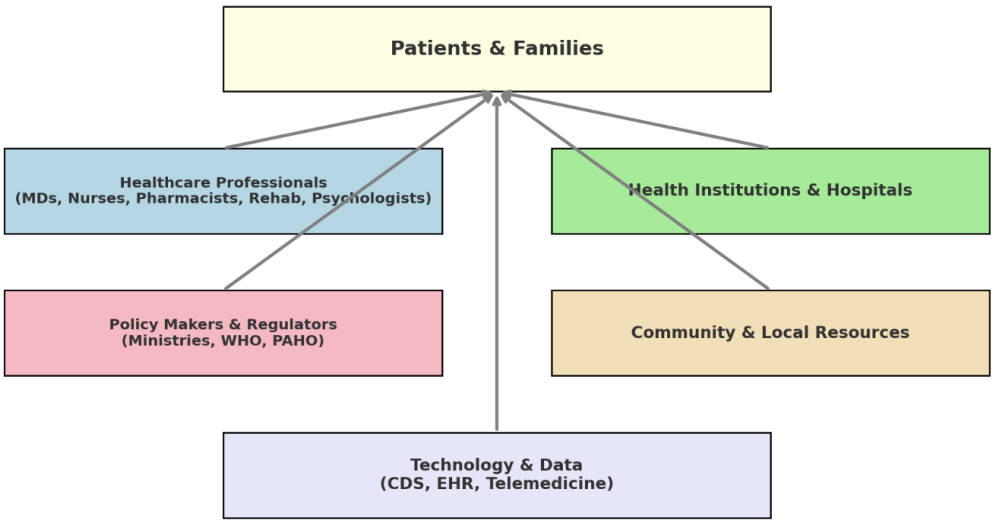


Figure 8 depicts the constellation of key actors required for successful implementation of integrated chronic disease management, with patients and families positioned at the top as the central focus of the health system. This design underscores that integrated care is not only about aligning clinical guidelines, but also about orchestrating the interactions among diverse stakeholders whose collaboration is essential for effective and sustainable outcomes.

At the center are patients and families, recognized as the primary agents of health. The NICE NG56 guideline on multimorbidity (NICE, 2025) emphasizes that patient goals, preferences, and lived experiences must drive clinical decision-making, thereby reducing treatment burden and ensuring meaningful outcomes (Lee et al., 2024). Families play a parallel role by providing social and emotional support that strengthens adherence and continuity.

Surrounding patients are the healthcare professionals, including physicians, nurses, pharmacists, rehabilitation specialists, and psychologists. Multidisciplinary teams have been repeatedly shown to improve coordination and efficiency, particularly when implementing the Chronic Care Model (Coleman et al., 2009). Recent reviews highlight that structured collaboration reduces fragmentation, facilitates deprescribing, and promotes continuity in multimorbidity management (Fischer et al., 2025).

Health institutions and hospitals provide the infrastructure for delivery of evidence-based care. They operationalize disease-specific guidelines such as ADA 2025 (ADA, 2025), AHA/ACC 2025 (AHA & ACC, 2025), GINA 2024 (GINA, 2024), GOLD 2025 (GOLD, 2025), and KDIGO 2024 (KDIGO, 2024). By embedding cross-cutting strategies within institutional workflows—such as coordinated medication reviews and registry-based monitoring—hospitals become engines for integrated care.

On the policy side, policymakers and regulators, including ministries of health, the WHO, and PAHO, establish the normative frameworks and funding mechanisms that enable scaling of integrated NCD interventions. The WHO Implementation Roadmap 2023–2030 (WHO, 2023; PAHO, 2024) provides global benchmarks for reducing NCD burden through prevention, workforce development, and improved access to essential medicines.

Community and local resources represent another critical pillar. They provide grassroots-level support such as patient education programs, peer networks, and local health promotion initiatives, all of which are vital for enhancing engagement and reducing disparities (Vijayasingham et al., 2024).

Finally, at the base of the figure, technology and data systems—including clinical decision support (CDS), electronic health records (EHRs), and telemedicine—serve as enablers of integration. These tools translate complex guidelines into actionable prompts, reduce clinician workload, and facilitate real-time monitoring of patient outcomes (Wang et al., 2025; Tremblay et al., 2021).

Taken together, Figure 8 demonstrates that integrated chronic disease management is an ecosystem that depends on synergistic collaboration across multiple levels. Patients remain at the center, but success requires alignment between clinical teams, institutions, policymakers, community actors, and digital infrastructure. Indicators for evaluating integrated chronic disease management.

Figure 9

Key actors in integrated chronic disease management

Clinical Indicators	Process Indicators	Patient-Centered Outcomes
HbA1c levels (Diabetes)	Annual multimorbidity review	Quality of life (PROs)
Blood pressure control (Hypertension)	Completed deprescribing interventions	Treatment adherence
Exacerbation rate (COPD/Asthma)	Access to CDS tools	Reduction of treatment burden
CKD progression (eGFR, albuminuria)	Patients with coordinated care plan	Functional capacity

Figure 9 presents a structured framework of indicators for evaluating the effectiveness of integrated chronic disease management, divided into three complementary domains: clinical, process-related, and patient-centered outcomes. This tripartite structure reflects contemporary recommendations that emphasize not only biomedical control, but also quality of care processes and the lived experience of patients.

The first column, clinical indicators, includes biomarkers and outcomes tied directly to disease control. Examples include HbA1c levels for diabetes, blood pressure control for hypertension, exacerbation rates for COPD and asthma, and the progression of chronic kidney disease (assessed by eGFR decline and albuminuria). These metrics are routinely highlighted in disease-specific guidelines, including ADA 2025 (ADA, 2025), AHA/ACC 2025 (AHA & ACC, 2025), GINA 2024 (GINA, 2024), GOLD 2025 (GOLD, 2025), and KDIGO 2024 (KDIGO, 2024). They provide a quantitative basis for assessing the success of interventions, but when used in isolation, they risk perpetuating disease-specific silos.

The second column, process indicators, evaluates how care is delivered rather than the direct biomedical outcome. Examples include the proportion of patients receiving annual multimorbidity reviews, completion rates for deprescribing interventions, patient access to CDS tools, and the percentage of individuals with a coordinated care plan. These measures operationalize recommendations from frameworks such as the NICE NG56 guideline on multimorbidity (NICE, 2025) and the Chronic Care Model (Coleman et al., 2009), ensuring that integration is embedded at the service delivery level. Process indicators are essential for monitoring fidelity to integrated models and highlight areas where structural reforms may be required (Fischer et al., 2025).

The third column, patient-centered outcomes, reflects the ultimate goals of integration: improvements in quality of life, adherence to therapy, reduction of treatment burden, and maintenance of functional capacity. These measures align with recent literature emphasizing the importance of patient-reported outcomes (PROs) in chronic disease care (Lee et al., 2024; Grudniewicz et al., 2023). Unlike clinical or process indicators, patient-centered outcomes directly capture what matters most to patients and families, providing a humanistic counterbalance to biomedical metrics.

Together, these three domains form a comprehensive evaluative framework. Clinical indicators ensure biomedical rigor, process indicators assess organizational effectiveness, and patient-centered outcomes confirm alignment with patient values. Figure 9 thus operationalizes the principle that effective integrated care must be judged not only by what clinicians achieve physiologically, but also by how care is delivered and how it impacts the daily lives of patients.

DISCUSSION

This review set out to examine how clinical practice can move from disease-specific silos toward an integrated approach to the diagnosis and management of chronic diseases. Across the included guidelines, frameworks, and reviews, three convergent threads emerged: (i) the feasibility and necessity of aligning condition-specific recommendations into coordinated care plans; (ii) the centrality of multimorbidity-aware strategies—deprescribing, treatment-burden reduction, and goal-oriented care; and (iii) the enabling role of organizational models and digital clinical decision support (CDS). Together, these findings answer our guiding questions by showing that integrated care is both evidence-supported and operationally tractable when built on contemporary guideline content and service-delivery frameworks (ADA, 2025; AHA & ACC, 2025; GINA, 2024; GOLD, 2025; KDIGO, 2024; NICE, 2025; Coleman et al., 2009; Grudniewicz et al., 2023; Lee et al., 2024; Linsky et al., 2024; Linsky et al., 2025; Tremblay et al., 2021; Zhang et al., 2025; Fischer et al., 2025; Scherer et al., 2024; Dubin et al., 2024; McCarthy et al., 2025; WHO, 2023; PAHO, 2024; Bloomfield et al., 2020).

Theoretical and practical implications

From single-disease excellence to integrated coordination. Recent guideline

updates have converged on themes that facilitate cross-condition integration: standardized measurement, early risk modification, and longitudinal monitoring. For example, the ADA's emphasis on cardio-renal protective agents in diabetes dovetails with KDIGO's renoprotective pharmacotherapy and AHA/ACC's BP-lowering targets, allowing construction of shared cardiometabolic pathways (ADA, 2025; KDIGO, 2024; AHA & ACC, 2025). Respiratory guidance (GINA 2024; GOLD 2025) contributes parallel structures for exacerbation prevention and comorbidity screening that can be synchronized with cardiometabolic care (GINA, 2024; GOLD, 2025). Practically, this alignment enables unified order sets, registry metrics, and bundled reviews across conditions rather than duplicative, guideline-by-guideline workflows (Dubin et al., 2024; McCarthy et al., 2025).

Multimorbidity as the organizing principle. NICE NG56 reframes care around patient goals, coordinated medication reviews, and the reduction of treatment burden—an orientation that directly addresses the tension clinicians face when multiple guidelines conflict (NICE, 2025). Empirically, treatment burden predicts adherence and quality of life (Lee et al., 2024), while polypharmacy—often an unintended product of parallel guideline application—raises risks of adverse outcomes (Bloomfield et al., 2020; Fischer et al., 2025). Systematic evidence supports deprescribing as a structured, patient-centered countermeasure that can improve safety without sacrificing disease control (Linsky et al., 2025; Linsky et al., 2024). The implication is that integrated programs should elevate routine multimorbidity reviews and deprescribing to the same status as disease-specific target checks.

Operational scaffold: CCM and CDS. The Chronic Care Model (CCM) situates integrated care within proactive team design, clinical information systems (registries, recall), and community linkages; decades of evaluation show improved outcomes when multiple CCM components are implemented together (Coleman et al., 2009). Contemporary CDS frameworks can map overlapping recommendations across guidelines, reduce cognitive load, and standardize evidence-based actions at the point of care (Tremblay et al., 2021; Wang et al., 2025). At system level, the WHO Implementation Roadmap and PAHO regional guidance provide policy anchors—financing, workforce, essential medicines—without which clinical models cannot scale (WHO, 2023; PAHO, 2024). Synthesizing these strata produces a practicable architecture: guideline content → CCM-structured delivery → CDS-enabled execution → measurement on shared indicators (Zhang et al., 2025).

Measurement that matches integration. Our proposed indicator set (Figure 9) blends clinical control (e.g., A1C, BP, eGFR, exacerbations) with process measures (multimorbidity reviews, deprescribing completion, CDS uptake) and patient-reported outcomes (PROs) on treatment burden, adherence, and function (ADA, 2025; AHA & ACC, 2025; KDIGO, 2024; GINA, 2024; GOLD, 2025; Lee et al., 2024; NICE, 2025). This triangulation prevents "performance paradoxes" where disease targets improve while the lived experience worsens (Scherer et al., 2024).

Comparison with prior literature and alternative explanations

Our synthesis accords with earlier evidence that integrated primary-care interventions strengthen continuity and outcomes (Zhang et al., 2025) and that multidisciplinary teams reduce fragmentation (Fischer et al., 2025; Coleman et al., 2009). Where it extends prior work is in showing concrete convergence points among the 2024–2025 guideline updates, clarifying how to stitch them together with deprescribing and CDS. An alternative explanation for observed improvements in integrated programs is secular trend: guideline updates alone might drive better outcomes. However, evidence that deprescribing and goal-oriented care independently reduce harms and treatment burden suggests additive effects beyond guideline refreshes (Linsky et al., 2025; Lee et al., 2024; NICE, 2025). Another alternative is case-mix and selection bias—integrated programs may preferentially enroll motivated patients or better-resourced clinics—which can inflate apparent

effectiveness (Fischer et al., 2025). This underscores the need for equity-sensitive implementation and reporting.

Limitations

First, this is a narrative (not systematic) review. Although we applied explicit eligibility criteria and triangulated across major databases and organizations, selection and confirmation biases remain possible (Tremblay et al., 2021). Second, heterogeneity in health-system context limits generalizability: guideline feasibility and medication access vary across regions, particularly in low-resource settings despite WHO/PAHO roadmaps (WHO, 2023; PAHO, 2024). Third, our synthesis relies heavily on guidelines and secondary evidence; high-quality pragmatic trials directly comparing integrated vs. single-disease pathways across multimorbidity profiles are still scarce (Zhang et al., 2025; Fischer et al., 2025). Fourth, digital readiness constrains CDS impact—data quality, workflow fit, and clinician trust are variable (Wang et al., 2025). Finally, publication in English-language sources and the recency focus (2020–2025) may omit relevant non-English or earlier foundational work beyond CCM (Coleman et al., 2009).

Future directions

- Pragmatic, equity-informed trials that randomize clinics to integrated bundles (multimorbidity reviews + deprescribing + CDS) versus usual care, powered for patient-centered outcomes (PROs, treatment burden) in addition to clinical targets (Zhang et al., 2025; Lee et al., 2024).
- Interoperable CDS that fuses ADA, AHA/ACC, KDIGO, GINA, GOLD, and NICE logic into conflict-aware recommendations, with human-factors evaluation and measurement of clinician cognitive load (Wang et al., 2025; Dubin et al., 2024; McCarthy et al., 2025).
- Deprescribing learning networks embedded in primary care and geriatrics, using common metrics, feedback dashboards, and patient-goal alignment (Linsky et al., 2025; Bloomfield et al., 2020).
- Policy and payment models aligned with WHO/PAHO roadmaps to fund team-based reviews, pharmacist time, CDS maintenance, and community partnerships (WHO, 2023; PAHO, 2024).
- Implementation research in LMICs and humanitarian settings to adapt integrated packages to supply constraints and workforce realities (Vijayasingham et al., 2024).
- Indicator harmonization across registries so that clinical, process, and PRO measures travel together and avoid perverse incentives (NICE, 2025; Scherer et al., 2024).

Overall contribution

This review contributes a practice-ready map for integration: it identifies where 2024–2025 guidelines align; elevates multimorbidity-specific strategies (deprescribing, burden reduction, goal-oriented care); and specifies the delivery/technology scaffolds (CCM, CDS) and measurement suite needed for accountable implementation. By centering patient goals within a structured, guideline-concordant system, integrated care can deliver not only improved biometrics but also better lived outcomes in the populations who most need them (ADA, 2025; AHA & ACC, 2025; GINA, 2024; GOLD, 2025; KDIGO, 2024; NICE, 2025; Coleman et al., 2009; Grudniewicz et al., 2023; Lee et al., 2024; Linsky et al., 2024; Linsky et al., 2025; Tremblay et al., 2021; Zhang et al., 2025; Fischer et al., 2025; Scherer et al., 2024; Dubin et al., 2024; McCarthy et al., 2025; WHO, 2023; PAHO, 2024; Bloomfield et al., 2020).

CONCLUSION

This review synthesized contemporary evidence on the diagnosis and management of chronic diseases, emphasizing the transition from disease-specific guidelines toward integrated, multimorbidity-aware care. Our analysis demonstrated that major clinical guidelines—ADA 2025, AHA/ACC 2025, GINA 2024, GOLD 2025, KDIGO 2024, and NICE 2025—share convergent principles of early detection, risk reduction, and patient-

centeredness that, when harmonized, provide a solid foundation for integration.

The findings highlight that cross-cutting strategies such as deprescribing, treatment burden reduction, and goal-oriented care are indispensable for translating these guidelines into real-world practice. The Chronic Care Model (CCM) and clinical decision support (CDS) systems emerged as operational scaffolds that can structure team-based interventions and resolve conflicts between overlapping recommendations. Moreover, indicators spanning clinical outcomes, care processes, and patient-reported measures ensure that evaluation reflects both biomedical effectiveness and lived patient experience.

The theoretical implication of this synthesis is that integration is not merely additive guideline application, but a systemic reorientation where multimorbidity becomes the organizing principle of chronic care. Practically, this approach enables clinicians, institutions, and policymakers to design interventions that reduce fragmentation, improve safety, and align care with patient values.

Limitations include the narrative design of this review, potential selection bias in the sources examined, and the heterogeneity of health system contexts that may constrain generalizability. Furthermore, the evidence base remains limited by a lack of large pragmatic trials directly comparing integrated versus disease-specific pathways.

Future research should prioritize the development of interoperable CDS tools, multicenter trials of deprescribing and multimorbidity care bundles, and equity-focused implementation studies in low- and middle-income countries. Strengthening the link between guideline content, delivery models, and patient-reported outcomes will be crucial for scaling integrated care globally.

In conclusion, integrated chronic disease management represents both a theoretical advance and a practical necessity in contemporary healthcare. By uniting disease-specific excellence with cross-cutting strategies and patient-centered evaluation, it is possible to create care pathways that are clinically effective, operationally feasible, and aligned with what matters most to patients.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflicts of interest.