Saudi Journal of Medicine and Public Health

https://saudijmph.com/index.php/pub

https://doi.org/10.64483/202412484

The Polypharmacy Patient: An Interprofessional Model for Deprescribing and Safe Care Transitions

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Abstract

Background: Polypharmacy, the concurrent use of multiple medications, is a pervasive public health challenge associated with increased adverse drug events, hospitalizations, and diminished quality of life. This risk is magnified during transitions of care, where medication discrepancies and inappropriate prescribing are common. **Aim:** This narrative review synthesizes evidence on interprofessional models for proactively identifying and managing polypharmacy, with a specific focus on collaborative deprescribing frameworks and ensuring medication safety during care transitions. **Methods:** A comprehensive search of PubMed, CINAHL, Scopus, and PsycINFO (2010-2024) was conducted, integrating literature from geriatrics, clinical pharmacy, nursing, and health services research. **Results:** Effective management requires a structured, team-based approach. Key elements include pharmacist-led medication reviews informed by laboratory monitoring of organ function, nursing/health assistant assessments of real-world adherence and functional status, social work interventions to address socioeconomic barriers, and surgical service protocols for perioperative medication management. Successful models hinge on clear communication, shared documentation, and defined roles. **Conclusion:** A proactive, interprofessional model is essential to mitigate the risks of polypharmacy. Future efforts must standardize deprescribing processes and integrate them seamlessly into transitional care pathways to improve patient safety and outcomes.

Keywords: polypharmacy; deprescribing; transitional care; medication therapy management; interprofessional collaboration

Introduction

Polypharmacy, commonly defined as the concurrent use of five or more medications, has become a normative yet hazardous state for a growing population, particularly older adults with multiple chronic conditions (Csep et al., 2023). While often initiated with therapeutic intent, the cumulative regimen can lead to a cascade of iatrogenic harm, including adverse drug reactions, drug-disease and drug-drug interactions, falls, cognitive impairment, and significant financial burden (Maher et al., 2014). The complexity of managing multiple medications creates a state of therapeutic vulnerability, where the margin between benefit and harm is precariously thin. This vulnerability is most pronounced during transitions of care—such as hospital discharge, transfer between specialist and primary care, or admission to a skilled nursing facility—where fragmented communication and shifting clinical priorities create a high-risk environment for medication errors, omissions, and the continuation of potentially inappropriate medications (PIMs) (Mouazer et al., 2022).

The traditional, siloed approach to prescribing—where each specialist manages medications for their organ system or disease state—

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Receive Date: 19 December 2024, Revise Date: 30 December 2024, Accept Date: 31 December 2024

is fundamentally ill-suited to address the holistic needs of the polypharmacy patient (Mekonnen et al., 2022). What is required is a systematic, interprofessional model that shifts from a reactive, prescriber-centric process to a proactive, patient-centered strategy focused on medication optimization and intentional deprescribing. Deprescribing is defined as the systematic process of identifying and discontinuing drugs where existing or potential harms outweigh potential benefits, within the context of an individual's care goals, level of functioning, and life expectancy (Scott et al., 2015). This is not mere drug cessation, but a complex clinical intervention requiring monitoring and support. Figure 1 illustrates the coordinated roles in polypharmacy management and deprescribing across the care continuum.

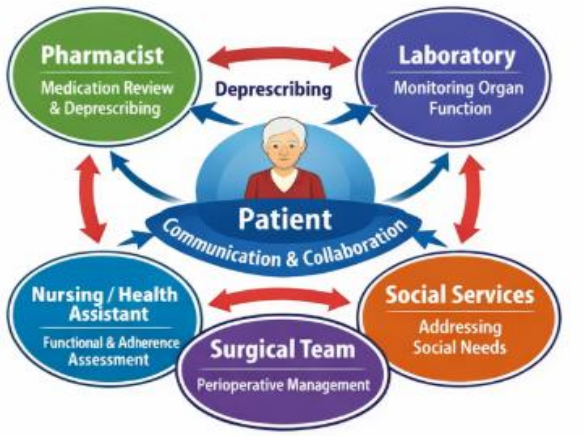

Figure 1. Interprofessional Framework for Polypharmacy Management and Deprescribing.

This narrative review aims to synthesize the literature from 2010 to 2024 on interprofessional frameworks for managing polypharmacy, with a dual focus on structured deprescribing and ensuring medication safety during care transitions. It will analyze the distinct but interdependent roles of key disciplines: the pharmacist as the medication review and deprescribing expert; the laboratory in providing critical physiological data to guide dosing and discontinuation; nursing and health assistants in assessing the patient's functional capacity and real-world medication management at home; social services in confronting the socioeconomic determinants of medication adherence; and surgical teams in navigating the specific perils of perioperative polypharmacy. By examining the evidence for collaborative models, this review seeks to provide a blueprint for integrating these diverse expertise into a coherent, patient-safety system that reduces the burden of polypharmacy and safeguards the most vulnerable patients during critical handoffs in their care journey.

Methodology

This interdisciplinary narrative review employed a systematic search strategy to identify relevant literature across clinical and health services domains. Databases searched included PubMed, CINAHL, Scopus, and PsycINFO for articles published in English between January 2010 and December 2024. The search strategy combined MeSH terms and keywords organized into three conceptual clusters: (1) Problem & Population: "Polypharmacy," "Inappropriate Prescribing," "Aged," "Chronic Disease," "Patient Care Transition"; (2) Interventions & Processes: "Deprescribing," "Medication Therapy Management," "Medication Reconciliation," "Interdisciplinary Communication," "Patient Care Team"; (3) Professional Roles: "Pharmacists," "Nurses," "Social Workers," "Clinical Laboratory Services," "Surgeons." Boolean operators (AND, OR) were used to combine clusters iteratively (e.g., "Polypharmacy" AND "Deprescribing" AND "Pharmacists").

Inclusion criteria were: peer-reviewed empirical studies (randomized controlled trials, cohort studies, qualitative research), systematic reviews, and meta-analyses focusing on interprofessional interventions to manage polypharmacy or improve medication safety during transitions of care. Studies had to involve at least two of the specified professional groups (e.g., pharmacist and nurse) in a defined collaborative model. Exclusion criteria included: editorials without original data, studies focusing on a single disease state without a polypharmacy lens, and descriptions of models without outcome evaluation. The initial search yielded 585 articles. After deduplication and title/abstract screening, 95 full-text articles were assessed, with 42 selected for in-depth synthesis. Data were extracted and organized thematically around core model components, roles of specific disciplines, transitional care interventions, and reported outcomes.

The Scope and Impact of Polypharmacy

Polypharmacy is not merely a clinical issue but a systemic one, driven by disease-centered clinical guidelines, a culture of prescribing, and inadequate systems for longitudinal medication management. The prevalence of polypharmacy exceeds 40% in adults over 65 in many high-income countries and is rising (Midão et al., 2018). Its consequences are profound. Beyond the direct harm of adverse drug events—a leading cause of hospital admissions in older adults—polypharmacy contributes to prescribing cascades, where new drugs are prescribed to treat side effects of existing ones, further compounding complexity (Rochon & Gurwitz, 2017). It also imposes a significant pill burden, leading to non-adherence, either intentional (due to side effects or cost) or unintentional (due to cognitive or physical limitations). During care transitions, this complex regimen is destabilized. Discharge summaries may be incomplete, patients may be unsure which medications to restart, and community pharmacists may not receive timely

information, resulting in a high incidence of post-discharge medication discrepancies with the potential for serious harm (Kripalani et al., 2014). Addressing this requires moving beyond individual prescriber education to redesigning the systems and teams responsible for medication management across the care continuum (Table 1).

Pharmacist-Led Medication Review as the Foundation

The clinical pharmacist is uniquely positioned to lead the interprofessional effort to optimize complex medication regimens (Duncan et al., 2023). Their role extends far beyond dispensing to include Comprehensive Medication Reviews (CMRs), a structured, patient-centered evaluation of all medications (prescription, over-the-counter, supplements) to ensure appropriateness, effectiveness, safety, and adherence (Bulajeva et al., 2014). In collaborative models, pharmacists employ validated tools like the Medication Appropriateness Index (MAI) or STOPP/START criteria (Screening Tool of Older Persons' Prescriptions/Screening Tool to Alert to Right Treatment) to systematically identify PIMs and prescribing omissions (O'Mahony et al., 2023).

The pharmacist's contribution is particularly critical in deprescribing initiatives. This involves a multi-step process: 1) creating a complete and accurate medication list; 2) identifying candidate drugs for discontinuation (e.g., drugs without a current indication, drugs with higher harm potential in the context of life expectancy); 3) discussing risks/benefits with the patient, family, and prescriber; 4) implementing a discontinuation plan (taper if needed); and 5) monitoring for withdrawal effects or return of the original condition (Reeve et al., 2017). Pharmacist-led deprescribing interventions, especially when embedded in primary care clinics or as part of post-discharge follow-up, have demonstrated significant reductions in PIMs, medication numbers, and drug costs, with some studies showing reduced fall rates and improved patient-reported outcomes (Riordan et al., 2016).

The Laboratory as the Objective Arbiter of Safety and Dosing

Laboratory medicine provides the essential physiological data that grounds deprescribing and medication management in objective reality. For patients with polypharmacy, routine monitoring of renal function (estimated glomerular filtration rate - eGFR) and hepatic enzymes is non-negotiable, as many drugs are metabolized or excreted via these pathways (Davies et al., 2020). Declining renal function, common in aging, necessitates dosage adjustment or cessation of numerous medications, including direct oral anticoagulants, metformin, and many antibiotics (Hosseini et al., 2023). Laboratory monitoring transforms deprescribing from a theoretical exercise into a data-driven safety imperative.

Furthermore, therapeutic drug monitoring (TDM) for specific agents like digoxin, certain anticonvulsants (phenytoin, valproate), and some antibiotics is crucial (Menz et al., 2021). For instance, a stable patient on long-term digoxin with a level at the low end of the therapeutic range, who is also on other medications for heart failure, may be an excellent candidate for deprescribing digoxin, a decision informed and supported by the laboratory result (Roller-Wirnsberger et al., 2019). The laboratory thus acts as a critical partner, flagging abnormal values that demand immediate attention and providing the evidence base to support or refute the continued need for high-risk medications.

Nursing and Health Assistant as The Bridge to Real-World Medication Use

While pharmacists and laboratories focus on the *appropriateness* of the regimen, nurses and health assistants provide indispensable intelligence on its *feasibility and execution* in the patient's daily life (Rodgers et al., 2018). Through direct observation during home visits or clinic assessments, they evaluate functional and cognitive capacity for medication management. Can the patient open child-resistant caps? Read the labels? Afford the co-pays? Organize a weekly pill box? (Sun et al., 2019). They are also frontline observers of potential adverse effects—dizziness, fatigue, confusion—that may not be volunteered to the physician but are crucial clues to drug-related harm.

Their role is pivotal during the post-discharge transition. A nurse or health assistant conducting a follow-up home visit can perform the most accurate form of medication reconciliation by conducting a "brown bag review"—having the patient produce all medications from all sources (Chen et al., 2021). This often reveals discrepancies invisible to the electronic health record, such as the patient continuing a drug that was meant to be discontinued or misunderstanding new instructions (Rojas-Ocaña et al., 2023). They provide essential education, reinforce adherence plans, and serve as a communication conduit back to the pharmacist and prescriber, closing the loop on the care transition.

Social Services in Confronting the Socioeconomic Determinants of Adherence

The most expertly crafted, evidence-based medication regimen will fail if the patient cannot afford it or lacks the social support to maintain it. Social workers are integral to the interprofessional team, addressing the non-clinical barriers to safe medication use. They screen for and intervene in cases of financial toxicity, assisting patients with applications for patient assistance programs, copay cards, or switching to lower-cost therapeutic alternatives in consultation with the pharmacist (Tran & Zafar, 2018). They assess the home environment and support network: Is there a reliable family member to assist with administration? Is the patient

socially isolated and at risk of missing doses? (McCarthy et al., 2022).

Furthermore, social workers understand health literacy and cultural beliefs about medications, facilitating conversations that align medical recommendations with patient values and capabilities (Vázquez-Serrano et al., 2021). By connecting patients to community resources—transportation services to pharmacies, meal delivery programs that can improve nutritional status and drug efficacy—they address the foundational determinants of health that underpin successful chronic disease management and deprescribing (Marshall et al., 2020).

Table 1: Interprofessional Roles in Polypharmacy Management and Deprescribing

Discipline	Core Function in Model	Key Assessments & Actions	Contribution to Safe Care Transitions
Pharmacy	Medication regimen review & deprescribing leadership.	Conducts CMR using STOPP/START; identifies drug interactions & PIMs; develops deprescribing plans; provides patient education on changes.	Leads post-discharge medication reconciliation; communicates regimen changes to community pharmacy; provides transitional medication management clinics.
Laboratory	Objective safety & dosing data provision.	Monitors eGFR, LFTs for dose adjustment; performs TDM (digoxin, anticonvulsants); flags critical values impacting drug safety.	Ensures discharge medications are dosed correctly for current renal/hepatic function; provides baseline labs for post-discharge monitoring.
Nursing & Health Assistant	Real-world feasibility & adherence assessment.	Evaluates functional/cognitive capacity for self-management; conducts "brown bag" reviews; observes for ADRs in home setting.	Performs home visit medication reconciliation; assesses understanding of new post-discharge regimen; provides hands-on adherence support.
Social Services	Addressing socioeconomic & environmental barriers.	Screens for financial hardship & health literacy; assesses social support network; connects to community resources.	Ensures discharge medications are affordable; arranges supports for medication administration if patient unable; addresses transition-related anxiety.
Surgical Operations	Perioperative medication management.	Implements evidence-based protocols for pre-op holds & post-op restart (e.g., anticoagulants, diabetes meds); manages acute post-op pain without exacerbating chronic polypharmacy.	Creates a clear perioperative medication plan communicated to patient and post-acute providers; avoids unnecessary post-op prescription cascades.

Surgical Operations in Navigating the Perioperative Polypharmacy Minefield

The perioperative period represents an extreme stress test for the polypharmacy patient. Surgical teams must manage the delicate balance of continuing essential chronic therapies while holding others to reduce intraoperative risk (e.g., bleeding from anticoagulants, hypoglycemia from diabetes medications, acute kidney injury from NSAIDs or diuretics) (de Wildt et al., 2023). Poorly coordinated perioperative medication management is a major source of adverse events, including rebound thrombosis, hypertensive crises, and delirium (Huang et al., 2012).

An interprofessional approach is vital. Surgeons, anesthesiologists, and pharmacist collaboratively develop and adhere to evidence-based protocols for holding and restarting high-risk medications. For example, protocols for direct oral anticoagulants (DOACs) balance thromboembolic risk with surgical bleeding risk to determine the optimal pre-op cessation interval (Douketis et al., 2022). Post-operatively, the team must decide when to restart chronic medications, avoiding the automatic reinstatement of drugs that may have been deprescribed or that may interact with new post-op analgesics. Involving the primary care pharmacist and the patient's longitudinal medical team in this planning, particularly for elective surgery, is a hallmark of a safe, patient-centered system (Zuckerman et al., 2023). Figure 2 highlights the interprofessional interventions to reduce medication-related harm in patients with polypharmacy.

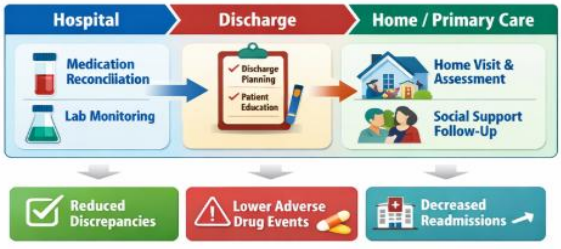

Figure 2. Medication Safety Across Transitions of Care in Polypharmacy Patients

Implementing the Model in Communication, Workflow, and Technology

Successful implementation of an interprofessional polypharmacy model requires deliberate design of communication structures, workflows, and technology supports. Structured communication tools like SBAR (Situation, Background, Assessment, Recommendation) or I-PASS (Illness severity, Patient summary, Action list, Situation awareness, and Synthesis by receiver) can standardize handoffs between team members regarding medication changes (Starmer et al., 2014). Shared care plans or problem lists within the electronic health record, accessible to all team members including community pharmacists, are essential.

Workflow integration might include embedded pharmacists in primary care clinics, scheduled interprofessional team huddles to review high-risk patients, and automated alerts triggered by laboratory values (a critically low eGFR) sent to both the prescriber and pharmacist (McDonald et al., 2022). Patient-facing technology, such as medication management apps that sync with the pharmacy record, can empower patients and provide another layer of safety, though their design must consider the needs of older adults (Matsuyama et al., 2021). Table 2 summarizes the strategies and outcomes for interprofessional polypharmacy interventions.

Table 2: Strategies and Outcomes for Interprofessional Polypharmacy Interventions

Intervention Type	Example Model	Key Collaborative Elements	Reported Outcomes (Selected Studies)
Primary Care-Based Medication Review	Pharmacist-led CMR with GP integration.	Pharmacist conducts review using STOPP/START, makes recommendations to GP; Nurse assesses adherence; Lab provides eGFR data.	Reduced number of medications & PIMs (Riordan et al., 2016); improved medication appropriateness; high patient satisfaction.
Hospital-to-Home Transition	Pharmacist discharge reconciliation + Nurse home visit follow-up.	Inpatient pharmacist reconciles meds at discharge; Community nurse performs home visit with brown-bag review; Social worker assesses barriers.	Significant reduction in medication discrepancies (Rojas-Ocaña et al., 2023); lower 30-day readmission rates (Kripalani et al., 2014).
Perioperative Medication Management	Pre-op clinic with PharmD, Surgeon, Anesthesiologist.	Team creates evidence-based hold/restart plan; plan communicated to patient, inpatient team, and post-discharge providers.	Reduced post-op complications (e.g., bleeding, AKI) (Huang et al., 2012); fewer medication errors at handoffs.
Geriatric Outpatient Clinic	Interprofessional team (MD, PharmD, RN, SW) evaluation.	Comprehensive assessment including medication review, functional eval, social eval; team develops unified care plan.	Improved health-related quality of life; reduced inappropriate prescribing; decreased healthcare utilization (Reeve et al., 2017).
Technology-Facilitated Model	EHR-integrated deprescribing alerts + patient portal.	CDS alerts GP to PIMs based on lab/age; Pharmacist reviews alerts; Patient accesses med list via portal.	Increased deprescribing initiation (McDonald et al., 2022); improved patient knowledge of medications.

Conclusion and Future Directions

Polypharmacy is a predictable and preventable threat to patient safety, demanding a systemic, team-based response. This review has outlined the essential components of an interprofessional model, where the pharmacist's expertise in deprescribing is informed by the laboratory's objective data, operationalized through the nursing and health assistant's understanding of real-world feasibility, and supported by social work's mitigation of socioeconomic barriers, with surgical teams providing specialized protocols for high-risk transitions.

Future efforts must focus on scaling and sustaining these collaborative models. This requires: 1) Policy and Payment Reform: Developing reimbursement mechanisms that financially support pharmacist-led CMRs, nurse home visits for medication management, and interprofessional consultation (Yousuf Zafar, 2016); 2) Education and

Culture Change: Training all health professionals in the principles of deprescribing and collaborative practice, and shifting the clinical culture from one where "more is better" to one where "appropriateness is paramount"; 3) Advanced Health IT: Developing smarter clinical decision support that leverages artificial intelligence to identify high-risk polypharmacy patients and suggest deprescribing opportunities based on integrated clinical and laboratory data (Al-Arkee et al., 2021).

Ultimately, managing the polypharmacy patient is the quintessential test of a coordinated, patient-centered healthcare system. By embracing a structured, interprofessional approach to deprescribing and transitional care, we can reduce iatrogenic harm, honor patient preferences, and ensure that medication regimens serve as tools for health rather than sources of burden and risk.

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