

Polypharmacy: A Five-Step Call to Action for Family Physicians

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There has been immense progress with drug development for the prevention and treatment of diseases since around 1500 BC, when an ancient Egyptian medical papyrus described the first pills.¹ Today, over 20,000 drugs are approved by the Food and Drug Administration (FDA) for marketing in the United States.² Clinical guidelines recommend medications for use, and health care providers routinely prescribe them. Medicine has moved from plant powders, honey, and grease to evidence-based medical therapies, but these advances are not without consequence. Physicians have created a new iatrogenic medical condition—that of polypharmacy, or the concurrent use of multiple medications by a patient.

The literature most commonly defines polypharmacy as taking five or more concomitant medications, but consensus is lacking about the exact definition. Numerical definitions range from two to 11 or more concomitant medications.³ Some definitions consider appropriateness of prescribing, and some include over-the-counter medications and dietary supplements.^{3,4} While no universal agreement exists about the exact definition of polypharmacy, the data do suggest that many patients take too many medications.

The evidence clearly shows that the risk of potential drug-drug interactions increases steeply with the number of concomitant drugs taken. The risk for interactions reaches 50% with the coadministration of four medications and approaches 100% with 10 concomitant medications.^{5,6} Over one fifth of typical outpatients aged 40-79 years with stable chronic

medical conditions received polypharmacy in 2015-2016.⁷ Adults aged 65 years and older took a median of four prescription medications, with 39% taking more than five.⁸ Over the next decade, it is estimated that polypharmacy will result in over 4.6 million hospitalizations and 150,000 premature American deaths.⁹ Thus, polypharmacy is a major public health problem.

A number of different strategies have been proposed and tested to address polypharmacy and reduce the number of medications that patients take. These include approaches such as: (1) avoiding the addition of a medicine to treat the unwanted effects of another medicine, sometimes referred to as the prescribing cascade (eg, when a patient prescribed a calcium channel blocker develops peripheral edema and receives an inappropriate new prescription for a loop diuretic)¹⁰⁻¹²; (2) ensuring that treatments are not continued for longer than originally intended (eg, antidepressants, proton pump inhibitors, bisphosphonates)¹³; and (3) deprescribing of high-risk medications using complex multifaceted approaches involving interdisciplinary teams of physicians, pharmacists, and nurses.¹⁴ Deprescribing approaches have included establishing lists of high-risk or inappropriate medications, and physician and other health care professional education about strategies for reducing the use of these

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medications.^{15,16} National campaigns have focused on reducing the use of individual agents such as atypical antipsychotics or opioids but have not focused on the use of multiple medications as a risk factor for adverse medication effects.¹⁷ Despite efforts over many decades, polypharmacy persists.¹⁴

Some may wonder about the link between direct-to-consumer advertising (DTCA) and polypharmacy. However, since only a few countries allow DTCA and polypharmacy is a worldwide problem, DTCA is likely not a major contributor to polypharmacy. The sparse data available on this issue also do not provide evidence to link DTCA and polypharmacy, as few patients report expecting prescriptions based on advertisements.¹⁸

There is a need for effective methods to address polypharmacy, particularly in the primary care setting. We propose five steps for primary care physicians, practices, health systems, and organizations to take:

1. Know the Number

Put polypharmacy in the spotlight by requiring documentation of the total number of medications taken by patients at every encounter. Medical records and electronic health record (EHR) systems currently contain lists of patient medications, but display of the total number of medications does not occur. We propose that EHRs routinely prompt primary care physicians to enter the total number of medications a patient is taking, for example as a sixth vital sign, and that this information is prominently displayed in the EHR. The EHR could prompt physicians to update the total number of medications if patient medication lists change, or could be programmed to require physician entry of the number of patient medications before medications are prescribed. In the absence of an EHR, the information could be determined by a physician and entered with the vital signs at every encounter.

2. Initiate Quality Improvement Efforts to Reduce Polypharmacy at Every Level

For practitioners, one approach could be to mandate a performance improvement activity on polypharmacy for board recertification by the American Board of Family Medicine. These activities typically prompt physicians to implement and measure the effect of a change in their practice. The polypharmacy performance improvement activity could be required for clinically active family physicians who provide care for continuity patients in outpatient

and/or telehealth settings. For family medicine trainees, medication reconciliation sessions could be a required part of their curriculum. These sessions would provide trainees with patient-based learning that includes interdisciplinary sessions with pharmacists, clinical pharmacologists, and nursing colleagues.

3. Leverage EHR Capabilities to Provide Point-of-Care Suggestions and Advice to Address Polypharmacy

EHRs can be programmed to provide alerts to prescribers when they prescribe or refill high-risk or inappropriate medications, or when medications are prescribed for longer than typically needed. But alert fatigue comes into play, and alerts without advice on specific actions to take are largely ineffective. Family physicians must participate in the development and testing of actionable notifications when automated or electronic systems flag polypharmacy. Successful examples of these approaches exist for integrating pharmacogenomic information into clinical practice¹⁹ and for informing physicians about patients' Drug Burden Index.²⁰ It is time to implement polypharmacy reduction algorithms to reduce the adverse effects of medications.

4. Lobby for Adequate Time and Reimbursement to Evaluate Polypharmacy

Primary care physicians need adequate time and reimbursement to identify and address polypharmacy. These activities may include thorough review of patient medications and medical problems to determine appropriateness of prescribing, consideration of multiple drug-drug interactions and economic/pill burden, identification of potential deprescribing targets, consultation with pharmacists or specialist physicians who often prescribe a subset of patient medications, assessment of patient goals of care, and counseling of patients and/or care partners. These activities often occur outside of in-person patient encounters and historically have been largely nonreimbursed.

5. Engage in Polypharmacy Research

We need to develop an evidence base to replace current guidelines, focused on single diseases, with guidelines to treat patients who have multiple chronic medical conditions.²¹ In addition, family physicians are needed to help establish standards for identifying polypharmacy, from developing a standard definition of the term to determining which prescription

medications, over-the-counter medications, and dietary supplements (which are often taken sporadically) should be included when assessing polypharmacy. We also need to identify best practices for minimizing the number of concomitant medications without compromising therapeutic goals.

The prescription of multiple medications is clearly beneficial in selected patients. Nonetheless, physicians must take responsibility for solving the iatrogenic problem of polypharmacy. We must implement strategies for the routine identification and reduction of polypharmacy. Family physicians are well positioned to tackle this problem as they have long-standing relationships with patients, knowledge of the entire spectrum of a patient's medical problems, and of patient goals of care. We need action now, before this burgeoning public health problem becomes a global polypharmacy epidemic.

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