

Invited Commentary

A Call for a Systems-Thinking Approach to Medication Adherence

Stop Blaming the Patient

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The writing of a prescription has long been one of the most expected steps to occur at the end of a physician-patient encounter. The subsequent events are assumed to follow a natural order: patients fill their prescriptions at a pharmacy and then continue to use their medications as prescribed.



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Unfortunately, these assumptions often do not hold. The challenges of consistent medication use, often called secondary adherence or persistence, have been well characterized by decades of research estimating that, on average, fewer than half of patients use their medications as prescribed over the long-term and many stop using their medications within months of beginning.¹ Much less well appreciated has been primary nonadherence, where patients do not fill the initial prescriptions they are given.

In this issue of *JAMA Internal Medicine*, Dayoub and colleagues² provide contemporary data to help us better understand this vexing issue. They conducted a retrospective cohort study of 55 340 commercially insured patients who had undergone percutaneous coronary intervention and evaluated whether patients filled a prescription for a platelet adenosine diphosphate P2Y₁₂ receptor inhibitor—clopidogrel, prasugrel, or ticagrelor—after their hospitalization. They observed that 19% of patients in 2016 had not filled 1 of these medications within 30 days of discharge, up from 6% in 2008. Patients who were younger, female, or lived in areas with lower socioeconomic status were even less likely to start antiplatelet therapy.

There are several possible explanations for these findings. The failure of patients to fill prescriptions may have been a failure of the physician to prescribe; this could not be evaluated with the administrative claims data used for the present study. Alternatively, if patients were given a sample for their first month's supply, used a secondary source of insurance, or paid cash, they may have received antiplatelet therapy without fills being recorded in claims data. The latter factor may have become increasingly likely after clopidogrel became a generic medication in 2012. Conversely, the results presented by Dayoub et al² could be accurate and, if so, should give us great pause. With the observed changes over time ignored, their results are roughly consistent with the limited existing literature about primary nonadherence to antiplatelet medications, which suggests that approximately 10% of patients who received prescriptions for antiplatelets do not fill them.³

So, why does primary nonadherence happen? Why would patients not fill prescriptions for life-saving medications after having undergone a major cardiovascular procedure? The

classical view assumes that patients are careless, poorly informed, or simply too stubborn to fill their prescriptions. Earlier research used the term *compliance*, defined as the extent to which the patient's action conforms to the prescribed regimen, to describe this type of behavior.

However, the perception that nonadherence results only from patients' failure to follow instructions is an inadequate explanation for what is, more fairly, a complex behavioral process. Undoubtedly, patient factors, such as motivation, beliefs, perceptions about the need for medication, forgetfulness, and health literacy contribute to suboptimal use of medication. However, poor adherence results from multiple barriers, many of which patients cannot control. For example, patients may have difficulty physically obtaining medications because of limited pharmacy hours or long travel distances. The specific medications they are picking up may not be immediately available, necessitating a return visit at a later date. Patient out-of-pocket costs may be prohibitively high. Insurance may also impose other types of restrictions on access, such as prior authorizations, quantity limits, or required step therapy. Clinicians may also prescribe complex regimens or fail to explain the importance of therapies they have prescribed. Any of these factors independently may be insufficient to reduce the likelihood of adherence—but together they certainly are.

From this perspective, the problem of nonadherence (both the primary and secondary types) is really a “systems” problem to which we should apply “systems thinking.” Formally, systems thinking is defined as an approach to a problem that considers how components within a larger system operate and interact and provides guidance on how to design and optimize the system with a lens on future actions.⁴ A shift from individual actors to systems thinking for medication adherence is analogous to the transition that occurred decades ago for errors in medicine.⁵ We have come to understand that most errors do not result from the negligent acts of individuals but rather a result of failures at multiple points along a care pathway. In the world of medical errors, we learned to stop blaming individual health care professionals; in the world of nonadherence, we should stop blaming patients.

Carrying this analogy further, to reduce medical errors, we learned to develop error-proof systems. For example, medication errors have been significantly reduced through the design and implementation of relatively error-proof computerized systems that provide checks and balances across the phases of prescribing, dispensing, and administration. For medication adherence, this would mean designing and implementing entire systems of care that optimally allow for patients to fill the prescriptions and adhere to their medications.

What would this type of closed-loop system look like for adherence? Each step from medication availability by insurers to prescribing by clinicians to ultimate ingestion by patients would need to be modified. For example, timely and precise decision support would need to be available to alert clinicians that they are prescribing treatments that are unaffordable or overly complex. Efforts should be made to deliver all prescriptions electronically, as this has been shown to significantly reduce primary nonadherence.⁶ Hospitals could ensure access by implementing robust transitions of care programs at the time of hospital discharge, including those that bring medications to the bedside before discharge or which facilitate outpatient medication reconciliation. Changes in insurance regulation to facilitate synchronization of filling with other medications may also reduce transportation and access problems for patients.⁷ Alerting physicians about the filling patterns of their patients may allow for early intervention. One could imagine many other solutions once we begin to think at the systems level.

This is not to say that patients should be left out of this process—it is ultimately patients who must put pills in their mouths and swallow them. But the system, of course including physicians, needs to acknowledge the importance of barriers, such as unmet social needs and work, to help patients address them.

For example, consistent with extensive literature correlating higher copayments with lower rates of initiation and adherence,⁷ prasugrel and ticagrelor users in Dayoub et al's² study had significantly lower long-term adherence than clopidogrel users and faced per-prescription out-of-pocket costs more than twice as high. Total drug costs (ie, the amount paid by insurers and patients combined) are also substantially higher for the newer antiplatelets. From a systems-thinking perspective, addressing cost-related nonadherence would require clinicians to screen for it and, when necessary, help patients access all available coverage options. Ultimately, clinicians need to choose optimal medications based on patients' ability to afford them. In this context, this could mean prescribing clopidogrel rather than prasugrel or ticagrelor, even if its efficacy may be lower. After all, higher long-term adherence to a slightly less-effective therapy might ultimately be more beneficial than short-term adherence to the best available therapy.

Building a systems-thinking approach to adherence could address the pressing rates of poor adherence for patients who receive prescriptions for evidence-based medications, including antiplatelets. Our challenge now is to identify and address the interdependence of components across the health care system to design an error-proof system for medication adherence.

ARTICLE INFORMATION

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