VIEWPOINT

Ingredients of Successful Interventions to Improve Medication Adherence

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Nonadherence to prescription medication is common and costly.[1] On average, 50% of medications for chronic diseases are not taken as prescribed.[2] Medication nonadherence is widespread, and accountability for this issue is shared by patients, their caregivers, clinicians, and the health care system as a whole. Furthermore, there is an increasing business case for addressing medication nonadherence; as payment and delivery system models evolve to place health care organizations and clinicians at risk for patient outcomes and downstream costs (eg, bundled payments and accountable care organizations), interest in coordination of care and invention of durable treatments continues to increase.

Because the problem of nonadherence is often multifactorial, effective programs to improve medication adherence need to adopt comprehensive approaches, often involving several proven strategies. Several evidence reviews have identified interventions effective in promoting both overall and condition-specific medication adherence.[3-5] Although no universal formula will improve medication adherence in all settings, several ingredients are essential for any well-designed intervention for improving medication adherence. These ingredients include improving patients' understanding of their treatments; providing counseling and accountability; ensuring that there are tools and strategies to assist patient self-monitoring; and increasing access to affordable medications.

Patient Knowledge

For an intervention to be effective, the first step is understanding patients' knowledge and perceptions, as well as addressing confusion or uncertainty. The objective of increased knowledge is to help patients understand what medications they take, how to follow prescribed behavior, and why adherence is important for their health. The educational content provided must be appropriately matched to the patient's level of health literacy and put into appropriate cultural context. Additionally, education must be aligned with the patient's readiness to make a behavioral change and must build incrementally on the patient's existing knowledge base. Given clinicians' often-limited time, patient education may be delivered and reinforced by other members of the clinical care team in a collaborative care model.[6] In addition, many technological solutions[7] have been developed to help improve patient adherence (**Table**).

Counseling and Accountability

Longitudinal patient counseling and accountability interventions are critical to reinforce understanding and ensure sustained improvement. This support can come in many forms, including case management, peer or social support, or telephone or in-person sessions. Supportive counseling helps patients become and remain engaged in their health, provides a forum to address questions, and may build patients' self-efficacy in their medication-taking behaviors. When these sessions are delivered by a physician, nurse practitioner, or pharmacist, they can also provide an opportunity to adjust treatment regimens to meet patients' changing health needs. Continued interaction with patients also may provide an opportunity to identify barriers to medication adherence as well as a chance to suggest potential strategies to overcome them (eg, use of a pill box or cueing the taking of medications with a routine activity such as tooth brushing). Developing this situational awareness and embracing accountability are important for self-management, which ultimately will improve medication adherence.

Self-monitoring

Self-monitoring is an essential tool to improve adherence and to inform the health care team about a patient's behaviors and health needs. Depending on the chronic condition of interest, a variety of metrics can be collected, often remotely. Common measures include medication adherence data such as prescription renewal and medication diaries; biological information such as blood pressure or glucose levels; and clinical information such as patient symptoms and functional status. New technologies can help facilitate self-monitoring of medication taking (eg, automatic pill dispensers, smart pill caps), as well as biological and patient-reported outcome information (eg, home blood pressure monitors, physical activity monitors, electronic health coach monitors) (Table).

Once collected, these data could provide patients with direct feedback regarding their success or challenges with treatment adherence. Data collected through self-monitoring also can be shared with the patient's health care team, which can inform the team about the patient's health status and provide an opportunity to adapt treatment or behavioral intervention strategies in response. For example, patients could be educated to visit the emergency department or contact their physician if their blood pressure exceeds a predetermined value. Patients also could be instructed about when adverse effects or symptoms are considered severe and what actions might be needed when those occur. Self-monitoring data can also be reported to health care systems for patient tracking and incorporation into the electronic health record.

Costs

Prescription medications may be prohibitively expensive for the patient.[8,9] Affordability of prescription medications may require different price points based on patients' distinct financial situations and their own

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Table. Technological Solutions to Deliver Patient Education and Enable Self-monitoring

Technology Categories	Specific Technological Solutions	Example Applications
Mobile health technology	Text messaging Smartphone applications Interactive voice response Electronic health records	Provide tailored educational information and feedback to multiple patients simultaneously Deliver time-sensitive, patient-specific medication reminders automatically
Electronic monitors	Biometric monitors (eg, blood pressure, glucose) Physical activity monitors Digital scales	Collect patient data (eg, blood pressure) between clinic visits to inform better treatment decision making Inform patient self-monitoring
Pill-monitoring technology	Electronic pill caps Smart blister packaging Digital pills	Measure adherence behaviors objectively Understand patients' medication taking patterns to advise a tailored intervention
Online resources and social media	Web-based peer support Condition-specific online support communities Online self-monitoring and reporting	Enable patient self-monitoring Develop patients' social support system

perceptions related to their willingness to spend to improve their health. To facilitate adherence, cost reductions can be accomplished in a variety of ways. Successful approaches have included reducing patients' out-of-pocket costs through increased coverage of prescription medications, reduced co-payments, and refill assistance.[3,4] Regardless of the specific strategy used, increasing access to medications through logistical solutions to reduce prescription costs is one of the most vital components of efficacious interventions to improve medication adherence. Educational interventions that reinforce the benefits and value of a medication and adherence to it can also increase a patient's willingness to spend resources on that medication.

Personalizing the Program

Although there is no universal solution to improve adherence, combining these approaches—building patients' knowledge, providing counseling and accountability, continual patient self-monitoring, and increasing access to medication through cost reduction—may equip patients with the understanding and tools they need to successfully engage in self-management. Interventions are often designed to incorporate multiple components with the goal of providing synergistic effects and an additive if not multiplicative effect, but components must be personalized to the patient's situation. The intensity of resources and technology used should be scaled to meet an individual patient's needs. Some patients may require intensive, individualized in-person counseling with a pharmacist, other patients may respond just as well with infrequent telephone contact with a nurse, and others may only need well-timed text-messaged reminders to take their medications. Matching intervention delivery and intensity with a specific patient's needs must be a goal for successful medication adherence programs.

Need for Future Research

Several general ingredients support successful medication adherence, and more clarity is needed about how to develop scalable and sustainable interventions. How can clinicians prospectively identify which interventions will work best for specific patients (ie, personalized adherence planning)? Similarly, the extent to which findings from one successful program can be generalized to other clinical settings is often unclear. Therefore, in a manner similar to the drug development process, more sequential evaluation of adherence interventions is needed. Novel interventional strategies should initially be carefully evaluated in single select settings for signals of success (phase 1). These evaluations should be followed by more definitive—and, ideally, randomized—evaluation and assessment of whether the success of the intervention varies by patient or among sites (phases 2-3). In addition, effort is needed to disseminate proven interventions to promote broad-scale adoption (phase 4).

To date, improving medication adherence has proven elusive—yet recent advances in understanding of how to help patients sustain adherence are helping to identify the major ingredients needed for success. The challenges now involve how to create and sustain large-scale programs that ensure patient adherence on a national scale.

ARTICLE INFORMATION

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