

Medication Adherence: The Search for Interventions That Work

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Recent estimates suggest that medication nonadherence may result in annual costs to the United States healthcare system in excess of \$300 billion, as well as contributing to adverse clinical outcomes including hospitalization and death.¹ Specifically for patients with coronary artery disease, nonadherence has been shown to be associated with an increased risk for acute myocardial infarction or heart failure as well as cardiovascular mortality; similar increased risks of hospitalization and mortality exist for nonadherent diabetic patients.^{2,3} Developing effective interventions to improve patients' medication adherence remains an active field of research—an endeavor that aims to enhance not only compliance but also health outcomes. The systematic review of interventions to improve medication adherence in this issue of *The American Journal of Managed Care* sheds light on both effective and ineffective means by which patients have been encouraged to adhere to regimens prescribed to them by medical professionals.⁴

The current study examined methods and results from 51 randomized clinical trials published since 1975 involving interventions aimed at improving adherence to cardiovascular medications. Most of the included studies were in-person interventions—those involving direct, personal message delivery by a trained layperson or medical professional, either over the phone or at the site of care. Other modes of intervention delivery included mailed, faxed, or hand-distributed messages and electronic systems. The inclusion criteria allowed for multiple measures of adherence across all studies. Results indicated that electronic interventions and in-person delivery either by a pharmacist or at hospital discharge were the most successful at improving medication adherence. In addition, nonautomated phone calls did not result in significant adherence improvement and, by and large, were less likely to lead to improvement compared with in-person modes of message delivery.

Cutrona and colleagues found that several modes of intervention may prove successful in improving the adherence rates of patients for whom cardiovascular treatment regimens have been prescribed. Assessing a diverse set of interventions across a wide time horizon, these researchers provide an informative overview of formal methods (both person-dependent

and person-independent) by which improving adherence has been addressed.

The outcomes reported in the study, however, lacked a connection to clinically meaningful outcomes such as disease control or mortality analysis. The results focused primarily on medication adherence. Analysis assessing the health outcomes associated with successful adherence interventions would have added weight to the argument for initiating such methods of message delivery in real-world settings. Similarly, reporting costs (if available) would be helpful to translate the results of individual interventions into economically meaningful results relevant to potential payers and other financial stakeholders.

A recent assessment of adherence-improving interventions involving cardiovascular medications determined that a favorable cost-effectiveness ratio could be achieved when considering the lifetime benefits of improved medication adherence.⁵ Further assessment or modeling of the current findings could lead to similar interpretations or, at the very least, consequential economic evidence for or against particular interventions.

The suggestions made by this study mirror those reported in the literature on medication adherence interventions. Support for pharmacist-led interventions is well represented, suggesting that methods used by pharmacists lead to improved rates of cardiovascular medication adherence.⁶⁻⁸ Programs centered at community pharmacies, however, fail to capture patients who either never fill their prescription or who opt to use a mail-order pharmacy. Similarly, interventions done at the time of hospital discharge fail to reach patients who have not been hospitalized. Means by which interventions can spur proper adherence from the point of initial prescribing, irrespective of the prescribing or dispensing location, deserve further investigation.

However, the study's finding that medication adherence can be improved by messages delivered electronically is encouraging, as innovative approaches to electronic message delivery continue to evolve. Although the current study focused on electronic monitoring

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and automated calling, other electronic systems are emerging and show promise. Low-cost systems including short message service (SMS) text and smartphone applications have been introduced to the market for both medication use monitoring and patient reminders, with results from several studies pending.^{9,10} Innovative approaches such as these have been previously suggested by other researchers, after study results indicated that current interventions to increase medication adherence have only shown modest success.¹¹ Evidence exists, however, that SMS-delivered interventions can lead to positive behavior change.¹²

The content of the intervention also has been discussed as an important factor in the potential success of efforts to improve adherence. Tailoring messages to patients through motivational interviewing has been suggested as a technique that interventionists can consider when crafting approaches to improve patient-centricity.¹³ Used in combination, tailored electronic messages may present an opportunity for potentially low-cost interventions that could aid in improving patient adherence to medication.

The current study is a reminder to the medical community that medication nonadherence remains a pressing issue. Furthermore, it sheds light on a related issue: current interventions to improve adherence lack a clear, uniform approach by which patient compliance can be universally improved. Several options reviewed in their study, however, show promise (eg, electronic systems, pharmacist-led interventions). Future research should focus on how these approaches may be combined with tailored messages in order to produce successful results that are clinically meaningful and economically attractive.

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