

LEARNING OBJECTIVES

After completing this activity, the primary care clinician will be better able to:

1. Define compliance, adherence, concordance, medication persistency, and medication interest.
2. Discuss the impact of poor adherence on clinical outcomes.
3. Describe communication techniques that can be used in the primary care setting to promote adherence.
4. Describe examples of strategies that have been shown to improve adherence.
5. Identify situations in which pharmacists, case managers, and nurses may be especially helpful in improving adherence.

TARGET AUDIENCE

Family physicians and clinicians who are interested in increasing their knowledge and gaining a stronger competency regarding management of patients with adherence issues.

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Improving Medication Adherence in Chronic Disease Management

Introduction

"If you don't realize poor adherence to treatment is a major problem in every physician's practice—including yours—then it's probably because you are not communicating with your patients," declared Thomas C. Bent, MD, medical director of the Laguna Beach Community Clinic in Laguna Beach, California, at the Summit on Improving Patient Adherence, convened by the Primary Care Education Consortium (PCEC) July 23-25, 2010. Representatives of several primary care organizations were invited to participate in the summit, which took place in Charlotte, North Carolina (APPENDIX 1). Other clinicians, representing a broad spectrum of clinical environments, were also invited. The goal was to identify actionable strategies to help primary care clinicians translate what is known about barriers to medication adherence into practical methods for engaging patients in partnerships that are likely to improve adherence and health status.

The view of Dr. Bent regarding poor adherence is demonstrated by extensive research.¹⁻¹⁰ Several decades of research indicate that up to 20% of all patients do not fill a new prescription, and approximately one-half of those who do fill a new prescription discontinue therapy in the first 6 months.⁶ A systematic review of 23 studies showed that adherence to oral glucose-lowering or insulin therapy ranged from 36% to 93% over 6 to 24 months.¹ In an analysis of 139 studies focused on hypertension, dyslipidemia,

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APPENDIX 1 Organizations that participated in the Summit on Improving Patient Adherence, July 23-25, 2010, in Charlotte, North Carolina

American Academy of Nurse Practitioners
American Academy of Physician Assistants
American College of Physicians
American Congress of Obstetricians and Gynecologists
American Osteopathic Association
Illinois Academy of Family Physicians
National Council on Patient Information and Education
American Academy of Pediatrics*

*A designated observer rather than an official representative attended.

other cardiovascular disease, and diabetes, only 63% of patients continued with their medication for 1 year.⁹ A retrospective review of 2 years of claims data for persons with asthma taking either inhaled corticosteroids or leukotriene modifiers showed a medication possession rate (MPR)—the percentage of days per year that the medication prescription was filled—of 15% for those using inhaled corticosteroids and 39% for those using leukotriene modifiers.⁷ Another study showed that for patients with major depressive disorder, the MPR was 46%, with only 70% of patients having filled the initial prescription.⁴

Of particular concern is the discordance that often exists between physicians' perceptions of their patients' adherence to medications and the actual level of adherence, as demonstrated in a study of patients with inflammatory bowel disease. In this study, physicians overestimated adherence (defined as MPR >80%) in 67% of patients ($P < .0001$).¹¹ The magnitude and negative health impact of medication nonadherence is so great that a World Health Organization report on medication adherence to long-term therapies observed that "increasing the effectiveness of adherence interventions may have a far greater impact on the health of the population than any improvement in specific medical treatments."¹²

In advance of the Summit on Improving Patient Adherence, specific issues regarding barriers to medication adherence were identified via an online survey of primary care clinicians conducted by PCEC in January 2010 (APPENDIX 2). The survey demonstrated that patient, medication, and clinician factors serve similarly as barriers to adherence. Among patient factors, fear of side effects, cost, and complexity of medication regimens were particularly common. Among clinician factors, a poor relationship with the patient, poor communication with the patient, and lack of time were identified by clinicians as the most important barriers to adherence.

Prompted by data such as these, as well as their own experience, the summit attendees determined that greater awareness and a sense of urgency among clinicians must be created to address the serious problem of poor adherence. The attendees organized the problems contributing to poor adherence into 3 groups: 1) clinician-patient communication, 2) the health care system, and 3) the health care team. The focus of this article is clinician-patient communication in the primary care setting, as barriers within this group can be addressed by clinicians without the need for resource allocations. A discussion of the role of the health care team in promoting medication adherence as well as links to organizations that have medication adherence programs and resources may be found online in the **Supplemental Material** for this article (<http://www.jfponline.com/supplements.asp?id=9428>).

APPENDIX 2 The Primary Care Education Consortium online primary care survey on medication adherence

On January 22, 2010, the Primary Care Education Consortium (PCEC) distributed an online survey to 153 members of *The Journal of Family Practice* Honorary Advisory Panel and 1500 members of the PCEC Primary Care Metabolic Group (PCMG) on the topic of medication adherence. Complete surveys were received from 244 persons, for a 14.8% response rate.

Key findings of the survey:

Cost of treatment or lack of insurance was the greatest barrier listed; however, when asked what 1 tool or resource respondents would like for improving patient adherence, the top 3 tools all related to more time for or better tools for communication with the patient. Lower costs were the 4th most requested resource. Respondents had tried many strategies to improve patient adherence, and the results below indicate how effective they believe their efforts to date had been:

- 63.7% of respondents believed their current strategies to improve patient-related barriers had been effective to highly effective
 - Only 19.1% believed these strategies had been very to highly effective
- 60.1% of respondents believed their current strategies to improve medication-related barriers had been effective to highly effective
 - Only 17.5% believed these strategies had been very to highly effective
- 65.8% of respondents believed their current strategies to improve clinician-related barriers had been effective to highly effective
 - Only 25.3% believed these strategies had been very to highly effective

Laying the groundwork for successful adherence

Several terms have been used to describe the extent of agreement between what is recommended or prescribed by the clinician and what is actually done by the patient. The term *compliance* refers to the extent to which a patient's behavior matches the clinician's advice, while *adherence* refers to the extent to which a patient's behavior matches recommendations from the clinician to which he or she has agreed. The latter term, adherence, has been adopted by many as an alternative to compliance in an attempt to emphasize the patient's right to decide whether to follow the clinician's recommendations, and to remove the concept of blame if the patient chooses not to do so.¹³ *Concordance* extends the definition of adherence by including the concept of a shared decision or consensual agreement about treatment, in which the patient's beliefs and preferences have been considered.^{13,14} *Medication persistency* refers to consistent and timely medication-taking behavior over time, particularly with regard to chronic drug therapy.¹⁵

As patient-centered principles have moved to the forefront of medicine and nursing, there has been a growing concern in the medical literature that questions the utility of words such as compliance and adherence.¹⁶⁻¹⁸ Steiner and Earnest succinctly summarize this concern: "Words make a difference. The terms compliance and adherence should be abandoned because they subtly exaggerate the importance of the clinician, describe behavior inaccurately, and shed little light on motivations."¹⁹ While we generally agree with this viewpoint, we will use the term adherence throughout, as this term is most familiar to physicians. Alternatively, the term concordance, as de-

finied above, could be used, as it eliminates the concerns raised by Steiner and Earnest. Another alternative to the term adherence is the nonoppositional term *medication interest*, which has been introduced into the literature. The term medication interest places the focus of attention directly on patient choice, offering a positive term that resonates well with patient-centered and medical home models.²⁰⁻²³ However, medication interest does not deal with non-medication-related treatment options.

The importance of treatment adherence has been clearly established, as nonadherence contributes to disease progression, increased morbidity and mortality, and increased hospitalizations.^{6,24} To promote medication adherence and its consequent beneficial health impact on patients, it is critical for clinicians to realize that individual patients have their own perspectives about their illness and the use of medications, and they make decisions based on their beliefs and experiences.^{13,25} Consequently, it is imperative that clinicians relate information regarding disease progression, the stages of disease, morbidity statistics, and recommended treatments in a manner that takes into account each patient's unique perceptions regarding the disease and its treatment.²⁵ Patients' perspectives and experiences regarding their disease and the use of medication must be considered when developing strategies to 1) educate them regarding the potential consequences of the disease and the rationale for treatment and 2) support them in adopting behaviors that promote treatment adherence and beneficial health outcomes.²⁵⁻²⁷

Assessing or measuring medication adherence is a necessary first step in understanding nonadherence and laying the groundwork for interventions targeted at

improving adherence.²⁸ Approaches that can be used to assess medication adherence include simply asking the patient about adherence; monitoring the patient's failure to keep appointments, lack of therapeutic response, and drug level; and electronic monitoring (eg, with medication event monitoring systems), pill counting, and monitoring pharmacy fill rates.^{28,29} Self-report measures have the advantages of simplicity and low cost. They also have the potential to provide real-time feedback and possible reasons for poor adherence, particularly if the clinician communicates in an empathetic, nonjudgmental manner when screening for appropriate medication use,^{24,28,29} as this may increase the likelihood of an honest response.^{30,31} For example, a clinician might ask a patient one of the following questions: "Many of my patients find it difficult to remember to take all of their medicines; has that been true for you as well?" "How many times in an average week would you say that you forgot to take some of your medications?" "Are there some of these medications that you can't afford?"

Communicating with the patient

A positive, trusting clinician-patient relationship is strongly associated with adherence to treatment and perceived effectiveness of care. It is also associated with a greater likelihood that patients will share information regarding their medication use, including issues and barriers that impede appropriate use.^{24,32-34} In turn, the physician's communication style (eg, active listening, providing emotional support, providing clear and thorough information, involving the patient in the treatment decision, allowing adequate time for patient questions) is the strongest predictor of patients' trust in their physicians and also directly correlates with better medication adherence.^{34,35} An open-ended, interrogative communication style is more effective than a close-ended, declarative style for assessing a patient's adherence to treatment. Furthermore, a collaborative style, using lay language, also facilitates discussion.³⁶

Another factor that affects treatment adherence is a patient's level of readiness to follow health recommendations.¹² The clinician can assess a patient's readiness by eliciting perceived barriers to adherence and collaboratively developing solutions to these barriers to optimize a patient's medication adherence.^{12,24} The Readiness Assessment Ruler (0-10 scale) measures how a patient feels about taking a medication for a long period of time by determining into which of 3 readiness stages he or she falls: Not Ready, 0-3; Not Sure, 4-6; or Ready to Take Action, 7-10. This information can help the clinician tailor the intervention to support the patient's movement toward change. For example, the clinician could help a patient in the Not Ready stage become more aware of the condition, its consequences, and the benefits of early treatment; reinforce a Not Sure patient's understanding of the need to change and teach

them the necessary skills to do so; and help patients in the Ready stage with goal-setting and ongoing motivation.²⁴

Clinical interviewing skills remain the foundation for communicating with patients and are the major pathway for translating the beneficial qualities of trust, collaboration, and education into actual clinical practice. Cheng identifies 3 interviewing models as significantly influencing the contemporary approach to building a powerful therapeutic alliance: 1) solution-focused interviewing, 2) motivational interviewing, and 3) the medication interest model.²¹ All 3 models represent prototypic person-centered interaction that focuses on collaborating with the patient to find his or her own goals, as well as interventions and motivations for lifestyle changes and adherence. In particular, motivational interviewing and the medication interest model have important applications for improving medication adherence.

Arguably, the greatest advance in the field of collaborative interviewing was the development of motivational interviewing to assist clients in the field of substance abuse recovery.^{37,38} Motivational interviewing has subsequently been adopted as a method for improving adherence in many arenas, including exercise, dieting, and wellness programs, as well as medication adherence.³⁹ It is also being used as a core component of health coaching and enhancement of adherence to wellness practices.^{40,41} A meta-analysis showed that a positive effect was obtained in 75% of studies using motivational interviewing, whether the issues addressed were psychological or physiological, and this approach outperformed traditional advice in about 80% of the studies. Even in brief encounters of 15 minutes, 64% of the studies showed a positive effect with motivational interviewing.⁴²

Concerning medication adherence, motivational interviewing has been studied in various contexts, from improving medication adherence generally⁴³ to improving adherence to specific medications, such as antiretroviral medications for AIDS.⁴⁴ Motivational interviewing has also been used as a high-tech adjunctive tool with computer-assisted telephone counseling to improve medication adherence in patients dealing with multiple sclerosis.⁴³ Excellent reviews of its use in improving medication adherence are available^{45,46} and additional resources can be found online at <http://www.motivationalinterview.org/>.

Whereas the strength of motivational interviewing is its generalizability to adherence in many situations, the strength of the medication interest model is that it was developed by clinicians "in the trenches"—case managers, nurses, and physicians—specifically to transform medication nonadherence.^{22,23} The medication interest model is an integrative model that joins the principles of motivational interviewing and solution-focused interviewing with practical interviewing techniques provided

by clinicians from the field. The resulting 45 interviewing techniques are designed to be easily taught, learned, and tested by objective-structured clinical examinations for medical, nursing, physician assistant, and clinical pharmacy students and residents.⁴⁷ The behavioral concreteness of these techniques was designed specifically to provide a platform for both quantitative and qualitative evidence-based research.²³

As a prototypic patient-centered model, the medication interest model focuses on patient choice and provides a clarifying theory, called the Choice Triad, for understanding how and why patients choose to start or to stay on a medication. The Choice Triad postulates that patients choose to start or to stay on a medication because 1) they believe there is something wrong with them; 2) they are motivated to try a medication because they believe a medication may help bring relief from what is wrong; and 3) they personally believe the benefits of the medication outweigh the risks. With relatively few exceptions, the decision of a patient to refuse to take or to stop taking a medication is not viewed as resistance in this model; rather, it is viewed as a logical decision based on a patient's personal set of beliefs related to the Choice Triad. The medication interest model provides specific, behaviorally well-defined interviewing techniques for uncovering patient concerns at each step of the Choice Triad and subsequently transforming those concerns.

Barriers to medication adherence

As revealed in the online survey of primary care clinicians conducted by PCEC (APPENDIX 2), there are a variety of barriers to medication adherence that can be categorized as patient-, medication-, or clinician-related. For a discussion of the barriers to medication adherence, please see the online **Supplemental Material** (<http://www.jfponline.com/supplements.asp?id=9428>).

Interventions to improve medication adherence

Improving medication adherence is challenging, not only because of the numerous potential barriers, but also because the barriers often vary from patient to patient. Even for an individual patient, beliefs may vary from one medication to another, from one condition to another, and over time.^{5,48} Therefore, solutions must be multifaceted and tailored to an individual patient, medication, and condition (TABLE 1).^{5,24,30}

The effectiveness of multifaceted, ongoing approaches to improve medication adherence and achieve better therapeutic outcomes vs that of single interventions or onetime approaches has been demonstrated and is recommend-

TABLE 1 Elements of multifaceted approaches to improve medication adherence

Positive relationships and quality of the clinical environment
Ongoing reinforcement, motivation, and support at every step in the health care system
Simplifying dosage regimens
Involving patients in the decision-making process and setting goals that are later reviewed with the patient
Education about the medication, its benefits, side-effect management, duration of therapy, and what a patient can expect
Follow-up care and reminders
Rewards for achieving goals
Social support, including family members, when possible
Self-management training

From Oyekan E, Nimalasuriya A, Martin J, Scott R, Dudl RJ, Green K. The B-SMART appropriate medication-use process: a guide for clinicians to help patients—part 1: barriers, solutions, and motivation. *The Permanente Journal*. 2009;13(1):62-69. Reprinted with permission from The Permanente Press, www.thepermanentejournal.org, © 2009.

ed.^{14,24,49,50} These findings parallel those from studies of continuing medical education (CME) programs, which show that multimedia interventions and multiple exposures to content are more effective in meeting objectives intended to improve physician practice and patient outcomes than are CME programs offered once using a single medium.⁵¹⁻⁵³

Many of the elements of multifaceted approaches to improve medication adherence have been combined and operationalized in the B-SMART (Barriers, Solutions, Motivation, Adherence Tools, Relationships, and Triage) Appropriate Medication-Use Process.²⁴ The first step of the B-SMART process is identification of potential barriers to medication adherence for a particular patient. This may be accomplished by asking specific questions in an empathetic, nonjudgmental way about how many days a patient has missed taking prescribed medications, whether the patient has ever stopped or started taking any of the prescribed medications on his or her own, whether the patient has had difficulty taking the medications as prescribed (and if so, why?), what gets in the way of taking the medications on some days, and whether the patient has experienced any problems or side effects while taking the medications.²⁴

In addition, or alternatively, use of the Adherence Estimator or the Morisky Medication Adherence Scale is recommended to assess the likelihood of medication non-adherence and to identify specific proximal adherence drivers that are most problematic to a particular patient. The Adherence Estimator is a brief, 3-question screening tool (TABLE 2).⁶ The Morisky Medication Adherence Scale was first developed as a 4-item self-reported scale and expanded to an 8-item scale; the added items address the circumstances surrounding adherence behavior.²⁸ Assessment of barriers to adherence is critical prior to prescrib-

TABLE 2

The Adherence Estimator®

	Agree Completely	Agree Mostly	Agree Somewhat	Disagree Somewhat	Disagree Mostly	Disagree Completely
I am convinced of the importance of my prescription medication	0	0	7	7	20	20
I worry that my prescription medication will do more harm than good to me	14	14	4	4	0	0
I feel financially burdened by my out-of-pocket expenses for my prescription medication	2	2	0	0	0	0

The Adherence Estimator® was designed to be administered shortly after the initiation of new therapy and was designed to be completed for each new medication prescribed

References: McHorney CA. The Adherence Estimator: A brief proximal screener for patient propensity to adhere to prescription medications for chronic disease. *Current Medical Research and Opinion* 2009;25(1):215-238. McHorney, CA, Spain, VA, Alexander, CA, Simmons, JS. Validity of the Adherence Estimator in the prediction of nine-month persistence with medications prescribed for chronic disease: A prospective analysis of data from pharmacy claims. *Clinical Therapeutics* 2009;31(11):2584-2607.

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ADD UP THE TOTAL NUMBER OF POINTS FROM THE CHECKED BOXES

Score	Interpretation
0	Low risk for adherence problems
1-7	Medium risk for adherence problems
8+	High risk for adherence problems

ing each medication and at each office visit, because the drop-off rate of medication persistency observed in the first 6 months of therapy has been shown to be approximately 50%.⁶ Improved communication may be facilitated by the use of these screening tools early in the course of therapy. The subsequent discussion can provide the clinician with the opportunity to influence a patient's nascent beliefs about the diagnosed condition and prescribed medications by eliciting the patient's perspective regarding his or her readiness to accept the condition, perceived understanding of the condition and its consequences, and perceived benefits and risks of therapy.⁵ Patient responses can guide areas to be addressed and allow collaborative solutions.

Collaborative solutions

Providing education about a patient's condition and the medications necessary to treat it is essential for patients who demonstrate concerns about taking medications, lack of knowledge about a medication and/or their condition, or denial about their condition or its severity. The education provided should be guided by patient feedback but should generally encompass the disease, the reason for treatment, and expected short- and long-term benefits of treatment, as well as likely adverse effects of treatment and what can be done to minimize them.^{5,54,55}

The following strategies maximize the effectiveness of educational interventions to promote medication adherence:

1. Ensure that the information is presented or provided in

a manner that is compatible with the patient's level of health literacy. Presenting information at a 5th-grade reading level and using a teach-back method (see 3) can help improve patient understanding.

2. Provide the information in multiple formats, such as the pharmacy-generated printed drug information that accompanies a prescription, visual aids (eg, a medication card or instruction label with universal illustrations to depict proper medication use, including time of day to take it and special warnings or instructions), and verbal instruction.
3. Use a teach-back strategy—eg, “Please explain to me how to take this medication” or “Please tell me how this medication should help you”—to assess the patient's comprehension of new concepts and to detect any health beliefs that may interfere with the integration of the concept.^{24,56,57}
4. Limit the amount of new information presented to no more than 2 to 3 new concepts per visit to increase the likelihood of retention.

For patients whose medication concerns or barriers to medication adherence are rooted in cultural or religious beliefs or practices, becoming familiar with these beliefs and practices may help the clinician anticipate potential conflicts. A medication plan can then be developed in collaboration with the patient that will minimize these conflicts.²⁴

Inquiries about a patient's ability to pay for medications can uncover a barrier to medication adherence that may be addressed through generic drug prescribing,

mail-order discount programs, or, potentially, medical financial assistance or pharmaceutical company programs.²⁴ It is important to note that noncost factors are also associated with patterns of cost-related nonadherence to medications.^{34,48,58} For example, patients with negative beliefs about medications, a depressed mood, and/or a heavy disease burden appear to be more susceptible to cost-related nonadherence, while those experiencing high-quality, trustworthy relationships with their physicians may be less likely to experience cost-related nonadherence.^{34,58} Therefore, for patients who report difficulty paying for medications, further probing regarding mood as well as beliefs and knowledge about medications may be helpful in clarifying the relative roles of these factors to help guide strategies aimed at improving adherence.⁴⁸

For patients daunted by complex medication regimens or those who are challenged by forgetfulness in taking their medications, the following are strategies to improve adherence:

1. Simplify the regimen to the greatest extent possible.
2. Ensure that the regimen is appropriate to the patient's situation (ie, consider the goal of medication use for the specific patient in the context of his or her life expectancy, prognosis, and social situation).
3. Employ behavioral interventions such as cueing (eg, linking medication use with daily habits, such as brushing teeth) and adherence tools (eg, medication organizers, reminder calls, postcards).
4. Follow up contact within 3 to 5 days of an appointment to review the treatment plan.³⁰⁻³²

Other behavioral strategies that support improved medication adherence are those that help empower patients to take control of their health. These strategies include patient self-monitoring of the condition, such as for blood pressure, blood glucose, or pain scale, and collaborative goal-setting with the patient, including subgoals that allow patients to celebrate each step toward achievement of the larger goal.^{14,24} Review and reinforcement of goals at each office visit, along with positive feedback and encouragement, provide ongoing motivation to help sustain success.²⁴

Actively engaging patients in treatment decision-making is an extension of these strategies to empower patients to manage their condition, an approach that has demonstrated beneficial effects on medication adherence and health outcomes.⁵⁹ In a randomized controlled study examining the impact of training patients in communication skills for treatment adherence and overall health benefits, the use of a training booklet mailed 2 to 3 days

prior to a scheduled primary care appointment positively influenced overall adherence, particularly with regard to behavioral treatments and follow-up appointments.⁶⁰ The training was designed to instruct patients in information seeking, provision, and verification during the medical interview.⁶⁰ The investigators suggested that a possible way to adapt this patient-empowering approach to private practice or a small clinic setting might be to train staff nurses to engage in a brief face-to-face training session with the patient prior to the physician interaction, focusing on patient communication skills and potentially supplementing the training session with printed material provided to the patient well in advance of the appointment.⁶⁰

Interventions demonstrating improved adherence

There are many published examples of interventions that have been employed to improve adherence.^{14,49,50,54,61-63} In 2 recent systematic reviews of controlled trials of such interventions in chronic medical conditions, successful interventions were those that contained multiple elements delivered over time (eg, informational interventions providing education counseling over several sessions and addressing self-care issues; behavioral interventions based on monitoring and feedback; combined interventions including self-management plans, reinforcement, and occasionally rewards).^{14,62} The case examples summarized in the online **Supplemental Material** (<http://www.jfponline.com/supplements.asp?id=9428>) illustrate the positive impact of multifaceted interventions with frequent patient interactions on medication adherence and, ultimately, health outcomes.

Conclusion

The magnitude of medication nonadherence and the consequent negative health impact are great and should create a sense of urgency among clinicians to address this serious problem. While improving medication adherence can be challenging owing to numerous and varied barriers, success is possible. Key approaches are to improve the clinician-patient relationship and to work collaboratively with the patient in a shared decision-making approach. In addition, educational interventions must be continuous and tailored to an individual patient's needs and situation. ■

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