Published in final edited form as:
JAMA. 2013 May 22; 309(20): 2105–2106. doi:10.1001/jama.2013.4638.

Medication Nonadherence:

A Diagnosable and Treatable Medical Condition

Dr. Zachary A. Marcum, PharmD, MS, **Dr. Mary Ann Sevick, ScD, RN**, and **Dr. Steven M. Handler, MD, PhD**
Division of Geriatric Medicine (Drs Marcum and Handler) and Departments of Biomedical Informatics (Dr Handler) and General Internal Medicine (Dr Sevick), School of Medicine, University of Pittsburgh, Pittsburgh, Pennsylvania; and VA Pittsburgh Healthcare System (Dr Sevick)

Medication nonadherence is widely recognized as a common and costly problem.[1] Approximately 30% to 50% of US adults are not adherent to long-term medications leading to an estimated $100 billion in preventable costs annually.[1] The barriers to medication adherence are similar to other complex health behaviors, such as weight loss, which have multiple contributing factors. Despite the widespread prevalence and cost of medication nonadherence, it is undetected and undertreated in a significant proportion of adults across care settings. According to the World Health Organization, “increasing the effectiveness of adherence interventions may have far greater impact on the health of the population than any improvement in specific medical treatments.” How can adherence be improved? We propose that the first step is to view medication nonadherence as a diagnosable and treatable medical condition.

To treat a medical condition, an accurate diagnosis must first be established. However, for undetected and under-treated conditions such as medication nonadherence, one way to identify the population of interest is to conduct screening. The 1968 World Health Organization principles on screening tests have clear application to medication non-adherence. For example, the condition is an important problem, there are suitable tests available, and there are acceptable treatments for those with this problem.

However, most clinicians are not formally trained on screening for, and diagnosing, medication nonadherence, nor are they fully aware of how best to treat nonadherence if detected. As a result, research has shown that clinicians develop varying heuristics surrounding the diagnosis and documentation of medication nonadherence. For example, one of the most common diagnostic assessments for medication nonadherence is simply asking patients if they have any problems taking the medication regimen as prescribed (and assuming the patient’s response is accurate). When no further questions are asked, potentially addressable medication issues are left unattended.

Corresponding Author: Zachary A. Marcum, PharmD, MS, Division of Geriatric Medicine, School of Medicine, University of Pittsburgh, 3471 Fifth Ave, Ste 500, Pittsburgh, PA 15213 (zam12@pitt.edu).

Conflict of Interest Disclosures: All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Dr Marcum reports receiving support from grants K07AG033174 and P30AG024827 from the National Institutes of Health and R01HS018721 from the Agency for Healthcare Research and Quality. Dr Sevick reports receiving support from grant K24-NR012226 and pending grants R01-DK100492 and 2R01-NR010135 from the National Institutes of Health. Dr Handler reports receiving funding from grants K07AG033174 from the National Institutes of Health and R01HS018721 from the Agency for Healthcare Research and Quality.

To further improve the diagnostic accuracy of the problem, attention should be paid to the underlying behavior(s) at hand. There are at least 6 representative medication nonadherence phenotypes, highlighting the differences in underlying behaviors and barriers that exist at the patient level: (1) the patient does not understand the relevance of medication adherence to continued health and well-being; (2) the patient has concluded the benefits of taking medications do not outweigh the costs; (3) the complexity of medication management exceeds the information processing capacity of the patient; (4) the patient is not sufficiently vigilant; (5) the patient holds inaccurate, irrational, or conflicting normative beliefs about medications; and (6) the patient does not perceive medication to have therapeutic efficacy.

Each medication nonadherence phenotype requires different diagnostic tools and treatments in the same way that subtypes of a medical condition, such as heart failure (diastolic vs systolic), require them. Similar to treating heart failure, without a correct diagnosis made for the specific medication nonadherence phenotype, no significant benefit will be achieved; even worse, patient harm can occur and resources can be unnecessarily wasted.

Using previously established methods and instruments, screening to diagnose medication nonadherence among adults across care settings should be routine. A number of screening tools or instruments are currently available to determine the underlying behavior(s) of interest (Table).[2–5] This approach illustrates how clinicians and researchers can begin conceptualizing the diagnosis and treatment of medication nonadherence.

An *International Classification of Diseases, Ninth Revision, Clinical Modification* (*ICD-9-CM*) code (V15.81) is available and is used by pharmacists and mental health practitioners to document services they deliver related to medical nonadherence. However, it is unknown how often medication nonadherence is the underlying reason for using this diagnostic code. Furthermore, to have the largest public health effects, measures of medication adherence should be included in the electronic health record. Inclusion of medication adherence data in the electronic health record will allow for sharing among health care professionals and insurers, establishing trends over time as well as benchmarking for quality improvement purposes. Moreover, it is paramount that patient-reported medication adherence information (eg, medication beliefs and values) is incorporated into such documentation. This patient-centered approach to health care is supported by the establishment of the new Patient-Centered Outcomes Research Institute.[6] Also, given the proposal to routinely screen for medication non-adherence in adults, the next step is to match the identified barriers to a proven treatment for the condition.

Over the past several decades, numerous attempts have been made to improve medication adherence in adults; modest success has been achieved. While this literature has been previously summarized, a recent systematic review assessed the comparative effectiveness of patient, clinician, systems, and policy interventions that aimed to improve medication adherence for chronic health conditions in the United States.[7] On the patient level, the results showed that educational interventions with behavioral support through continued patient contact over several weeks or months were effective for several chronic diseases, including hypertension, hyperlipidemia, heart failure, and myocardial infarction.[7] Other systematic reviews have found that few studies specifically recruit participants with medication adherence difficulties and target interventions to the participant's adherence barriers. More progress could be made by utilizing a patient-centered approach to the diagnosis and treatment of medication nonadherence.

In the current health care climate, there is a strong demand for improving the quality of care delivered, including medication adherence. In fact, medication adherence is central to the measures included in the Centers for Medicare & Medicaid Services Five-Star Quality

Rating System. For health plans to achieve 5 stars, more than 75% of covered beneficiaries will be required to obtain at least 80% of the medication prescribed to them from 3 initial medication classes (hypoglycemic agents, statins, and hypertension medications). This represents another critical reason to better understand how to best identify medication non-adherence and intervene appropriately in order to address these increasingly important health policy issues.

Based on identified barriers derived from systematic screening, patient-tailored interventions can be delivered in a safe, effective, and efficient manner, with systematic monitoring over time due to the dynamic process of medication adherence. Consistent with Patient-Centered Outcomes Research Institute goals and priorities, community and patient partners should be identified and included throughout the planning and implementation of future studies. Finally, synergism among multiple disciplines is necessary to successfully improve medication adherence for adults.

References

1. Osterberg L, Blaschke T. Adherence to medication. N Engl J Med. 2005; 353(5):487–497. [PubMed: 16079372]
2. McHorney CA. The Adherence Estimator: a brief, proximal screener for patient propensity to adhere to prescription medications for chronic disease. Curr Med Res Opin. 2009; 25(1):215–238. [PubMed: 19210154]
3. Anderson K, Jue SG, Madaras-Kelly KJ. Identifying patients at risk for medication mismanagement: using cognitive screens to predict a patient's accuracy in filling a pillbox. Consult Pharm. 2008; 23(6):459–472. [PubMed: 18764676]
4. Morisky DE, Ang A, Krousel-Wood M, Ward HJ. Predictive validity of a medication adherence measure in an outpatient setting. J Clin Hypertens (Greenwich). 2008; 10(5):348–354. [PubMed: 18453793]
5. Horne R, Weinman J, Hankins M. The beliefs about medications questionnaire: the development and evaluation of a new method for assessing the cognitive representation of medication. Psychol Health. 1999; 14(1):1–24.10.1080/08870449908407311
6. Selby JV, Beal AC, Frank L. The Patient-Centered Outcomes Research Institute (PCORI) national priorities for research and initial research agenda. JAMA. 2012; 307(15):1583–1584. [PubMed: 22511682]
7. Viswanathan M, Golin CE, Jones CD, et al. Interventions to improve adherence to self-administered medications for chronic diseases in the United States: a systematic review. Ann Intern Med. 2012; 157(11):785–795. [PubMed: 22964778]

Table

Examples of Methods/Instruments for Measuring Internal Barriers to Medication Nonadherence in Adults[a]

	Medication Nonadherence Phenotype					
Method/Instrument	**Establishing Relevance of the Behavior**	**Evaluating Risks and Benefits of the Treatment**	**Processing of Complex Information**	**Remaining Vigilant Toward Behavior**	**Holding Inaccurate, Irrational, or Conflicting Normative Beliefs About Medications**	**Perceived Lack of Therapeutic Effectiveness**
Adherence estimator	√	√				
Medi-Cog scoring			√			
Morisky Medication Adherence Scale				√		
Beliefs about Medications Questionnaire (General)					√	
Beliefs about Medications Questionnaire (Specific)	√	√				
Ecologic Momentary Assessment			√	√		√

[a]The examples listed are from references 2 through 5.