Intervening at the Intersection of Medication Adherence and Health Literacy
Jackie H. Jones, EdD, RN, Linda A. Treiber, PhD, and Matthew C. Jones, MS

ABSTRACT
Medications play a prominent role in the treatment of many illnesses. Failing to adhere to prescribed medication regimens contributes to an array of poor health outcomes. In addition to the cost in terms of human suffering, the financial cost of medication nonadherence is staggering. Poor health literacy has been identified as a major cause of medication nonadherence. This paper focuses on nonadherence related to health literacy in the older adult population in the United States. Eight simple interventions to aid health care personnel in working with this population to improve adherence are provided.

Keywords: adherence, health literacy, literacy, medication adherence, medication errors, patient safety
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Medications are commonly used to treat, cure, and prevent illnesses and, accordingly, play a crucial role in improving and maintaining the health and well-being of patients. This role is thwarted, however, when patients do not take their medications as prescribed. Adherence to medication is the process by which patients take medications as prescribed. Failing to adhere to medication regimens can occur at any point during treatment and is, unfortunately, not an uncommon problem. The National Community Pharmacists Association commissioned a study of American adults at least 40 years old who had been prescribed ongoing medication for a chronic condition.

This CE learning activity is designed to augment the knowledge, skills, and attitudes of nurse practitioners (NPs) and assist in their understanding of how health literacy influences medication compliance.

At the conclusion of this activity, the participant will be able to:
A. Document the extent of medication nonadherence and poor health literacy in the US older population
B. Elaborate upon the impact of failing to adhere to medication regimens
C. Describe interventions to improve adherence related to health literacy in older adult populations

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The authors do not present any off-label or non-FDA-approved recommendations for treatment.

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Participants were asked 9 questions related to non-adherent behavior. These included whether, in the previous 12 months, they had missed a dose, failed to fill or refill a prescription, took a lower or higher dose than prescribed, stopped taking the medication early, or took an old medication for a new problem without consulting a physician. Respondents had a median age of 60 years, were taking an average of 4 ongoing prescriptions, and represented 30% of all American adults. An astounding 76% of respondents responded affirmatively to at least 1 of the non-adherence questions, thus indicating failure to take prescription medication as directed.

Failing to adhere to medication regimens is also not a new problem but rather has existed for decades. C. Everett Koop, surgeon general of the United States from 1981 to 1989, in calling attention to the problem, was quoted many times saying, “Drugs don’t work in patients who don’t take them,” and, “No medication works inside a bottle. Period.” These longstanding concerns about medication adherence have been inadequately resolved, and the problem has now reached crisis proportions.

Medication nonadherence is considered to be a serious threat to the overall physical, mental, and economic health of the US. The repercussions in both health outcomes and economic impact are significant. Adverse health outcomes resulting from poor medication adherence can range from exacerbations of disease processes to premature death. Nonadherence also results in increased utilization of health care resources, such as increased visits to clinicians’ offices and emergency departments, increased numbers of hospitalizations and nursing home placements, and greater utilization of home health nurses. The financial costs of nonadherence are staggering. Poor medication adherence is estimated to cost $100 billion for excess hospitalizations alone and as much as $290 billion per year in total avoidable medical spending.

Although medication nonadherence can occur in any population, studies have found the prevalence to be greater in the elderly. Causes are many, including physical, cognitive, psychological, sociocultural, and economic issues. A significant factor is the increased prevalence of chronic illnesses, with a concomitant increase in number of prescribed medications, disproportionately experienced by the elderly population. The increase in medications due to an increased number of chronic illnesses simply creates greater opportunities for nonadherence.

### INTERSECTION OF HEALTH LITERACY AND MEDICATION ADHERENCE

Another significant cause of nonadherence in the elderly is poor health literacy, defined as “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.” In a study by the US Department of Education assessing the health literacy of America’s adults, individuals were rated on their responses to questions about health care tasks that adults may commonly do, such as reading a pamphlet in a clinician’s office or reading a prescription label. Based on the responses given, literacy levels were scored and categorized as below basic, basic, intermediate, or proficient. People 65 years of age and older were found to have higher percentages of Below Basic and Basic levels and lower average health literacy scores than people in any other age group (Table 1).

The correlation between health literacy and medication adherence is well documented. A person with low health literacy is twice as likely to misinterpret medication labels. A significant percentage failed to understand instructions, such as “take on an empty stomach,” “take 1 pill every 12 hours by mouth with a meal,” “do not chew or crush; swallow whole,” “take with food,” “avoid prolonged or excessive exposure to direct and/or artificial sunlight while taking this medication,” and “medication

### Table 1. Levels of Literacy in America’s Adults

<table>
<thead>
<tr>
<th>Age group</th>
<th>Below Basic (%)</th>
<th>Basic (%)</th>
<th>Average score</th>
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<tbody>
<tr>
<td>16-18 years</td>
<td>11</td>
<td>23</td>
<td>244</td>
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<tr>
<td>19-24 years</td>
<td>10</td>
<td>21</td>
<td>249</td>
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<tr>
<td>25-39 years</td>
<td>10</td>
<td>18</td>
<td>256</td>
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<td>40-49 years</td>
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<tr>
<td>50-64 years</td>
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<td>21</td>
<td>246</td>
</tr>
<tr>
<td>65+ years</td>
<td>29</td>
<td>30</td>
<td>214</td>
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Data from Kutner et al.
should be taken with plenty of water. Inability to understand administration instructions will cause patients to take medications in ways not intended by the prescriber. The impact of poor health literacy on adherence is so significant that it has been identified as 1 of 10 national priorities to improve medication adherence by the National Council on Patient Information and Education. In addition, health literacy has been made a research priority, due in part to its relationship with medication adherence, by the US Department of Health and Human Services, the Institute of Medicine, the National Institutes of Health, the American Medical Association, and the Centers for Disease Control and Prevention.

INTERVENTIONS
Medication nonadherence in the elderly is a complex and multifaceted problem. Every patient is unique and may have different challenges that impact adherence. An early step should be to assess each patient for barriers to medication adherence. Interventions can then be tailored to the specific needs of each individual patient. Success is “related to how well the strategy can first identify the varying needs of individual patients, and then match services accordingly.” This would include determining how the patient can incorporate appropriate strategies into his/her life. Tailoring interventions to the individual patient may require creativity and an initial investment of a significant amount of time. However, after the initial investment, the interventions should take minimal time and utilization of resources. The rewards of increasing adherence should compensate for whatever resources are used in the beginning.

Subsequent sections of this article focus on nonadherence due to poor health literacy and identify interventions to improve medication adherence. The 8 simple interventions described herein concentrate on communication, provider and patient education, simplifying the educational experience, interdisciplinary collaboration and teamwork, patient- and family-centered care and commitment to adherence, and evaluation. These aspects are considered crucial to any plan to improve adherence. The interventions are relatively easy to design, implement, and incorporate into standard professional practices.

Understand the Problem
To appropriately intervene, health care personnel should have a thorough understanding of the extent of, and relationship between, medication adherence and health literacy. The Institute of Medicine estimates that over 90 million Americans have poor health literacy. Many studies have shown that poor health literacy has a significant impact on medication adherence. As stated previously, the magnitude and costs of nonadherence, especially in the elderly with chronic diseases, are both staggering and unsustainable. Although these interventions involve education of the patient, the health care provider should stay current on the issues involved. All health care professionals should be knowledgeable about the problems of health literacy, medication adherence, and the interaction between the two. There is a vast amount of easily accessible material designed to educate health care personnel and patients about both health literacy and medication adherence (Table 2).

Approach to Assessment
There are different approaches that can be taken related to assessment of health literacy. Instead of individual assessment, the Agency for Healthcare Research and Quality advocates use of Health Literacy Universal Precautions for improved communication with all patients, not just those patients who have poor health literacy. The reasoning is that it is often difficult to discern who does or does not have health literacy deficits, and therefore the practitioner should create all materials and structure all services and interactions with an assumption that all patients may have difficulty understanding. This universal approach has been very successful when used to reduce bloodborne disease by having nurses utilize appropriate personal protective equipment when coming into contact with blood and body fluids.

A different approach is to screen for health literacy. Screening has become somewhat controversial and few would disagree with the recommendations for a universal approach. However, in a busy practice a universal approach may not be consistently or effectively followed. Further, the information gained through screening may aid in tailoring the teaching
and tools to the appropriate comprehension level. If choosing to screen, there are subtle clues that a patient may have poor health literacy, such as taking a long time to complete forms, asking to take the forms home to complete, citing “glasses left at home,” and asking for assistance in reading. A practitioner may choose to screen a patient after observing these behaviors or it may be preferable to screen all patients. This practice will institutionalize the screening and minimize any stigma associated with being screened.

<table>
<thead>
<tr>
<th>Table 2. Health Literacy and Medication Adherence Information Resources</th>
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<td><strong>Information to aid health care personnel</strong></td>
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<td><strong>Website(s)</strong></td>
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<td><a href="http://www.acpfoundation.org">www.acpfoundation.org</a></td>
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<td><strong>For patients and health care personnel</strong></td>
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<td><strong>Website(s)</strong></td>
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<td><a href="http://www.pfizerhealthliteracy.com/">http://www.pfizerhealthliteracy.com/</a></td>
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Numerous instruments are available to assess health literacy. Two of the easiest and fastest to use are the Rapid Estimate of Adult Literacy in Medicine (an 8-item health literacy word recognition assessment tool) and Newest Vital Sign—where the patient is asked 6 questions about the information contained on a nutrition label. Alternatively, if time is limited, an organization may choose to design its own quick screening tool. Asking patients about confidence in completing medical forms, how often they get assistance in reading health information, or even rating their own reading ability has been found to be an effective indicator of health literacy.28

“It Takes a Village”

Resolving the issue of medication adherence related to poor health literacy requires the involvement, collaboration, and communication of all care providers. Patient advocacy is a foundational value of nursing. Included in advocacy is the responsibility to ensure that patients are educated in a way that ensures understanding. However, this responsibility does not reside exclusively with nurses but instead is shared by all members of the health care team. In the acute care environment, nurses are often the primary source of education to patients. Depending on the environment, other providers interact in different and unique ways that contribute to the patient’s knowledge. Nurse practitioners or physicians usually provide a diagnosis and prescribe a treatment regimen, including medications. Sufficient time should be spent with patients to ensure adequate understanding of their disease process, reasons for being prescribed the medication, expected therapeutic benefits, and the importance of adherence. Pharmacists serve as the last line of defense in medication distribution and have a pivotal role in adherence.6 They engage with patients when filling prescriptions and can reinforce and expand upon information the patient has already been provided. Pharmacists should ensure patient understanding about label directions, including when and how to take the medication, instructions specific to taking the medications, what side effects to monitor for, and to answer any questions the patient may have.6 Home health nurses can monitor for adherence and investigate nonadherence. All providers involved in the patient’s care should function as a team to ensure patient understanding and adherence.

The involvement of patients and their families, whenever possible and appropriate, in the decision-making and education is essential. Adherence represents a joint venture between health care practitioner and patient.6 Patient involvement, agreement, and commitment is critical to the success of this venture. In addition, families can play a vital role in aiding their loved one’s medication adherence regimen. If families are unavailable, the patient should be asked whether there is another support person that can work with them. This multidisciplinary, holistic approach acknowledges that everyone has a role to play in improving patient adherence to medication-taking. Although roles can frequently overlap, redundant guidance and education should serve to reinforce patient adherence.

Simplify the Educational Experience

A primary purpose of educating patients is to empower them so that they may appropriately attend to their health care needs. This purpose is obstructed when, for any reason, patients fail to understand the message. It should be considered that the language of health care is unique to the profession and not always understood by those outside it. Even words commonly used by health care workers, such as “orally” or “by injection,” may be misunderstood. Using lay language and avoiding medical jargon is essential.29

Consistent with principles of adult learning, it is important to first determine the patient’s existing knowledge and then build upon that foundation. Assessing and acknowledging their prior learning is an indicator of respect but can also eliminate going over unnecessary information, aid in identifying patient’s personal goals related to health and adherence, facilitate rapport with patients, and engage patients more fully.

Reading materials should be written at a level that patients can understand. Even patients with higher levels of health literacy have difficulty understanding some of the more complex health care documents. It is recommended that reading materials be published at or below a sixth-grade reading level.30 There are many resources that can aid health care personnel...
in simplifying reading materials (Table 2). In developing these reading materials, words and sentences should be kept short. A larger font and one of the easier-to-read styles, such as Times New Roman, may be preferable. The length of documents should be limited to sufficiently convey important information and not overwhelm the patient.29

Teaching sessions should be kept short. Lengthy teaching sessions can overwhelm the patient with excessive amounts of new information.29 Shorter sessions may result in the need for additional teaching sessions but should also result in greater learning. Patients commonly experience stress and/or fear during illness or injury, which can impede learning and repetition of instruction may be necessary.

Patients should be asked about their preferred learning style. Education should be provided predominantly in the preferred style. However, for optimal learning, a variety of teaching methods should be utilized, such as videos, written materials, demonstrations, and verbal instructions. The old adage that “one remembers 10% of what they read, 20% of what they hear, 30% of what they see, 50% of what they see and hear, and 80% of what they say and do” may be imprecise but its wisdom rings true: Patients will retain more information when numerous and varied sensory experiences have been utilized.

Simplify the Medication Regimen When Possible
Greater compliance occurs with simplicity.10 It is easier to remember to take a pill once per day rather than 2, 3, or more times per day. It is easier to take 1 prescription rather than 2, 3, or more. Clearly, these decisions are dependent upon medical needs, dosages needed, dosages available, and any financial considerations involved. However, the patient’s medication regimens should be reviewed, any unnecessary or redundant medications discontinued, and combination drugs used whenever possible and appropriate.

Tying medication administration times to normally scheduled activities, such as meals or bedtime, can also aid adherence. When possible, the patient’s preferences should be considered related to timing. Some patients may prefer to take their medications in the morning; some may prefer the evening. If there is no medical reason dictating timing, patient preference should be the determining factor. The route of medication administration should also be considered. Oral medications can be easier to self-administer and, whenever possible, ease of administration should be considered.

Choose Tools Tailored to Individual Patient Needs and Capabilities
In concert with the patient, aids most beneficial to the individual patient should be chosen. Older patients have reported that compensatory tools and strategies help to improve adherence to medication regimens.31 These tools range from simple to complex. Simple tools, such as pill boxes and organizers, are available in a variety of styles/formats; these include pill boxes with separate compartments for taking medications 1, 2, 3, or 4 times a day for 7 days a week. More sophisticated pillbox containers that may include alerting and/or reporting functions are also available. An easy-to-read pill card can be created to aid understanding and adherence. These cards provide a simple, visual way to track all the medications that a patient needs to take on a regular basis. Simple pictures and phrases can be tailored to the individual patient’s scheduled medications, including when to take it, how much to take, and the purpose of each medication. A guide to creating, personalizing, and using a pill card template can be found on the website of the Agency for Health Care Research and Quality (http://www.innovations.ahrq.gov/content.aspx?id=2073).32

Computer apps and a wide array of other technologies are available to aid compliance. The American Medical Association consumer app, “My Medications,” available through Apple’s AppStore for $1, reminds patients to take medications on time. Other cell-phone apps are available free of charge. A talking prescription pill bottle is also available. The pharmacist records into the prescription bottle information about how many pills to take, when to take them, and why the patient is taking them. The bottle is then placed in a recording stand and the patient can push a button on the side of the pill bottle to hear the information played back. Numerous tools are available that can signal the patient, the clinician’s office, the pharmacist, or an outside call center about medication usage. There
are watches with alarms that can be programmed to signal the patient when it is time to take pills. Other electronic tools include a recordable talking alarm clock that reminds patients to take pills and an automated voicemail messaging system. Although some of these will require a technology skill set that not every patient may have, some are prerecorded or preprogrammed and require little action or skill to utilize. Together the nurse and the patient should determine which of these devices or tools are most beneficial and practical.

Assess Learning/Understanding

Accurately assessing understanding involves thoughtful communication with the patient. Patients will sometimes verbalize understanding when, in fact, their understanding may be minimal. It is important that an environment is created in which the patient feels comfortable talking and asking questions. Talk with the patient. Question the patient about what, when, how, and how often they need to take their medications. Listen to the patient’s responses. One of the best ways to assess learning of psychomotor skills is to have the patient demonstrate the skill. The goal is to accurately evaluate the patient’s understanding and ability to self-administer medications. Demonstrating professionalism and respect for the patient will encourage an open dialog and enhance communication.

Follow-Up

Regular follow-up has consistently been shown to be a part of a successful strategy to improve adherence. In addition, follow-up care provided to older adults by advanced practice nurses has been found to improve the quality of patient care and reduce health care costs significantly. As part of a model of transitional care, follow-up care by advanced practice nurses was found to result in reductions in preventable hospital readmissions, improved health outcomes, improved patient satisfaction, and reductions in health care costs. Even so, the critical need for patient follow-up has received insufficient attention in both the literature and in practice in past years. However, with the implementation of the Affordable Care Act, follow-up will play a pivotal role in reducing readmissions by improving medication adherence. It will be important to call the patient a few days after discharge from the hospital or after receiving an order for a new medication. The patient should be asked about taking the medication and understanding of instructions. Any misunderstanding should be clarified and barriers to adherence identified and resolved.

At every appointment thereafter, an adherence check should be conducted. The patient should be asked to bring in all their medications so that medication reconciliation can take place. Instead of asking “Are you taking your medications as prescribed?” more specific questions should be asked, such as “When do you take this medication? When was the last time you took it? How do you take it?” If it is determined that patients are not taking medications as prescribed, discover the reason(s) why. Information should be obtained about the patient’s life and resources. Are they employed? This may affect the time to, and ease of, taking medications. Do they have the resources, including finances and transportation, to obtain medications regularly? Are they experiencing undesirable side effects? It is important that all barriers to medication adherence be identified and resolved. Also, if adherence is found to be problematic, perhaps a nurse or other health care provider could provide home visits until adherence is improved. While obtaining this information, it is critical that the nurse communicates respectfully and professionally, taking care not to embarrass the patient or make the patient feel belittled or reprimanded.

CONCLUSIONS

The US health care system is becoming increasingly complex. Patients are being expected to do more of their own care at home and manage sometimes complicated medication regimens. In this environment, educating and communicating effectively with patients is crucial. In this article we have identified 8 simple and easy-to-implement interventions designed to improve medication adherence in the elderly patient with poor health literacy. Both poor health literacy and medication nonadherence are experienced disproportionately in this population. The ultimate goals of these interventions are to improve the ability of older adults to engage more effectively in self-care, reduce adverse health care outcomes that
result from medication nonadherence, and avoid the economic consequences of nonadherence. Nurses play a crucial role in achieving these goals and are pivotal in creating a culture in which patient empowerment and knowledgeable engagement with their health care is the standard.

References