Better Transitions: Improving Comprehension of Discharge Instructions

AMITA CHUGH, MARK V. WILLIAMS, JAMES GRIGSBY, AND ERIC A. COLEMAN

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SUMMARY • Discharge out of the hospital is a time of heightened vulnerability for our patients. The combination of shorter lengths of stay and increased clinical acuity results in increased complexity of discharge instructions and higher expectations for patients to perform challenging self-care activities. Yet, the amount of time and resources available for patient and family caregiver preparation prior to discharge has not significantly changed commensurate with these new demands. Inadequate health literacy and unrecognized cognitive impairment are two important contributing factors. In this article we discuss the effects of health literacy and cognitive impairment on patient comprehension of discharge instructions, how this may impact the frequency of adverse events after they leave the hospital, and likelihood of readmission, and offer an evidence-based prototype for how to address the problem.

Amita Chugh is a researcher in the Division of Health Care Policy and Research at the University of Colorado at Denver. Mark V. Williams, MD, FACP, is a professor of medicine and chief of the Division of Hospital Medicine at Northwestern University's Feinberg School of Medicine. James Grigsby, PhD, is a professor of psychology in the Division of Health Care Policy and Research at the University of Colorado at Denver. Eric A. Coleman, MD, MPH, is a professor of medicine in the Division of Health Care Policy and Research at the University of Colorado at Denver.

Clinical Vignettes

A 68-year-old retired auto mechanic is admitted for management of his heart failure. He had been discharged from the hospital just one week ago for treatment of this same condition. During the current hospitalization, the patient brought in a bag with all his pill bottles. The admitting physician noticed that all the bottles were full; it appeared the patient had not been taking his medications. The physician held up one of the pill bottles to show the patient and asked why had he not been taking his pills. The patient hesitated and then began to cry. He related how he had never learned to read and could not understand the instructions on the pill bottles. Widowed, he lived with his daughter who had been away on vacation when he was discharged from the hospital one week ago. This patient has limited health literacy.

An 80-year-old female retired school teacher has been seen four times in the past month in the emergency department for exacerbations of her heart failure. Two of these episodes required hospital readmission. The hospital care team often remarks that they are surprised how often she gets into trouble given that her heart failure is relatively mild and requires only modest intervention to correct the condition. When providing her with her discharge instructions, the patient is able to repeat back her instructions accurately and can tell the care team what she should do to avoid these exacerbations. However, she does not follow through with these instructions upon return to home. This patient has unrecognized impaired executive cognitive functioning.

Background

A patient's ability to understand and implement hospital discharge instructions is critical to recovery. It is a mistake for us to assume a patient has that ability, because there are many factors that may affect it. The large volume of information conveyed in a brief period of time alone presents a significant challenge. This is likely compounded by the influence of acute illness, inadequate sleep, and medication side effects. Inadequate health literacy and unrecognized cognitive impairment are two additional important contributing factors.

There are no standardized approaches to screening or intervention to assure adequate comprehension of discharge instructions. Healthcare professionals receive minimal formal training on communicating clear and concise discharge instructions tailored to the patient's learning ability. As a result, wide variations exist.

Definitions of Health Literacy and Executive Cognitive Function

Health literacy, according to the Institute of Medicine (2003), is "the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions." Health literacy may be deficient for any number of reasons, including limited education, cultural factors, impaired short-term (working) memory, impaired capacity for learning, and difficulty with language comprehension. The Institute of Medicine (2003) estimates that 90 million, or more than 47 percent, of U.S. adults have limited health literacy skills.

Cognition has three basic components: (1) working memory (i.e., short-term memory); (2) semantic learning (i.e., the processing and recall of new facts or

information); and (3) executive cognitive function (i.e., the capacity for behavioral self-regulation). Each of these functions may diminish as a person ages, either in association with mild cognitive impairment or as a function of neurological (e.g., stroke) or other medical illness.

Executive cognitive function involves complex activity, including planning, problem solving, anticipation of possible consequences of a course of action, initiation of activity, inhibition of irrelevant and inappropriate behavior, and the capacity to monitor the effectiveness of one's own behavior.[1] Deficits in executive cognitive function may affect a person's ability to manage his or her health. Studies suggest that about 30 percent of those over age 55 experience executive cognitive function impairment.[2]

How Do Cognition and Literacy Affect Knowledge of Discharge Instructions?

Misunderstanding of Discharge Instructions

Many of the problems with confusing discharge instructions can be blamed on the healthcare system or the individual practitioner. Multiple studies document that physicians' use of medical terms, combined with patients' limited health vocabulary, result in inadequate and even confusing communication.[3] While discharge instructions are commonly written at an 8-13 grade reading level, patients on average read at the 6th grade level.[4] Additionally, physicians and nurses overestimate patients' understanding of the post-discharge treatment plan. Though physicians believed that 89 percent of patients understood potential side effects of their medications, only 57 percent of patients reported that they understood. Similarly, physicians believed that 95 percent of patients understood when to resume normal activities, while only 58 percent of patients reported that they understood.[5] Nurses also overestimate their patients' understanding of post-discharge treatment plans.[6]

In one study, 23 percent of patients did not understand at least one part of their emergency department discharge instructions.[7] Among recently discharged patients, 54 percent did not recall being given specific self-care instructions.[8]

Effects of Low Literacy on Comprehension of Discharge Instructions

Health literacy problems include difficulty reading and interpreting medical instructions, medication labels, and appointment slips, and poor understanding of chronic conditions and accompanying management. Large studies have documented the barriers of inadequate and marginal health literacy, especially among older adults.[9] Patients with inadequate health literacy are more frequently hospitalized,[10] and have a poorer understanding of their illness.[11] A recent systematic review indicated that patients with low literacy had worse health outcomes, including increased morbidity, worse general health status, and increased subsequent use of health resources.[12]

Effects of Cognitive Impairment on Comprehension of Discharge Instructions

While many of the reported communication problems described in the preceding

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paragraph are attributed to inadequate health literacy, some may also be attributed to impairment of cognitive abilities. This impairment is sometimes the result of delirium. In one study of 1,000 patients aged 65 and older who were admitted to the hospital, 43 percent had cognitive impairment, including dementia and delirium, but clinicians only recognized impairment in 40 percent of them (study under review/personal communication with Malaz Boustani, MD, University of Indiana).

Older patients with Folstein Mini Mental State Examination (MMSE) scores of 24 or less were at risk for inability to perform tasks such as reading prescription labels, interpreting medication instructions, and differentiating tablet colors.[13] Individuals with moderate to severe cognitive impairment had the highest probability of at least one medication error when on a medication self-management program, regardless of the complexity of the medication regimen.[14] Compounding the problem is the fact that this impairment is not identified in a significant percentage of older adults.[15] Cognitive function is not routinely assessed with standardized instruments in hospitalized patients.

Execution of Discharge Instructions Is Not Solely Attributable to Literacy and Cognition

There are other reasons patients don't follow through on their discharge instructions. A patient's underlying motivation or sense of priority for the recommendations may also play a significant role. Nonetheless, if patients' capability to understand discharge instructions (i.e. their health literacy and cognitive function) is not addressed, then they may not have the opportunity to manage their illness and recovery appropriately.

Why Healthcare Executives Should Be Concerned

The business case for enhancing patients' comprehension of their discharge instructions is strengthening. This case largely builds upon the association between patients' lack of understanding of their instructions and the risk for hospital readmission. MedPAC recommended to Congress in its June 2007 report that hospitals publicly disclose their own risk-adjusted rehospitalization rates and "after a year or two, public disclosure could be complemented by a change in payment rates, so that hospitals with high risk-adjusted rates of readmission receive lower average per case payments."[16] In July 2008, the National Quality Forum adopted two hospital performance measures based on rate of rehospitalization and the Centers for Medicare and Medicaid Services (CMS) indicated an interest in making rehospitalization rate a measure for value-based hospital payment.[17] As described in Appendix A, ensuring patients' comprehension of their discharge instructions is integral to gaining hospital accreditation through the Joint Commission.

Recent national data on hospital satisfaction using the Hospital Care Quality Information from the Consumer Perspective survey indicate that discharge preparation is the lowest rated aspect of hospital care.[18] When patients report that they are not adequately prepared for post-hospital self-care activities as measured by the National Quality Forum endorsed Care Transitions Measure, they are signifi-

cantly more likely to return to the emergency department or be readmitted to the hospital.[19]

In addition to a potential adjustment to diagnosis related group based hospital reimbursement, other financial incentives for reducing hospital readmission are being considered. Policymakers recognize that a bundled approach to paying for the costs of acute and post-acute care could further incentivize better care coordination and help ensure that the discharge plan is executed.[20]

Understanding the Relationship Between Health Literacy and Cognition

A better understanding of the relationship between limited health literacy and impaired cognition is important when considering interventions to improve communication and comprehension. Depending on the nature and severity of cognitive deficit, healthcare providers may need to tailor the content and method of communication of discharge instructions and follow-up to the specific patient. For example, a process referred to as Teach-Back asks patients to recall and restate their discharge instructions immediately after they are given. While this approach may overcome problems associated with inadequate health literacy, it only assesses working memory and not semantic memory or executive cognitive function, and therefore may be ineffective with a cognitively impaired patient. Thus, concurrently evaluating hospitalized patients for deficits in health literacy as well as executive cognitive function may be necessary to most effectively tailor communication of discharge instructions.

Combining Literature Review with Expert Opinion

We developed our recommendations based on: (1) a review of the existing evidence from the literature and best practices; (2) individual interviews with national experts in the areas of health literacy, cognitive impairment, and hospital discharge; and (3) an interdisciplinary panel composed of national experts (Appendix B).

Literature Review

We conducted a comprehensive literature review on screening approaches and potential intervention strategies for addressing limited health literacy and/or impaired executive cognitive function in hospitalized patients, with a focus on comprehension of discharge instructions. We searched multiple databases including OVID, ERIC, CINAHL, The National Network of Libraries of Medicine bibliographies, AARP's AgeLine database, NIH's Current Bibliographies in Medicine, and Google Scholar. A web search was conducted to find information on screening practices and interventions.

Screening for Low Literacy

Formal screening tools used to determine health literacy are rarely employed outside of the context of a research study. Only two out of 30 pharmacies reported that they assessed patient's literacy needs.[21] One opinion attributes the lack of screening to the fact that minimal evidence exists on the benefits of health literacy screening. Another concern is the shame and alienation patients with low health literacy may experience when their deficits are exposed. The tools most commonly used to screen for health literacy levels were the Test of Functional Health Literacy in

Adults (TOFHLA), Short Test of Functional Health Literacy in Adults (STOFHLA), Rapid Estimate of Adult Literacy in Medicine (REALM), and Rapid Estimate of Adult Literacy in Medicine–Revised (REALM-R). Other tools used to assess health literacy levels included the Newest Vital Sign (NVS), a six-item test based on a nutrition information label.

A systematic review of studies examining discharge instructions found that providing instructions in both written and oral formats increased patient knowledge.

Screening for Cognitive Impairment

Relatively few articles examined screening hospitalized patients for cognitive impairment. In those that did, the Folstein Mini Mental Status Exam (MMSE) was the most commonly used tool. One team of authors noted, however, that the MMSE does not assess the cognitive aspects of compliance.[22] Another commonly used tool, the Clock Drawing test, which has patients draw the face of a clock, insert the numbers in the proper sequence and location, and then have the hands of the clock represent a specified time, was found to be useful in assessing executive cognitive function along with additional domains of cognition not examined by the MMSE.[23] In one review of studies which had used the Clock Drawing test, it was found to correlate highly with the MMSE, with the added benefits of being quick to administer and well tolerated by patients.[24] Another study developed a six-item screening tool, with the six items taken from MMSE. The six-item screen can be administered in one to two minutes and had a strong correlation with the full MMSE.[25]

Few studies gathered information on patients' cognitive status from family caregivers. One study suggested using a family questionnaire if a caregiver is present;[26] another developed the Public Health Center Cognitive Dysfunction Test (PHC-Cog), which includes a section to be completed by the family caregiver and is correlated with the MMSE.[27]

Screening for Concurrent Low Health Literacy and Cognitive Impairment

We found only one tool specifically developed to assess both literacy and cognition, the Regimen Adherence Capacity Test (RACT). It tests a patient's ability to read and comprehend medication bottles, manual dexterity to open bottles and take out pills, and ability to understand medication regimens (including memory, estimation of consequences, and judgment). This screening tool had a high correlation with MMSE.[28] One study also found that patients' performance on the STOFHLA correlated with measures of cognitive ability,[29] suggesting that this tool can be used to assess cognition as well as literacy.

Interventions for Low Health Literacy (Table 1)

The most common interventions to improve comprehension for patients with low health literacy provided print materials to patients. These interventions included rewriting materials using simpler language, using a more relevant organizational structure, and/or adding illustrations,[30] or providing the instructions in an audio/visual format.[31] A systematic review of studies examining discharge instructions found that providing instructions in both written and oral formats increased patient knowledge.[32] The use of illustrations was most often used to improve understanding of medication regimens, and included using computer programs to create a visual

Table 1: Interventions for Improving Comprehension Among Patients with Low Health Literacy and Impaired Cognitive Function

Target Population	Intervention
Low health literacy	Provide graphic instructions
	Provide instructions using a variety of media
	Use pictures to illustrate instructions
	Provide verbal and written instructions
	Teach-Back/check for understanding/simulations
	Engage patient in dialogue/face-to-face communication
	Implement follow-up telephone calls to reinforce instructions
	Tailor materials to individuals' strengths
	Make effective communication an organizational priority/promote organizational awareness of health literacy
	Focus print materials on patient action and level of motivation
	Check for patient understanding, then reframe instructions if needed
	Computerized assistant to reinforce discharge instructions
	Provide post visit services/support
	Implement Ask Me 3
	With appropriate provisions for privacy, include literacy levels in medical record to increase awareness among all providers
Impaired cognitive functioning	Evaluate cognitive status at admission
	Provide additional detailed counseling to family caregivers, paid and unpaid caregivers
	Involve social services from time of admission to explore whether patient may need to be in a more supervised care setting
Both low health literacy and impaired cognitive functioning	Involve family caregivers and schedule discharge instructions when they can be present
	Train interdisciplinary team in startegies to improve comprehension
	Simplify written materials and discharge instructions
	Redesign written instructions, including use of larger fonts, color
	Limit instructions to focus on essential information
	Restructure sequence of written instructions: put most important points first
	Provide an illustrated medication schedule
	Employ pharmacist based interventions for improving medication comprehension and adherence

image of a weekly medication schedule showing how much of each to take.[33]

Providing information verbally, including using the Teach-Back method or Ask Me 3, was also a common intervention, and found to improve adherence.[34] Ask Me 3 outlines three simple questions patients should ask their providers in every healthcare interaction: (1) What is my main problem? (2) What do I need to do? (3) Why is it important for me to do this? This approach empowers patients to take an active role in their health education. The Teach-Back method involves

having the patient demonstrate or repeat their discharge instructions as a way to assess understanding, ideally after first providing information verbally, and then, if needed after the Teach-Back is performed, reframing and repeating instructions.[35]

Technology has also been studied as an option to assist patients with low health literacy, including weekly automated phone calls with basic educational messages and/or questions that require touch-tone answers,[36] and an adaptive computer assistant.[37] These interventions still have many barriers, including IT logistics and the identification and training of healthcare staff.[38] Additionally, a comprehensive Cochrane review of telemedicine or telehealth interventions, including social alarms, electronic assistive devices, and telecare social alert platforms, found none that met criteria indicating sufficient evidence exists to support wide scale recommendation.[39]

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Merely recording the results of a literacy screening test in the patient's medical record can alert other members of the healthcare team of the need to modify the presentation of information. In one study, adding a note in medical records stating "your patient has undergone a screen and was found to have marginal or inadequate functional health literacy," resulted in physicians' use of more than three management strategies, including involving family members or friends, providing referrals to specialists, and using pictures and diagrams.[40] However, recording literacy levels often raises concerns for patient privacy and potentially for shaming patients.[41] As a result, several studies have looked at alternative ways to record this information. One site includes a field for "communication needs" on patient registration forms; another site uses red charts for patients with low health literacy.[42]

Several studies that looked at interventions employed a more systematic approach.[43] The Joint Commission recommends making effective communication an organizational priority, addressing patient communication needs across the continuum of care, and pursuing policy changes that promote improved practitioner-patient communication[44] (Appendix A).

Interventions for Cognitive Impairment (Table 1)

Two articles discussed interventions targeted toward helping patients with impaired cognitive functioning. One article offered tips including asking questions that only require a yes/no response, using gestures and modeling the desired behavior, and reducing competing environmental distractions.[45] Another article recommended activities such as reviewing and reinforcing teaching before and on day of discharge, involving family caregivers, and involving the entire interdisciplinary team in the discharge planning process.[46]

Interventions for Concurrent Low Health Literacy and Cognitive Impairment (Table 1)

No published articles simultaneously address low health literacy and impaired executive cognitive function. Suggested interventions were largely aimed at improving comprehension for all older patients, and as such, could potentially be adapted as a singular intervention for both patients with low health literacy and

those with impaired cognitive functioning. Several of these interventions were similar to the interventions used solely for patients with limited health literacy. These included using illustrations,[47] providing verbal instructions,[48] and using the Teach-Back method.[49] One study provided hospitalized patients an illustrated medication schedule and found that its subsequent use was highest among patients with low literacy or cognitive impairment.[50] In another study, patients given their discharge instructions with illustrations were 1.5 times more likely to correctly answer five out of ten comprehension questions than those given standard written instructions.[51] Verbal instructions also helped patients retain information. In one study, patients who received only verbal discharge instructions were more likely to recall receiving instruction than those who received written or written *and* verbal instructions.[52] Another study tested an intervention that involved providing patients with written standardized discharge instructions along with verbal education from a nurse; this method resulted in a 67 percent retention rate of instructions three days following discharge.[53]

Screening/Intervention Barriers

Although the benefits of literacy and cognition screening and interventions are apparent from the information presented above, there are still barriers to implementing these in practice. Many current interventions are too costly and are reactive rather than proactive (i.e., waiting for the patient to show up with a problem rather than addressing the potential for a problem before one actually occurs).[54] Additionally, one study reported that very few primary care physicians assess patient recall and comprehension of new concepts during outpatient visits;[55] another reported that few physicians attempt to assess patient understanding and less than 40 percent use Teach-Back.[56] When surveyed, clinicians reported barriers to implementing literacy interventions that included lack of time and resources, viewing interventions as a low priority, and lack of knowledge of interventions among the healthcare team.[57]

Expert Interviews

Methodology

Following the literature review, we interviewed academic, clinical, policy, and governmental leaders with expertise in hospital discharge, health literacy, cognitive impairment, adult learning, health information technology, and quality improvement (Appendix B). Thirteen 45-minute interviews were conducted. They consisted of eight structured questions along with open-ended questions that were based on information shared during the interviews. Our goals were to collect and utilize knowledge that is currently available, benefit from expert opinion, and explore best practices.

Preferred Tools to Screen for Limited Health Literacy

Few of those interviewed used or advocated for a specific tool to screen for limited health literacy. Among those who did, the most common tools recommended were the S-TOFHLA and REALM. Those who don't formally screen noted that it was more important to just be attentive and aware of the likelihood of limited health literacy. They emphasized the importance of using task-based approaches, such as a focused interview that reviewed discharge

instructions, asking the patient about their understanding of the illness/problem, or employing the Teach-Back method.

Many of the experts advocated against routine screening of adults for limited health literacy. Rather, they recommended taking a "universal precautions" approach to screening that assumes that most adults have some degree of impairment. A universal precautions approach would entail designing all materials for a low health literacy audience. Experts pointed to the value of simplifying discharge instructions and accompanying information, followed by tailoring information based on the patient's needs. None of the experts cited any instance when a patient complained that his or her instructions were too simple.

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Preferred Tools to Screen for Impaired Executive Cognitive Function

In screening for impaired executive cognitive function, the use of formal screening tools was more frequently recommended. Experts suggested the Clock Drawing test, the Mini-Cog test (the Clock Drawing test combined with a three-item recall test), and the MMSE test. As with screening for limited health literacy, many experts mentioned that they try to use assessments that bring the evaluation back to the task at hand, as with the Teach-Back method.

Tools Used to Screen for Limited Health Literacy and Cognitive Impairment

The Teach-Back method was also frequently mentioned as serving a dual purpose as a screen for health literacy and executive cognitive functioning. Similarly, it was noted that there is a linear relationship between performance on the MMSE and health literacy levels, which suggests that it may be possible to use this single screening tool to measure both attributes.

When Should Screening Occur?

Among experts who were in favor of screening patients, most recommended that screening take place shortly after admission in order to tailor communication throughout the course of the hospital stay (i.e., not limited to discharge communication). However, they noted that some patients might be so compromised by their acute illness and/or delirium that screening may need to be postponed. For this reason, many experts also recommended that discharge instructions be provided outside of the hospital setting (i.e., in the patient's home) following discharge.

Most experts recommended screening for executive cognitive functioning first, and either using the results to help interpret the results of the literacy screening, or, if there is a high level of executive cognitive impairment, to determine whether screening for limited health literacy is even necessary.

Who Should Screen?

There was no consensus on which healthcare professional should be responsible for screening hospitalized patients. Those most frequently mentioned were nurses, physicians, and discharge planners. Several experts pointed out that patients tend to prefer physicians to administer and interpret screening tests. More important than which healthcare professional should screen is that this individual be well trained and adopt a consistent and systematic approach.

What Should Be Done with the Results of Screening Tests?

There was no consensus about what to do with the results of a patient's health literacy and executive cognitive function screening. Some suggested storing the results would be useful, so they could be compared to subsequent screenings. Storing the results would also make it easier for other healthcare professionals to know the patient's health literacy levels and cognitive status.

Balancing the need to share screening tests and the risk of shaming low literacy patients has proven challenging. As literacy is less likely to fluctuate over time than cognition, referencing the result of screening tests in the patient's medical record may obviate the need to re-screen at each encounter. Many experts suggested ways to record the information from literacy screens that are less likely to invoke feelings of shame or concerns for privacy. For example, change the phrase "does the patient read?" to "what is the patient's Teach-Back ability?" or "what is the patient's preferred learning method?" Training clinicians on how to approach health literacy issues with sensitivity was also noted as being important. Additionally, results should only be recorded if something will be done with the information and if consistency and reproducibility are ensured during testing.

Preferred Interventions

A wide variety of interventions have been used to help patients with limited health literacy or impaired executive cognitive functioning understand their discharge instructions (see Table 1). Examples include repetition of instructions, post-discharge follow up and reminders, and the use of a computerized assistant that calls patients at home after discharge and asks questions, and can trigger an alert if human interaction is needed. Other examples included simplifying written materials by using common language, using larger fonts, including diagrams and pictures, tailoring information to the patient's learning strengths, and paying attention to how information is organized. However, the experts interviewed acknowledged that not all information can be simplified.

Many experts also used Teach-Back as both a screening approach and an intervention. However, it was pointed out that if the patient has cognitive impairment, Teach-Back may not be an effective intervention as these patients can potentially be able to restate their results, but not be able to remember at a later time or may remember but fail to execute the task. Concurrently providing discharge instructions to a patient's family caregiver was mentioned, with the caveat that sometimes it may be necessary to assess the health literacy levels and cognitive status of the caregiver. Healthcare professionals should not just assume that they understand what role a family member plays in the patient's care. One way to gain insight into the family caregiver's role is to ask "are you the person who is going to provide most of the care for this patient?" If the family member answers yes, follow up with "have you done it for a while?"

Many recommended interventions focused specifically on medication management. One of the more intensive of these has two parts. First, the patient meets with a pharmacist who has received results of the patient's S-TOFHLA and Mini-Cog tests, as well as information on the patient's age and primary language. The second part is then tailored to the

patient's health literacy and cognitive ability and could include the use of Teach-Back, simplified language, an illustrated schedule of the patient's medication regimen, and a follow-up phone call by a pharmacist. In addition, the patient may be given a sample medication organizer (i.e., a pill box), and be given time to practice filling it.

Another suggested intervention focused on increasing the patient's knowledge of warning signs and symptoms. This intervention starts early in the patient's hospital stay and involves having him or her list four key symptoms that would warrant a telephone call to the physician. Having the patient repeat this list every day while in the hospital increases patient's recall and retention of the warning signs and symptoms.

Barriers to Screening and Intervention (Table 2)

Barriers to routine screening occur at multiple levels. At the institutional level, overcoming resistance, lack of time and financial resources, training the health-care team members to administer the intervention, and gaining the support of administrators, providers, and patients were among the barriers cited. At the clinician level, a common barrier is the lack of time to administer tests and the need for training to ensure consistency in the administration, interpretation, and response to the results of testing. At the patient level, the primary barrier cited was overcoming the patients' resistance to testing that may identify weaknesses and the accompanying potential to be stigmatized.

Table 2: Barriers to Implementing Screening and Interventions

Time/perception of lack of time
Uncertainty about what to do with positive screening results
Provider/physician buy-in
Lack of education and training for providers
Cost of screening and implementation
Risk for causing patient shame
Lack of consensus for which clinician should screen and/or perform the intervention
Patient/family resistance

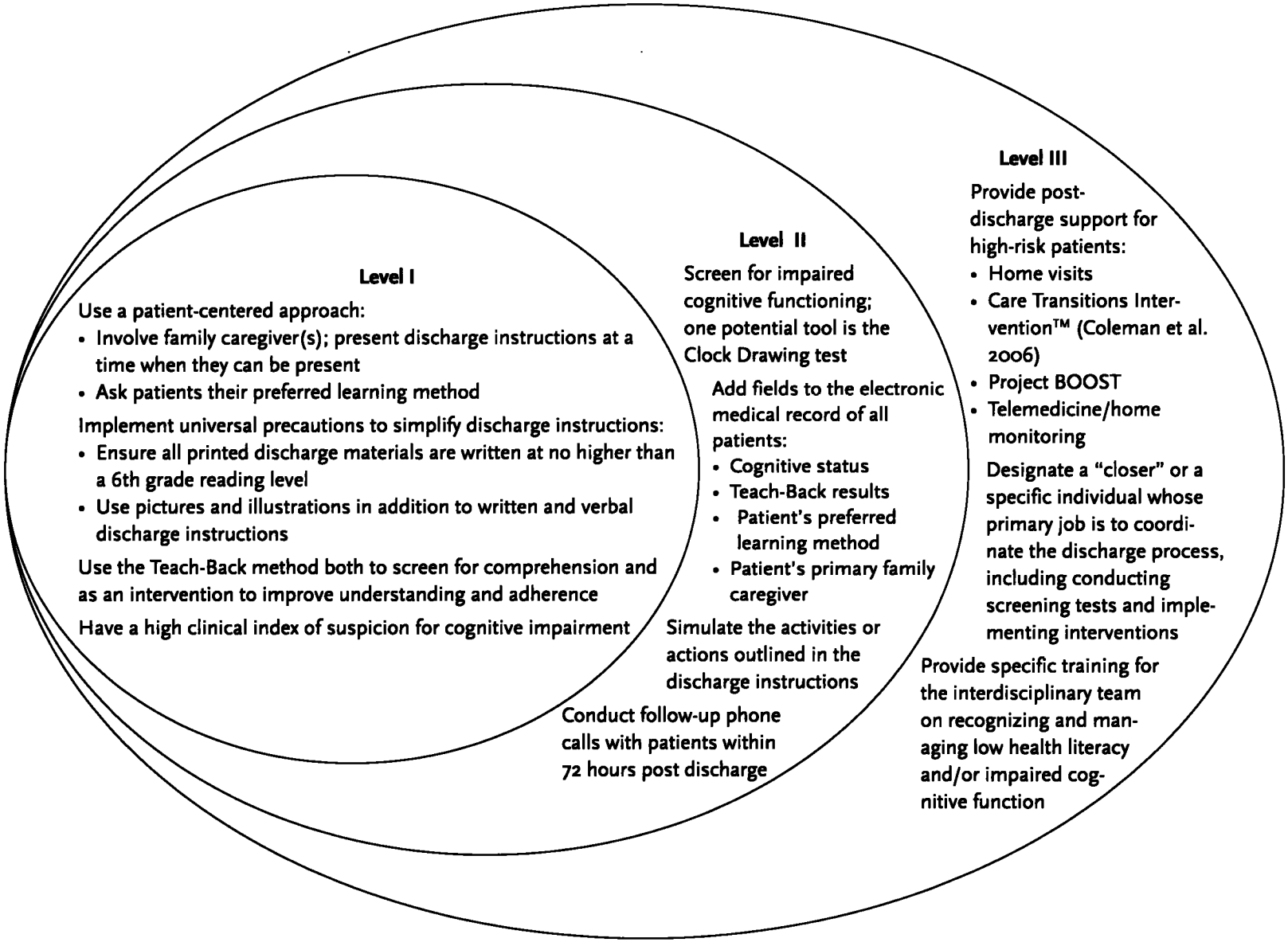
Implications of Findings/Next Steps

The information and suggestions collected through the literature review and expert interviews point to several important gaps in the current evidence with respect to the ideal approach to ensuring comprehension of discharge instructions in patients with limited health literacy or impaired cognitive function. The experts uniformly upheld that patients and their family caregivers would benefit from greater understanding of how to take their medications, knowing and being able to recognize important warning signs, and having a firm comprehension of their post-discharge follow-up plan. Many of these experts are practicing clinicians and made recommendations based on their experiences with patients. The project team recognized that these "real world" experiences could be combined with the currently available evidence and known best practices to create a prototype screening and intervention approach.

Proposed Prototype for Screening and Intervention

Our proposed prototype of screening and intervention steps is outlined in Figure 1. We recognize that the evidence base for all components of this approach remains

FIGURE 1



incomplete, but it represents the current state of the science. This three-tiered approach is designed to allow hospitals and healthcare systems to implement approaches to screening and intervention in a step-wise fashion, commensurate with the level of resources and expertise they have available.

In order to improve comprehension of discharge instructions for older patients with limited health literacy and impaired executive functioning, we recommend that all hospitals and health systems implement several fundamental steps, and have incorporated these as Level I of the model depicted in Figure 1. Within Level I, we recommend that all systems implement a "universal precautions" approach and take steps to simplifying discharge instructions. This can be done through modifying written instructions so they do not exceed a 6th grade reading level, using a larger font size, using icons, pictures or cartoons instead of or in addition to written instructions, and providing verbal instructions translated into lay-person terms.

Within Level I, we also recommend taking a patient-centered approach to the discharge process. This includes involving family caregivers (when available), and scheduling the time for preparing the patient for discharge when the family caregivers can be present. As described earlier, it is important to identify what roles the family caregiver plays and with what frequency or intensity. Further, clinicians should not assume that the family caregiver does not have limited health literacy or impaired cognitive function. This patient-centered approach also includes asking patients their preferred learning approaches and tailoring their discharge instructions accordingly.

In keeping with the current state of the science, we do not recommend formal screening for health literacy per se. Rather, we recommend the use of Teach-Back as both a screening tool and an intervention. In contrast, we do recommend (within Level II) screening patients for executive cognitive functioning levels. Although no screening tool is ideal, we recommend using the Clock Drawing test. This tool is relatively quick, inexpensive, and correlates with more rigorous testing. It also is acceptable to patients, and is already familiar to many healthcare professionals. This test does have a number of scoring systems available, and we have had successful field experience with the method developed by Mendez et al.[58]

Level II of the prototype proposes approaches for healthcare systems that have implemented the steps in Level I and are ready to make the commitment of additional resources. We recommend having patients practice the self-care instructions and medication administration. For Level II we also recommend calling patients within 72 hours after discharge, and adding fields to electronic medical records to ensure the transfer of key information. These additional fields might include the patient's cognitive status, or the results of their Clock Drawing test and Teach-Back tests, the patient's preferred learning method, and the patient's primary caregiver.

In Level III of the model, we suggest interventions for hospitals and health systems that are able to exceed the recommendations of Levels I and II and strive to become national leaders in ensuring comprehension of discharge instructions. At this level, we recommend providing specific training for an interdisciplinary team on recognizing and managing low health

literacy and/or impaired cognitive functioning. In addition, we recommend designating a "closer," a specific individual who is an integral member of the care team, has advanced training in optimizing adult learning, and whose primary job is to coordinate the discharge process, including conducting the screening tests, implementing the interventions, and making follow-up phone calls. The "closer" would work with the primary ward team (hospitalist and nurse) to translate and/or customize their instructions for the patient, thus "off-loading" this task from an already busy ward team.

We also recommend more intensive post-discharge support for high-risk patients. This support could include telemedicine and telephonic reminder/cueing systems, or coaching patients and family caregivers to assert a more active role in their care through the Care Transitions Intervention (www.caretransitions.org). The Care Transitions Intervention is a low-cost, low-intensity, evidence-based model adopted by over 135 of the nation's leading healthcare organizations. Findings from rigorous randomized controlled trials have demonstrated that this model reduces re-hospitalization during the 30 days of coaching, and has a sustained effect as far as six months after the intervention.[59] Hospitals may wish to learn from Project BOOST (Better Outcomes for Older adults through Safe Transitions—www.hospitalmedicine.org/BOOST), which aims to improve the care of patients as they transition from the hospital to home. Project BOOST has created a "toolkit" for quality improvement based on best practices, provides technical support to hospitals implementing the toolkit, and provides mentoring to promote long-term sustainability.

Appendix A: Current Hospital Requirements

2009 Joint Commission National Patient Safety Goals

Requirement NPSG.02.05.01
The [organization] implements a standardized approach to hand-off communications, including an opportunity to ask and respond to questions.

Elements of Performance for NPSG.02.05.01

1. The hospital's process for effective hand-off communication includes the following: Interactive communication that allows for the opportunity for questioning between the giver and receiver of patient information.
2. The hospital's process for effective hand-off communication includes the following: Up-to-date information regarding the patient's condition, care, treatment, medications, services, and any recent or anticipated changes.
3. The hospital's process for effective hand-off communication includes the following: A method to verify the received information, including repeat-back or read-back techniques.

Requirement NPSG.08.03.01
When a [patient] leaves the [organization]'s care, a complete and reconciled list of the [patient]'s medications is provided directly to the [patient] and, as needed, the family, and the list is explained to the [patient] and/or family.

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Centers for Medicare & Medicaid Services, Hospital Conditions of Participation

Sec. 482.43 Condition of participation: Discharge planning.
The hospital must have in effect a discharge planning process that applies to all patients. The hospital's policies and procedures must be specified in writing.

(a) Standard: Identification of patients in need of discharge planning. The hospital must identify at an early stage of hospitalization all patients who are likely to suffer adverse health consequences upon discharge if there is no adequate discharge planning.
(b) Standard: Discharge planning evaluation.
The hospital must provide a discharge planning evaluation to the patients identified in paragraph (a) of this section, and to other patients upon the patient's request, the request of a person acting on the patient's behalf, or the request of the physician.
A registered nurse, social worker, or other appropriately qualified personnel must develop, or supervise the development of, the evaluation.

Discharge Planning Requirements of the Medicare Statute (2005)

1e. (acute care hospital setting)
Discussion of Post-hospital Needs—
Before leaving the hospital, it is important to make sure that the hospital has discussed with the beneficiary and his or her family member(s) all post-hospital care needs and that a post-hospital plan of care and services has been developed before discharge. Particular vigilance is necessary to ascertain whether the patient's discharge plan identifies the services that are needed and how those services will be provided. Beneficiaries should also request assistance in assuring that necessary services are put in place prior to discharge.

Appendix B: Expert Sources

Phone Interviewees

Malaz A. Boustani, MD, MPH; Indiana University; Regenstrief Institute, Inc.
Christopher M. Callahan, MD; Indiana University; Regenstrief Institute, Inc.
Joshua Chodosh, MD, MSHS; UCLA School of Medicine
James Grigsby, PhD.; University of Colorado at Denver
S. Nicole Hastings, MD, MHS; Durham VA Medical Center; Duke University Medical Center
Sunil Kripalani, MD, MSc; Vanderbilt University School of Medicine
Carol Levine; Families and Health Care Project; United Hospital Fund
Lee Lindquist, MD, MPH; Northwestern University Feinberg School of Medicine
Aanand D. Naik, MD; Baylor College of Medicine
Gail A. Nielsen; Clinical Performance Improvement; Iowa Heath System
Michael Paasche-Orlow, MD, MPH; Boston University School of Medicine
Rebecca Sudore, MD; University of California, San Francisco
Mark V. Williams, MD, FACP; Northwestern University Feinberg School of Medicine

Expert Panelists

Peg Bradke, MA, RN; Heart Care Services, St. Luke's Hospital
Christopher M. Callahan, MD; Indiana University; Regenstrief Institute, Inc.

James Grigsby, PhD.; University of Colorado at Denver
Sunil Kripalani, MD, MSc; Vanderbilt University School of Medicine
Lee Lindquist, MD, MPH; Northwestern University Feinberg School of Medicine
Pam Mitzner RN, BSN; Department of Discharge Planning, Centura Health Penrose Hospital
Ariella Peist; United Hospital Fund
Jean Range; The Joint Commission
Mark V. Williams, MD, FACP; Northwestern University Feinberg School of Medicine

End Notes

1. Fuster 1997; Goldberg and Bilder 1985; Goldman-Rakic 1984; Goldman-Rakic 1987; Luria 1966; Luria 1980; Prigitano and Schachter 1991; Stuss and Benson 1986
2. Albert and Kaplan 1980; Goldberg and Bilder 1985; Grigsby et al. 2002a; Grigsby et al. 2002b; Grigsby, Kaye, and Robbins 1992; Hochanadel and Kaplan 1984; Libon et al. 1994; Libon and Goldberg 1990; Mittenberg et al. 1989; Robbins et al. 1998; Uchiyama et al. 1994; Veroff 1980; West 1999; Whelihan and Lescher 1985; Daigneault, Braun, and Whitaker 1992
3. Centers for Disease Control and Prevention 1990; Davis et al. 2001; Gibbs, Gibbs, and Henrich 1987; Mayeaux, Jr. et al. 1996; Samora, Saunders, and Larson 1961
4. Powers 1988; Spandorfer et al. 1995; Williams, Counselman, and Caggiano 1996
5. Calkins et al. 1997
6. Reiley et al. 1996
7. Spandorfer, Karras, Hughes, and Caputo 1995
8. Flacker, Park, and Sims 2007a
9. Gazmararian et al. 1999; Williams et al. 1995
10. Baker et al. 1998; Baker et al. 2002
11. Williams et al. 1998a; Williams et al. 1998b
12. Dewalt et al. 2004
13. Ruscin and Semla 1996
14. Maddigan et al. 2003
15. Chiovenda, Vincentelli, and Alegiani 2002; Gehi et al. 1980; Newman 1997
16. Medicare Payment Advisory Commission 2007
17. Department of Health and Human Services and Centers for Medicare and Medicaid Services 2008
18. Department of Health and Human Services and Centers for Medicare and Medicaid Services 2008
19. Coleman, Mahoney, and Parry 2005; Parry et al. 2008
20. Medicare Payment Advisory Commission 2008; National Quality Forum 2003; Davis 2008
21. Praska et al. 2005
22. Fitten et al. 1995
23. Juby, Tench, and Baker 2002
24. Shulman 2000
25. Callahan et al. 2002
26. Mezey and Maslow 2007
27. Park et al. 2005
28. Fitten, Coleman, Siembieda, Yu, and Ganzell 1995
29. Baker et al. 2008
30. Hayes 1998; Jolly, Scott, and Sanford 1995; Lichterman, Simpson, and Rothschild 2007; Paasche-Orlow et al. 2006; Williams et al. 2002; Wynia and Matiasek 2006
31. Pignone et al. 1920; TenHave et al. 1997
32. Johnson, Sandford, and Tyndall 2003
33. Wynia and Matiasek 2006
34. Davis et al. 2006; Paasche-Orlow, Schillinger, Greene, and Wagner 2006; Pignone, Dewalt, Sheridan, Berkman, and Lohr 1920; Wynia and Matiasek 2006
35. Schillinger et al. 2003
36. Commonwealth Fund 2008; Wynia and Matiasek 2006
37. Blanson Henkemans et al. 2008
38. Commonwealth Fund 2008
39. Martin et al. 2008
40. Seligman et al. 1920
41. Parikh et al. 1996; Wolf et al. 2007
42. Wynia and Matiasek 2006
43. Institute of Medicine Committee on Health Literacy 2003
44. Joint Commission 2007
45. Frazier-Rios and Zembrzuski 2007
46. Dellasega and Shellenbarger 1992
47. Austin et al. 1995; Kripalani et al. 2007
48. Flacker, Park, and Sims 2007b; Johnson, Sandford, and Tyndall 2003; Lee and Bokovoy 2005
49. Baker, Wolf, Feinglass, and Thompson 2008

50. Kripalani et al. 2007
51. Austin, Matlack, Dunn, Kesler, and Brown 1995
52. Flacker, Park, and Sims 2007b
53. Lee and Bokovoy 2005
54. Commonwealth Fund 2008
55. Schillinger et al. 2003
56. Schwartzberg et al. 2007
57. Barrett, Sheen Puryear, and Westpheling 2008
58. Mendez, Ala, and Underwood 1992
59. Coleman et al. 2006

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