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Health Literacy and the Patient With Heart Failure—Implications for Patient Care and Research: A Consensus Statement of the Heart Failure Society of America

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Abstract

Background—Low health literacy compromises patient safety, quality health care, and desired health outcomes. Specifically, low health literacy is associated with decreased knowledge of one's medical condition, poor medication recall, nonadherence to treatment plans, poor self-care behaviors, compromised physical and mental health, greater risk of hospitalization, and increased mortality.

Methods—The health literacy literature was reviewed for: definitions, scope, risk factors, assessment, impact on health outcomes (cardiovascular disease and heart failure), and interventions. Implications for future research and for clinical practice to address health literacy in heart failure patients were summarized.

Results—General health literacy principles should be applied to patients with heart failure, similar to others with chronic conditions. Clinicians treating patients with heart failure should address health literacy using five steps: recognize the consequences of low health literacy, screen patients at risk, document literacy levels and learning preferences, and integrate effective strategies to enhance patients' understanding into practice.

Conclusion—Although the literature specifically addressing low health literacy in patients with heart failure is limited, it is consistent with the larger body of health literacy evidence. Timely

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recognition of low health literacy combined with tailored interventions should be integrated into clinical practice.

Keywords

Heart failure; health literacy; communication; self-care

Acknowledgement of the impact of health literacy on health care has steadily increased since the 1990s.[1] Patient safety, quality health care, and desired health outcomes depend on clear communication between health care professionals and their patients and families. When health literacy is low, communication is compromised, safety is at risk, and optimal care is not achieved.

Low health literacy specifically compromises education about self-care skills that are essential for patients with chronic disease to achieve desired outcomes.[2,3] Heart failure practice guidelines from the Heart Failure Society of America and the American College of Cardiology and the American Heart Association recommend that patient education about self-care measures be part of heart failure disease management programs.[4–6] Regulatory agencies mandate such education be performed and documented for hospitalized patients.[2,3,7] Understanding and applying principles of health literacy as it relates to heart failure patients should optimize educational efforts.

Despite the important implications of low health literacy, health care providers are often unaware of literacy problems in their patients.[8] Many health care providers overestimate patients' understanding of health information, and few recommend appropriate educational strategies. In a recent survey of Heart Failure Society of America members, 58% of providers stated that health literacy was a "small problem" among their patients,[9] though statistics show otherwise.[10–13]

For these reasons, the Nursing Committee of the Heart Failure Society of America formed a working group to identify and evaluate current issues related to health literacy in patients with heart failure. During this meeting, a consensus statement on health literacy was drafted and submitted to the Education Committee and Executive Council for review and approval. This article provides a summary of the key issues that were discussed and includes a description of key concepts about health literacy; research on the impact of low health literacy on patients with cardiovascular disease, including heart failure; areas in which more research is needed and suggestions for future research; and clinical implications to improve care of patients with low health literacy including a 5-step approach to low health literacy from recognition to education.

Health Literacy: Definition and Scope

Health literacy 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.[2] Health literacy encompasses more than the ability to read written materials; it also means understanding the information in order to actively participate in managing health. People with average and proficient general literacy may have low health literacy because of the stressful environment in which health care communication frequently occurs and because of the use of medical jargon and terminology that is often foreign and confusing to patients. Health literacy ultimately includes the ability to: comprehend complex vocabulary, share personal information with health care providers, make decisions about healthy lifestyle habits, and participate in self care and chronic disease management while navigating a complex health care system.

According to the most recent National Assessment of Adult Literacy, there are approximately 30 to 34 million adults in the United States in the lowest of 4 levels of health literacy (*below basic*, *basic*, *intermediate*, and *proficient*), including 4 million adults with a language barrier.[14] The 30 million Americans at *below basic* literacy level are only able to do simple and concrete literacy tasks. The 63 million at the *basic* literacy level are only able to read and understand short and commonplace texts. Among adults age 65 and older, 59% are at the *below basic* or *basic* levels of health literacy.[14] Only 12% of the 228 million adults in the United States have the skills to manage their own health care proficiently.[15]

A systematic review of US studies examining the prevalence of health literacy concluded that approximately 50% of the total subjects had low health literacy.[16] More than one-third of respondents to a survey of Medicare enrollees, many with chronic conditions including heart failure, had inadequate or marginal health literacy.[10,16] A study of patients at 2 urban, public hospitals showed that more than one third were unable to read and comprehend basic health-related teaching materials.[11]

Low health literacy has been reported in 27% to 54% of patients with heart failure.[10–13] A cross-sectional study in primary care in the northeastern United States showed more than one quarter of diabetic adults with heart failure have limited health literacy.[11] Although these numbers are moderately high, an accurate percentage of patients that have low health literacy is difficult to gauge because of varying definitions and measurements of health literacy across studies.

Health Literacy and Its Impact on Health Outcomes

Such factors as patient knowledge about health outcomes and services, comprehension of medical information, risk of hospitalization, and overall health status by self-report are important when managing chronic heart failure. Dewalt et al[17] conducted a meta-analysis across 7 databases (1980 to 2003) and concluded that “low literacy is associated with several adverse health outcomes,” including increased risk of hospitalization and lack of knowledge about health services. In a study of Medicare patients, Baker et al[18] reported a higher risk of hospitalization (31.5% versus 14.9%, $P < .001$) among those who had low functional health literacy. Patients with lower literacy were more likely to self-report fair or poor health status compared with patients with higher literacy (43% versus 20%).[17] Three of 4 cross-sectional studies showed an association between low reading ability and diminished global health status. In one, global health status was ranked by 3260 Medicare patients as excellent, good, fair, or poor. Using bivariate comparison, patients with lower literacy were more likely to self-report fair or poor health compared with patients with higher literacy (43% versus 20%).[17]

Wolf et al[19] examined 2923 Medicare patients in a cross-sectional survey to evaluate the association between health literacy, self-reported physical and mental health functioning, and health-related activity limitations. Outcome measures included scores on the physical and mental health functioning subscales of the Medical Outcomes Study 36-Item Short-Form Health Survey. Individuals with low health literacy had worse physical (67.7 versus 78.0, $P < .001$) and mental health (76.2 versus 84.0, $P < .001$) compared with patients with adequate literacy and significantly higher rates of hypertension, diabetes mellitus, heart failure, and arthritis.

Baker et al[20] designed a prospective cohort study of 3260 Medicare-managed patients to examine the relationship between health literacy and mortality and determine whether low literacy independently predicted overall and cause-specific mortality. In-home interviews were conducted. Deaths were monitored between 1997 and 2003 through the National Death

Index database. The average follow-up was 67.8 months. Sixty-four percent had adequate health literacy, 11% had marginal health literacy, and 25% had inadequate health literacy. Individuals with inadequate health literacy and marginal health literacy were more likely to die during follow-up than those with adequate literacy. Crude mortality rates were 39.4%, 28.7%, and 18.9%, respectively ($P < .001$). Risk adjusted rates of cardiovascular mortality were markedly higher among inadequate and marginal health literacy participants.

Sudore et al[21] also studied limited general literacy and mortality in a 5-year prospective study among 2512 community-dwelling elders. Literacy was assessed as limited or adequate. Limited health literacy remained an independent predictor of mortality even after adjusting for demographics and socioeconomic status, comorbid conditions, self-rated health status, health-related behaviors, health care access measures, and psychosocial status (HR 1.75; 95% CI 1.27–2.41).

Management of chronic diseases, including heart failure, requires a high level of self-care skills.[1] One important self-care skill is medication adherence. Davis et al[22] examined adult patients visiting primary care clinics to evaluate their ability to correctly interpret commonly used prescription medication warning labels. Patients with low literacy were more than 3 times less likely to interpret medication warning labels correctly (95% CI 2.3–4.9). All literacy levels had a better understanding of warning labels that contained single-step versus multiple-step instructions.[22] Another study by Davis et al showed that low and marginal literacy were significantly associated with misunderstanding medication labels, with only 35% of those with low literacy able to indicate correctly how many pills need to be taken daily.[23] Other studies reinforce the connection between low literacy and incorrect medication use.[24–26]

In summary, limited health literacy is associated with decreased knowledge of one's medical condition,[27–32] poor medication recall,[33] nonadherence to treatment plans,[27,29] poor self-care behaviors,[27,28,34] poorer physical and mental health,[19,35] increased hospitalizations,[18,36] and increased mortality.[20,21] People who read at low levels are 1.5 to 3 times more likely to have adverse health outcomes compared with people who read at higher levels.[17]

Health Literacy Interventions in Heart Failure: A Review of the Literature

A review of the literature identified three interventional studies on health literacy in the heart failure population. One single-center study performed by Murray et al[37] randomized 314 low-income patients with heart failure to receive usual care versus a 9-month multifaceted intervention designed for patients with low literacy. The intervention included support from an individual pharmacist, in-person verbal instructions, written materials developed for patients with low literacy, and therapeutic monitoring and communication with patients' providers.[38] Adherence was measured through the use of electronic monitoring prescription container lids, patient self-report, and medication refill history. Methods used to determine subjects' health literacy were not disclosed. The intervention group had greater medication adherence than the usual care group; however, after the 3-month intervention stopped, medication adherence decreased. In addition, the intervention group had significantly fewer emergency room visits, hospitalizations, lower direct costs, and greater patient satisfaction than the patients in the usual care group.

DeWalt et al[13] developed a 12-month intervention that provided practical self-management instructions to manage fluid volume status in patients with heart failure. The intervention was targeted toward patients with low literacy and consisted of the use of educational materials that were written at a third-grade level. Patients also received follow-up phone calls from a clinician to monitor their progress and answer any questions. Of 127 patients,

41% with low-literacy skills were randomized to receive the intervention or usual care. The intervention group did not show a significant decrease in hospitalizations or mortality, although the study was powered to detect a difference only in the primary outcome, quality of life. The intervention group did show a significant improvement compared with the usual care group in heart failure knowledge (12%, $P < .001$), self-efficacy score (2 points, $P = .0026$) and self-care behavior (79% versus 29%, $P < .001$). There was no significant difference in quality of life, as measured on the Minnesota Living with Heart Failure Questionnaire between the groups.

A study by Smith et al[39] used a disease management approach to improve self-care in patients with heart failure. The intervention included a comprehensive, standardized program, including education, telephone follow-up, and tools for self care including a weighing scale, blood pressure cuff, and pulse oximetry. This study focused on improving all aspects of self-care, including medication management, dietary adherence, symptom management, and self-monitoring skills. The intervention group had lower all-cause mortality and hospitalizations when compared with the usual care group, but on performing a secondary analysis comparing patients with low and high educational attainment, no difference in morbidity and mortality outcomes was found. However, sodium intake differed significantly by education ($P = .04$), with the largest drop (−838 mg/day) observed in the least-educated group. This suggests that patients with lower education benefited from the intervention by increasing self-care skills.

Studies of health literacy, including those focusing on heart failure, are often multifaceted interventions involving care and follow-up from providers trained in disease management and self-care education. Many require additional resource allocation, including equipment, medications, and transportation. This makes it difficult to compare studies and confounds interpretation of results and subsequent application. In addition, literacy or health literacy is measured differently in different studies, making comparisons difficult.

Interventions tailored to meet the needs of a low literacy population affect outcomes, including: symptom monitoring and management, perceived knowledge, quality of life, mortality, and hospitalizations. However, intervention trials related to heart failure and health literacy are small and limited. Many questions remain as to which specific educational strategies best serve particular patient groups with low health literacy and heart failure.

Implications for Research

The concept of health literacy appeared in the health care literature in the 1990s and has since become a prevailing issue. Credentialing entities and major national organizations have challenged the existing delivery of health information between health care providers and the patients they care for. Research on health literacy indicates that low literacy has an impact on such things as quality of life, hospitalization rates, and mortality rates. Yet there is limited research examining the impact of low health literacy in the heart failure patient population. A review of the few studies on health literacy and heart failure lead to several needed areas for research.

Outcomes

- Evaluate the effects of low health literacy in patients with heart failure regarding medication and warning label comprehension.
- Assess the impact of low health literacy on knowledge concerning health outcomes and services of patients with heart failure.

- Refine tools to identify patients with heart failure and inadequate health literacy.
- Examine characteristics of patients with heart failure most vulnerable to low or marginal health literacy (ie, education level, employment, income).
- Determine the effect of low health literacy on adherence and self-care measures in patients with heart failure.
- Analyze morbidity, mortality, and cost of low health literacy in patients with heart failure.

Interventions

- Evaluate the effects of individual interventions, such as social support, patient follow-up, disease management, and educational tools, on patients with heart failure who have low health literacy.
- Evaluate the impact of strategies on health care outcomes (eg, morbidity, mortality, cost, self-care, symptom management) and health care costs.
- Examine efficiency and effectiveness of various strategies to train health care professionals to provide health care education to patients with various health literacy needs.

Implications for Clinical Practice

Despite the paucity of research of health literacy in heart failure patients, available reports support the idea that patients who cannot understand health care instructions have difficulty adhering to health care regimens and accessing needed health care services.[12,24,25] Among providers who recognize the importance of health literacy, few feel equipped to deal with this problem.[1] Yet it is increasingly important for providers caring for patients with heart failure to recognize and respond to health literacy problems in their patients because of numerous and often complex therapies and the need for engagement in self-care activities among patients with chronic heart failure. This includes increasing health care providers' understanding and awareness of low and marginal health literacy through the use of existing agencies and organizations who understand health literacy. (Appendix 1). Low health literacy may be a proxy for other factors such as cognitive impairment, severity of chronic illnesses, socioeconomic characteristics, and other barriers to good health care that are associated with poor outcomes.[20,21] Low educational level, unemployment, and lack of adequate health insurance are among the factors of which practitioners must be aware. Because current research indicates that up to 45% of chronic heart failure patients incur mild to severe memory and learning deficits secondary to reduced cerebral blood flow,[40] it may be necessary to do some neuropsychological screening to adequately assess patients' health literacy level.

Practitioners must put aside personal biases about health literacy and concerns about time limitations in order to make a concerted effort to deal with health literacy issues in the usual flow of patient care. Clinical practice settings need to identify a core of leaders who understand health literacy and have the ability to apply strategies to combat the problems low health literacy creates. These leaders need to foster a multidisciplinary approach that focuses on health literacy in both the hospital and outpatient settings, including medication instruction and information about diagnostic testing. Strategies that minimize or address barriers in self-care that are related to low health literacy are of utmost importance. Carefully designed self-management interventions targeting self-efficacy, which is the perception that one is capable of influencing events that affect one's health and life, may be effective in populations with low health literacy. Clinicians can work to involve patients in

their own care and guide them in actively learning about the disease and exploring their feelings about having the disease. Teaching patients the skills necessary to adjust their behaviors can help them improve self-care and promote positive health outcomes.

A novel "situation-specific" theory of heart failure self-care has recently been proposed that may serve as a guide for clinical care.[41] It is based on the concept that patients with heart failure balance self-care *maintenance* (behaviors to maintain physiologic stability) with self-care *management* (decisions based on symptoms) with the degree of self-care *confidence* influencing the entire process. The theory focuses on 4 principles: "(1) symptom recognition is the key to successful self-care management; (2) self-care is better in patients with more knowledge, skill, experience, and compatible values; (3) confidence moderates the relationship between self-care and outcomes; and (4) confidence mediates the relationship between self-care and outcomes." In related research, when patients with heart failure were surveyed regarding their perceived learning needs after hospital discharge, they indicated that signs, symptoms, and medications were more important than learning about diet, activity, and psychological factors.[42] These factors need to be considered when creating and evaluating heath education materials specific to heart failure care. Likewise, health care providers need to evaluate patients' preferred methods of learning, which include language preference and preference for verbal, written, or hands-on communication.

Ongoing patient feedback that is clearly communicated is essential to facilitate self-care and care in general.[43] Because patients with reading problems often are ashamed and embarrassed, they hide their inability to read, even from spouses and children and especially from health care providers.[44] Most patients with low literacy would appreciate assistance from their health care provider in understanding medical terms.[45] In addition to understanding the complexities of self-care and communicating clearly, it helps if the clinician has a plan to address issues of low health literacy in patients with heart failure.

Five Steps for Health Care Providers to Address Low Health Literacy

Step 1: Recognize that health literacy is real and may compromise patient care.

Step 2: Identify patients at risk for low health literacy.

Step 3: Screen patients who are at risk.

Step 4: Document learning preferences in patient records.

Step 5: Integrate strategies to facilitate health education.

Step 1: Recognize Health Literacy

All practitioners need to recognize the impact of low health literacy on patient care and health outcomes. The first step is to acknowledge that many patients actually have limitations in their ability to understand health information. Low health literacy may lead to a failure to carry out the reading and numerical tasks necessary in complex health regimens, which in turn may lead to confusion and inadequate adherence or use of services. The recognition of low health literacy should not be perceived by patients as an indictment or insult but rather as an opportunity to positively impact health care.

Step 2: Identify Patients at Risk

The degree of health literacy deficits may be assessed by informally screening patients for clues. For example, assessing patients' responses to questions about written instructions or about medications might alert providers to health literacy issues.[46] Patients who exhibit the behaviors listed in Table 1 may be showing signs of compromised health literacy.[46]

Health care providers need to also recognize that patients with certain characteristics are more likely to have trouble reading and understanding health-related information, which places them at risk for low health literacy. These include older adults[10,27,28,47,48]; racial and ethnic minorities[10,29,30,48]; people with low education or low income levels[10,28,48]; non-fluent speakers of English; and people with chronic diseases including diabetes, HIV/AIDS, hypertension, and asthma.[10,19,27–29,34] Individuals who are older, minority, poor, male, and those with increased comorbidities are particularly vulnerable in complex health care systems, and may be even more so if they are functionally low literate.[12]

Step 3: Formally Screen Patients at Risk

Watching for signs of low health literacy can be useful in clinical practice and may establish the need for more formal assessment. Asking simple questions, such as "How often do you have someone help you read hospital materials?" can provide some guidance as to a patient's health literacy.[49] Several tools to assess health literacy have been used in clinical trials and validated in other patient populations other than chronic heart failure (Table 2). For practical purposes, classifying patients into one of three health literacy categories is suggested: "*adequate*" for patients who do not have limitations, "*marginal*" when there are deficits, and "*low*" when severe limitations exist.

Step 4: Document Low Health Literacy Levels

Because of the growing acknowledgement of the health consequences of patients with low literacy, the Joint Commission has added improving health literacy to their patient safety goals. The 2007 Joint Commission standard indicates that language and communication preferences need to be documented in the hospital and outpatient settings and in paper and electronic records to facilitate care, treatment, and services. Creating templates in electronic and paper records will facilitate compliance with the Joint Commission standard and will alert providers about patient learning preferences (Appendix 2). As with all other elements of patients' personal health history, strict privacy needs to be followed in the documentation of literacy levels.

Step 5: Integrate Strategies to Enhance Health Understanding

Knowledge about one's disease is an important component in the ability to actively participate in its management. Without accurate disease knowledge, self-care is compromised and worse outcomes are likely. Strategies aimed to assist patient understanding in health care settings need to focus on communication, sharing appropriate educational information, and assessing materials for readability. Good patient communication is critical, and it becomes more so when patients suffer from low health literacy. Some simple, but effective communication strategies are shown in Table 3.[46,50]

Educational materials given to patients need to be in their language of preference and in the manner in which they prefer to learn. In those practice settings in which translated educational materials are limited or not available, translator services can be used. Video tapes, CDs, picture/diagram-based learning, or online modules should be considered for those with significant literacy deficits.

Encourage use of the "Ask Me 3" questions.[46]

1. What is my main problem?
2. What do I need to do?
3. Why is it important for me to do this?

This strategy fosters the feeling in patients that they can ask questions of their health care team at each visit.

Open communication between the health care provider and patients need to be supported and encouraged. Most patients with low health literacy are unable to follow directions on written prescriptions. Strategies that are helpful for patients with low health literacy include more frequent use of oral and visual instructions, such as pictographs or line drawings; limiting instructions to essential information only; making instructions interactive; and including patient and family, friends, caretakers, and significant others in the discussion. Cultural appropriateness is particularly important when attempting to tailor health education to each patient. Know the foods common in the patient's cuisine.

Health care providers should ensure that patient education materials are appropriate for all levels of literacy. The following tools are available to assess readability. The Simple Measure of Gobbledygook (SMOG) Index uses a formula to calculate the reading grade level of the work of an educational tool.[50] The Flesch-Kincaid Formula and the Fog Index look at the number of words in a sentence and the number of syllables in words.[51] The Dale-Chall calculates grade level based on the length of a sentence and the number of unfamiliar words.[52] The Fry Graph, a formula based on the average number of sentences and syllables per 100 words, is often used to assess the readability of documents in health care.[53]

Conclusion: Call to Action

Failure to address health literacy in patients with heart failure will compromise the effective implementation of medical and device therapies. Patient self-care will be weakened and health care resources will be wasted. It is the responsibility of health care teams to recognize patients with low health literacy and provide them with additional support to enhance self-care and optimize therapy. Using a multidisciplinary approach to assess and treat patients with heart failure who have limited health literacy and partnering with available resources will optimize the care of this at-risk population.

References

1. Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs AMA. Health literacy: report of the Council on Scientific Affairs. JAMA 1999;281:552–7. [PubMed: 10022112]
2. Institute of Medicine. Health literacy: a prescription to end confusion. Washington DC: National Academic Press; 2004.
3. The Joint Commission. What did the doctor say?. Improving health literacy to protect patient safety. 2007. Available online at: http://www.jointcommission.org/PublicPolicy/health_literacy.htm
4. Heart Failure Society of America. Executive summary: HFSA 2006 comprehensive heart failure practice guideline. J Card Fail 2006;12:10–38. [PubMed: 16500578]
5. Hunt SA, Abraham WT, Chin MH, Feldman AM, Francis GS, Ganiats TG, et al. ACC/AHA 2005 guideline update for the diagnosis and management of chronic heart failure in the adult: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Update the 2001 Guidelines for the Evaluation and Management of Heart Failure): developed in collaboration with the American College of Chest Physicians and the International Society for Heart and Lung Transplantation: Endorsed by the Heart Rhythm Society. Circulation 2005;112:e154–235. [PubMed: 16160202]
6. Hauptman PJ, Rich MW, Heidenreich PA, Chin J, Cummings N, Dunlap ME, et al. The heart failure clinic: a consensus statement of the Heart Failure Society of America. J Card Fail 2008;14:801–15. [PubMed: 19041043]
7. Bryan C. Provider and policy response to reverse the consequences of low health literacy. J Healthc Manage 2008;53:230–41.

8. Powell C, Kripalani S. Brief report: resident recognition of low literacy as a risk factor in hospital readmission. J Gen Intern Med 2005;20:1042–4. [PubMed: 16307631]
9. Riegel B, Moser DK, Powell M, Rector TS, Havranek EP. Nonpharmacologic care by heart failure experts. J Card Fail 2006;12:149. [PubMed: 16520265]
10. Gazmararian JA, Baker DW, Williams MV, Parker RM, Scott TL, Green DC, et al. Health literacy among Medicare enrollees in a managed care organization. JAMA 1999;281:545–51. [PubMed: 10022111]
11. Laramee A, Morris N, Littenberg B. Relationship of literacy and heart failure in adults with diabetes. BMC Health Serv Res 2007;7:98. [PubMed: 17605784]
12. Morrow D, Clark D, Tu W, Wu J, Weiner M, Steinley D, et al. Correlates of health literacy in patients with chronic heart failure. Gerontologist 2006;46:669–76. [PubMed: 17050758]
13. DeWalt D, Malone R, Bryant M, Kosnar M, Corr K, Rothman R, et al. A heart failure self-management program for patients of all literacy levels: a randomized, controlled trial. BMC Health Serv Res 2006;6:30. [PubMed: 16533388]
14. Kutner, M.; Greenberg, E.; Yin, Y.; Paulsen, C. Results from the 2003 National Assessment of Adult Literacy. Washington DC: National Center for Education Statistics: US Department of Education; 2006.
15. The Agency for Heathcare Research and Quality. America's Health Literacy: Why We Need Accessible Health Information. Rockville, MD: Agency for Healthcare Research and Quality; [Accessed March 2009]. Available at: http://www.health.gov/communication/literacy/issuebrief/
16. Paasche-Orlow M, Parker R, Gazmararian JA, Nielsen-Bohlman R, Rudd R. The prevalence of limited health literacy. J Gen Intern Med 2005;20:175–84. [PubMed: 15836552]
17. DeWalt DA, Berkman ND, Sheridan S, Lohr KN, Pignone MP. Literacy and health outcomes. A systematic review of the literature. J Gen Intern Med 2004;19:1228–39. [PubMed: 15610334]
18. Baker D, Parker R, William M, Clark W. Health literacy and the risk of hospital admission. J Gen Intern Med 1998;13:791–8. [PubMed: 9844076]
19. Wolf MS, Gazmararian JA, Baker DW. Health literacy and functional health status among older adults. Arch Intern Med 2005;165:1946–52. [PubMed: 16186463]
20. Baker DW, Wolf MS, Feinglass J, Thompson JA, Gazmararian JA, Huang J. Health literacy and mortality among elderly persons. Arch Intern Med 2007;167:1503–9. [PubMed: 17646604]
21. Sudore R, Yaffe K, Satterfield S, Harris T, Mehta K, Simonsick E, et al. Limited literacy and mortality in the elderly: the health, aging, and body composition study. J Gen Intern Med 2006;20:806–12. [PubMed: 16881938]
22. Davis T, Wolf MS, Bass P, Middlebrooks M, Kennen E, Baker D, et al. Low literacy impairs comprehension of prescription drug warning labels. J Gen Intern Med 2006;21:847–51. [PubMed: 16881945]
23. Davis TC, Wolf MS, Bass PF III, Thompson JA, Tilson HH, Neuberger M, et al. Literacy and misunderstanding prescription drug labels. Ann Intern Med 2006;145:887–94. [PubMed: 17135578]
24. Gazmararian JA, Kripalani S, Miller M, Echt K, Ren J, Rask K. Factors associated with medication refill adherence in cardiovascular-related diseases: a focus on health literacy. J Gen Intern Med 2006;21:1215–21. [PubMed: 17105519]
25. Kripalani S, Henderson LE, Chiu ERR, Kolm P, Jacobson T. Predictors of medication self-management skill in a low-literacy population. J Gen Intern Med 2006;21:852–6. [PubMed: 16881946]
26. Kripalani S, Robertson R, Love-Ghaffari MH, Henderson LE, Praska J, Strawder A, et al. Development of an illustrated medication schedule as a low-literacy patient education tool. Patient Educ Couns 2007;66:368–77. [PubMed: 17344015]
27. Williams M, Baker D, Honig E, Lee T, Nowlan A. Inadequate literacy is a barrier to asthma knowledge and self-care. Chest 1998;114:1008–15. [PubMed: 9792569]
28. Williams MV, Baker DW, Parker RM, Nurss JR. Relationship of functional health literacy to patients' knowledge of their chronic disease: a study of patients with hypertension and diabetes. Arch Intern Med 1998;158:166–72. [PubMed: 9448555]

29. Kalichman SC, Benotsch E, Suarez T, Catz S, Miller J, Rompa D. Health literacy and health-related knowledge among persons living with HIV/AIDS. Am J Prev Med 2000;18:325–31. [PubMed: 10788736]
30. Lindau ST, Tomori C, Lyons T, Langseth L, Bennett CL, Garcia P. The association of health literacy with cervical cancer prevention knowledge and health behaviors in a multiethnic cohort of women. Am J Ob-stet Gynecol 2002;186:938–43.
31. Conlin K, Shumann L. Literacy in the health care system: a study on open heart surgery patients. J Am Acad Nurse Pract 2002;14:38–42. [PubMed: 11845640]
32. Gazmararian JA, Williams MV, Peel J, Baker DW. Health literacy and knowledge of chronic disease. Patient Educ Couns 2003;51:267–75. [PubMed: 14630383]
33. Persell S, Osborn C, Richard R, Skripkauskas S, Wolf MS. Limited health literacy is a barrier to medication reconciliation in ambulatory care. J Gen Intern Med 2007;22:1523–6. [PubMed: 17786521]
34. Scott T, Gazmararian JA, Williams M, Baker D. Health literacy and preventive health care use among Medicare enrollees in a managed care organization. Med Care 2002;40:395–404. [PubMed: 11961474]
35. Baker DW, Parker RM, Williams MV, Clark WS, Nurss J. The relationship of patient reading ability to self-reported health and use of health services. Am J Public Health 1997;87:1027–30. [PubMed: 9224190]
36. Baker DW, Gazmararian JA, Williams MV, Scott T, Parker RM, Green D, et al. Functional health literacy and the risk of hospital admission among Medicare managed care enrollees. Am J Public Health 2002;92:1278–83. [PubMed: 12144984]
37. Murray MD, Young J, Hoke S, Tu W, Weiner M, Morrow D, et al. Pharmacist intervention to improve medication adherence in heart failure: a randomized trial. Ann Intern Med 2007;146:714–25. [PubMed: 17502632]
38. Murray M, Young J, Morrow D. Methodology of an ongoing, randomized, controlled trial to improve drug use for elderly patients with chronic heart failure. Am J Geriatric Pharmacotherapy 2004;2:53–65.
39. Smith B, Forkner E, Krasuki R, Galbreath A, Freeman G. Educational attainment has a limited impact on disease management outcomes in heart failure. Dis Manage 2006;9:157–66.
40. Bennett SJD, Sauve MJDR. Cognitive deficits in patients with heart failure: a review of the literature. J Cardiovas Nurs 2003;18:219–42.
41. Riegel BDRCFF, Dickson VVPC. A situation-specific theory of heart failure self-care. J Cardiovasc Nurs 2008;23:190–6. [PubMed: 18437059]
42. Clark JC, Lan VM. Heart failure patient learning needs after hospital discharge. App Nurs Res 2004;17:150–7.
43. Naik AD, Kallen MA, Walder A, Street RL Jr. Improving hypertension control in diabetes mellitus: the effects of collaborative and proactive health communication. Circulation 2008;117:1361–8. [PubMed: 18316489]
44. Parikh NS, Parker RM, Nurss JR, Baker DW, Williams MV. Shame and health literacy: the unspoken connection. Patient Educ Couns 1996;27:33–9. [PubMed: 8788747]
45. Wolf MS, Williams M, Parker R, Parikh NS, Nowlan A, Baker D. Patients' shame and attitudes toward discussing the results of literacy screening. J Health Commun 2007;12:721–32. [PubMed: 18030638]
46. Weiss, B. Health literacy and patient safety: help patients understand: a manual for clinicians. 2. Chicago, IL: American Association Foundation and American Medical Association; 2007.
47. Schillinger D, Grumbach K, Piette J, Wang F, Osmond D, Daher C, et al. Association of health literacy with diabetes outcomes. JAMA 2002;288:475–82. [PubMed: 12132978]
48. Miller MJ, Degenholtz HB, Gazmararian JA, Lin CJ, Ricci EM, Sereika SM. Identifying elderly at greatest risk of inadequate health literacy: a predictive model for population-health decision makers. Res Social Adm Pharm 2007;3:70–85. [PubMed: 17350558]
49. Chew L, Bradley K, Boyle E. Brief questions to identify patients with inadequate health literacy. Fam Med 2004;36:588–94. [PubMed: 15343421]

50. Williams MV. Recognizing and overcoming inadequate health literacy, a barrier to care. Cleve Clin J Med 2002;69:415–8. [PubMed: 12022385]
51. Kincaid, JP.; Fishburne, RP.; Rogers, RL.; Chissom, BS. Derivation of new readability formulas (Automated Readability Index, Fog Count, and Flesch Reading Ease Formula) for Navy enlisted personnel, Research Branch Report. 8-75. Memphis, TN: Naval Technical Training US Naval Air Station; 1975.
52. Layton J. A chart for computing the Dale-Chall Readability Formula above fourth grade level. J Reading 1980;24:239–44.
53. Fry, E. Elementary reading instruction. New York: McGraw Hill; 1977.
54. Weiss BD, Mays MZ, Martz W, Castro KM, DeWalt DA, Pignone MP, et al. Quick assessment of literacy in primary care: the newest vital sign. Ann Fam Med 2005;3:514–22. [PubMed: 16338915]
55. Davis TC, Long SW, Jackson RH, Mayeaux EJ, George RB, Murphy PW, et al. Rapid estimate of adult literacy in medicine: a shortened screening instrument. Fam Med 1993;25:391–5. [PubMed: 8349060]
56. Bass P, Wilson J, Griffith C. A shortened instrument for literacy screening. J Gen Intern Med 2003;18:1036–8. [PubMed: 14687263]
57. Jastak, S.; Wilkinson, G. Wide range achievement test - revised 3. Wilmington, DE: Jastak Associates; 1993.
58. Parker R, Baker D, Williams MV, Nurss J. The test of functional health literacy in adults: a new instrument for measuring patients' literacy skills. J Gen Intern Med 1995;10:537–41. [PubMed: 8576769]
59. Baker DW, Williams MV, Parker RM, Gazmararian JA, Nurss J. Development of a brief test to measure functional health literacy. Patient Educ Couns 1999;38:33–42. [PubMed: 14528569]
60. Lee S, Bender D, Ruiz R, Cho Y. Development of an easy-to-use Spanish health literacy test. Health Serv Res 2006;41:1392–412. [PubMed: 16899014]

Appendix 1. Health Literacy Resources

National organizations committed to providing useful tools include the following.

• American Medical Association (AMA)

The AMA Foundation has developed resources for healthcare providers, including a tool kit, patient safety monographs, patient safety tip cards, and health literacy partnerships: http://www.ama-assn.org/ama/pub/category/8115.html.

Partnerships worked to develop the slogan "Ask Me 3," which uses 3 questions to assist providers who want to improve patient-provider communication: http://www.npsf.org/askme3/

• Joint Commission (JC)

In 2007, the JC published *"What Did the Doctor Say?:" Improving Health Literacy to Protect Patient Safety*, a white paper on the results from a round table on health literacy and patient safety: http://www.jointcommission.org/PublicPolicy/health_literacy.htm

• National Institutes of Health (NIH)

Health literacy is one of the health communication objectives of *Healthy People 2010*.

• National Library of Medicine

A comprehensive list of health literacy resources is available online: MEDLINE/PubMed Search and Health Literacy Information Resources.

• Institute of Medicine (IOM)

In 2004, the IOM published *Health Literacy: A Prescription to End Confusion*, a report on the impact of limited health literacy in the United States. In 2006, a roundtable was convened to translate health literacy research into practice: http://www.iom.edu/?id=31489

• US Department of Health and Human Services (DHHS)

The DHHS developed a "quick guide" to health literacy and techniques to improve communication: http://www.health.gov/communication/literacy/quickguide/Quickguide.pdf

• The Heart Failure Society of America (HFSA)

The HFSA's fact sheet, available on its website, includes information on health literacy in heart failure: www.hfsa.org.

Appendix 2. Health Literacy and Learning Preference Documentation Template

Patient's name:	Native language:	Preferred method of learning:	Formal screening for Health Literacy:	Intervention:
	□ English	□ Verbal		
	□ Other:_____	□ Hands-on	□ Yes	
	Proficiency in English (English as second language; EOL):	□ Written	□ No	
		□ Audio	Results (health literacy: HL):	
	□Fluent	□ Multimedia	□ Adequate HL	
	□Moderate fluency	□ Other:_____	□ Marginal HL	
	□ Limited fluency		□ Low HL	
	□ Not fluent			

Table 1

Possible Signs of Low Health Literacy

Patients who:	State they forgot their reading glasses
	Claim the lighting is poor
	State they will read instructions later
	Point to words as they read
	Lift the paper closer as they read
	Fail to follow medication instructions
	Miss appointments
	Fail to follow through with tests and referrals

Table 2

Instruments to Assess Health Literacy

Tool Acronym	Tool's Full Name	Time to Administer	Pros	Cons
NVS	Newest Vital Sign[54]	3 minutes	Available online English and Spanish versions Limited to 6 items	Only validated in primary care settings Reading nutritional labels, not general written text
SILS	Single Item Literacy Screener[55]	<1 minute	Simple Single question	Limited sensitivity among persons with marginal reading ability
REALM	Rapid Estimate of Adult Literacy in	233 minutes	Easy to administer	Used in PCP setting
REALM-R	Medicine[55] (R-revised)[56] (Medical word recognition test)		Two versions; longer and shorter	English only Adults only Limited to word recognition, not reading comprehension
WRAT-R	Wide Range Achievement Test-Revised[57] (Medical word recognition test)	338 minutes	Easy to administer	WRAT (earlier version) for children only English only
(S)TOFHLA	Test of Functional Health Literacy in Adults[58] (S) = short version (Reading[59] comprehension and numerical ability test)	Long: 22 minutes Short: 7 minutes	Short and long version English and Spanish versions Used in numerous clinical trials More effective than word recognition alone	Original version too lengthy
SAHLSA	Short Assessment of Health Literacy for Spanish Speaking Adults[60]	5 minutes	Ability to test Spanish speakers	Only in Spanish Only for adults

Table 3

Effective Communication Strategies

Slow down communication with patients.
Use common language and fewer medical terms.
Use or draw pictures.
Use analogies or stories to personalize the message.
Limit information given in each interaction and repeat instructions.
Focus on key messages.
Use a “teach back” approach to confirm patient understanding.
Include family, significant others, or friends in discussions.
Be respectful, sensitive, and kind.