

Provider and Policy Response to Reverse the Consequences of Low Health Literacy

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EXECUTIVE SUMMARY

The 2004 Institute of Medicine publication, *Health Literacy: A Prescription to End Confusion*, is the first comprehensive report about low health literacy and its consequences. Although affecting more than 50 percent of the adult population in the United States, low health literacy is a pervasive issue that has received little attention among policymakers and healthcare executives. Yet, strategies to increase the health literacy of patient communities are relatively inexpensive and easy to implement. Furthermore, such strategies have the potential to significantly reduce costs and improve outcomes by arming the population with information on self-management and prevention of disease. This article presents an overview of the issues surrounding low health literacy, highlights its impact on the delivery system, and discusses practical steps that healthcare providers and executives can implement to enable health literate communities.

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Healthcare delivery providers and executives must take practical steps to combat the consequences of low health literacy, which is pervasive throughout the United States. Ninety million people, representing more than 50 percent of the U.S. adult population in 2003, have poor or inadequate health literacy skills (NCES 2003). Low health literacy affects individuals in all walks of life, although it is more observable among the elderly, persons with limited English proficiency, and those with lower socioeconomic status or educational attainment (NCES 2003). In 2004, the Institute of Medicine (IOM) published the first report to examine this topic. Entitled *Health Literacy: A Prescription to End Confusion*, this report estimated that this issue, along with its resultant quality implications, carries an annual price tag of \$73 billion. Despite these facts, health literacy remains a ubiquitous, but virtually silent, crisis. Central to the IOM report is the challenge to the provider community to respond strategically to this issue.

In an era with increased attention on accountability, medical-error reduction, quality improvement, and chronic disease prevention and management, healthcare providers and executives must focus on issues surrounding health literacy. This article presents an overview of the issues surrounding low health literacy, highlights its impact on the delivery system, and discusses practical steps that healthcare providers and executives can implement to enable health literate communities.

BUILDING AWARENESS

Clinician: "Mr. Smith, I see your lipids are still elevated and your blood pressure is high. It does not appear that the meds we prescribed worked. Because of your diabetes, I will give you two new medications for your cholesterol and blood pressure. Take each daily, and then come back for follow-up and blood work in four to six weeks. Your new prescription will be ready at the front desk when you leave. Any questions?"

Patient: *Shakes head.*

Clinician: "Good. Let me know if you need anything else."

Such provider–patient encounters occur daily in hospitals and clinics across the United States. Clinicians regularly juggle administrative and clinical tasks and, in the process, make assumptions based on limited and incomplete information such as the patient’s appearance, language skills, or body language (e.g., a nod). Often, little attention is paid to the patient’s actual comprehension of medical directives, health diagnoses, or self-management skills. It is at these critical points of provider–patient interaction that health literacy must be recognized and addressed to combat the perpetuating cycle of low health literacy.

The myriad of crises facing the healthcare industry today—the prevalence of medical errors, the epidemic of chronic disease, and the magnitude of the issues surrounding the high cost of care—are just a few issues at the forefront of consumers’ minds, documented in popular and professional publications, widely discussed at industry gatherings, and increasingly the topic

of legislation and political agendas. Low health literacy—often an underlying constant factor in many of these crises—is not a new phenomenon, yet it garners little attention. Recognizing the issue is an important first step toward establishing an environment in which health literacy becomes the rule, not the exception.

With recognition of the issue comes a responsibility to give healthcare providers the time, skills, and support necessary to transform the typical provider–patient encounter into one that supports health literacy. Open-ended conversations and interactions are imperative to promote the insight required for enabling health literacy (see the following sample questions):

- What do you understand about how your illness can affect your life?
- What medications are you currently taking? Do you know what each of these pills look like and what each is for?
- How often do you take each pill, and how many do you take at one time?
- Have you experienced any side effects that you think may be related to these medications?

Dialogue prompted by questions such as these is how disease management, self-care, and preventive care can be realized across populations and communities and how true improvements in patient outcomes can be achieved.

REVIEW OF THE ISSUE

The IOM report, *Health Literacy: A Prescription to End Confusion*, defines

health literacy as “the degree to which individuals have the capacity to obtain, process, and understand basic information and services needed to make appropriate decisions regarding their health” (IOM 2004). Differing from the more general issue of literacy, health literacy requires more than just basic reading and comprehension skills. The term encompasses the individual’s ability to act on the information received and to effectively access and navigate the healthcare system at the appropriate time, place, and level of service. As such, it requires competency on the part of the healthcare provider to effectively communicate health information and instructions and to create a system that is accessible to the individual (IOM 2004; Rudd 2007).

Based largely on the 2003 National Assessment of Adult Literacy conducted by the National Center for Education Statistics, the IOM report highlights both the widespread occurrence of low health literacy and the shortcomings of the U.S. healthcare system to recognize and respond to the issue. A call to action, the IOM report highlights four primary areas of focus for healthcare organizations (Parker and Kindig 2006):

1. Define the scope of the problem.
2. Identify obstacles to creating a health-literate public.
3. Assess past efforts.
4. Determine goals for future efforts.

Additionally, the report calls on both government and private sectors to become active participants in initiatives aimed at increasing funding for

research, establishing effective metrics to evaluate health literacy, and developing standards for communicating health information.

In a recent article, Parker and Kindig (2006), contributors to the IOM report, present an assessment of the health-care industry's progress to date toward the recommendations put forth in the report. The authors conclude that, although federal and private agencies have substantially increased funding and support for health literacy research, there remains marked stagnation of organizational support for the development of appropriate policies and initiatives, an absence of literacy-related quality standards, and a lack of effective tools using educational modalities beyond simple written and oral communication (Parker and Kindig 2006). These deficiencies, however, offer the greatest opportunity for organizational innovation and response.

The Patient Perspective

Low health literacy is most prevalent among the elderly (regardless of educational attainment), persons who have limited English proficiency, and people with lower socioeconomic status or less education. However, low health literacy does not discriminate, transversing all socioeconomic sectors, levels of educational attainment, and ethnicity. Likewise, it is impossible to determine a person's health literacy based on his or her ability to function easily within society or to converse fluently in English (NCES 2003).

Also at play are both intrinsic and extrinsic factors, which are often difficult to identify but can significantly influ-

ence an individual's health literacy. For example, the complexity and emotional toll of illness or disease can leave even the most highly educated patient or family member confused, frustrated, and mentally exhausted. Additionally, low health literacy is often compounded by shame, a social network with equally poor health literacy skills, and personal and cultural perceptions toward health and disease (Andrulis and Brach 2007; Paasche-Orlow and Wolf 2007).

The Provider Perspective

Physicians frequently overestimate the health literacy of their patients and often, in the rush of the day, lapse into using medical jargon—a practice that exacerbates patients' reluctance to ask clarifying questions (Castro et al. 2007; Kripalani and Weiss 2006). Recent research in this area determined that many of the communication tactics deemed most effective by literacy experts are often the ones least commonly used by clinicians (Schwartzberg et al. 2007). Similarly, another study found that "unclarified medical terminology" was used in 81 percent of the outpatient encounters for people with diabetes (Castro et al. 2007).

Given that patients overwhelmingly prefer to receive medical information directly from their physicians, the IOM report's recommendation to improve the communication skills of physicians comes as no surprise. However, educating patients—the cornerstone of health literacy—needs to be the responsibility of the entire healthcare delivery team and should not rest solely on the shoulders of the physician community (Andrulis and Brach 2007). Further,

Kripalani and Weiss (2006) suggest that low health literacy should be included in the patient's problem list, as this is often the underlying cause of disease exacerbation. The physician is certainly central to the patient-education equation, but leveraging the physician's role with assistance from qualified ancillary staff is a critical component to creating an organizational culture that promotes and sustains health literacy.

The Organizational Perspective

Low health literacy is costly not only to the entire industry but also to the individual organization. Although there is a limited body of research that analyzes the direct costs of low health literacy, the IOM report did find correlation between poor literacy, high utilization of services, and increases in per patient costs. The healthcare industry has certainly recognized the relationship among health status, outcomes, and cost, as demonstrated by the rapid movement toward performance-based reimbursement. Recognizing the role of health literacy in achieving the outcomes desired under performance-based reimbursement places an organization at a significant advantage.

Improving health literacy is on the priority list of the Office of the Surgeon General, with effective health communication encompassing all ten of the leading health indicators outlined in *Healthy People 2010* (HHS 2007a, 2007b). The \$73 billion price tag attributed to the cost of health literacy in the IOM report translates into real expenses that affect the ability of organizations to provide care on a daily basis (IOM 2004). Exacerbating this financial impact is

the steady growth of two sectors of the population most vulnerable to low health literacy: the Hispanic population, projected to account for 25 percent of the U.S. population by 2050, and the elderly population (U.S. Census Bureau 2004). Whereas the health consequences of low health literacy should alone raise concern in the industry, the inevitable financial burden on care delivery elevates this concern to all healthcare organizations.

STRATEGIC ORGANIZATIONAL INITIATIVES

Low health literacy is not a recent phenomenon, and as such will not be alleviated within a few months or even a few years. Creating a health-literate community requires a multifaceted, patient-centric approach, much like providing medical care. Efforts to counteract low health literacy must occur at the local, regional, and national levels, focused on producing a healthcare environment in which health literacy is deemed a right, not simply a privilege. Coordination of health literacy initiatives across the various segments of society certainly is the goal, but much can be done now by provider-centric organizations. By following some practical strategies, such as the ones listed here, organizations can begin to meet patients' literacy needs and move toward the goal of having health-literate communities.

Strategy 1: Designate Health Literacy Communication as a "Universal Precaution"

Enabling health literacy should first and foremost be designated as a "universal

precaution"—that is, each patient is deemed by all healthcare providers as in need of effective, health-literate communication (Paasche-Orlow et al. 2006). Just as universal precautions for blood-borne pathogens are widely accepted and have extended far beyond the healthcare setting, so also can effective health literacy initiatives. Senior management must recognize and embrace health literacy as both a core value and a responsibility of the organization and, to that end, must offer a clear vision and full support of related initiatives. The Joint Commission and other agencies are helping this effort by expanding certification requirements to include health literacy objectives, thus setting a framework for achieving these goals (Murphy-Knoll 2007).

Strategy 2: Engage the Stakeholders

Educating the clinical staff about the issues presented in the IOM report is certainly necessary, but to create an awareness that results in a culture change within the organization, it is necessary to engage all of the various stakeholders. One way to accomplish this is to report on the demographic, socioeconomic, and literacy data for the community in which the organization resides. However, an even more powerful way to gain stakeholder engagement is to actually measure the health literacy of the patient population served. This can be accomplished either through random sampling with standardized literacy assessments or by performing a small, observational study of the actual learning that occurs within an organization. Conducting patient interviews, even for one day, at either check-out or discharge

will provide a real-world analysis of the overall quality and effectiveness of the health literacy of the patient population. The outcome from such an analysis will likely show the staggering number of patients who cannot demonstrate retained knowledge of self-care directives, even before they leave the facility.

Strategy 3: Provide Necessary Resources

Once awareness to the issue has been raised, organizations must provide the necessary resources to allow for the development and implementation of strategies aimed at building health literacy. Instead of pondering how much improving health literacy will cost the organization, consider instead the greater costs of leaving the issue unaddressed. The resource typically identified as the single most valuable asset needed to implement the initiatives to combat low health literacy is that of time. Although an investment in internal and external staff training and the procurement and use of effective tools are certainly necessary, even more important is allowing clinicians the time needed for instruction, return demonstration, and follow-up. Additionally, attention must be given to strategies that indirectly support health literacy, such as decreasing conflicting messages to patients, improving communication between clinicians, and reviewing the workflow process surrounding patient transfers or the involvement of multiple team members in patient education.

Senior management will demonstrate responsibility and accountability for health literacy efforts by not only designating capable staff to manage

these initiatives but also by recognizing and providing the resources needed for the planning, implementation, and evaluation of the initiatives. Without clear directives, adequate resources, and ongoing measurement and assessment, such initiatives will quickly fall by the wayside. Investing time, money, and staff certainly will not address all of the issues surrounding low health literacy, such as patient noncompliance, lack of personal resources, and cultural bias. However, such an investment has been shown to improve health literacy overall with a return on investment in the form of lower utilization costs, better clinical outcomes, higher ratings on patient safety and quality metrics, and slower disease progression—all measures for which organizations are increasingly held accountable (Paasche-Orlow and Wolf 2007; Schillinger et al. 2002).

Strategy 4: Increase Awareness Beyond the Organization

The landmark IOM report, *To Err Is Human* (Kohn, Corrigan, and Donaldson 1999), which made the public aware of the preponderance of medical errors, received a tremendous amount of coverage in the news media and attention in both the political arena and the healthcare industry. On the other hand, the 2004 IOM report, *Health Literacy: A Prescription to End Confusion*, a topic that is equally noteworthy, has failed to gain the same traction or attention.

The reasons for this lack of publicity are unclear, especially in light of the profound pervasiveness of the problem. Perhaps what is needed to bring this issue to a level of higher visibility is a clearer understanding of both the direct

and significant financial impact on the industry and the substantial effect on disease progression and quality of life for patients. However, state and national leaders will not begin to understand these correlations without hard evidence and insights from those on the front line who witness the impact daily.

Organizational leaders can help call attention to this issue by petitioning state and national legislators and reporting not only the initiatives within their own organization but also the more far-reaching effects on the community. Submitting case histories is a good start for generating interest and personalizing the issue, but outlining planned, sustainable health literacy strategies will be needed to communicate the need for funding and reimbursement. Health leaders should also consider the infrastructure needs to support health literacy that fall beyond the walls of the organization, such as using local social service agencies for language-proficiency needs or establishing technology access points throughout the community. Steps such as these provide a distinct opportunity for developing strong public relations and goodwill within the community, and they encourage innovative ideas and partnerships within the community (Lurie and Parker 2007).

Strategy 5: Call for National Efforts Toward Standardization

One factor that contributes greatly to perpetuating low health literacy is the overwhelming lack of standardization in the area of health information and communication. Inconsistency in printed materials, variation in prescription messages and warnings, complex processes

for accessing and navigating the system, and convoluted health insurance requirements test even the most literate healthcare consumer (Paasche-Orlow et al. 2006; Wood 2007). Much can be done to create a more user-friendly healthcare delivery environment—from standardizing medication instruction sheets and prescription labeling to reformatting or reorganizing the processes that patients follow in a clinic, unit, or hospital. Additionally, organizational leaders can assist in defining and developing the standards for literacy metrics by which all organizations are measured. Ensuring that health literacy efforts are uniformly evaluated or measured is especially important in light of the movement toward performance-based reimbursement (Paasche-Orlow et al. 2006).

STRATEGIC PATIENT INITIATIVES

Organizational initiatives are a necessary component to moving toward a health-literate community, but strategies that target individual patient needs are the ones that will have the greatest impact on improving clinical outcomes. The good news is that many of the patient-directed initiatives recommended here are relatively inexpensive and can be implemented quickly and easily.

Strategy 1: Talk About the Issue

The first step is to provide a forum for discussion among frontline clinicians who can affect the most change. Presenting the IOM report at staff meetings, discussing data related to the organization's actual performance in health literacy, and endorsing the organization's

commitment to establishing a health-literate culture can create the sense of urgency that fosters creative solutions. Organizational dedication to these initiatives is further emphasized through forming multidisciplinary committees to review current communication strategies and incorporating literacy-based measures into performance improvement activities.

Additionally, seeking the patient perspective as it relates to health literacy strategies is invaluable in defining methods for addressing the issue. It is difficult for those who are health literate—namely, organizational staff—to fully understand the concerns and hurdles that face patients with low health literacy. The combination of patient and staff perspectives, under the direction of capable leadership, can result in creative innovations that are practical and can be easily implemented. Such a strategy will prove to be successful far beyond anyone's expectations.

Strategy 2: Show Pictures

Printed text is the least effective means of communicating effectively with patients, but it is the primary, and often only, tool used by many providers (Schwartzberg et al. 2007). Much can be accomplished to enhance patient education materials simply by converting text-driven documentation to picture-intensive communication aids.

One study found that using simple, concise, and easy-to-read prescription information that includes a patient's complete daily medication regimen increased by five-fold the comprehension of medication therapy among participants of the study (Wood 2007).

Additionally, pictures reduce confusion and misunderstanding because they graphically illustrate, and hence simplify, basic concepts such as the size of a tablespoon or the concept of “twice daily.” Picture cards of medication dosages, “cheat sheets” for prescription warning labels, or patient-specific medication lists with pictures and lay-friendly wording are just some of the inexpensive ways to use graphic elements to clarify complex medical terminology.

Strategy 3: Ask Questions

A health-literate environment is one in which patient comprehension is continually evaluated. The “Ask Me 3” program, developed by the Partnership for Clear Health Communication (2007), encourages clinicians to pose three simple questions after each encounter in which medical information has been provided to a patient:

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

Developing an organizational campaign around an initiative such as “Ask Me 3” may include the use of buttons for staff and signage throughout the organization. This simple gesture can foster not only increased awareness of the issue but also can create organizational cohesiveness needed for incorporating health literacy into the culture (Mika et al. 2007).

A culture in which health literacy is considered a universal precaution can become a reality not only with programs such as Ask Me 3, but also through rou-

tine patient assessments of health literacy to identify those with specific literacy needs. Although several standardized literacy assessments are available, such as the commonly-used Rapid Estimate of Adult Literacy in Medicine or the Test of Functional Health Literacy in Adults, most of these are time consuming and not useful in the clinical setting. A much simpler approach might be to incorporate the work of Wallace and colleagues (2006) who found that a single question—“How comfortable are you filling out medical forms by yourself?”—can be a very effective, easy-to-administer and practical tool for assessing health literacy. Adding a simple question, such as this one, to the assessment process as patients move through the organization can assist in making the patient’s literacy needs known by all clinicians and can provide continuity in communication and patient education efforts.

Strategy 4: Use Technology

Technology offers numerous opportunities to facilitate the health literacy efforts of the organization. More and more organizations are relying on Web-based technologies to attract and retain patients, to assist patients in navigating the delivery system, or to provide basic health information. According to estimates by the Pew Internet and American Life Project (2007), almost 70 percent of the U.S. adult population access the Internet, and 80 percent of these users look for health-related information. However, Internet usage and access are greatly reduced among those with low health literacy; thus, organizations must take this into account when designing Web-based efforts. Partnering with

local resource centers or libraries is one strategy that an organization can take to expand the availability and reach of Web-based tools to the entire community. However, information posted on the Internet often tends to be text intensive as well, so care must be taken to ensure that Internet content uses a variety of communication formats as well (Baker et al. 2003). That said, the Internet can certainly provide an effective alternative to printed communication as well as a means to connect patients with providers, resources, and patients alike.

Additionally, other forms of technology beyond the Internet should not be overlooked. Kaphingst and colleagues (2005) found that direct-to-consumer television advertisements were effective in providing health education to a low-literacy population. Health-instruction presentations recorded on video or television may also be an effective strategy, especially for patients who have difficulty traveling or who live in remote areas. Outbound phone calls, interactive voice response, WebTV services, and digital text or voicemail reminders should be explored, as these represent devices that are generally accessible and familiar to most patients.

Technology also plays a key role in facilitating communication within the organization and decreasing the frustration of inconsistent messages to the patient. Because technology-based initiatives tend to be expensive and complicated to develop and implement, lessons learned in this area should be shared at professional association meetings, in conferences, and in publications for the unified purpose of creating a nationwide, health-literate community.

Strategy 5: Measure and Report

A critical component of any organizational-wide initiative is the ongoing dialogue among organizational stakeholders about both successes and failures related to the project. One of the most effective means for assessing progress and barriers is the use of metrics related to the initiative, which serve to provide a barometer of how well the organization is meeting its own mandates and directives. Measurement and reporting not only target areas that need continued attention but also serve to further incorporate health literacy into the culture. It is imperative that specific measures of health literacy be included in performance improvement activities, individual performance reviews, and organizational strategies. Doing so communicates that literacy activities are central to the mission, vision, and values of the organization. Additionally, proactive organizations may choose to include health literacy components into pay-for-performance or other accountability programs, serving not only as a significant differentiator for the organization but also as a potential generator or new source of revenue.

Strategy 6: Tell Your Story

Marketing executives are always looking for a story to tell as a way to personalize organizational mandates and initiatives. These stories not only motivate employees and clinicians but also build good public relations and goodwill within the community. The issue of health literacy transcends many aspects of the community. Creating an organizational story can encourage and foster partnerships with local resources and other provider

groups that are also struggling with the same issues. The success of just one organization's efforts can easily serve as a catalyst for the development of communitywide initiatives and ultimately for a health-literate nation.

SUMMARY

Low health literacy touches each and every healthcare organization and is a major contributor to many of the crises that face the industry. Despite the fact that this issue affects large segments of society, it receives little recognition, funding, or support from policymakers and industry leaders alike. This article aims to increase the focus on this issue by offering not only basic information but also practical approaches to creating health-literate organizations and communities. The strategies suggested here aim to propose manageable and obtainable objectives and strategies that are appropriate for any type of healthcare organization and that can positively influence both the costs and outcomes of care delivery.

REFERENCES

- Andrulis, D. P., and C. Brach. 2007. "Integrating Literacy, Culture, and Language to Improve Health Care Quality for Diverse Populations." *American Journal of Health Behavior* 31 (Suppl 1): S122–33.
- Baker, L., T. H. Wagner, S. Singer, and M. K. Bundorf. 2003. "Use of the Internet and E-Mail for Health Care Information: Results from a National Survey." *JAMA* 289 (18): 2400–406.
- Castro, C. M., C. Wilson, F. Wang, and D. Schillinger. 2007. "Babel Babble: Physicians' Use of Unclarified Medical Jargon with Patients." *American Journal of Health Behavior* 31 (Suppl 1): S85–95.
- Institute of Medicine (IOM). 2004. *Health Literacy: A Prescription to End Confusion*. [Online information; retrieved 11/4/07.] www.iom.edu/CMS/3775/3827/19723.aspx.
- Kaphingst, K. A., R. E. Rudd, W. Dejong, and L. H. Daltroy. 2005. "Comprehension of Information in Three Direct-to-Consumer Television Prescription Drug Advertisements Among Adults with Limited Literacy." *Journal of Health Communication* 10 (7): 609–19.
- Kohn, K., J. Corrigan, and M. Donaldson. 1999. *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academies Press.
- Kripalani, S., and B. D. Weiss. 2006. "Teaching About Health Literacy and Clear Communication." *Journal of General Internal Medicine* 21 (8): 888–90.
- Lurie, N., and R. Parker. 2007. "Editorial: Moving Health Literacy from the Individual to the Community." *American Journal of Health Behavior* 31 (Suppl 1): S6–7.
- Mika, V. S., P. R. Wood, B. D. Weiss, and L. Trevino. 2007. "Ask Me 3: Improving Communication in a Hispanic Pediatric Outpatient Practice." *American Journal of Health Behavior* 31 (Suppl 1): S115–21.
- Murphy-Knoll, L. 2007. "Low Health Literacy Puts Patients at Risk: The Joint Commission Proposes Solutions to National Problem." *Journal of Nursing Care Quality* 22 (3): 205–09.
- National Center for Education Statistics (NCES). 2003. "National Assessment of Adult Literacy." [Online information; retrieved 11/8/07.] http://nces.ed.gov/naal/health_results.asp.
- Paasche-Orlow, M. K., D. Schillinger, S. M. Greene, and E. H. Wagner. 2006. "How Health Care Systems Can Begin to Address the Challenge of Limited Literacy." *Journal of General Internal Medicine* 21 (8): 884–87.
- Paasche-Orlow, M. K., and M. S. Wolf. 2007. "The Causal Pathways Linking Health Literacy to Health Outcomes." *American Journal of Health Behavior* 31 (Suppl 1): S19–26.
- Parker, R. M., and D. A. Kindig. 2006. "Beyond the Institute of Medicine Health Literacy Report: Are the Recommendations Being Taken Seriously?" *Journal of General Internal Medicine* 21 (8): 891–92.
- Partnership for Clear Health Communication

- (PCHC). 2007. "Ask Me 3." [Online information; retrieved 11/8/07.] www.npsf.org/askme3/.
- Pew Internet & American Life Project. 2007. "Demographics of Internet Users." [Online information; retrieved 11/8/07.] www.pewinternet.org/.
- Rudd, R. E. 2007. "Health Literacy Skills of U.S. Adults." *American Journal of Health Behavior* 31 (Suppl 1): S8–18.
- Schillinger, D., K. Grumbach, J. Piette, F. Wang, D. Osmond, C. Dahe, J. Palacios, G. D. Sullivan, and A. B. Bindman. 2002. "Association of Health Literacy with Diabetes Outcomes." *JAMA* 288 (4): 475–82.
- Schwartzberg, J. G., A. Cowett, J. Vangeest, and M. S. Wolf. 2007. "Communication Techniques for Patients With Low Health Literacy: A Survey of Physicians, Nurses, and Pharmacists." *American Journal of Health Behavior* 31 (Suppl 1): S96–104.
- U.S. Census Bureau. 2004. *U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin*. Washington, DC: Government Printing Office.
- U.S. Department of Health and Human Services (HHS). 2007a. "Healthy People 2010: Leading Health Indicators...Touch Everyone." [Online information; retrieved 11/8/07.] www.healthypeople.gov/LHI/Touch_fact.htm.
- . 2007b. "Public Health Priorities." [Online information; retrieved 11/10/07.] www.surgeongeneral.gov/publichealthpriorities.html#literacy.
- Wallace, L. S., E. S. Rogers, S. E. Roskos, D. B. Holiday, and B. D. Weiss. 2006. "Brief Report: Screening Items to Identify Patients with Limited Health Literacy Skills." *Journal of General Internal Medicine* 21 (8): 874–77.
- Wood, A. J. 2007. "Simplifying Medication Scheduling: Can We Confuse Patients Less?" Paper presented at the Sixth Annual National Health Communication Conference, Advances in Health Literacy, Washington, DC, November 28.