

Inadequate Functional Health Literacy Among Patients at Two Public Hospitals

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Objective.—To determine the ability of patients to complete successfully basic reading and numeracy tasks required to function adequately in the health care setting.

Design.—Cross-sectional survey.

Setting.—Two urban, public hospitals.

Patients.—A total of 2659 predominantly indigent and minority patients, 1892 English-speaking and 767 Spanish-speaking, presenting for acute care.

Main Outcome Measure.—Functional health literacy as measured by the Test of Functional Health Literacy in Adults (TOFHLA), an instrument that measures ability to read and understand medical instructions and health care information presented in prose passages and passages containing numerical information (eg, prescription bottle labels and appointment slips).

Results.—A high proportion of patients were unable to read and understand written basic medical instructions. Of 2659 patients, 1106 (41.6%) were unable to comprehend directions for taking medication on an empty stomach, 691 (26%) were unable to understand information regarding when a next appointment is scheduled, and 1582 (59.5%) could not understand a standard informed consent document. A total of 665 (35.1%) of 1892 English-speaking patients and 473 (61.7%) of 767 Spanish-speaking patients had inadequate or marginal functional health literacy. The prevalence of inadequate or marginal functional health literacy among the elderly (age ≥ 60 years) was 81.3% (187/230) for English-speaking patients and 82.6% (57/69) for Spanish-speaking patients, and was significantly higher ($P < .001$) than in younger patients.

Conclusions.—Many patients at our institutions cannot perform the basic reading tasks required to function in the health care environment. Inadequate health literacy may be an important barrier to patients' understanding of their diagnoses and treatments, and to receiving high-quality care.

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AN ESTIMATED 40 million to 44 million adults in the United States are functionally illiterate, ie, they cannot per-

form the basic reading tasks required to function in society, according to the National Adult Literacy Survey.¹ Another 50 million adults are only marginally literate. Among those with the lowest literacy skills, nearly half live in poverty, and one fourth report physical, mental, or health conditions that prevent them from participating fully in work, school, or housework.

Lack of adequate literacy skills may be an important barrier to receiving proper health care. Patients are routinely expected to read and understand labels on medicine containers, appointment slips, informed consent documents,

and health education materials. Anecdotal reports have described the difficulties encountered by illiterate patients,^{2,3} and several studies have shown health education materials and consent forms are often written at levels exceeding patients' reading level.⁴⁻¹⁵ Poor literacy skills have also been associated with decreased comprehension of discharge instructions.^{16,17} Doak and Doak⁴ noted that patients' report of the number of years of school completed was four or five levels higher than their actual reading ability based on the Wide Range Achievement Test (WRAT), a word pronunciation and recognition test.⁴

For editorial comment see p 1719.

Other investigators have used reading vocabulary and comprehension tests designed for school-aged children to detect poor literacy skills in health care settings.^{13,18} Davis and colleagues developed and used the Rapid Estimate of Adult Literacy in Medicine (REALM), a medical word pronunciation and recognition test designed for screening medical literacy in adult patients.^{15,19-22} To our knowledge, no study has used a standardized instrument to measure the ability of patients to perform basic reading tasks required to function in the health care environment, such as reading labels on prescription bottles, understanding information on appointment slips, completing health insurance forms, and following instructions pertaining to diagnostic tests. We refer to this constellation of skills as functional health literacy.

Functional literacy is the ability to use reading, writing, and computational skills at a level adequate to meet the needs of everyday situations.¹ Functional literacy varies by context and setting; the literacy skills of a patient may be

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adequate at home or work, but marginal or inadequate in the health care setting. Adequate functional health literacy requires the ability to comprehend quantitative information (numeracy), which may differ from the ability to read a prose passage. None of the previously mentioned reading tests measures numeracy skills. Moreover, word recognition and pronunciation tests are not valid in Spanish,²³ so little is known about the ability of Spanish-speaking patients to understand health care instructions written in Spanish.

The need to measure the ability of patients to perform health-related tasks requiring reading and computational skills, or functional health literacy, prompted the development of the Test of Functional Health Literacy in Adults (TOFHLA).²⁴ The TOFHLA was developed using actual hospital materials, and is the first instrument to test the ability of patients to complete basic reading and numeracy tasks required to function in the health care setting. Developmental testing showed the TOFHLA to be a reliable measure of functional health literacy in both English-speaking and Spanish-speaking patients and a valid measure among English-speaking patients.²⁴ Using the TOFHLA, we undertook this study to determine the prevalence of functional health literacy among patients seeking medical care at two public hospitals.

METHODS

This study was conducted at two urban public hospitals. Grady Memorial Hospital is an approximately 1000-bed public hospital in Atlanta, Ga. The vast majority of its patients are African-American indigent residents of Fulton and DeKalb counties. The nonappointment acute care clinics are the site of more than 250 000 patient visits annually. Harbor-UCLA Medical Center is a 500-bed public hospital in Torrance, Calif, operated by the Los Angeles County Department of Health Services. The hospital serves a diverse patient population; approximately 40% are Latino, 30% African American, 25% white, and 5% other ethnic minorities. The emergency department has approximately 110 000 patient visits annually. The study design and contact forms were approved by the human investigations committees at both institutions.

Prior to this study, we developed the TOFHLA. A literacy expert (J.R.N.) reviewed commonly used medical texts from these hospitals to develop the two parts of the TOFHLA. The reading comprehension section is a 50-item test that uses a modified Cloze procedure; ie, every fifth to seventh word in a passage

is omitted and four multiple-choice options are provided.²⁵ This section of the TOFHLA measures the ability of patients to read and understand prose passages selected from instructions for preparation for an upper gastrointestinal tract radiograph series, the patient "Rights and Responsibilities" section of a Medicaid application, and a standard hospital informed consent document. Readability levels of these passages on the Gunning-Fog index are grade 4.3, 10.4, and 19.5, respectively.²⁶ The numeracy section of the TOFHLA consists of 17 items that test the ability of patients to comprehend labeled prescription vials, blood glucose test results, clinic appointment slips, and financial information forms. The numeracy score is multiplied by a constant of 2.941 to create a score from 0 to 50, the same range as for the reading comprehension section. The sum of the two sections yields the TOFHLA score, which ranges from 0 to 100. Patients are allowed a maximum of 22 minutes to complete the test. Prior developmental testing showed the TOFHLA has good internal consistency reliability (Cronbach's α , 0.98) and validity (correlation coefficient, 0.74 with the Wide Range Achievement Test-Revised [WRAT-R] and 0.84 with REALM).²⁴ The TOFHLA was translated into Spanish (TOFHLA-S), which had similarly good internal consistency reliability (Cronbach's α , 0.98). The TOFHLA-S has not been evaluated for criterion validity, but does have content validity.

Patients were enrolled from November 1993 through April 1994. Research assistants underwent 15 hours of training, which included explaining the rationale and study design, and interviewing techniques and procedures for TOFHLA administration. The emergency department was selected as the best study site because other care locations were subject to bias by age, sex, or possible barriers to access for patients with low levels of literacy. In Atlanta, patients presenting to the emergency care center and walk-in clinic between 9 AM and 5 PM daily were eligible. Exclusion criteria were prior enrollment in the study, age less than 18 years, unintelligible speech, overt psychiatric illness, lack of cooperation, police custody, native language other than English, too ill to participate, and presentation for a follow-up visit. Patients were recruited after they were triaged and while they waited to see a physician. To diminish selection bias, eligible patients were enrolled sequentially from the medical charts of patients waiting to be seen. We introduced the study to patients by saying we wanted to find out what health care information is understood by patients and what is confusing

to them, with the goal of helping us write things more clearly. Patients were not told that their reading ability would be tested.

After obtaining informed consent, we interviewed patients to collect information about demographics, self-reported reading difficulties, health care access, and health care utilization. Because the vast majority of patients using these two hospitals are poor and previous attempts to quantify income through questioning have been unsuccessful, we used markers of material deprivation as proxies for socioeconomic status, including car ownership, telephone ownership, type of housing, and financial assistance for food. Visual acuity screening was performed using a pocket vision screener (Rosenbaum, Graham-Field Surgical Co, Inc, New Hyde Park, NY). Patients with visual acuity of 20/50 or better were given the TOFHLA.²⁴ A large-print version (14-point font) of the TOFHLA was administered to patients with visual acuity from 20/70 to 20/100. Patients with vision worse than 20/100 were excluded.

The study methods were similar at Harbor-UCLA, except patients who spoke either English or Spanish as their primary language were included. Patients whose primary language was Spanish were given the TOFHLA-S. Patients presenting to the Harbor-UCLA emergency department were eligible if they presented between 7 AM and 11 PM, had a nonemergency medical problem according to the standard triage criteria, had no significant risk factors for tuberculosis based on established screening criteria, and had none of the exclusion criteria listed above. The emergency department registration log was used to call patients in consecutive order while they were waiting to be seen by a physician.

Data were analyzed using Epi Info²⁷ and STATA.²⁸ Continuous variables were compared using Mann-Whitney and Kruskal-Wallis tests. Multiple linear regression was used to analyze the association of age and education on TOFHLA scores. Categorical variables were analyzed with unadjusted χ^2 tests. A *P* value of .05 was considered statistically significant without adjusting for multiple comparisons.

RESULTS

In Atlanta, of 1271 patients invited to participate in the study, 979 (77.0%) completed the TOFHLA and initial questionnaire. A total of 89 patients (7.0%) refused to participate, and an additional 203 patients (16.0%) were excluded for the following reasons: too ill (36), native language other than English (26), inadequate visual acuity (24), previously in-

Table 1.—Characteristics of Patients Completing the Test of Functional Health Literacy in Adults

	Atlanta, Ga (n=979)	Los Angeles, Calif	
		English (n=913)	Spanish (n=767)
Median age, y (range)	40 (18-88)	36 (18-85)	35 (18-84)
Women, No. (%)	576 (58.8)	452 (49.5)	495 (64.5)
Race/ethnicity, No. (%)			
African American	899 (91.8)	433 (47.4)	0 (0)
White	76 (7.8)	268 (29.4)	1 (0.1)
Latino	4 (0.4)	189 (20.7)	763 (99.5)
Other	0 (0)	23 (2.5)	3 (0.4)
Socioeconomic indicators, No. (%)			
Owns a car	241 (24.6)	409 (44.8)	294 (38.3)
Owns a telephone	597 (61.0)	458 (50.2)	602 (78.5)
Receives financial assistance for food	407 (41.6)	331 (36.3)	202 (26.3)
Has health insurance	394 (40.2)	139 (15.2)	158 (20.6)
Years of education, No. (%)			
≤6	77 (7.9)	18 (2.0)	420 (54.8)
7-11	368 (37.6)	236 (25.9)	204 (26.6)
12	372 (38.0)	390 (42.7)	62 (8.0)
>12	162 (16.5)	269 (29.4)	81 (10.6)

terviewed (12), overt psychiatric illness (11), and other reasons (94). Nonparticipants were more likely to be men. In Los Angeles, 1997 patients were invited to participate in the study and 1680 (84.1%) completed the TOFHLA and initial questionnaire. A total of 108 (5.4%) refused to participate, 95 (4.8%) were called for medical evaluation during the interview, and 114 (5.7%) were excluded because of inadequate visual acuity (46), being too ill (43), or other reasons (25). Nonparticipants were more likely to be African American and those excluded because of vision had completed fewer years of school. Characteristics of patients who completed the TOFHLA are shown in Table 1. The majority of patients at both sites were poor and had no health insurance, and many had not completed high school.

Many patients could not read and understand basic medical directions containing numerical information (Table 2). Incorrect responses to test items were least common among English-speaking patients in Los Angeles and most common among Spanish-speaking patients. Many patients were unable to read instructions on medication bottles and were unable to explain how to take medications correctly. After examining a standard appointment slip, 20.8% (Los Angeles, English) to 31.2% (Los Angeles, Spanish) of patients could not describe when a follow-up appointment was scheduled. From 32.5% (Los Angeles, English) to 59.3% (Atlanta) of patients were unable to determine if they were eligible for financial assistance based on their income and number of children.

Patients also did poorly on the reading comprehension passages (Table 2). Patients scoring less than 75% on a passage are likely to have inadequate or

marginal comprehension of the passage's content. Between 10.8% (Los Angeles, English) and 33.0% (Los Angeles, Spanish) of patients could not read well enough to understand standard preparation instructions for an upper gastrointestinal tract radiographic procedure (grade level, 4.3 on Gunning-Fog index). In Atlanta, 42.9% of patients could not fully comprehend the "Rights and Responsibilities" section of the Medicaid application (grade level, 10.4). Among the 244 patients in Atlanta who had Medicaid coverage, the average proportion of items answered correctly on this section was 58%. The more difficult standardized informed consent section was beyond the reading level of 40.7% to 74.5% of all patients.

Based on patients' scores on individual TOFHLA items, total scores for the TOFHLA were divided into three categories: inadequate, marginal, and adequate functional health literacy. The percentages of incorrect responses to specific items on the TOFHLA compared with these categories are shown in Table 3. Patients with inadequate functional health literacy (TOFHLA score, 0 to 59, n=775) often misread medication dosing instructions (23.6% incorrect) and appointment slips (39.6% incorrect), and the Cloze passage with instructions for the upper gastrointestinal tract radiographic procedure (57.2% incorrect). Those with marginal literacy (TOFHLA score, 60 to 74, n=363) performed better on these tasks (9.4%, 12.7%, and 11.9% incorrect, respectively). However, those with marginal literacy frequently misread other information on prescription bottles (eg, 33.7% incorrect for understanding instructions to take all the pills in a bottle and 52.1% incorrect for taking medications on an empty stomach),

and had difficulty comprehending the Medicaid "Rights and Responsibilities" passage (31.0% incorrect). Patients with adequate literacy (TOFHLA score, 75 to 100, n=1521) did well on these tasks, although they had some difficulty comprehending the more difficult numerical tasks (eg, determining financial eligibility, determining date for renewing financial aid eligibility) and informed consent documents.

A total of 340 (34.7%) of 979 patients in Atlanta, 321 (41.9%) of 767 Spanish-speaking patients, and 114 (12.5%) of 913 English-speaking patients in Los Angeles had inadequate functional health literacy (Figure). When patients with marginal reading abilities were included, the proportion of patients who had difficulty performing tasks commonly required of patients seeking health care increased to 47.4% (464/979), 61.7% (473/767), and 22.0% (201/913), respectively.

Age and education were highly correlated with literacy skills for all three groups of patients. In Atlanta, the median TOFHLA scores (25th to 75th percentiles) by age group were as follows: 18 to 30 years, 87.1 (77.4 to 93.1); 31 to 45 years, 79.4 (56.5 to 89.1); 46 to 59 years, 69.2 (42.4 to 86.2); and 60 years and older, 35.4 (23.6 to 54.4) ($P<.001$). Among elderly (age ≥ 60 years) patients, 34 (47.9%) of 71 English-speaking patients in Los Angeles, 49 (71%) of 69 Spanish-speaking patients, and 128 (80.5%) of 159 in Atlanta had inadequate functional health literacy ($P<.001$ compared with patients aged <60 years). The TOFHLA scores were lower among those aged 70 years or older compared with patients 60 to 69 years old in Los Angeles, but only six English-speaking and 16 Spanish-speaking patients aged 70 years or older were sampled. The median TOFHLA score for patients aged 70 years or older (n=69) was similar to those aged 60 to 69 years (n=90) in Atlanta, 36.9 vs 34.5, respectively. However, even among English-speaking younger adults aged 18 to 30 years, 19% (101/530) had scores on the TOFHLA consistent with inadequate or marginal functional health literacy. An even higher proportion of Spanish-speaking young adults, 51.3% (139/271), were found to have inadequate or marginal functional health literacy.

The number of years of school completed was correlated with the mean TOFHLA score ($P<.001$ for all groups). However, the number of years of school alone did not reliably identify functional health literacy. Among 1336 high school graduates at both sites, 258 (20%) had inadequate or marginal functional health literacy. The majority of patients with 6 or fewer years of education, 96.1%

Table 2.—Patients Incorrectly Answering Selected Numeracy Questions and Unable to Correctly Complete 75% or More of the Items in the Reading Passages According to Study Site and Language

	Atlanta, Ga (n=979)	Los Angeles, Calif	
		English (n=913)	Spanish (n=767)
Numeracy, No. (%)			
How to take medication four times a day	153 (15.6)	70 (7.7)	111 (14.5)
How to take medication on an empty stomach	436 (44.5)	222 (24.3)	446 (58.2)
How many pills of a prescription should be taken	322 (32.9)	175 (19.2)	388 (50.6)
How many times a prescription can be refilled	105 (10.7)	125 (13.7)	380 (49.5)
When next appointment is scheduled	262 (26.8)	190 (20.8)	239 (31.2)
How to determine financial eligibility	581 (59.3)	297 (32.5)	437 (57.0)
Reading comprehension passages, No. (%)			
Instructions for preparation for upper gastrointestinal tract radiographic procedure	284 (29.0)	99 (10.8)	253 (33.0)
Rights and responsibilities section of Medicaid application	420 (42.9)	162 (17.7)	378 (49.3)
Standard informed consent document	640 (65.4)	372 (40.7)	571 (74.5)

Table 3.—Functional Health Literacy Levels, Proportion of Patients Incorrectly Answering Selected Numeracy Items, and Proportion of Items Incorrectly Answered on Cloze Passages*

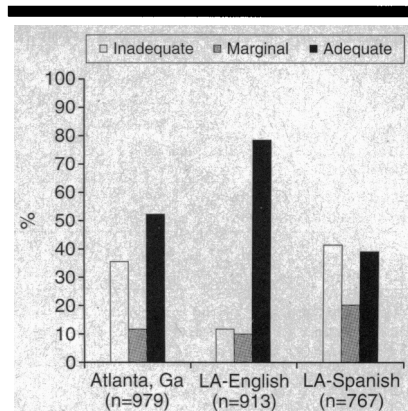
Test Item	Incorrect, %		
	Inadequate (n=775)	Marginal (n=363)	Adequate (n=1521)
Numeracy			
How to take medication four times a day	23.6	9.4	4.5
How to take medication on an empty stomach	65.3	52.1	23.9
How many pills of a prescription should be taken	69.9	33.7	13.0
How many times a prescription can be refilled	42.0	24.7	9.6
When next appointment is scheduled	39.6	12.7	4.7
How to determine financial eligibility	74.3	49.0	31.5
Prose Cloze passages			
Instructions for preparation for upper gastrointestinal tract radiographic procedure	57.2	11.9	3.6
Rights and responsibilities section of Medicaid application	81.1	31.0	7.3
Standard informed consent document	95.1	72.1	21.8

*All study sites combined (N=2659). Functional health literacy levels are defined as follows according to the total Test of Functional Health Literacy in Adults score: inadequate, 0 to 59; marginal, 60 to 74; and adequate, 75 to 100.

(74/77) in Atlanta and 83.3% (365/438) in Los Angeles, did not have adequate functional health literacy. There were no significant differences in literacy levels between English-speaking and Spanish-speaking patients in Los Angeles after stratifying for the number of years of school completed. Older patients had fewer years of schooling, but age and education were independent predictors of TOFHLA scores in a multivariate analysis ($P<.001$ for both).

Markers of socioeconomic status were not consistently associated with functional health literacy. Mean TOFHLA scores for English-speaking patients were similar regardless of type of housing (excluding patients residing in nursing homes), telephone ownership, or receipt of financial assistance for food (eg, food stamps). Car ownership was associated with a higher TOFHLA score in both English-speaking and Spanish-speaking samples ($P<.001$). Race was not associated with TOFHLA scores among all patients 18 to 45 years of age ($P=.5$).

Patients who reported reading difficulties had lower TOFHLA scores than those who did not. We asked patients three questions about their perceived reading abilities in an attempt to develop a simple screening tool for identifying those with inadequate functional health literacy. First, patients were asked if they could read a newspaper. This question had a sensitivity of 16.7% and specificity of 99.4%, but only 5.3% of the total sample admitted being unable to read a newspaper. Second, we inquired about the ability to read forms and other written materials obtained from the hospital. This question had a sensitivity of 19.8% and a specificity of 99.3%. We also asked patients if they usually ask somebody to help them read materials they receive from the hospital. This use of a surrogate reader had a sensitivity of 51.4% and a specificity of 88.6%. These sensitivities and specificities were similar across study site and language and suggest that patients' self-reported reading ability does not adequately screen for functional health literacy.



Functional health literacy levels according to the Test of Functional Health Literacy in Adults (TOFHLA). Scores on the TOFHLA range from 0 to 100, with classification as follows: inadequate literacy, 0 to 59; marginal literacy, 60 to 74; and adequate literacy, 75 to 100. LA indicates Los Angeles, Calif.

COMMENT

To our knowledge, this is the first published study to assess the ability of patients to perform the wide range of literacy tasks required to function in the health care environment. Prior studies have focused on the ability of patients to pronounce correctly a list of words.^{10,17,20,29} These studies have shown that patient educational materials and informed consent forms are written at a level that exceeds the reading ability of many patients. However, information from these studies provides no indication of the capacity of patients to perform more basic tasks of reading labels on prescription bottles, understanding appointment slips, or completing financial eligibility requirements. Our study provides a comprehensive view of how often English-speaking and Spanish-speaking patients at two public hospitals have difficulty with reading tasks routinely required to function in the health care setting.

In our study, up to 33% of patients presenting for acute care at our facilities did not adequately understand instructions for a common radiographic procedure written at a fourth-grade level. More worrisome was how frequently patients did not understand instructions on medication bottles. From 24.3% to 58.2% of patients did not understand directions to take a medication on an empty stomach. Comprehending when a follow-up visit was scheduled was also problematic; more than 20% of patients incorrectly answered questions regarding information on a routinely used appointment slip. Patients are frequently discharged from a clinic with prescriptions and appointment slips and given only brief oral instructions. Assuming patients can read these materials may result in decreased compliance, poorer health outcomes, or adverse

reactions among patients with low literacy levels.

Our findings regarding the high prevalence of inadequate functional health literacy are consistent with the National Adult Literacy Survey,¹ which reported that 46% to 51% of adult US citizens have deficient literacy skills. We found that 22.0% to 61.7% of patients in our sample had inadequate or marginal functional health literacy.

The higher prevalence of inadequate health literacy skills among the elderly is noteworthy. From 47.9% to 80.5% of patients aged 60 years or older had inadequate functional health literacy. This is consistent with a previous study of 76 elderly patients who had poorer reading skills than younger patients.²² The National Adult Literacy Survey also found a sharp decline in literacy proficiencies among those older than 54 years.¹ The higher prevalence of inadequate functional health literacy among the elderly African-American population (80.5%) in Atlanta most likely reflects lack of access to school during childhood. Since elderly persons have a greater burden of chronic medical problems and are more likely to need health care services, their higher prevalence of low functional health literacy takes on even greater significance. Many hospitalizations and adverse drug reactions may be due to patients incorrectly taking medications because of their inability to read prescription bottles or other self-care instructions correctly.

Patients with limited literacy skills have particular difficulty reading informed consent forms, thereby presenting a troubling ethical issue. The ethical obligation of physicians to explain the risks and benefits of any procedure or treatment is fundamental to the physician-patient relationship.³⁰ From 40.7% to 74.5% of patients we surveyed did not adequately comprehend the standard informed consent document routinely used for invasive procedures and surgery at the hospital in Atlanta. The complexity of consent forms is well described,^{5,31,32} and comprehension has been shown to vary inversely with age and directly with education.³³ Efforts have been made to simplify informed consent documents,³⁴ although attempts at comprehensiveness and legal concerns over malpractice vulnerability continue to guide their complexity. For example, the typical informed consent document used for oncology randomized controlled trials is five to eight pages long and is written at the grade 13 to 14 level.³⁵ Simplifying the text (ie, writing at a sixth-grade level) may allow marginally literate patients to comprehend these documents, but they will remain inaccessible to those with inadequate health literacy. Patients

unable to understand informed consent forms cannot intelligently participate in their own care. Valid alternatives to the typical written informed consent that overcome the barrier of low literacy need to be developed.

The inability of patients to understand the informed consent section of the Medicaid application (Medicaid "Rights and Responsibilities") raises concerns that low literacy may be an access barrier to receiving Medicaid. From 18% to 49% of our patients did not adequately understand the "Rights and Responsibilities" section of a Medicaid application form. In a 1993 survey conducted in Georgia on access to Medicaid, 74% of Aid to Families With Dependent Children denials were for procedural reasons, and only 17% of denials were due to excess income.³⁶ Eligibility workers cited "client uncooperative" as the most common reason for denial, meaning applicants failed to return requested information for verification purposes or failed to keep an interview appointment. Shuptrine³⁶ interviewed applicants denied Medicaid for procedural barriers and found the second most common reason that applicants did not return documents was because they did not know or understand what information was needed.

The high prevalence of inadequate functional health literacy presents a challenge for those interested in improving communication between patients and clinicians. The Joint Commission on Accreditation of Healthcare Organizations has recently begun a campaign to improve patient communication.³⁷ Its recommendations make it clear that attempts at education are not enough; the information must be presented in a manner that can be understood by patients and family members. In the future, Joint Commission surveyors will be talking to patients, to their family, or to both to determine how much they understand of what they have been taught.³⁸ The role of family members as surrogate readers for patients with low levels of literacy deserves emphasis. In our study, 23.1% of patients indicated that they usually request someone to help them read materials they receive from the hospital, and 51% of patients with low literacy skills usually ask for help. Unfortunately, surrogate readers (eg, family members) are often excluded from the physician's examination room, thereby preventing patients with low literacy levels from using one of their main coping mechanisms.

There is no easy way to identify patients with inadequate literacy skills; screening questions or self-reported reading difficulty are unreliable indicators of true reading ability. In addition,

patients with low literacy levels harbor a tremendous amount of shame and may not have disclosed their reading problem even to family or friends.^{39,40} In light of this, it is unrealistic to expect these patients to volunteer this information to health care providers. To identify patients with inadequate literacy skills correctly, screening tests of reading ability may be necessary. The length of the TOFHLA limits its use as a screening tool. The WRAT-R⁴¹ and REALM²⁰ have been used as rapid screening tools for literacy in the health care setting, but both have limitations. These tests measure the ability of patients to recognize and pronounce words and then assign a reading grade level, but may overestimate an individual's ability to read and comprehend prose passages written at a similar grade level.⁴² For example, patients scoring at the sixth-grade level on the WRAT-R or REALM may not be able to comprehend a health pamphlet judged to be written at the sixth-grade level according to common readability formulas.^{29,32} Neither test assesses the ability of patients to read and comprehend quantitative information (numeracy), which may be more important for common patient tasks than reading ability of longer prose passages. Finally, these word recognition tests are not valid indicators of literacy among Spanish-speaking adults.²³ Despite these limitations, the REALM is currently the best available rapid screening test for English-speaking patients in the health care setting. However, a test that includes numeracy skills assessment and reading comprehension passages is needed and has the potential to be a more valid screening instrument for both English-speaking and Spanish-speaking patients.

Much can be done to mitigate the negative effects of low literacy on health care. The first step toward solving the problem of caring for patients with low levels of literacy is to acknowledge its existence. Medical staff and administrators need to be educated about the prevalence of low literacy and how to deal sensitively with affected individuals. Increasing the involvement of the patient's own surrogate readers and providing ancillary surrogates allow patients to rely on familiar coping mechanisms. Communication using symbols could ease navigation within hospitals, as it does on highways and in airports.⁴³ Additional work is necessary to understand how best to teach patients with low levels of literacy, because medical education pamphlets may be ineffective for those who read poorly or not at all.⁴⁴⁻⁴⁶ Audiotapes and videotapes provide an alternative to the written word.⁴⁷ Multimedia resources have the capability to teach, test

patient knowledge, and ensure the message has been communicated and understood.^{43,49}

The majority of the literate US public takes the ability to read for granted. Reading is so much a part of the daily existence of health care professionals that it is difficult to imagine a world in which the written word is overwhelming and threatening. The fact that read-

ing is so basic and taken for granted by so many may be why those who cannot read well feel embarrassed and inadequate. Consequently, low literacy remains an occult, silent disability. Clinicians must learn to identify these individuals compassionately and overcome communication barriers to ensure that patients with inadequate literacy skills receive high-quality health care.

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Copies of the TOFHLA may be obtained for a small administrative fee (to cover copying and mailing) by contacting Joanne R. Nurss, PhD, Director, Center for the Study of Adult Literacy, Georgia State University, University Plaza, Atlanta, GA 30303-3083.

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