Part 2

- Health literacy and health outcomes
- The National Assessment of Adult Literacy health literacy tasks
  - On a scale of 0-500, what was measured?
  - How did people do?
- What tasks are involved in your patients' health care?
- Participants provide examples of prose, document, and quantitative tasks.

So what role does literacy, health literacy play in health outcomes?

- Some
- Hard to disentangle from all of previous
- Duh.

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Agency for Healthcare Research and Quality

Evidence Report/Technology Assessment

Number 87

Literacy and Health Outcomes

Summary

Introduction

Literacy can be defined as "an individual's ability to read, write, and speak in English and compute and solve problems at levels of proficiency necessary to function on the job and in society, to achieve one's goals, and to develop one's knowledge and potential."[1] Literacy sometimes describes a person's facility with or knowledge about a particular topic (e.g., "computer literacy"). In that context, "health literacy" is a constellation of skills that constitute the ability to perform basic reading and numerical numerical information (numeracy). A short version (S-TOFHLA) involves only two reading comprehension sections. All of these instruments are highly correlated with one another.

Low literacy is common in the United States; a decade ago, 40 million adult Americans scored on the lowest of five levels (level 1) of the National Adult Literacy Survey (NALS); another 50 million scored at level 2.[7] These levels correspond to having trouble finding pieces of information or numbers in a lengthy text, integrating multiple pieces of information in a document, or finding two or more numbers in a chart and performing a

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low literacy.

Methods

We examined two key questions in this review.

- Key question 1: Are literacy skills related to
  a. use of health care services?
  b. health outcomes?
  c. costs of health care?
  d. disparities in health outcomes or health care service use according to race, ethnicity, culture, or age?
- Key question 2: For individuals with low literacy skills, what are effective interventions to
  a. improve use of health care services?
  b. improve health outcomes?
  c. affect the costs of health care?
  d. improve health outcomes and/or health care service use among different racial, ethnic, cultural, or age groups?

Our inclusion/exclusion criteria limited studies to those with outcomes related to health and health services, studies published from 1980 on, and studies conducted in developed countries (United States, Canada, the United Kingdom, Australia, New Zealand, and Europe). Study participants included individuals of all ages.

We searched several databases, using terms such as "literacy" and "health literacy" and, in some cases, "numeracy" and the name or accepted acronym for standardized tests of literacy related to health outcomes (e.g., WRAT, REALM, and TOFHLA). For MEDLINE®, our primary database, we had to

of overall evidence, for the two key questions separately, in three domains: quality of the research; quantity of studies, including number of studies and adequacy of the sample size; and consistency of findings.[12,13]

Results

Key Question 1: Relationship of Literacy to Various Outcomes and Disparities

We identified 44 articles addressing relationships between literacy and use of health care services, health outcomes, costs of health care, and disparities according to race, ethnicity, culture, or age. Study designs, data analysis, and presentation varied widely. The number of participants enrolled ranged from 34 to 3,260. Literacy was most often measured with the REALM (13 studies), TOFHLA or S-TOFHLA (11), or WRAT (6). Literacy levels used to compare study participants varied widely among studies. Most studies reported the unadjusted (bivariate) relationship between literacy and the outcome of interest; 28 adjusted for at least one covariate, chiefly age and education. The quality of articles reviewed for these key questions was fair to good. The overall strength of evidence ranged from II (studies of strong design but remaining uncertainty because of inconsistencies or concern about generalizability, bias, research design flaws, or adequate sample size, or consistent evidence from studies of weaker design) to III (the number of studies was too limited to rate the strength of the literature).

1a. Health Care Services. Six studies measured the

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Structured abstract

- **Main Results:** We identified 3,015 unique abstracts from our literature searches. We excluded 2,330 that clearly did not meet our inclusion criteria after abstract review. Of the 684 remaining articles subjected to full review, 611 were rejected and 73 retained. Of those retained, 44 articles addressed KQ 1 and 29 articles addressed KQ 2.
- Studies examining the relationship between low literacy and adverse health outcomes generally found that patients with low literacy had poorer health outcomes, including knowledge, intermediate disease markers, measures of morbidity, general health status, and use of health resources. Most studies were cross-sectional in design, and many failed to adequately address confounding and the use of multiple comparisons in their analyses. For KQ 2, most interventions led to improved outcomes, particularly for outcomes of understanding or knowledge. Fewer studies examined the effect of interventions for patients with low health literacy on morbidity and mortality.
- Based on our 11-item quality scale, we found that the average quality of the individual articles addressing KQs 1a and 1b was good to fair. The quality of the one article addressing KQ 2a was good; the average quality of the articles addressing KQ 2b was fair. We did not find literature that discussed the portion of the key questions addressing costs or disparities, so an average grade is not available.
- We also graded the strength of the evidence for this body of literature on a scale from I (strongest design) to IV (no published literature). We concluded that the literature addressing KQ 1a and 1b should receive a grade of II; it generally includes studies of strong design, but some uncertainty remains because of concerns about generalizability, bias, research design flaws, and adequate sample size. The literature addressing KQ 1c and 1d was rated III since the evidence is from a limited number of studies of weaker design and studies with strong designs have not been done. The literature addressing KQ 2a and 2b also received a grade of III, while the literature addressing KQ 2c and 2d received a grade of IV, indicating that there was no published literature.

Conclusions

Low literacy is associated with several adverse health outcomes

- low health knowledge
- increased incidence of chronic illness
- poorer intermediate disease markers
- Sub-optimal use of preventive health services.

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Medscape Medical News

Poor Health Literacy in the Elderly Predicts All-Cause and Cardiovascular Mortality CME/CE

News Author: Laurie Barclay, MD
CME Author: Charles Vega, MD
Disclosures

Release Date: July 31, 2007; Valid for credit through July 31, 2008

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July 31, 2007 — Elderly patients with poor health literacy have higher incidence of all-cause mortality and cardiovascular death, according to the results of a prospective cohort study published in the July 23 issue of *Archives of Internal Medicine*.

"Individuals with low levels of health literacy have less health knowledge, worse self-management of chronic disease, lower use of preventive services, and worse health in cross-sectional studies," write David W. Baker, MD, MPH, from the Feinberg School of Medicine at Northwestern University in Chicago, Illinois, and colleagues. "The number of years of school completed is strongly

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ESEARCH ARTICLE

ne Association Between Age and Health Literacy Among Elderly ersons

vid W. Baker[a,b], Julie A. Gazmararian[c], Joseph Sudano[a] and Marian Patterson[d]

nter for Health Care Research and Policy, Case Western Reserve University at MetroHealth Medical Center, Cleveland, Ohio
epartment of Medicine and Department of Epidemiology-Biostatistics, Case Western Reserve University School of Medicine, Cleveland, o
nited States Quality Algorithms Center for Health Care Research™, Atlanta, Georgia
epartments of Neurology and Psychiatry, Case Western Reserve University School of Medicine and the Case Western Reserve versity Alzheimer Center, University Hospitals of Cleveland, Ohio

vid W. Baker, MetroHealth Medical Center, 2500 MetroHealth Drive, Rammelkamp 221, Cleveland, OH 44109-1998 E-mail: @po.cwru.edu.

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nter for Health Care Research and Policy, Case Western Reserve University at MetroHealth Medical Center, Cleveland, Ohio
epartment of Medicine and Department of Epidemiology-Biostatistics, Case Western Reserve University School of Medicine, Cleveland, o
nited States Quality Algorithms Center for Health Care Research™, Atlanta, Georgia
epartments of Neurology and Psychiatry, Case Western Reserve University School of Medicine and the Case Western Reserve versity Alzheimer Center, University Hospitals of Cleveland, Ohio

vid W. Baker, MetroHealth Medical Center, 2500 MetroHealth Drive, Rammelkamp 221, Cleveland, OH 44109-1998 E-mail: @po.cwru.edu.

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sults. Mean S-TOFHLA scores declined 1.4 points (95% CI 1.3–1.5) for every year increase in age ($p < .001$). After adjusting for sex, race, ethnicity, and ucation, the S-TOFHLA score declined 1.3 points (95% CI 1.2–1.4) for every year increase in age. Even after adjustment for performance on the MMSE, the TOFHLA score declined 0.9 points (95% CI 0.8–1.0) for every year increase in age ($p < .001$). Differences in newspaper reading frequency, visual acuity, onic medical conditions, and health status, did not explain the lower literacy of older participants.

scussion. Functional health literacy was markedly lower among older age groups even after adjusting for differences in MMSE performance, newspaper reading quency, health status, and visual acuity. Future studies should prospectively examine whether functional literacy declines with age and whether this is explained by clines in cognitive function.

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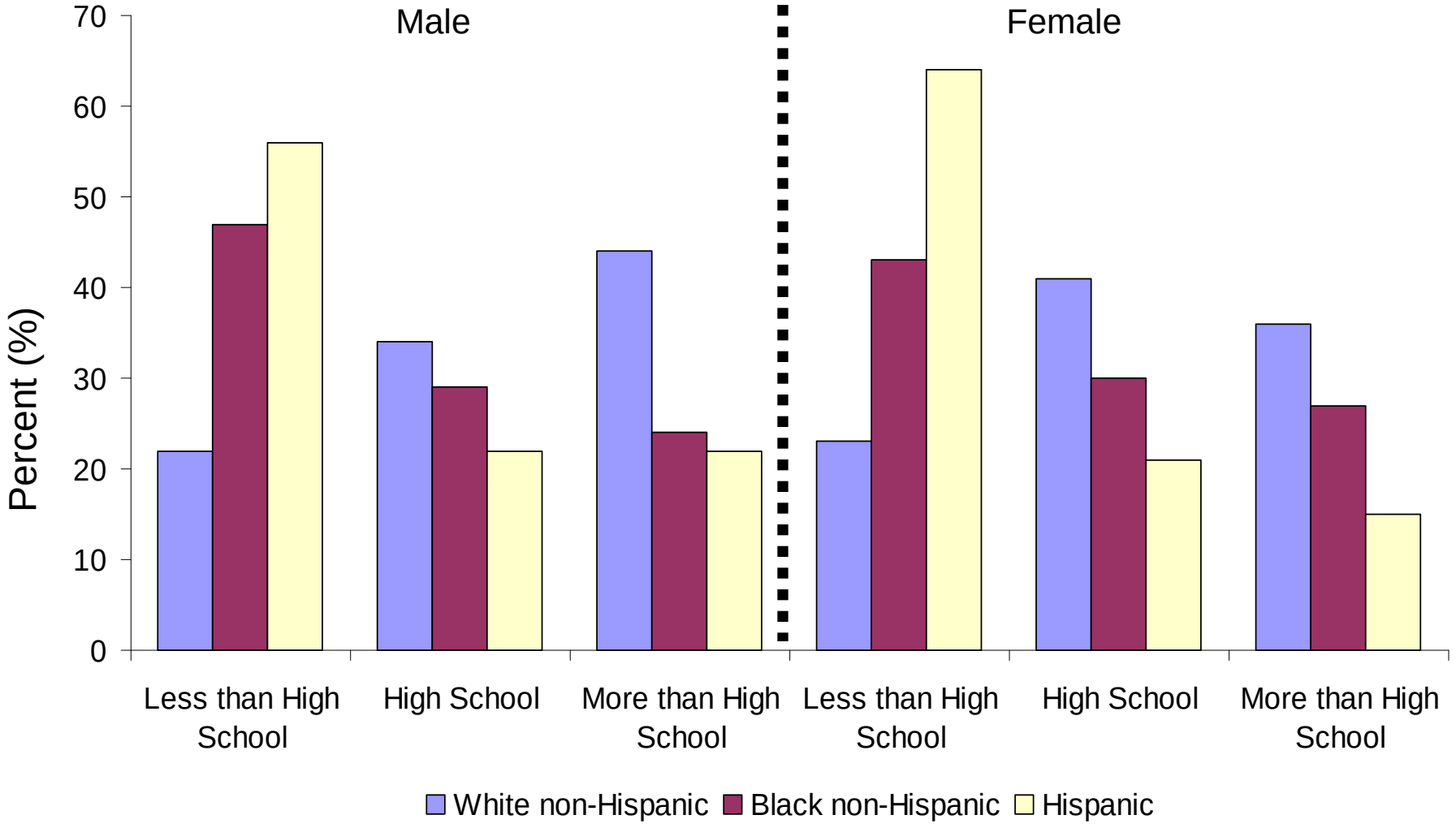
Years of Education Among Persons Age 65 and Over (age-adjusted) by Sex and Race/Ethnicity, 2006



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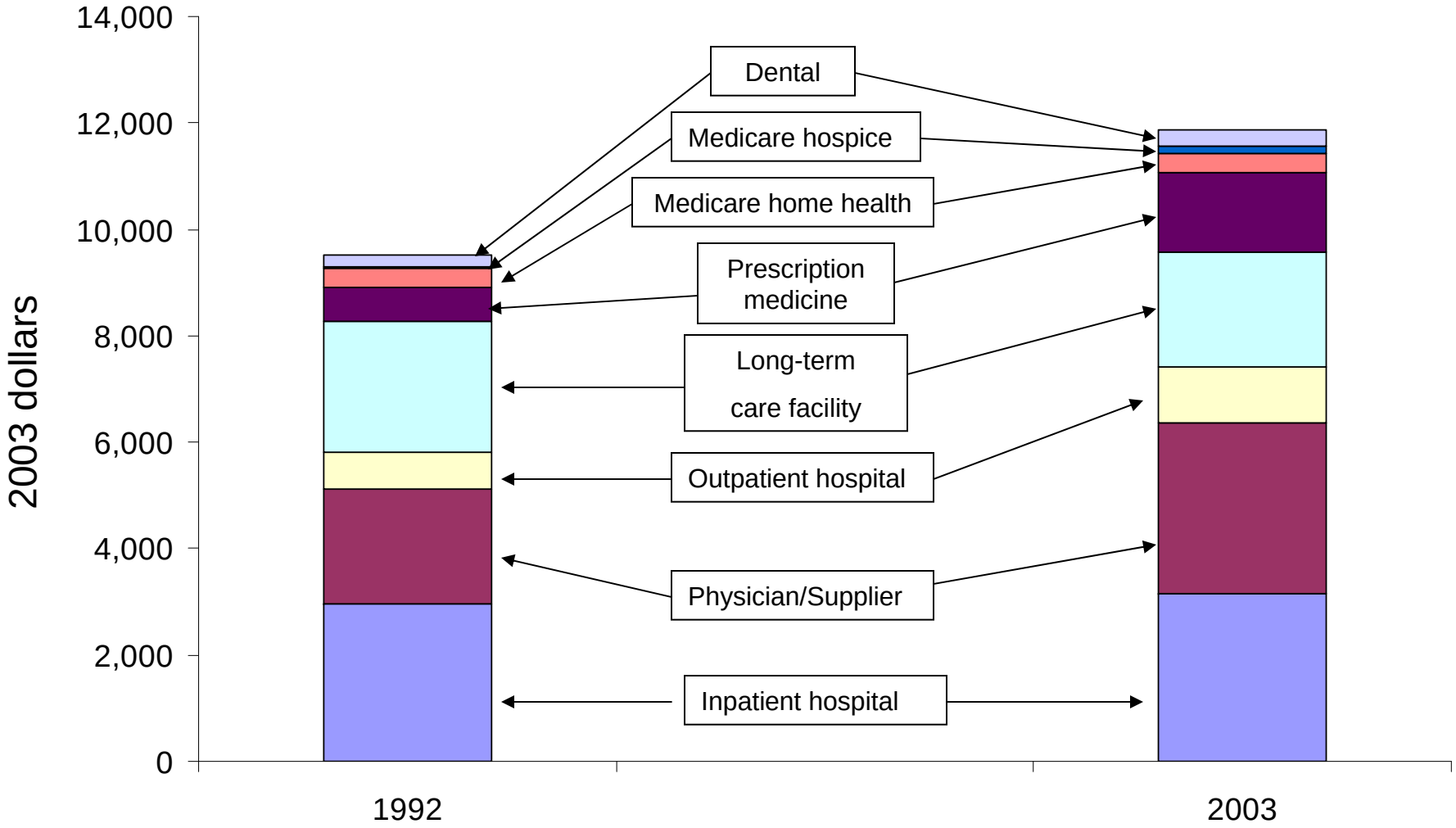

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NAAL National Assessment of Adult Literacy

The Health Literacy of America's Adults

Results From the 2003 National Assessment of Adult Literacy

U.S. Department of Education
NCES 2006–483

The National Assessment of Adult Literacy (NAAL)

- The NAAL is a nationally representative assessment of English literacy among American adults.
- The survey sample included over 19,000 adults ages 16 and older in homes and over 1,000 inmates in state and Federal prisons across the country.
- In 2003, for the first time, the NAAL included a health literacy component which assessed respondents' skills for locating and understanding health-related information and services.

Literacy: It's more than reading. It's comprehension

- We learn new information by adding it to what we already know:
  - Our Logic
  - Our Language
  - Our Experience
- Too often health information is presented using a different reference frame and the patient can not understand or incorporate the information effectively.

The Health Literacy Scale

The NAAL assessment measures health literacy on a scale of 0 to 500, using four literacy levels:

- *Proficient* – Able to perform complex activities such as searching a document to define a medical term or other information.
- *Intermediate* – Capable of conducting moderately challenging tasks such as finding the age range for a particular vaccine from a childhood vaccination chart.
- *Basic* – Able to complete simple tasks such as giving two reasons why a person should be tested for a specific disease, based on information in a clearly written pamphlet.
- *Below Basic* – Demonstrates the lowest levels of performance such as identifying what is permissible to drink before a medical test, based on a set of short instructions.
- There is also a fifth category, *Nonliterate in English*, which includes adults at the bottom of the *Below Basic* level and those adults who could not take the test because they did not speak English or Spanish.

Table 1-1. Overview of the literacy levels

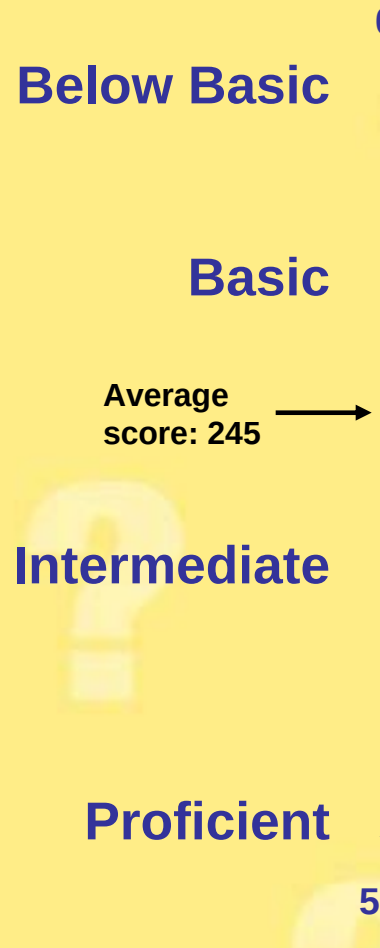
Level and definition	Key abilities associated with level
Below Basic indicates no more than the most simple and concrete literacy skills. Score ranges for *Below Basic*: Prose: 0–209 Document: 0–204 Quantitative: 0–234	Adults at the *Below Basic* level range from being nonliterate in English to having the abilities listed below: ■ locating easily identifiable information in short, commonplace prose texts ■ locating easily identifiable information and following written instructions in simple documents (e.g., charts or forms) ■ locating numbers and using them to perform simple quantitative operations (primarily addition) when the mathematical information is very concrete and familiar
Basic indicates skills necessary to perform simple and everyday literacy activities. Score ranges for *Basic*: Prose: 210–264 Document: 205–249 Quantitative: 235–289	■ reading and understanding information in short, commonplace prose texts ■ reading and understanding information in simple documents ■ locating easily identifiable quantitative information and using it to solve simple, one-step problems when the arithmetic operation is specified or easily inferred
Intermediate indicates skills necessary to perform moderately challenging literacy activities. Score ranges for *Intermediate*: Prose: 265–339 Document: 250–334 Quantitative: 290–349	■ reading and understanding moderately dense, less commonplace prose texts as well as summarizing, making simple inferences, determining cause and effect, and recognizing the author's purpose ■ locating information in dense, complex documents and making simple inferences about the information ■ locating less familiar quantitative information and using it to solve problems when the arithmetic operation is not specified or easily inferred
Proficient indicates skills necessary to perform more complex and challenging literacy activities. Score ranges for *Proficient*: Prose: 340–500 Document: 335–500 Quantitative: 350–500	■ reading lengthy, complex, abstract prose texts as well as synthesizing information and making complex inferences ■ integrating, synthesizing, and analyzing multiple pieces of information located in complex documents ■ locating more abstract quantitative information and using it to solve multistep problems when the arithmetic operations are not easily inferred and the problems are more complex

NOTE: Although the literacy levels share common names with the National Assessment of Educational Progress (NAEP) levels, they do not correspond to the NAEP levels.

3 Literacy Tasks

- The prose literacy scale measured the knowledge and skills needed to search, comprehend, and use information from texts that were organized in sentences or paragraphs.
- The document literacy scale measured the knowledge and skills needed to search, comprehend, and use information from non-continuous texts in various formats.
- The quantitative scale measured the knowledge and skills needed to identify and perform computations using numbers embedded in printed materials.

Difficulty of Selected Health Literacy Tasks



Circle the date of a medical appointment on a hospital appointment slip. (101)

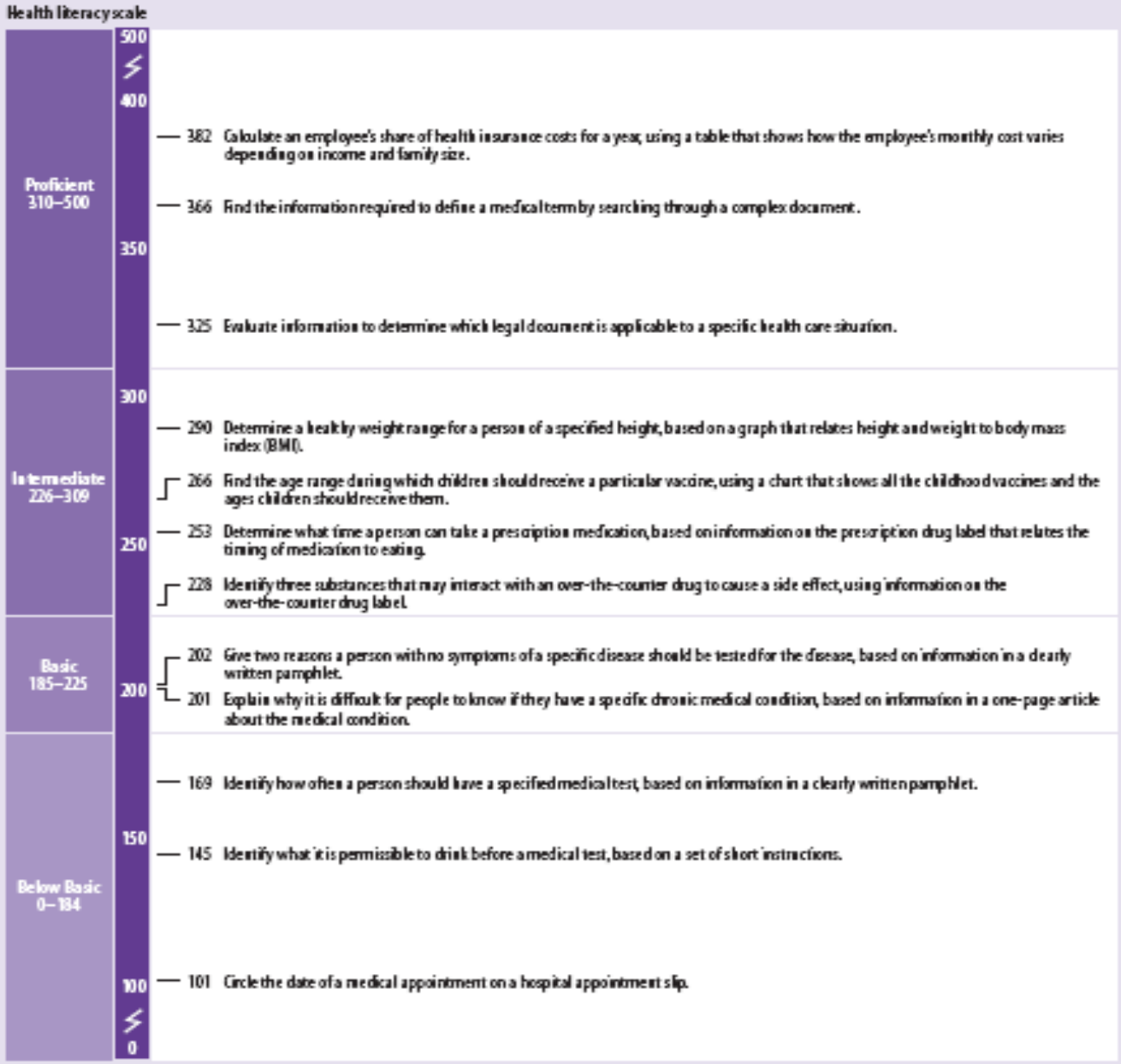
Give two reasons a person should be tested for a specific disease, based on information in a clearly written pamphlet. (202)

Determine what time a person can take a prescription medication, based on information on the drug label that relates the timing of medication to eating. (253)

Calculate an employee's share of health insurance costs for a year, using a table. (382)

Source: National Center for Education Statistics, Institute for Education Sciences

Figure 1-1. Difficulty of selected health literacy tasks: 2003



NOTE: The position of a question on the scale represents the average scale score attained by adults who had a 67 percent probability of successfully answering the question. Only selected questions are presented.

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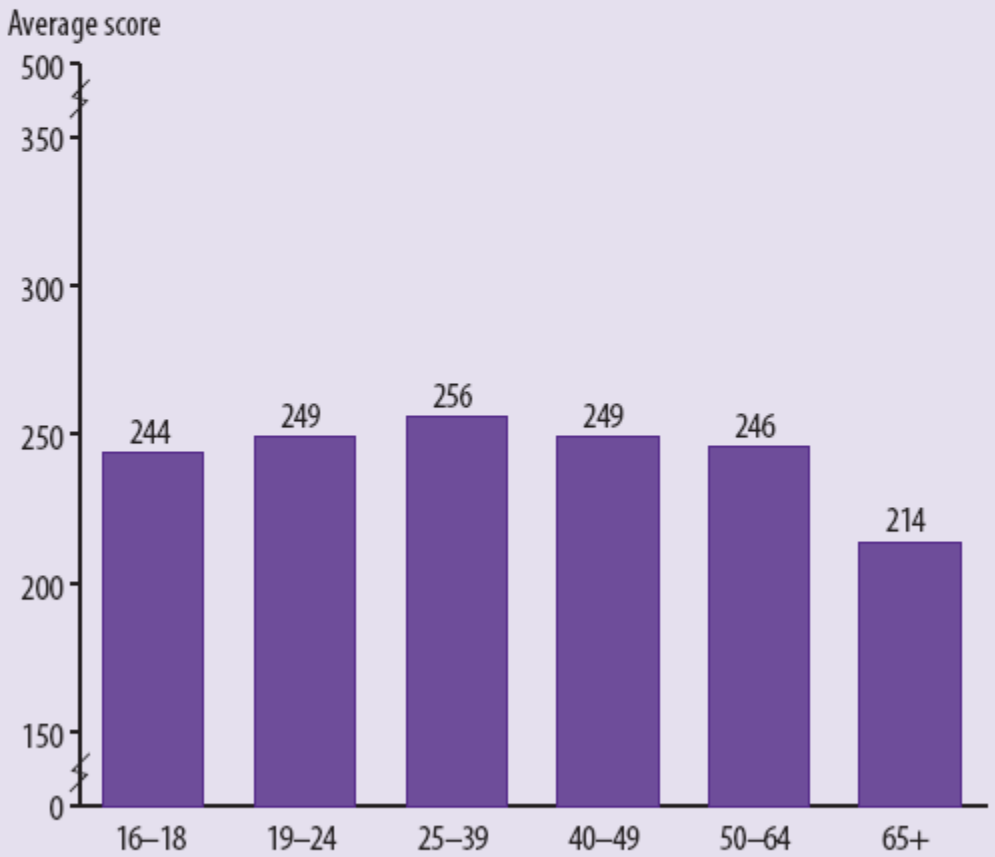
Figure 2-6. Average health literacy scores of adults, by age: 2003



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How does this apply to you?