

# PROGRAM BRIEF

## Health Literacy

The mission of AHRQ is to improve the quality, safety, efficiency, and effectiveness of health care by:

- Using evidence to improve health care.
- Improving health care outcomes through research.
- Transforming research into practice.

### Introduction

Literacy is a person's ability to read and write and the degree to which these skills can be integrated to function in society, learn, and achieve goals. Health literacy specifically refers to the degree to which a person can obtain, process, and understand basic health information and services needed to make appropriate health decisions. Many factors affect a person's health literacy including their literacy, numeracy, and verbal communication skills, and the complexity of printed and spoken health messages. Health literacy is a critical determinant of a person's ability to navigate the health care system, fill out forms, locate providers and services, and engage in self-care and chronic disease management.

According to the National Assessment of Adult Literacy, nearly 9 out of 10 adults do not have proficient health literacy and, therefore, may not have the skills required to manage their health and prevent disease. As such,

these adults are at risk for poorer health outcomes. The Agency for Healthcare Research and Quality (AHRQ) supports research to improve health literacy as it pertains to prevention, healthy living, chronic disease management, patient-centered health care, cultural competence, and health disparities.

### Research Findings

#### **Patients with low literacy have poorer health outcomes**

Studies have found that low literacy is associated with several adverse health outcomes, including low health knowledge, increased incidence of chronic illness, higher risk of hospitalization, and less than optimal use of preventive health services. Most interventions that have been studied have led to improved outcomes, particularly for outcomes of understanding or knowledge. Some have shown promise for improving patient health and receipt of health care services.



Agency for Healthcare Research and Quality

Advancing Excellence in Health Care • [www.ahrq.gov](http://www.ahrq.gov)



**Project Title:** Literacy and Health Outcomes

**AHRQ Contract:** 290-02-0016

**Principal Investigator:** RTI International-University of North Carolina Evidence-based Practice Center

**Reference:** Berkman ND, DeWalt DA, Pignone MP, Sheridan SL, Lohr KN, Lux L, Sutton SF, Swinson T, Bonito AJ. *Literacy and Health Outcomes*. Evidence Report/Technology Assessment No. 87. AHRQ Publication No. 04-E007-2. Rockville, MD: Agency for Healthcare Research and Quality. January 2004.

**Colorectal cancer screening rates are low among Latinos and people with little education**

Latinos and individuals with little education are less likely to be screened for colorectal cancer. Researchers assessed whether demographics, acculturation, and health literacy, measured by the Short Test of Functional Health Literacy in Adults (STOFHLA), affected whether Latino, white, and black patients had heard of colorectal cancer and screening. Over 40 percent of the patients had STOFHLA scores in the inadequate or marginal range. Lower scoring patients were more likely to be Latino, have less than an eighth grade education, and be poor and uninsured. Functional health literacy as assessed by the STOFHLA was not an independent predictor of colorectal cancer screening knowledge, beliefs, attitudes, or behavior. Latino ethnicity and low education emerged as stronger predictors of less knowledge and fewer screening tests.

**Project Title:** Measuring Patient Satisfaction—Low Literacy Populations

**AHRQ Grant:** HS10299

**Principal Investigator:** Judy Shea, Ph.D.

**Reference:** Literacy and knowledge, attitudes, and behavior about colorectal cancer screening. Carmen E. Guerra, M.D., F.A.C.P., Francisco Dominguez, and Judy A. Shea, Ph.D. October/November 2005. *Journal of Health Communication* 10, pp. 651-663.

**Poor communication between patients taking warfarin and their doctors may place them at risk for stroke and bleeding**

Researchers found that half of patients receiving weekly warfarin at an anticoagulant clinic thought their medication regimen was different from what their clinicians thought. This medication discordance, a possible result of miscommunication, was associated with both under- and over-coagulation and could place patients at risk for stroke or internal bleeding. Nearly one-third of the patients reported missing at least 1 day of warfarin during the previous 30 days. In a companion study, researchers found that limited literacy and limited English proficiency were associated with higher rates of warfarin regimen discordance. Of note, having subjects identify their regimen using a digital color printout of Coumadin® and warfarin pills led to lower rates of discordance overall and eliminated literacy and language-related disparities.

**Project Title:** Promoting Effective Communication and Decision-Making in Diverse Populations

**AHRQ Grant:** HS10856

**Principal Investigator:** A. Eugene Washington, M.D.

**Reference:** The importance of establishing regimen concordance in preventing medication errors in anticoagulant care. Dean Schillinger, M.D., Frances Wang, Ph.D., Maytrella Rodriguez, and others. September

2006. *Journal of Health Communication* 11, pp. 555-567; Language, literacy, and communication regarding medication in an anticoagulation clinic: A comparison of verbal vs. visual assessment. Dean Schillinger, M.D., Frances Wang, Ph.D., Jorge Palacios, and others. October-November 2006. *Journal of Health Communication* 11, pp. 651-664.

### **Many men still confuse benign prostatic hyperplasia with prostate cancer**

Researchers found that some men who watched a video about treatment for benign prostatic hyperplasia (BPH, enlarged prostate) still considered BPH and prostate cancer related to one another, despite explicit statements to the contrary in the video. Pre- and post-video survey responses suggested that up to 67 percent of the men persisted in misconceptions even after viewing the video. The researchers identified three basic misconceptions voiced by men while viewing the videotape: BPH and cancer are similar, BPH surgery is for removing cancer, and BPH leads to cancer.

**Project Title:** Information Interpretation in Patient Decision Support

**AHRQ Grant:** HS010608

**Principal Investigator:** Margaret Holmes-Rovner, Ph.D.

**Reference:** Men's theories about benign prostatic hyperplasia and prostate cancer following a benign prostatic hyperplasia decision aid. Margaret Holmes-Rovner, Ph.D., Chrystal Price, B.A., B.S., David R. Rovner, M.D., and others. January 2006. *Journal of General Internal Medicine* 21, pp. 56-60.

### **Community-based case managers increase public insurance enrollment of uninsured Latino children**

In Massachusetts, a State where low-income children are eligible for health insurance, current State Children's Health Insurance Programs (SCHIP) and Medicaid outreach and enrollment efforts are not reaching many uninsured Latino children. Parents of uninsured Latino children reported 52 barriers to insuring their children including lack of knowledge about the application process and eligibility (especially misconceptions about work, welfare, and immigration), language barriers, hassles with paperwork, family mobility, misinformation from insurance representatives (being told insurance is too expensive and the parent must work to qualify), and system problems (including lost applications, discrimination, and excessive waits). A randomized trial revealed that using bilingual community-based case managers to help poor Latino children enroll in Medicaid or SCHIP reduced the proportion who were uninsured, and eliminated this racial/ethnic disparity in uninsurance. Children assisted by case managers were more likely than children who were not to remain continuously insured (78 vs. 30 percent) and significantly less likely to be sporadically insured (18 vs. 27 percent) or continuously uninsured (4 vs. 43 percent). The case managers helped the children and their families by providing information about the types of available insurance programs and eligibility requirements, working with parents to complete and submit application forms, and expediting final coverage decisions by State agencies.



They also acted as family advocates when children were inappropriately deemed ineligible for insurance or had coverage inappropriately discontinued.

**Project Title:** Insuring Uninsured Children

**AHRQ Grant:** HS11305

**Principal Investigator:** Glenn Flores, M.D.

Reference: How Medicaid and the State Children's Health Insurance Program can do a better job of insuring uninsured children: The perspectives of parents of uninsured Latino children. Glenn Flores, M.D., Milagros Abreu, M.D., Vanessa Brown, B.A., and Sandra C. Tomany-Korman, M.S. November 2005. *Ambulatory Pediatrics* 5(6), pp. 332-340; A randomized controlled trial of the effectiveness of community-based case management in insuring uninsured Latino children. Glenn Flores, Milagros Abreu, M.D., Christine E. Chaisson, M.P.H., and others. December 6, 2005. *Pediatrics* 116(6), pp. 1433-41.

**Elderly Medicare patients with low health literacy receive little tangible support for their health care needs**

Sixty percent of elderly Medicare managed care plan members who had trouble understanding medical information received little or no social support from others. This low literacy group was much more likely than their more health literate counterparts (40 vs. 12 percent) to receive help reading information on drug labels or filling out medical forms at least some of the time. They were, however, less likely to receive tangible support such as having someone drive them to the doctor's office or help them with meals, which was linked to better physical and mental health in both groups.

**Project Title:** Health Literacy, Social Support, and Health: Survey of Medicare Enrollees

**AHRQ Grant:** HS13004

**Principal Investigator:** Shoou-Yih D. Lee, Ph.D.

**Reference:** Health literacy and social support among elderly Medicare enrollees in a managed care plan. Shoou-Yih D. Lee, Ph.D., Julie A. Gazmararian, Ph.D., and Ahsan M. Arozullah, M.D., M.P.H. August 2006. *Journal of Applied Gerontology* 25(4), pp. 324-337.

**Tools developed to overcome barriers and improve communication**

**Computer kiosks help patients with diabetes and low literacy skills understand their susceptibility to complications**

Patients with diabetes, especially those with low literacy skills, gain a better understanding of their susceptibility to complications when they use a computer kiosk that targets diabetes education. An intervention group used a computer kiosk provided in their physician's waiting room to view an audiovisual program that provided information about diabetes, psychological support, and diabetes self-management skills without extensive text or complex computer navigation while a control group had access only to quizzes on the kiosk. After 1 year, there were no significant differences in changes for HbA1c (blood glucose) levels, weight, blood pressure, knowledge, self-efficacy, or self-reported medical care between the intervention and control groups. However, patients who had low health literacy skills in the intervention group showed a greater

increase in perceived susceptibility to complications than patients who had low health literacy in the control group. The kiosk, which is still being used in Cook County Hospital clinics, uses audio and video to emphasize simple concepts in plain language.

**Project Title:** Diabetes Education Multimedia for Vulnerable Populations

**AHRQ Grant:** HS11092

**Principal Investigator:** Ben Gerber, M.D.

**Reference:** Implementation and evaluation of a low-literacy diabetes education computer multimedia application. Ben S. Gerber, M.D., Irwin G. Brodsky, M.D., M.P.H., Kimberly A. Lawless, Ph.D., and others. July 2005. *Diabetes Care* 28(7), pp. 1574-1580.

**Researchers develop an illustrated version of the CAHPS® to help low-literacy audiences.**

Health Plan CAHPS® measures consumers' experience with their health plans and the health care they receive. Researchers developed illustrations to support the central themes in each of 63 CAHPS® text items. A cognitive interview protocol was created for each illustration that described key and supporting elements unique to the picture. Each protocol was designed to answer two questions: "Did the participant understand the illustration?" and "Did the participant understand the question?" The illustrations were then revised to reflect respondents' feedback. By the final pilot, a median of 66 percent of participants had "full understanding," 20 percent had "partial understanding," and 14 percent had "limited/no understanding" of the 43 illustrations needing revision. The interview procedure and revision

process helped improve the respondents' understanding of the illustrations. The experiences and lessons learned can guide design of illustration-enhanced materials for low-literacy populations.

**Project Title:** Measuring Patient Satisfaction: Low Literacy Populations  
**AHRQ Grant:** HS10299

**Principal Investigator:** Judy A. Shea, Ph.D..

**Reference:** Developing an illustrated version of the Consumer Assessment of Health Plans. Judy A. Shea, Ph.D., Abigail C. Aguirre, M.P.A., John Sabatini, Ph.D., and others. January 2005. *Joint Commission Journal on Quality and Patient Safety* 31(1), pp. 32-42.

### **Short Assessment of Health Literacy for Spanish-speaking Adults (SAHLSA) can be used to screen for low health literacy**

Researchers developed and validated a health literacy assessment, the Short Assessment of Health Literacy for Spanish-speaking Adults (SAHLSA). SAHLSA was tested and compared with other health literacy instruments (the Rapid Estimate of Adult Literacy in Medicine and the Test of Functional Health Literacy in Adults) in a sample of over 200 Spanish-speaking and 200 English-speaking participants. The SAHLSA-50 score was significantly and positively associated with the physical health status of Spanish-speaking participants, holding constant age and years of education. The instrument displayed good internal reliability and test-retest reliability. The researchers conclude that the SAHLSA-50 could be used in the clinical or community setting to screen for low health literacy

among Spanish speakers. The SAHLSA instrument can be found online at [http://www.blackwell-synergy.com/doi/suppl/10.1111/j.1475-6773.2006.00532.x/suppl\\_file/HESR532sm.doc](http://www.blackwell-synergy.com/doi/suppl/10.1111/j.1475-6773.2006.00532.x/suppl_file/HESR532sm.doc)

**Project Title:** Development of a Spanish Health Literacy Assessment Tool  
**AHRQ Grant:** HS13233

**Principal Investigator:** Shoou-Yih Lee, Ph.D..

**Reference:** Development of an easy-to-use Spanish health literacy test. Shoou-Yih D. Lee, Ph.D., Deborah E. Bender, Ph.D., M.P.H., Rafael E. Ruiz, Sc.M., and Young Ik Cho, Ph.D. August 2006. *Health Services Research* 41(4), pp. 1392-1412.

### **Research in Progress**

#### **Project Title: PILL: Pharmacy Intervention for Limited Literacy.**

Researchers are evaluating a "3-P" approach to improve medication adherence: (1) Phone - reminder telephone calls for prescription refills; (2) Pharmacists trained in clear health communication who counsel patients on their medications; and (3) Pill card - a medication schedule with pictures of pills and information on what a medication is for, when to take it, and possible side effects. The study is assessing participant understanding of their medications; medication adherence through refill compliance; confidence in their ability to correctly take their medicines; health status, social support and health literacy; and level of satisfaction with pharmacy services received during the study. Products include a pharmacist training curriculum and a manual with instructions for producing a Pill card.

**Contract Number:** 290-00-0011

**Principal Investigator:** Julie Gazmararian, Ph.D.

**Institution:** Emory University

#### **Project Title: Communicating probabilities through interactive computer graphics.**

Researchers are developing and assessing interactive computer-based graphical displays that incorporate animation to present numerical/probability information to patients, particularly those with low numeracy. This study will develop new computer-based graphical displays that incorporate animation and patient interaction, assess the effect of these, and explore the effects of numeracy and health literacy on comprehension of different display formats. The interactive displays developed in this project have the potential to be applied to more comprehensive programs for health literacy education, tailored health and risk communication, shared medical decision-making, and patient decision support.

**Grant Number:** HS16333

**Principal Investigator:** Rita Kukafka, Dr.P.H.

**Institution:** Columbia University

#### **Project Title: Does Home Visitation Promote Maternal Health Literacy?**

The purpose of this project is to examine the influence of maternal-child health home visitation programs on maternal functional health literacy. Maternal-child health home visitation programs serve vulnerable families who lack resources, social supports and literacy skills to function well in the health arena during pregnancy and early parenting. Researchers are developing and validating functional



health literacy scales – the Life Skills Progression Instrument – to better understand and promote mothers’ progress toward higher functioning in the healthcare system and in health contexts at home. Researchers will examine influence of home visitation on maternal functional health literacy by using several instruments to evaluate health literacy and the effects of social support on various aspects of health literacy and will evaluate the usefulness of the Life Skills Progression instrument.

**Grant Number:** HD55618 (co-funded by the Office of Behavioral and Social Science Research at the National Institutes of Health)

**Principal Investigator:** Sandra A. Smith, M.P.H.

**Institution:** University of Washington

**Project Title: Hospital Patient Safe-D(ischarge): Discharge Bundle for Patients.**

The Patient Safe-D(ischarge) project implements a “discharge bundle” of patient safety interventions advocated by the Joint Commission on Accreditation for Healthcare Organizations, the National Quality Forum, and AHRQ. Helping patients to have a safe hospital discharge will increase the patient’s health literacy in terms of understanding their illness and treatment. The specific aims of the Patient Safe-D project are: 1) implement a discharge bundle consisting of medication reconciliation, patient-centered hospital discharge education, and a post-discharge continuity check by a clinician; 2) evaluate implementation of the discharge bundle assessing its level of adoption and acceptance; and 3) develop an implementation toolkit for dissemination of the discharge bundle,

which will include forms for medication reconciliation, a checklist for discharge patient education, and a checklist for the post-discharge continuity check along with directions and PowerPoint presentations.

**Grant Number:** HS15882

**Principal Investigator:** Mark Williams, M.D.

**Institution:** Emory University

**Project Title: Testing the Re-Engineered Hospital Discharge.**

This project builds on a previous project — “Safe Practices Implementation Challenge Grant” — which developed the “Reengineered Hospital Discharge” (RED) tool, a set of 10 discrete, mutually reinforcing components. Researchers will investigate if the newly designed RED intervention will (1) reduce the percentage of patients experiencing a post-discharge adverse event, and (2) reduce subsequent hospital utilization (emergency department visits and rehospitalization) within 30 days following hospital discharge. Adult patients will be randomized to receive either routine discharge or the RED intervention, provided by a case manager and re-enforced by a telephone call 2-4 days after discharge by a clinical pharmacist. The principles of the RED include clearer delineation of roles and responsibilities among health care providers, patient education, comprehensive discharge plans, and, specifically, patient access to discharge information in their language and at their literacy level. This project will provide valuable information about whether the “Re-Engineered Discharge” will reduce adverse events related to discharge and decrease subsequent hospital utilization.

**Grant Number:** HS15905

**Principal Investigator:** Brian Jack, M.D.

**Institution:** Boston Medical Center

**Project Title: Medications at Transitions and Clinical Handoffs (MATCH).**

The Medications at Transitions and Clinical Handoffs (MATCH) project will implement a practical, effective and replicable strategy to reduce medication errors and associated harm among hospitalized patients through effective medication reconciliation. The proposed project will: (1) analyze implementation of an integrated, multidisciplinary process to improve inpatient medication reconciliation at admission, transfer, and discharge; (2) assess the acceptability of and compliance with new medication reconciliation procedures by hospital staff; (3) measure whether the proportion of patients who experience medication reconciliation failures declines following implementation and the reasons for such failures; (4) identify patient risk factors frequently responsible for inaccurate medication reconciliation, including limited English proficiency and low health literacy, complex medication histories, lack of social support, or impaired cognitive status; and (5) develop a toolkit that can be widely disseminated to other acute care hospitals including strategies for patient involvement, staff education, workflow redesign, and feedback to healthcare workers.

**Grant Number:** HS15886

**Principal Investigator:** Gary Noskin, M.D.

**Institution:** Northwestern University

**Project Title: Improving Diabetes Efforts Across Language and Literacy (IDEALL).**

The IDEALL Project is a randomized controlled trial of a communication technology-based intervention (automated telephone diabetes management) to an interpersonally-oriented intervention (group medical visits) in the Community Health Network of San Francisco (CHNSF). The project aims to (1) expand exposure of these self-management support strategies to more patients and providers in a total of 4-5 primary care practices within the CHNSF; (2) compare the relative effects of these two interventions with respect to each other as well as to usual primary care; and (3) explore contextual factors that moderate both the effects of the interventions on patient outcomes as well as the success of implementation and maintenance. Specifically, the project will evaluate the efficacy of these interventions in patients with Type 2 diabetes who have a high prevalence of limited health literacy and limited English proficiency. The outcomes of interest for the IDEALL Project include extent of patient participation, engagement with the interventions, changes in diabetes indices (such as diabetes self-efficacy and glycemic control), and relative resource use.

**Grant Number:** HS14864

**Principal Investigator:** Dean Schillinger, M.D.

**Institution:** University of California San Francisco

**Project Title: Patient-Centeredness in Care of Vulnerable Populations.**

The specific aims of this research are: 1) to evaluate the impact of patient literacy on patient participation in care and patient-physician communication;



2) to test a multidimensional model of vulnerability to poor interpersonal treatment and to evaluate health care system features that moderate the relationship between vulnerability and poor interpersonal treatment; and 3) to develop an instrument measuring cultural competence from the patient's perspective.

**Grant Number:** HS13903

**Principal Investigator:** Mary C. Beach, M.D.

**Institution:** Johns Hopkins University

**Project Title: Web-based Renal Transplant Patient Medication Education.**

The renal failure/transplant population includes a high proportion of minority and indigent people at increased risk of poor health care literacy. The specific aims of this project address the creation of new knowledge and evidence (in a renal transplant population) of benefits of widely applicable health information technology tools including Web-enabled education of kidney transplant recipients. Randomized, control patients receive conventional teaching while study patients learn from four educational modules using wireless Internet access on portable computers. Primary study goals are improvement in test scores, from which reduced potential and actual medication errors will be inferred. Secondary goals

include reduced serum creatinine, lipids, and HbA1C, rejection episodes, and hospitalizations.

**Grant Number:** HS15038

**Principal Investigator:** Amy Friedman, M.D.

**Institution:** Yale University

## Looking to the Future

### Health Literacy CAHPS®

The CAHPS® Consortium is developing a set of supplemental survey items that could be added to the Clinician & Group Survey to assess providers' activities to foster and improve patients' health literacy. Under the lead of RAND, the CAHPS® grantees have begun testing this item set, and expect to publish measures in 2008. The CAHPS® Health Literacy Measures will dovetail with measures of cultural competence that are being developed simultaneously.

### Pharmacy Health Literacy Assessment Tool

To support improvements in health care related to health literacy, this publication will provide hospital, chain, and free-standing pharmacies with a three-part tool to assess how well the pharmacy is serving patients with limited health literacy. The three parts include: Part I - an assessment tour to be completed by objective, trained

auditors; Part II - a survey to be completed by pharmacy staff; and Part III - a guide for focus groups with pharmacy patients. The Guide also instructs users how to conduct the assessment and analyze the results.

## For More Information

The AHRQ Web site provides information on the Agency's agenda in health care literacy research at [www.ahrq.gov](http://www.ahrq.gov). For further details on AHRQ's program in health literacy, contact:

Cindy Brach  
Center for Delivery, Organization, and Markets  
Agency for Healthcare Research and Quality  
540 Gaither Road  
Rockville, MD 20850  
phone: 301-427-1444  
fax: (301) 427-1430  
[Cindy.Brach@ahrq.hhs.gov](mailto:Cindy.Brach@ahrq.hhs.gov)