

Just When You Thought Your Patients
Understand You...

Health Literacy, Outcomes,
and Interventions

Stacey L. Sheridan, MD, MPH
Division of General Medicine and Clinical
Epidemiology

Video

Health Literacy

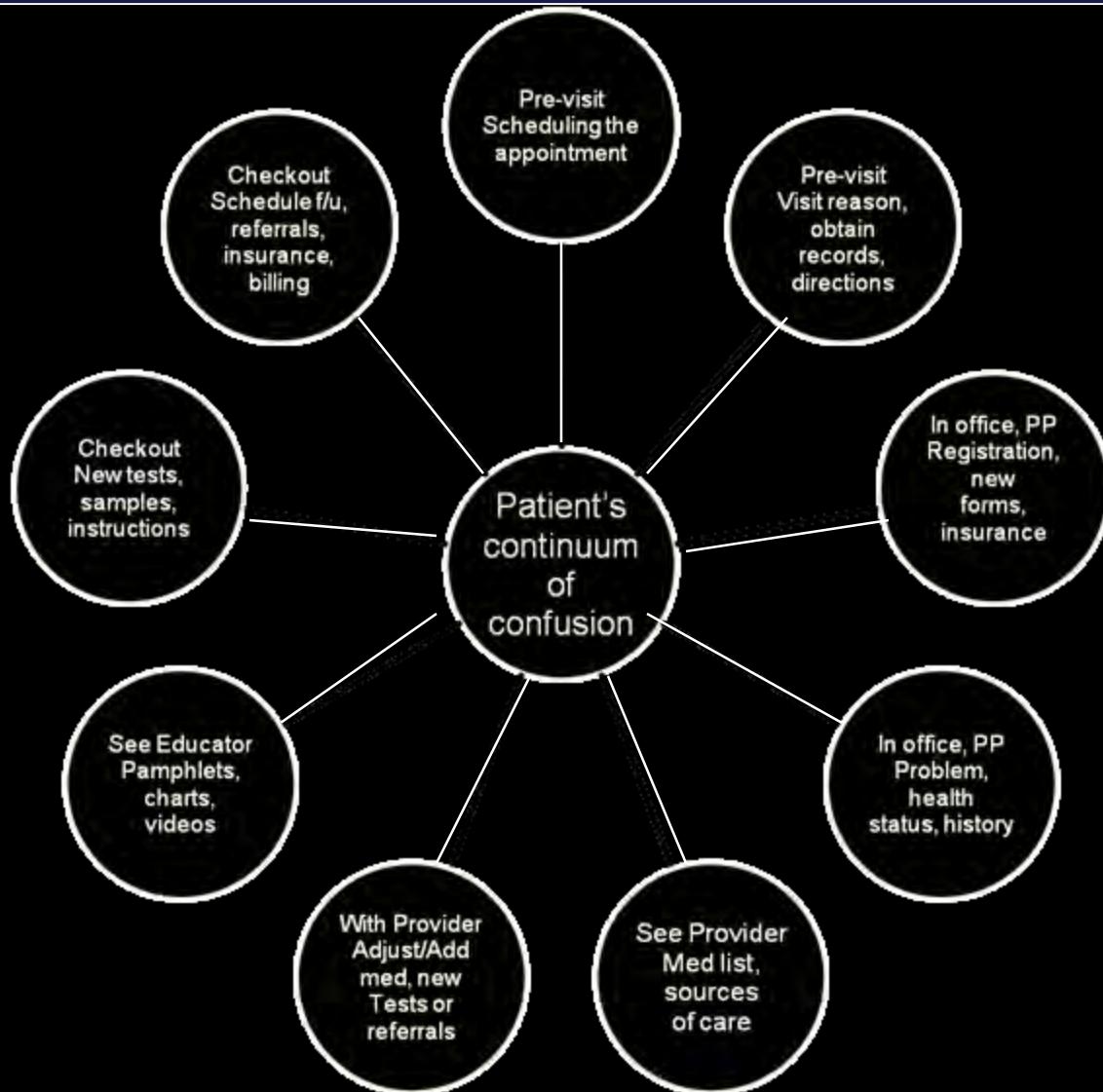
“the degree to which individuals can obtain, process, and understand the basic health information and services they need to make appropriate health decisions.”

Includes a constellation of skills:

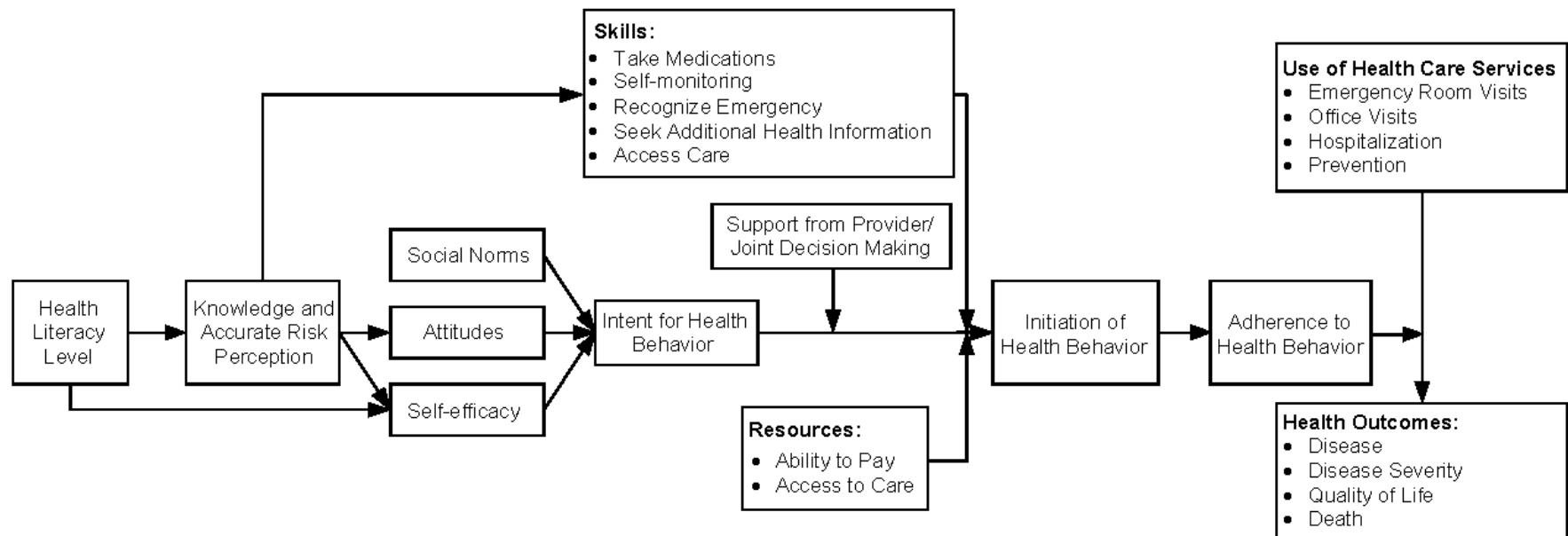
Ability to read and write

Use quantitative information

Communicate effectively



Proposed Impact of Health Literacy on Health



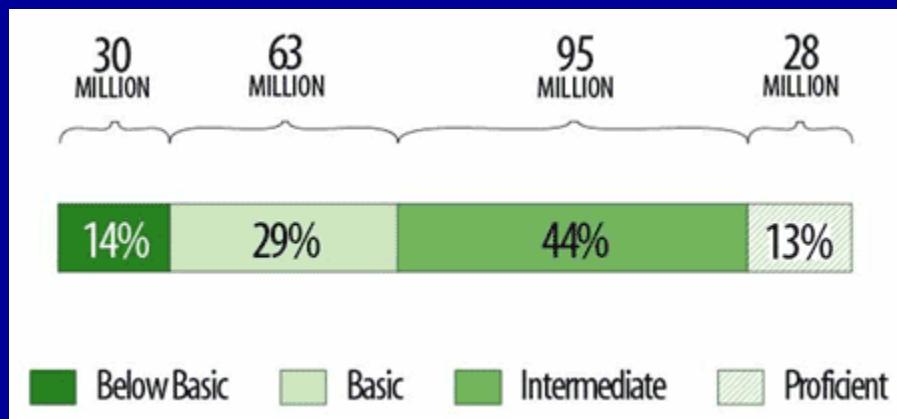
Health Literacy in the U.S.



Health Literacy in US Adults

National Assessment of Adult Literacy (NAAL,
2003; n=19,714)

- Most up to date portrait of literacy in U.S.



Examples of NAALS Proficiency Levels

Level	Sample tasks
Proficient	<ul style="list-style-type: none">• Calculate an employee's share of health insurance costs for a year, using a table that shows how the employee's monthly cost varies.• Find the information required to define a medical term by searching through a complex document.• Evaluate information to determine which legal document is applicable to a specific health care situation.
Intermediate	<ul style="list-style-type: none">• Determine a healthy weight range for a person of specified height, based on a graph that relates height and weight to body mass index.• Find the age range during which children should receive a particular vaccine using a chart that shows all the childhood vaccines and the ages children should receive them.• Determine what time a person can take a prescription medication, based on information on the prescription drug label that relates the timing of medication to eating.• Identify three substances that may interact with an over-the-counter drug to cause side effects, using information on the over-the-counter drug label.
Basic	<ul style="list-style-type: none">• Give two reasons why a person with no symptoms of a specific disease should be tested for the disease, based on information in a clearly written pamphlet.• Explain why it is difficult for people to know if they have a specific chronic medical condition, based on information in a two-page article about the medical condition.
Below basic	<ul style="list-style-type: none">• Identify how often a person should have a specified medical test, based on information in a clearly written pamphlet.• Identify what is permissible to drink before a medical test, based on a set of short instructions.• Circle the date of a medical appointment on a hospital appointment slip.

Epidemiology of Low Health Literacy

Group	Below basic	Basic	Total
	%	%	%
Highest education level completed			
Less than or some high school	49	27	76
High school graduation (no college study)	15	29	44
High school equivalency diploma	14	30	44
Racial/Ethnic group			
White	9	19	24
Asian/Pacific Islander	13	18	31
Black	24	34	58
Hispanic (all groups)	41	25	66
Health insurance status			
Employer provided	7	17	24
Privately purchased	13	24	37
Medicare	27	30	57
Medicaid	30	30	60
No insurance	28	25	53

National Interest in Health Literacy

- In 2004,
 - AMA/AHRQ released a systematic review on health literacy outcomes and interventions
 - IOM released the report “Prescription to End Confusion”
- In 2005,
 - NIH started funding health literacy research
 - Several national organizations promoted health literacy as a research priority
- In 2010,
 - AHRQ released Health Literacy Toolkit
 - HHS released a National Action Plan for Health Literacy

The Evidence: Impact of Health Literacy on Outcomes

<http://www.ahrq.gov/clinic/tp/lituptp.htm>

Berkman, 2011. Annals of
Intern Med 155(2): 97-107

Included Studies

- Of 81 fair/good quality studies (95 articles)*
 - Most cross-sectional, 22 cohorts
 - Most examined health literacy, 16 numeracy, 0 oral literacy

*42 poor quality studies were excluded from analysis

Strength of Evidence Grading

Grade	Definition
High	High confidence that the evidence reflects the true effect. Further research is very unlikely to change our confidence in the estimate of effect.
Moderate	Moderate confidence that the evidence reflects the true effect. Further research may change our confidence in the estimate of effect and may change the estimate.
Low	Low confidence that the evidence reflects the true effect. Further research is likely to change our confidence in the estimate of effect and is likely to change the estimate.
Insufficient	Evidence either is unavailable or does not permit estimation of an effect.

Impact of Health Literacy on Outcomes

- High strength of evidence for*:
 - Higher mortality among seniors (n=2)
- Moderate strength of evidence for:
 - Taking medications appropriately (n=6)
 - Poorer ability to interpret labels and health messages (n=3)
 - Lower quality of life among seniors (n=4)
 - Lower receipt of influenza vaccine (n=4)
 - Lower receipt of mammography (n=4)
 - Greater emergency care use (n=9)
 - Increased hospitalizations (n=6)

*Knowledge outcome excluded b/c
clearly related in 2004 review

Impact of Health Literacy on Outcomes

- Low Strength of Evidence for:
 - Receipt of colon CA, Breast CA, STI screening (n=5, 3, 1)
 - Access to Insurance (n=1)
 - Prostate cancer control (n=1)
 - Greater probability of depression (n=10)
 - Poorer health status, all adults (n=1)
 - Disparities between African-American race and outcomes (n=8)

Impact of Health literacy on Outcomes

- Insufficient evidence for:
 - Pneumococcal immunization (n=2, mixed)
 - Access to Care (n=9, mixed)
 - Self efficacy (n=5, mixed)
 - Adherence (n=11, mixed)
 - Behaviors
 - healthy lifestyle (n=8), smoking (n=2), ETOH (n=2), Sexual (n=2)
 - Disease Severity
 - Asthma (n=2), HTN (n=2), DM (n=5), global health
 - Quality of life, specific diseases (n=5, mixed)
 - Cost (n=2, mixed)
 - Disparities
 - Hispanic ethnicity and outcomes (n=1)
 - Gender and outcomes

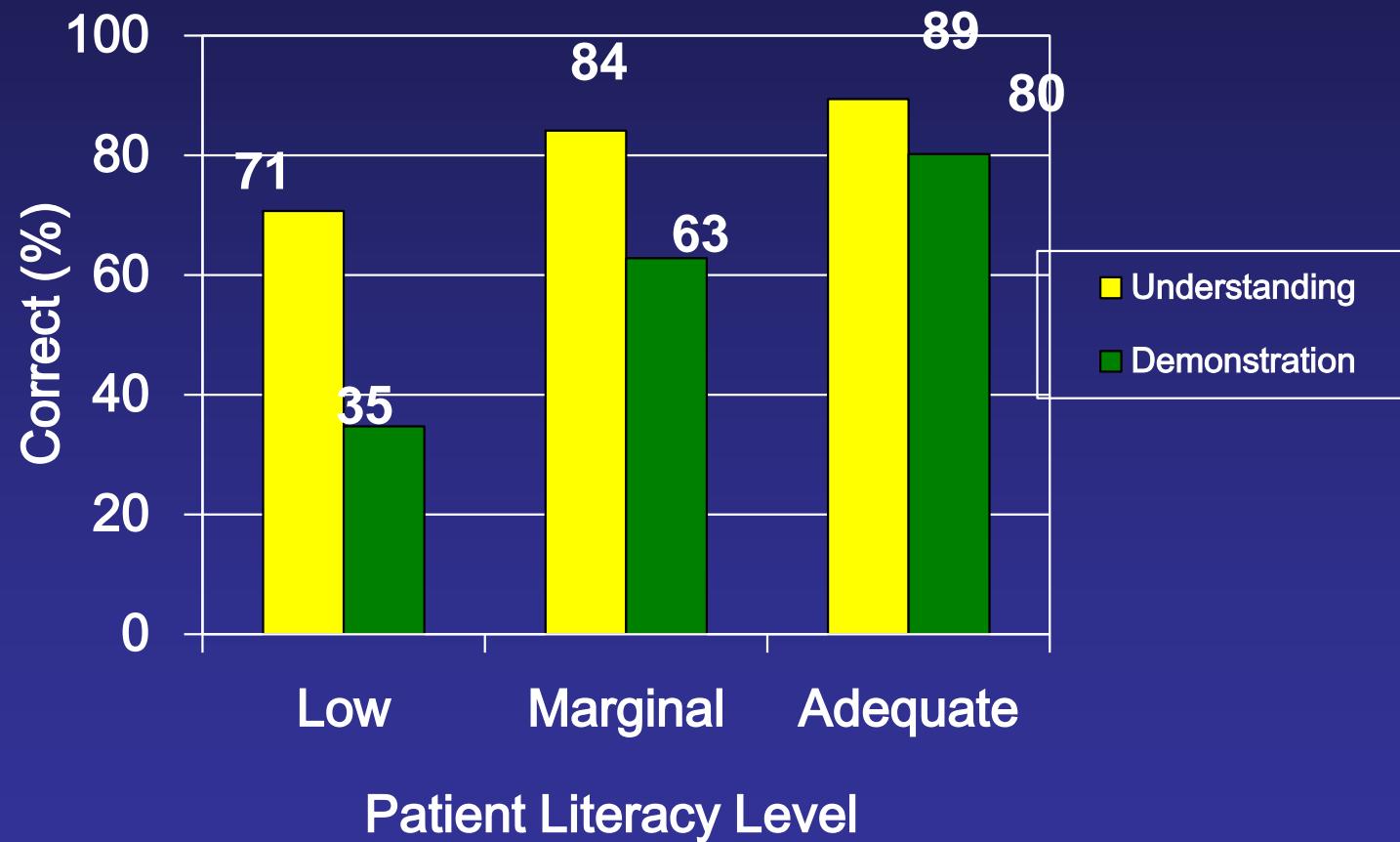
Impact of Numeracy on Outcomes

- Strength of Evidence low for:
 - Skill in interpreting health information (n=2)
 - Disparities (n=2)
 - Race and glycemic control
 - Gender and HIV medication management
- Strength of Evidence insufficient for:
 - Knowledge (n=4, mixed)
 - Accuracy of risk perception (n=5, mixed)
 - Self-efficacy (n=1, unadjusted)
 - Behavior (n=1, unadjusted)
 - Skill in taking medicine (n=4, mixed)
 - Disease prevalence and severity (n=5, mixed)
 - Cost (n=0)

Can Patients Understand Prescription Labels?

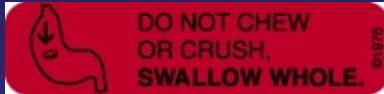
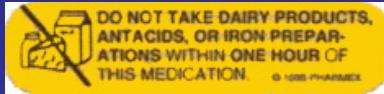


Rates of Correct Understanding vs. Demonstration of Instructions: “Take Two Tablets by Mouth Twice Daily”



Comprehension of Warning Labels

* p<.0001, † p<.05

	<u><6</u>	<u>7-8</u>	<u>>9</u>
 TAKE WITH FOOD © 1990	79%	86%	88% †
 DO NOT CHEW OR CRUSH, SWALLOW WHOLE. © 1976	35%	66%	78% *
 FOR EXTERNAL USE ONLY © 1976	8%	64%	82% *
 REFRIGERATE-SHAKE WELL DISCARD AFTER _____ © 1995	8%	18%	23% *
 DO NOT TAKE DAIRY PRODUCTS, ANTACIDS, OR IRON PREPARATIONS WITHIN ONE HOUR OF THIS MEDICATION. © 1995 PHARMEX	0%	6%	15% *

Patients with low literacy (< 6th gd.) 3x more likely to incorrectly interpret warning labels.

The Evidence:

Effect of Interventions Designed to Mitigate Low Health Literacy

<http://www.ahrq.gov/clinic/tp/lituptp.htm>

Sheridan, 2011. J Health Comm
16(S3): 30-54.

Included Studies

- 42 fair/good quality studies were included in review:
 - 27 RCTs, 2 cRCTs, 13 quasi-experimental studies
 - 21 used one specific low literacy strategy/21 used a mixture of strategies in their intervention
 - 21 stratified results by health literacy level

Effects of Interventions Using Single Design Strategies

- In aggregate, strength of evidence was low.
- Several interventions improved comprehension in 1 or a few studies

Single Design Strategies that Improved Comprehension

- Presenting only essential information
- Presenting essential information first
- Presenting quality information with the higher number indicating better quality
 - “nurses per patient” rather than “patients per nurse”
- Using the same denominators to present treatment benefit information
- Adding icon arrays to numerical presentations
- Adding video to verbal narrative to improve salience

Effects of Interventions Using Multiple Design Features

- Moderate strength of evidence that some interventions change health care service use
 - Intensive self-management and adherence interventions (ⁿ⁼³) reduced ED visits and hospitalizations
 - Educational interventions or cues for screening (ⁿ⁼²) increased colorectal and prostate cancer screening*

*benefits of increased prostate screening are unclear

Effects of Interventions Using Multiple Design Features

- Moderate strength of evidence that some interventions change some health outcomes
 - Self-management interventions ($n=3$) increased self-management behavior
 - Intensive disease (not self) management programs ($n=5$, 3 self) reduced disease severity

Effects of Interventions Using Multiple Design Features

- Insufficient evidence on:
 - Knowledge (n=10, mixed)
 - Self-efficacy (n=9, mixed)
 - Behavioral intent (n=0)
 - Adherence (n=5, mixed)
 - Health-related skills (n=1 + 2 from 2004; mixed)
 - Quality of life (n=4, mixed)
 - Cost (n=2, mixed)
 - Disparities (n=0)

Effects of Interventions Using Multiple Design Features

- Common components of effective interventions:
 - High intensity
 - Theory basis
 - Pilot testing
 - Emphasis on skill building
 - Delivery by a health professional

An Exemplar Self Management Program

Dewalt, 2006. BMC HSR 6: 30.

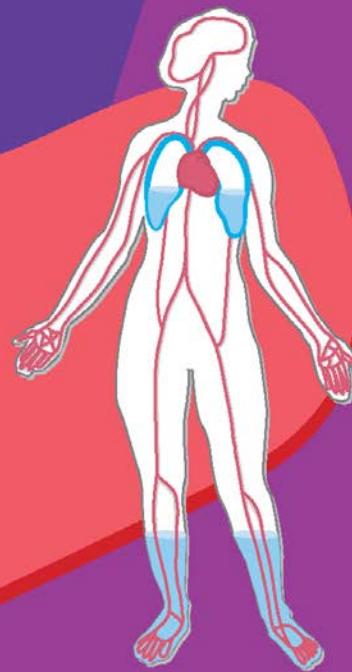
MANAGING YOUR HEALTH WITH HEART FAILURE

1

2

3

UNC School of Medicine and Department of Pharmacy (Working Group on Health Risk Communication) 919-843-6480



<http://www.shareddecisionmaking.org>

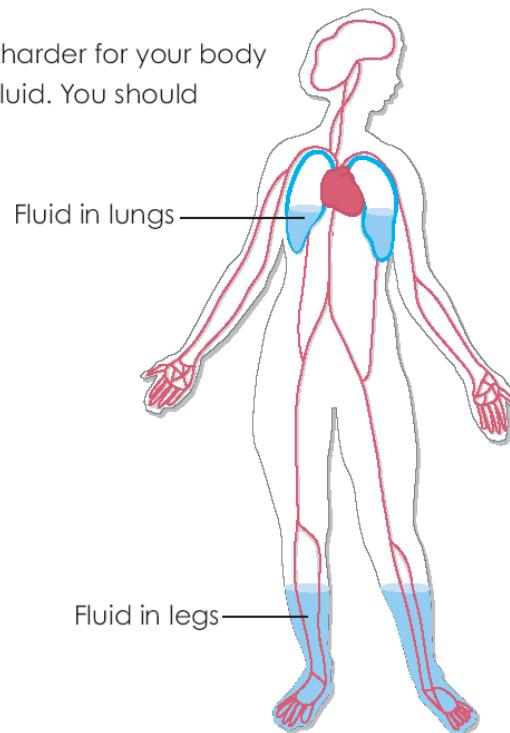
Congestive Heart Failure

With congestive heart failure, the heart cannot pump the blood well. As a result, blood doesn't flow well.

Fluid leaks out of your blood vessels and backs up in the lungs and the legs.



Salt makes it harder for your body to get rid of fluid. You should avoid salt.



How Bad Is Your Congestive Heart Failure?

You can tell how well your heart is doing by how you feel and what you can do.

SWELLING

Good -No Swelling



OK -Swelling in Ankle or Shin



Bad -Swelling in Knee Area



Call the UNC Clinic / 919-843-6480 ☎

WALKING

Good – You can walk easily with no shortness of breath



OK –Shortness of breath when walking fast



Bad –Short of breath at rest



Call the UNC Clinic / 919-843-6480 ☎

SLEEPING

Good – Sleeping flat, no shortness of breath



OK – Needing 2 pillows or more to avoid shortness of breath



Bad – Have to sleep upright to avoid shortness of breath



Call the UNC Clinic / 919-843-6480 ☎³

If you weigh		How many fluid pills?					
178				1	2	3	
177				Sunday	 Swelling <input type="radio"/> knee <input type="radio"/> shin <input type="radio"/> ankle <input checked="" type="radio"/> none	Morning	Morning
176				Date	172	1	1
175	2		2	Monday	 <input type="radio"/> knee <input type="radio"/> shin <input checked="" type="radio"/> ankle <input type="radio"/> none	Morning	Morning
174				Date	174	2	2
173				Tuesday	 <input type="radio"/> knee <input type="radio"/> shin <input type="radio"/> ankle <input type="radio"/> none	Morning	Morning
172				Date	171	1	1
171				Wednesday	 <input type="radio"/> knee <input type="radio"/> shin <input type="radio"/> ankle <input type="radio"/> none	Morning	Morning
170	1		1	Date			
169				Thursday	 <input type="radio"/> knee <input type="radio"/> shin <input type="radio"/> ankle <input type="radio"/> none	Morning	Morning
168				Date			
167				Friday	 <input type="radio"/> knee <input type="radio"/> shin <input type="radio"/> ankle <input type="radio"/> none	Morning	Morning
166				Date			
165				Saturday	 <input type="radio"/> knee <input type="radio"/> shin <input type="radio"/> ankle <input type="radio"/> none	Morning	Morning
164	1		0	Date			
163							
162		919-843-6480					

Good Weight →

Additional Program Elements

- Scheduled phone calls
- Reinforce teaching/Use of Teachback
- Address transportation barriers
- Help patients enroll in pharmacy assistance program

Improved HF Knowledge, Self-Efficacy, and Self-Care Behavior

6 Month Outcome	Control	Intervention	Difference (CI)
Knowledge change*	-2	10	12 (6, 18)
Self-efficacy change**	-0.5	1.3	2 (0.7, 3.1)
Quality of Life***	--	--	2 (-5 to 9)

*% CHF questions correct

**range 0-4

***range 0-105

Dewalt, 2006. BMC HSR 6: 30.

Hospital Admission or Death Incidence Rate

Adjusted IRR*, all
0.56 [0.32, 0.95]

Adjusted* IRR, inadequate literacy
0.38 [0.16, 0.88]

*Adjusted for baseline HFQOL, B-blocker use, digoxin use,
systolic dysfunction and hypertension

The Call to Action

<http://www.health.gov/communication/HLActionPlan/>

Goals to Improve Health Literacy

- Develop and disseminate information that is accurate, accessible, and actionable
- Promote changes in the health care system that improve health information, communication, informed decision making, and access to health services
- Incorporate developmentally appropriate health and science curricula in child care and education through the university level
- Support and expand local efforts to provide adult education, English language instruction, and culturally and linguistically appropriate health information

Goals to Improve Health Literacy

- Build partnerships, develop guidance, and change policies
- Increase basic research and the development, implementation, and evaluation of practices and interventions to improve health literacy
- Increase the dissemination and use of evidence-based health literacy practices and interventions

AHRQ Health Literacy Toolkit

- Takes a universal precautions approach
- Provides a collection of tips and tools to:
 - Improve spoken and written communication
 - Improve self-management and empowerment
 - Provide access to supportive resources
 - Make and measure practice changes

Assessing Health Literacy

- Use demographic calculators in the overall Population
- Use of individual measures in individuals with red flags such as
 - Multiple missed appointments
 - Incomplete forms
 - Medicine non-adherence
 - Incoherent or non-sequential history

Demographic Assessment of Population Literacy

- Derive an estimate of the percentage of patients likely to have low literacy
- Based on combined information about:
 - % over age 65 years
 - % enrolled in medicaid or other public assistance program
 - % white/black/hispanic
 - % speaking language other than English

Individual Assessment Of Health Literacy:

REALM

Prevention & Patient Education
Project
Terry Davis, PhD
P.O. box 33932
Box 598
Shreveport, LA 71130-3932

Davis, 1991 Fam Med. 23(6):433-5.

fat	fatigue	allergic
flu	pelvic	menstrual
pill	jaundice	testicle
dose	infection	colitis
eye	exercise	emergency
stress	behavior	medication
smear	prescription	occupation
nerves	notify	sexually
germs	gallbladder	alcoholism
meals	calories	irritation
disease	depression	constipation
cancer	miscarriage	gonorrhea
caffeine	pregnancy	inflammatory
attack	arthritis	diabetes
kidney	nutrition	hepatitis
hormones	menopause	antibiotics
herpes	appendix	diagnosis
seizure	abnormal	potassium
bowel	syphilis	anemia
asthma	hemorrhoids	obesity
rectal	nausea	osteoporosis
incest	directed	impetigo

Individual Assessment of Literacy: sTOFHLA

Your doctor has sent you to have a _____ X-ray.

- a. stomach
- b. diabetes
- c. stitches
- d. germs

You must have an _____ stomach when you come in for ____.

- a. asthma
- b. empty
- c. incest
- d. anemia

- a. is
- b. am
- c. if
- d. it

Individual Assessment of Literacy: Single Item Screener

- How confident are you filling out forms?
 - Performance in detecting inadequate health literacy compared with sTOFHLA and REALM
 - Sensitivity 60-80%
 - Specificity 80%
 - Overall accuracy 80%

Tips for Oral Communication

- Use Common words
- Speak slowly
- Limit content to 3-5 points
- Encourage questions (askme3):
 - What is my main problem?
 - What do I need to do?
 - Why is it important for me to do this?
- Use teach-back

Video

Tips for Written Communication

- Assess readability of education materials
- Choose or create low readability materials
 - Short simple sentences
 - Common words
 - Chunking of ideas
 - Illustrative graphics

Tips for Self-management

- Focus on need-to-know and need-to-do
- Make Action Plans
 - Small specific doable steps toward overall goals
- Improve Medicine Accuracy and Adherence
 - Med reviews
 - Pill charts/calendars
 - Adherence counseling

Tips to Improve Support

- Provide links to non-medical resources
 - Financial assistance
 - Transportation assistance
 - Social support

Tools for Making and Measuring Practice Change

Available in the toolkit:

- Practice Self-assessments
- Shared slide sets and videos
- Information on Plan-Do-Study-Act (PDSA) cycles

Summary

- Health literacy is:
 - Prevalent
 - Associated with significant health outcomes
 - Addressable
 - Supported by clinically useful resources

Our patients can
understand us!