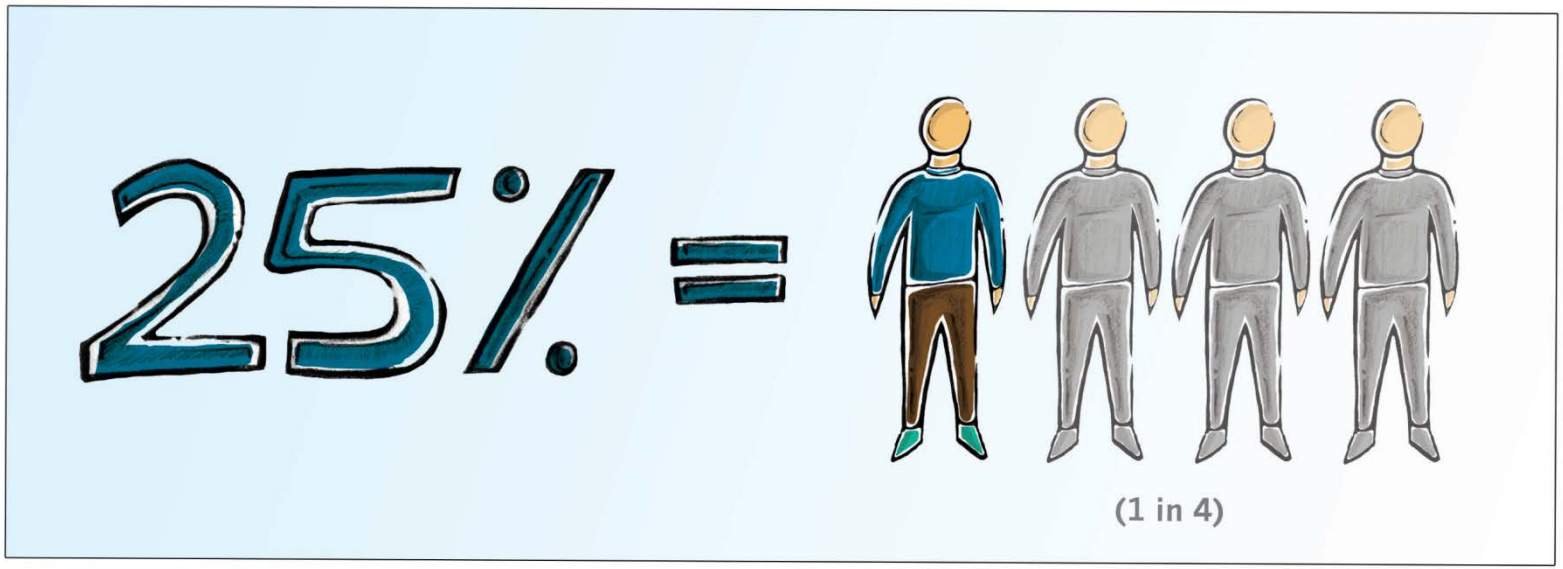

Health Numeracy

Agenda

I. Welcome and Objectives
II. Health Numeracy and Decision-Making
III. Skills and Competencies for Understanding Quantitative Health Information
IV. Factors Contributing to Comprehension
V. Strategies to Enhance Numeracy Skills\
VI. Assessing for Literacy
VII. Questions and Closing

Welcome and Introductions

Learning Objectives

- Identify the outcomes of poor numeracy skills in health care decision-making and treatment adherence
- Identify skills and competencies required for accessing, analyzing, and applying quantitative health information
- Identify best practices and tips for presenting quantitative health information to patients

Pop-up Question

- A patient with Type II Diabetes is diagnosed with Gastric Cancer and is currently on chemotherapy.
  - An endocrinologist tells the patient to drink 8 glasses of water a day.
  - A oncologist tells the patient to drink 4 glasses of water a day.
- How many glasses of water did the patient drink a day?
  A. None
  B. Eight Glasses
  C. Four Glasses
  D. Six Glasses

Numbers Numbers Numbers

Test	Your Value	Standard Range	Units
WBC	**5.35**	4.0 - 11.0	k/uL
RBC	**4.78**	4.60 - 6.20	M/uL
Hemoglobin	**14.5**	14.0 - 18.0	g/dL
Hemocrit	**43.2**	40.0 - 52.0	%
MCV	**90.4**	83.0 - 95.0	fl
MCH	**30.3**	28.0 - 32.0	pg
MCHC	**33.6**	32.0 - 36.0	g/dL
RDW	**12.4**	11.0 - 14.0	%
MPV	**9.3**	9.0 - 12.0	fl
Platelets	**288**	150 – 450	k/uL
Neutrophilis Percent	**48.4**	47.0 - 82.0	%
Neutrophilis Absolute Count	**2.59**	1.80 - 8.00	k/uL
Lymphocytes Percent	**38.9**	15.0 - 45.0	%
Lymphocytes Absolute Count	**2.08**	1.00 - 5.00	k/uL

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HEALTH NUMERACY AND DECISION-MAKING

Numeracy and Decision-Making

- Having fewer numeric skills, however, is associated with lower comprehension and less use of health information.[1]
- Many patients cannot perform the basic numeric tasks required to function in the current health care environment.[2]
- **26%** were unable to understand information about when an appointment was scheduled.[3]
- **16%** of highly educated people incorrectly answered straightforward questions about risk magnitude.[4]

[1]Ellen Peters, Judith Hibbard, Paul Slovic and Nathan Dieckmann Numeracy Skill And The Communication, Comprehension, And Use Of Risk-Benefit Information. Health Affairs, 26, no.3 (2007): 741-748

[2]ibid

[3]M.V. Williams et al, "Inadequate Functional Health Literacy among Patients at Two Public Hospitals," Journal of the American Medical Association 274, no. 21 (1995): 1677-1682

[4]Lipkus, I. M., Samsa, G., & Rimer, B. K. (2001). General performance on a Numeracy Scale among highly educated samples. Medical Decision Making, 21(1), 37-44.

Numeric Skills Associated with the Quality of Health Decisions

- Evaluating Risks and Benefits of Health Options
- Following Complex Health Regimens
- Weighing Short-Term against Long-Term Benefits

Ellen Peters, Judith Hibbard, Paul Slovic and Nathan Dieckmann Numeracy Skill And The Communication, Comprehension, And Use Of Risk-Benefit Information. Health Affairs, 26, no.3 (2007): 741-748

Health Numeracy Defined

Health numeracy can be considered "the **individual-level skills** to obtain, interpret, and process quantitative information for health behavior and decisions"

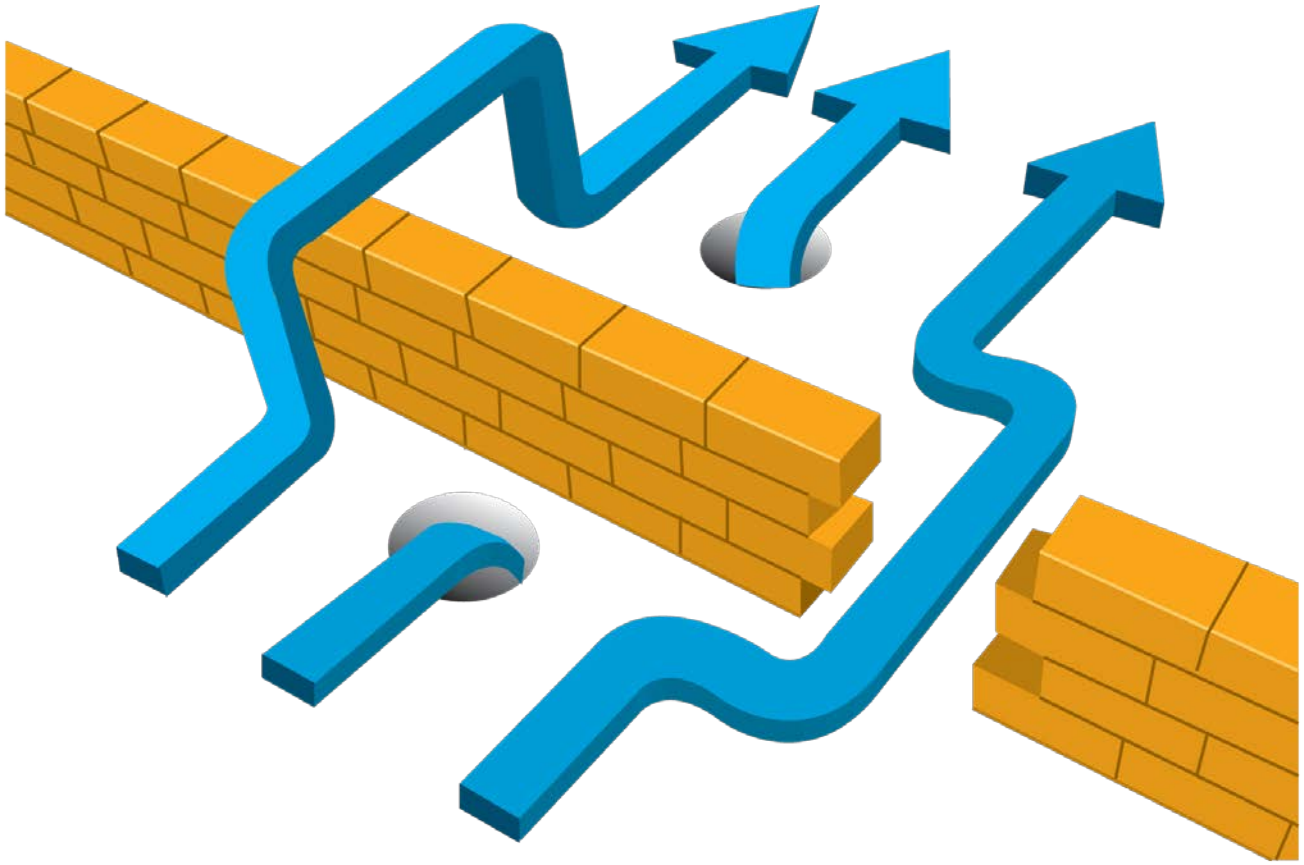
Ancker JS, Kaufman D.J. Rethinking Health Numeracy: A Multidisciplinary Literature Review. Am Med Inform Assoc. 2007 Nov-Dec; 14(6):713-21.

A New Definition of "Health Literacy"

"A traditional definition of *health literacy* concerns individual patients' abilities. We believe that this definition should also include the format of the provided information and what it requires from patients"

Ellen Peters, Judith Hibbard, Paul Slovic and Nathan Dieckmann Numeracy Skill And The Communication, Comprehension, And Use Of Risk-Benefit Information. Health Affairs, 26, no.3 (2007): 741-748

Accessible Information



Misalignment with Needs and Skills

- "The health literacy literature accumulating over the past three decades indicates that, overall, health materials and tools are out of sync with the documented skills of U.S. adults."
- "This mismatch calls for renewed attention to the written materials, displays, and tools developed for health and health care use."

Rudd, R.E. 2016. *Numbers get in the way*. Commentary, National Academy of Medicine, Washington, D.C. http://nam.edu/wp-content/uploads/2016/05/Numbers-Get-In-the-Way.pdf

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HEALTH NUMERACY SKILLS AND COMPETENCIES

Skills and Competencies

Accessing Information	Analyzing Information	Applying Information
Representational Fluency	Basic Computation	Risk-Benefits
Document Literacy	Estimation	Health Regimens
Graphical Literacy	Statistical Literacy	Long Term vs. Short Term

Ancker JS, Kaufman D.J. Rethinking Health Numeracy: A Multidisciplinary Literature Review. Am Med Inform Assoc. 2007 Nov-Dec; 14(6):713-21.

Skills for Understanding Information Artifacts

- Representational Fluency
  - "Representational fluency is the ability to translate between and recognize the identity of different representations of the same quantity."
- Document Literacy
  - "Quantitative information is often provided in the form of a complex print or electronic document that combines text with lists, forms, or tables."
- Graphical Literacy
  - "The ability to interpret quantitative graphics helps people use educational materials, news reports, and electronic systems."

Ancker JS, Kaufman D.J. Rethinking Health Numeracy: A Multidisciplinary Literature Review. Am Med Inform Assoc. 2007 Nov-Dec; 14(6):713-21.

Quantitative Skills: Individual Level Competencies

1. Basic Computation
   - Number recognition, comparisons, arithmetic, use of simple formulas
2. Estimation
   - Using estimates instead of calculations to make decisions
3. Statistical Literacy
   - Understanding of concepts related to change, uncertainty, sampling, margins of error, and randomization to evaluate scientific information

Ancker JS, Kaufman D.J. Rethinking Health Numeracy: A Multidisciplinary Literature Review. Am Med Inform Assoc. 2007 Nov-Dec; 14(6):713-21.

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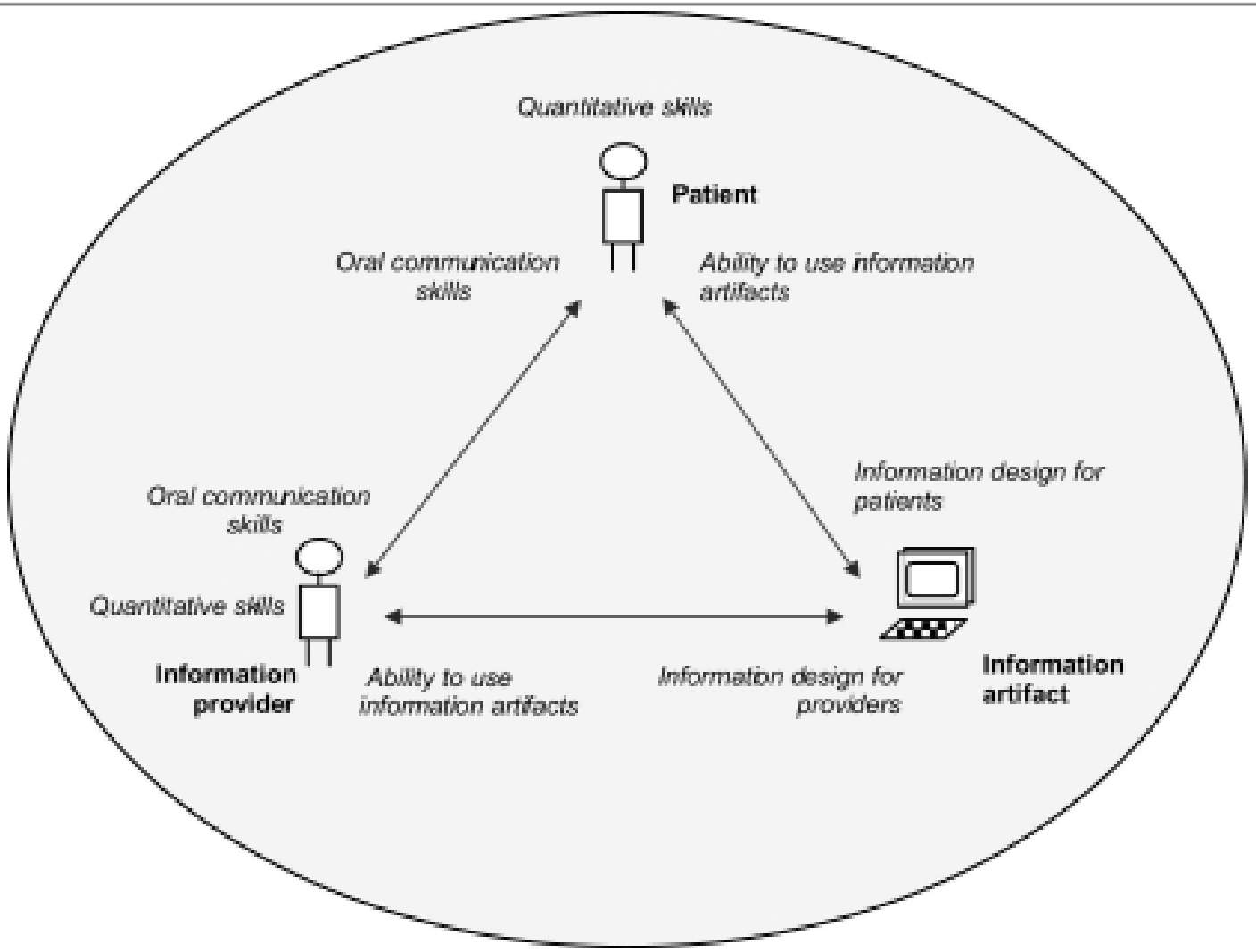
FACTORS CONTRIBUTING TO COMPREHENSION



Ancker JS, Kaufman D.J. Rethinking Health Numeracy: A Multidisciplinary Literature Review. Am Med Inform Assoc. 2007 Nov-Dec; 14(6):713-21.

Patient Factors

Factor	Definition	Examples
Patients' quantitative skills	basic computational skills (such as addition, multiplication, and use of simple formulas), estimation, and statistical literacy	computing calorie content; comparing computation to estimate to determine whether it is correct; understanding concept of randomization in a clinical trial
Patients' ability to use information artifacts	ability to navigate documents, interpret graphs, and translate between different representations of the same information	obtaining nutrient information from a nutrition label; comparing personal health data as displayed on different meters or devices
Patients' oral communication skills	ability to speak clearly about quantities and understand spoken information	reporting a previous medication regimen accurately to a new physician
Information design for patients	arrangement of information media and symbols to support comprehension and cognition	designing a patient interface for an electronic health record that provides graphics to illustrate numerical information

Ancker JS, Kaufman D.J. Rethinking Health Numeracy: A Multidisciplinary Literature Review. Am Med Inform Assoc. 2007 Nov-Dec; 14(6):713-21.

Provider Factors

Factor	Definition	Examples
Providers' oral communication skills	ability to communicate quantitative concepts clearly to the patient	explaining a new medication regimen to a patient in an understandable fashion
Providers' quantitative skills	basic computational skills, estimation, and statistical literacy	converting between units of measure; understanding the positive predictive power of a diagnostic test
Providers' ability to use information artifacts	ability to navigate documents, interpret graphs, translate between representations of the same information	interpreting a graph of patient lab values over time; applying the numerical output of a decision support system to an individual case
Information design for providers	ability of a system or document to support the provider's cognition	designing a provider interface that provides automated conversions between units of measure

Ancker JS, Kaufman D.J. Rethinking Health Numeracy: A Multidisciplinary Literature Review. Am Med Inform Assoc. 2007 Nov-Dec; 14(6):713-21.

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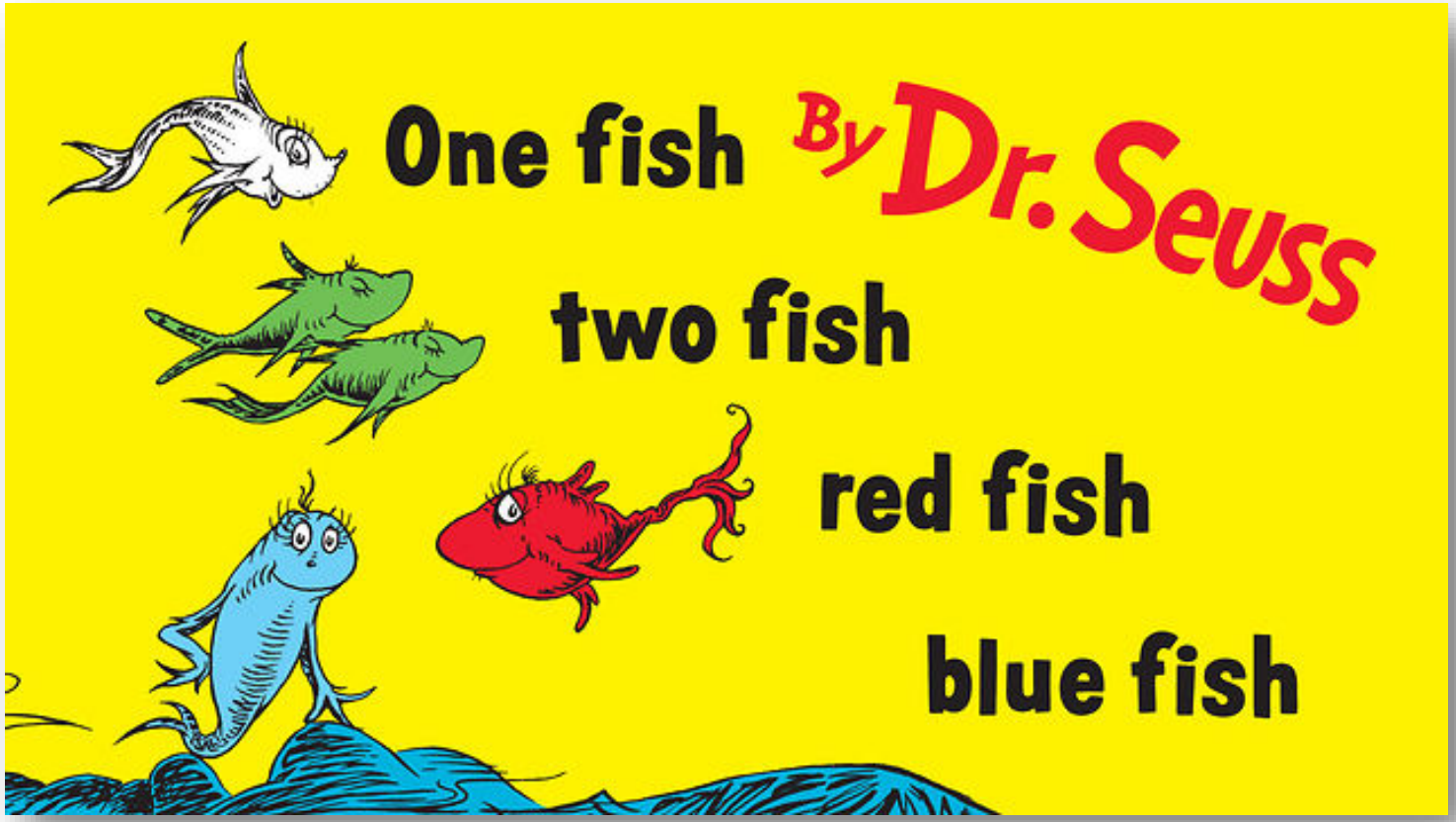
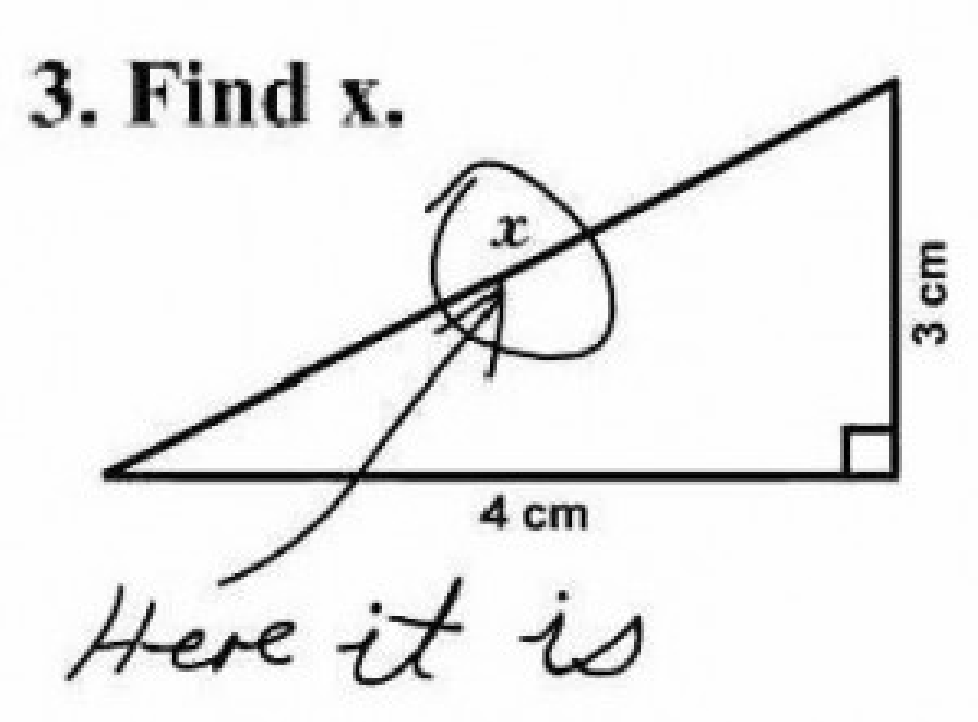
STRATEGIES TO ENHANCE NUMERACY SKILLS

Marry Words and Numbers



Pleasant, A., M. Rooney, C. O'Leary, L. Myers, and R. Rudd. 2016. *Strategies to enhance numeracy skills.* Discussion Paper, National Academy of Medicine, Washington, DC. http://nam.edu/wp-content/uploads/2016/05/Strategies-to-Enhance-Numeracy-Skills.pdf.

Do The Math

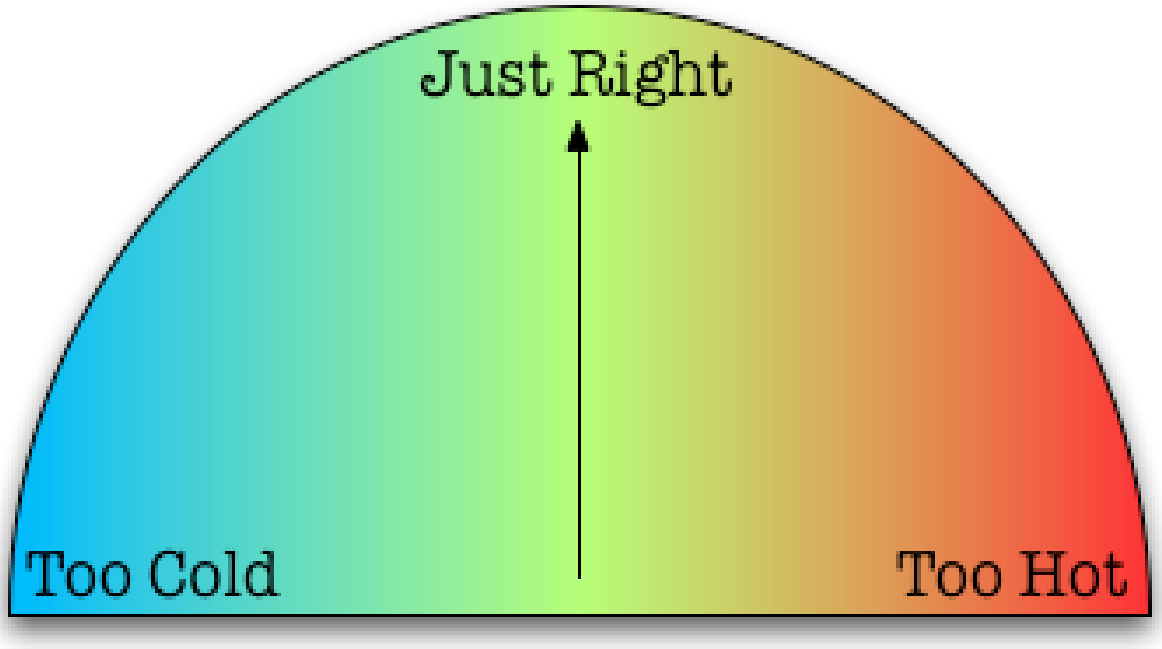


Pleasant, A., M. Rooney, C. O'Leary, L. Myers, and R. Rudd. 2016. *Strategies to enhance numeracy skills.* Discussion Paper, National Academy of Medicine, Washington, DC. http://nam.edu/wp-content/uploads/2016/05/Strategies-to-Enhance-Numeracy-Skills.pdf.

Be Consistent

Pleasant, A., M. Rooney, C. O'Leary, L. Myers, and R. Rudd. 2016. *Strategies to enhance numeracy skills*. Discussion Paper, National Academy of Medicine, Washington, DC. http://nam.edu/wp-content/uploads/2016/05/Strategies-to-Enhance-Numeracy-Skills.pdf.

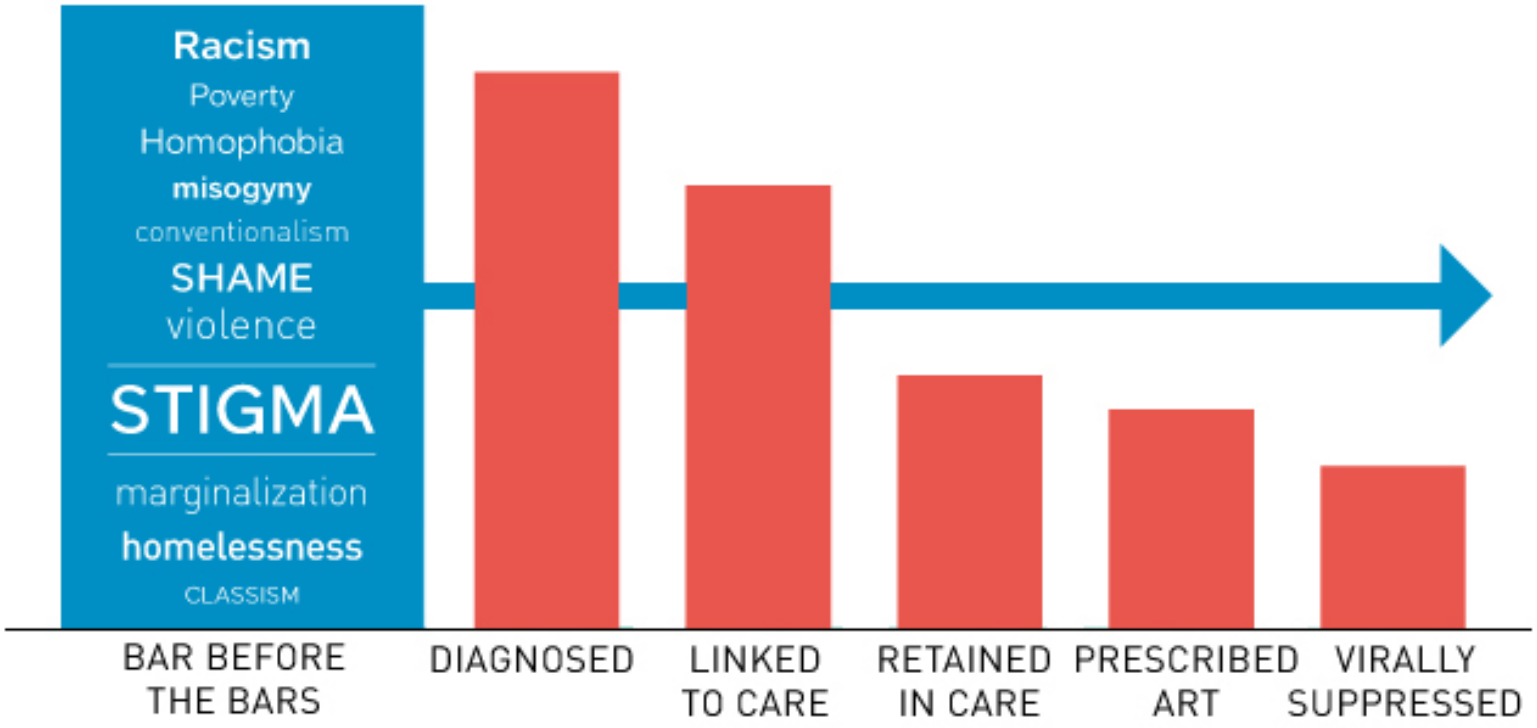
Present Only The Most Necessary Information, But Enough To Be Fully Understood



Porridge Temperature Monitor

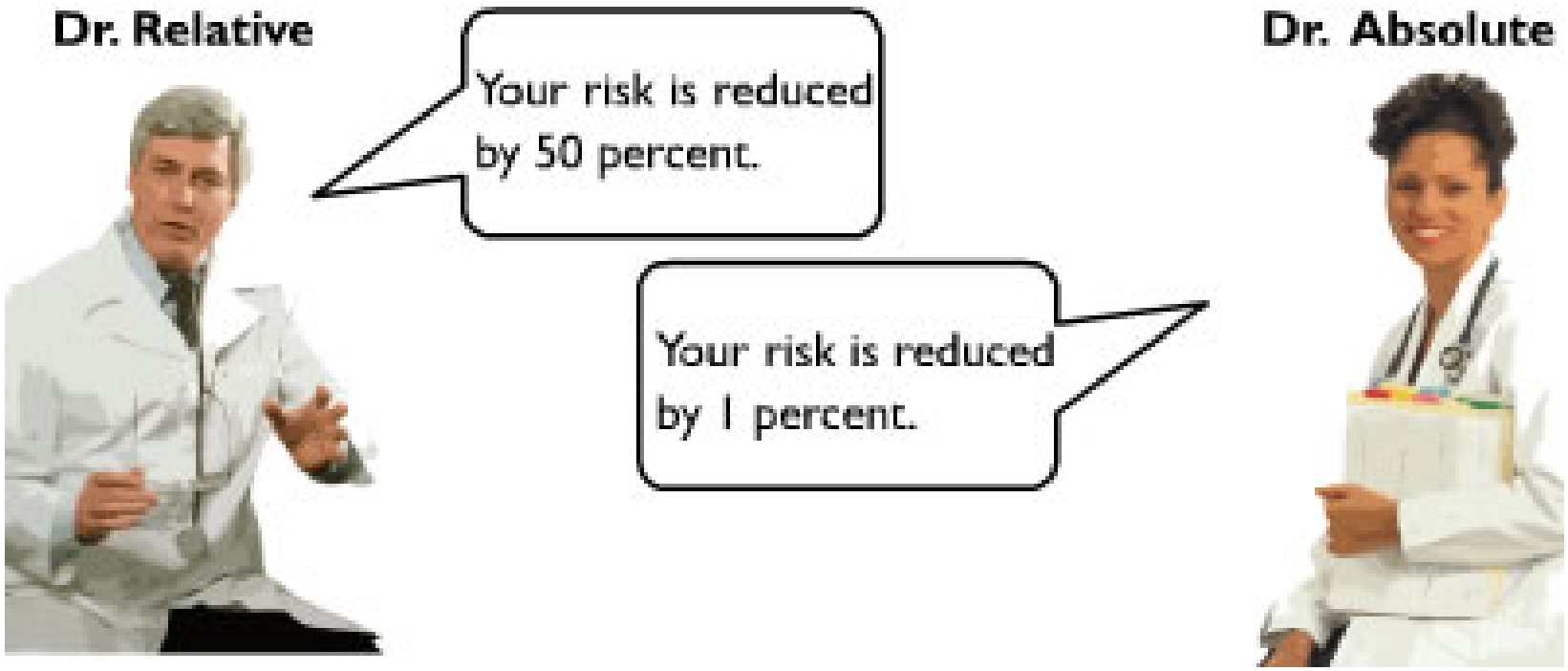
Pleasant, A., M. Rooney, C. O'Leary, L. Myers, and R. Rudd. 2016. *Strategies to enhance numeracy skills.* Discussion Paper, National Academy of Medicine, Washington, DC. http://nam.edu/wp-content/uploads/2016/05/Strategies-to-Enhance-Numeracy-Skills.pdf.

Be Visual – Use Images and Shapes to Reflect the Meaning of Numbers



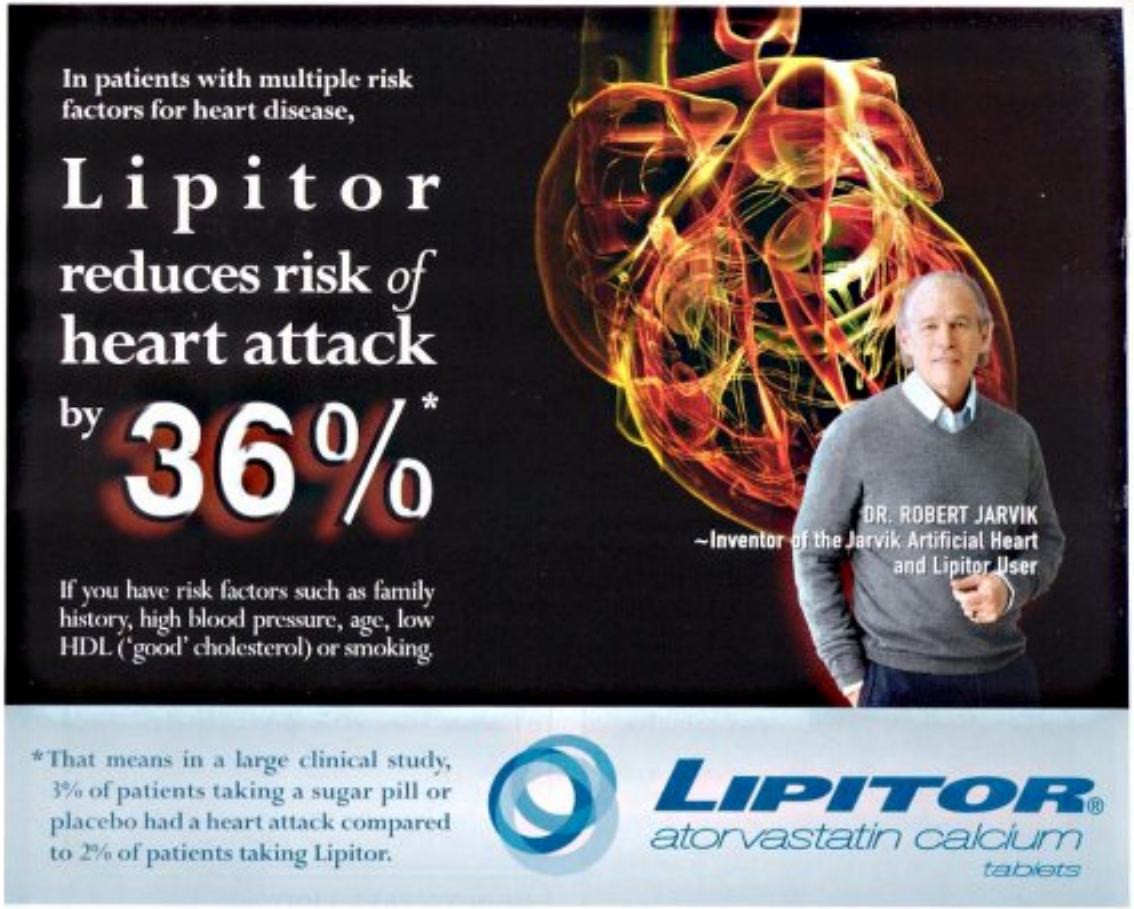
Pleasant, A., M. Rooney, C. O'Leary, L. Myers, and R. Rudd. 2016. *Strategies to enhance numeracy skills.* Discussion Paper, National Academy of Medicine, Washington, DC. http://nam.edu/wp-content/uploads/2016/05/Strategies-to-Enhance-Numeracy-Skills.pdf.

Be Aware of How You Present or Describe Risk



Pleasant, A., M. Rooney, C. O'Leary, L. Myers, and R. Rudd. 2016. *Strategies to enhance numeracy skills*. Discussion Paper, National Academy of Medicine, Washington, DC. http://nam.edu/wp-content/uploads/2016/05/Strategies-to-Enhance-Numeracy-Skills.pdf.

Absolute vs. Relative Risk



Check In Early and Often

Pleasant, A., M. Rooney, C. O'Leary, L. Myers, and R. Rudd. 2016. *Strategies to enhance numeracy skills*. Discussion Paper, National Academy of Medicine, Washington, DC. http://nam.edu/wp-content/uploads/2016/05/Strategies-to-Enhance-Numeracy-Skills.pdf.

Approaching Health Numeracy

- Assume Patients lack knowledge of quantitative concepts
- Focus on one idea at a time
- Use numbers when they are really needed
- Find out which measurement system your patient uses
- Offer support for ideas*

Helen Osborne, M.Ed., OTR/L , "*Health numeracy: How do patients handle the concept of quantity when it relates to their health?*" accessed from: http://www.boston.com/jobs/healthcare/oncall/articles/2007/09/19/health_numeracy on 04/11/13

Offering Support for Ideas

- Draw a picture
- Use analogies or reference points to explain quantity
- Show physical representations of quantity
- Encourage patients to create their own images
- Use vivid language
- Teach with stories

Source: http://www.boston.com/jobs/healthcare/oncall/articles/2007/09/19/health_numeracy/

ASSESSING FOR LITERACY

Ice Cream Label

Nutrition Facts

Serving Size	½ cup
Servings per container	4

Amount per serving

Calories	250	Fat Cal	120
			%DV
Total Fat	13g		20%
Sat Fat	9g		40%
Cholesterol	28mg		12%
Sodium	55mg		2%
Total Carbohydrate	30g		12%
Dietary Fiber	2g		
Sugars	23g		
Protein	4g		8%

*Percentage Daily Values (DV) are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Ingredients: Cream, Skim Milk, Liquid Sugar, Water, Egg Yolks, Brown Sugar, Milkfat, Peanut Oil, Sugar, Butter, Salt, Carrageenan, Vanilla Extract.

Source: http://www.pfizer.com/health/literacy/public_policy_researchers/nvs_toolkit

Why read an ice cream label?

- 3 minutes to administer
- Easy to document
- Validated tool in English and Spanish
- Assesses
  - Prose literacy
  - Numeracy (*Quantitative*)
  - Document literacy

From: National Quality Center Technical Assistance Call, October 18, 2012: Why read an ice cream label? Lucy Graham, RN, MPH, St. Mary's Family Medicine, Grand Junction, Colorado.

Assessment Questions

1. If you eat the entire container, how many calories will you eat?
2. If you are allowed to eat 60 grams of carbohydrates as a snack, how much ice cream could you have?

Source: http://www.pfizer.com/health/literacy/public_policy_researchers/nvs_toolkit

Assessment Questions

3. Your doctor advises you to reduce the amount of saturated fat in your diet.
   - You usually have 42 g of saturated fat each day, which includes one serving of ice cream.
   - If you stop eating ice cream, how many grams of saturated fat would you be consuming each day?

Source: http://www.pfizer.com/health/literacy/public_policy_researchers/nvs_toolkit

Assessment Questions

4. If you usually eat 2,500 calories in a day, what percentage of your daily value of calories will you be eating if you eat one serving?
5. READ TO SUBJECT: Pretend that you are allergic to the following substances: penicillin, peanuts, latex gloves, and bee stings.
   - Is it safe for you to eat this ice cream?

Source: http://www.pfizer.com/health/literacy/public_policy_researchers/nvs_toolkit

Assessment Questions

1. If you eat the entire container, how many calories will you eat?

   Answer: 1,000 is the only correct answer

2. If you are allowed to eat 60 grams of carbohydrates as a snack, how much ice cream could you have?

   Answer: Any of the following is correct: 1 cup (or any amount up to 1 cup), half the container. *Note: If patient answers "two servings," ask "How much ice cream would that be if you were to measure it into a bowl?"*

3. Your doctor advises you to reduce the amount of saturated fat in your diet. You usually have 42 g of saturated fat each day, which includes one serving of ice cream. If you stop eating ice cream, how many grams of saturated fat would you be consuming each day?

   Answer: 33 is the only correct answer

Source: http://www.pfizer.com/health/literacy/public_policy_researchers/nvs_toolkit

Ice Cream Label Assessment Questions

4. If you usually eat 2,500 calories in a day, what percentage of your daily value of calories will you be eating if you eat one serving?

   Answer: 10% is the only correct answer

READ TO SUBJECT: Pretend that you are allergic to the following substances: penicillin, peanuts, latex gloves, and bee stings.

5. Is it safe for you to eat this ice cream?

   Answer: No

6. (Ask only if the patient responds "no" to question 5): Why not?

   Answer: Because it has peanut oil.

Source: http://www.pfizer.com/health/literacy/public_policy_researchers/nvs_toolkit

Interpretation

- Number of correct answers: Tally up 'Yes' answers
  - Score of 0-1 suggests high likelihood (50% or more) of limited literacy.
  - Score of 2-3 indicates the possibility of limited literacy.
  - Score of 4-6 almost always indicates adequate literacy.

Source: http://www.pfizer.com/health/literacy/public_policy_researchers/nvs_toolkit

Source: National Patient Safety Foundation http://www.npsf.org/?page=askme3

Ask Me 3®

Health information is not clear at times. The Ask Me 3® program run by the National Patient Safety Foundation can help. The program gives you three questions to ask your health care provider during a health care visit, either for yourself or for a loved one. They are:

- **What is my main problem?**
- **What do I need to do?**
- **Why is it important for me to do this?**

Asking questions can help you be an active member of your health care team.

For more information on Ask Me 3, please visit www.npsf.org/askme3

Key Points

- Patients need more skills and knowledge to understand quantitative health information
- Different skills are needed to access, process, and apply numerical health information
- Providers should closely evaluate their use of numbers when explaining health information to patients
- A picture is worth a 1000 decimal points
- Make the numbers relevant and meaningful


QUESTIONS?
COMMENTS?

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