

Addressing Health Literacy and Health Communication in Population Health

Russell L. Rothman MD MPP

Professor, Internal Medicine, Pediatrics and Health Policy
Vice President, Population Health Research
Director, Center for Health Services Research
Chief, Internal Medicine/Pediatrics Section
Vanderbilt University Medical Center

Disclosures

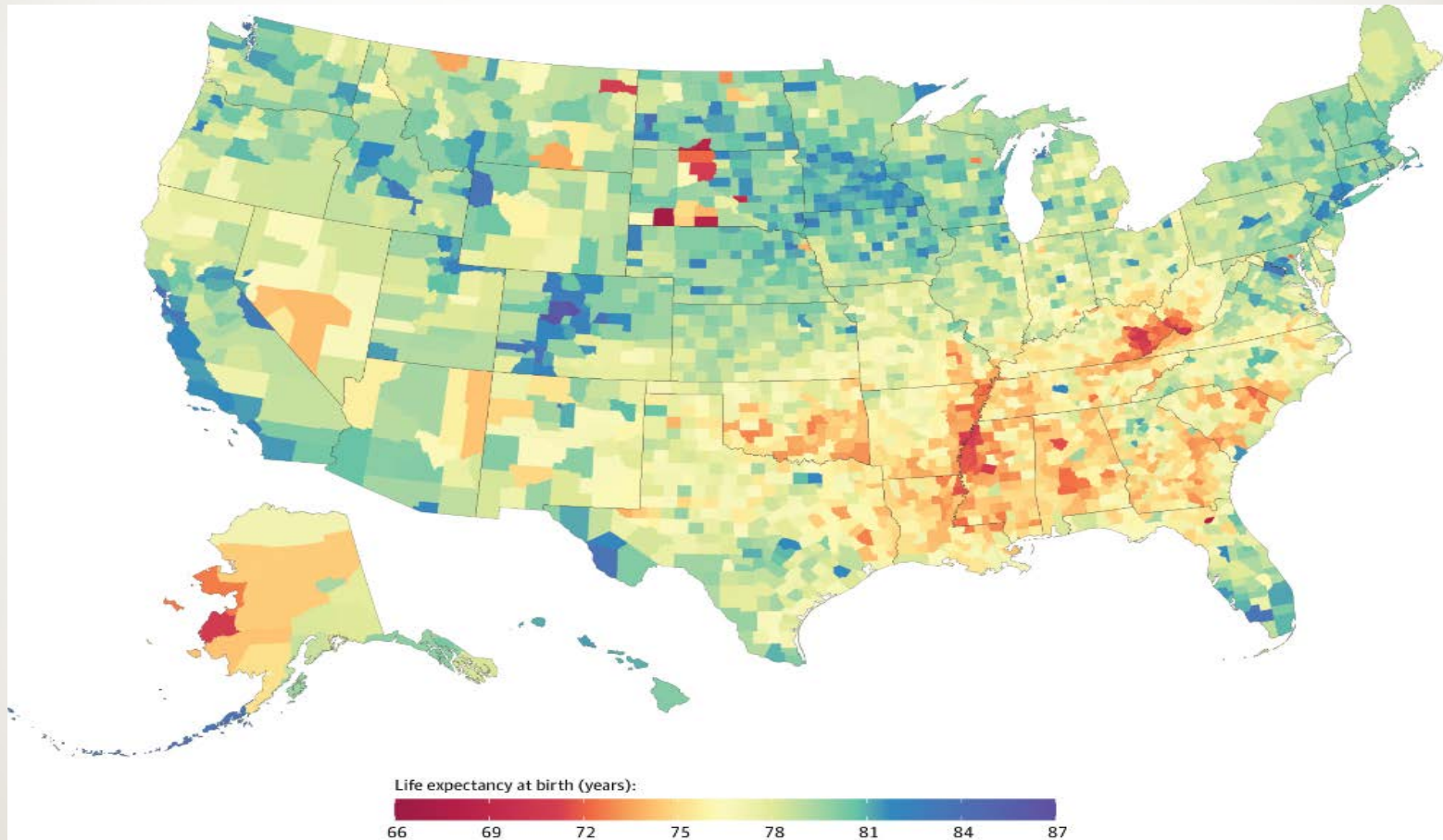
- **Previous Funding Support:** RWJ Clinic Scholars Program, UNC Department of Medicine, Vanderbilt Diabetes Center, Vanderbilt DRTC, Vanderbilt Center for Health Services Research, Pfizer Clear Health Communication Initiative, ADA (Novo Nordisk), K23/R03, AADE, National Academy of Medicine, NIDDK (R18)
- **Current Funding Support:** NICHD (R01), NCATS (VICTR), NIDDK (P30), PCORI, CMS
- **Disclosures:** EdLogics (Advisory Board), Abbott Diabetes Care

Outline

- Status of Healthcare in the US
- Definition of population health
- Health Reform Driving Population Health
- Addressing Health Literacy and Health Communication in Population Health

From: **Inequalities in Life Expectancy Among US Counties, 1980 to 2014** Temporal Trends and Key Drivers

JAMA Intern Med. 2017;177(7):1003-1011. doi:10.1001/jamainternmed.2017.0918



Life Expectancy at Birth by County, 2014.

Health Challenges

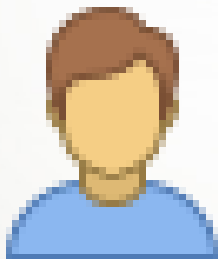
- Over 50% of recommended care is not achieved.
 - Significant disparities in health outcomes
 - Overuse, underuse and misuse of health services
- Up to 50% of patients do not comply with care recommendations.
 - 20% of patients do not fill initial prescriptions
 - 50% of patients do not take prescriptions as recommended
 - Lifestyle changes can be more challenging
- Navigation of our complex health system is challenging:
 - Patients asked to perform more complex self-care
 - Clinic visit times and hospitalizations are shorter
 - Patients only recall 20% of what is told to them in the doctor's office.
 - Less than 50% of patients know their discharge medications or plan.
- Disparities in health care delivery
- Costs are high for results achieved at population level

Why inadequate care?

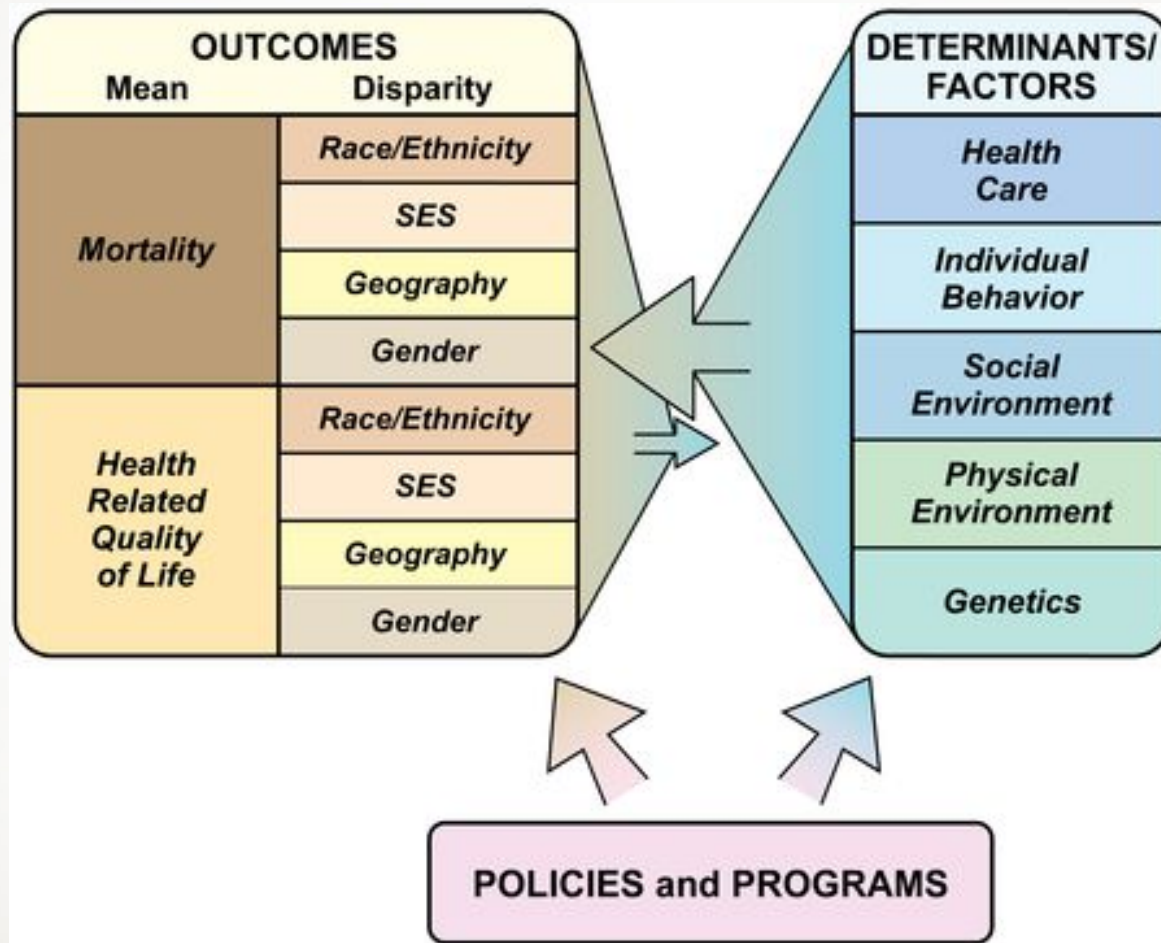


Population Health

- Population health is defined as the health outcomes of a group of individuals, including the distribution of such outcomes within the group.
- Population health is not just the overall health of a population but also includes the distribution of health, and the health of individuals.

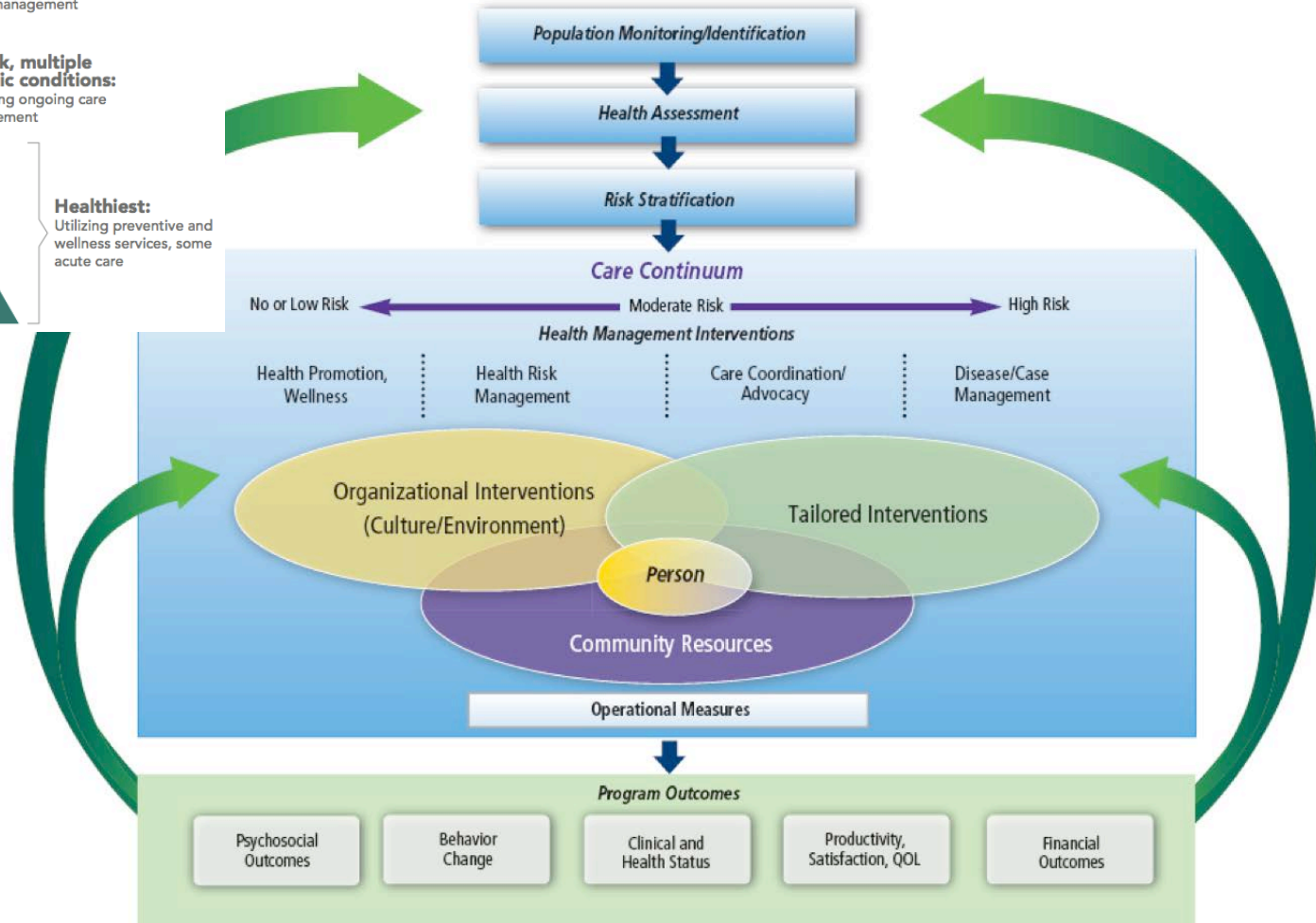
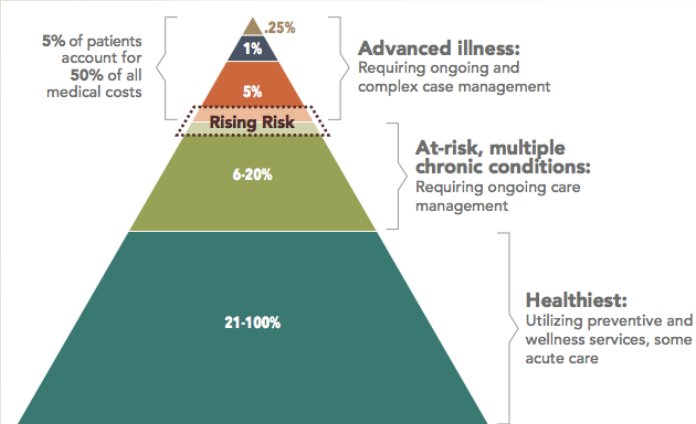


Population Health Paradigm



<http://www.improvingpopulationhealth.org/blog/what-is-population-health.html>

Population Health Management



Approaches to Population Health

- **Health System**
 - Accountable Care Organizations
 - Clinically Integrated Networks
 - Health Maintenance Organizations
 - Population Health Offices
 - Patient Experience Offices
 - Capitated and Value-Based Reimbursement
- **Leveraging Big Data**
 - Identify Gaps in Care
 - Predictive Analytics; Geocoding analyses
 - Collection of social and behavioral determinants
 - Collection of Patient Reported Outcomes
- **Targeted Programs**
 - Focus on chronic disease management and prevention
 - Focus on high utilizers
 - Patient Centered Medical Homes
 - Address social and behavioral determinants
 - Community efforts

Medicare Access and CHIP Reauthorization Act of 2015

- Overwhelming bipartisan support.
- Provides new tools in implementing the payment reforms.
- Applies to expanded group of clinicians
- Creates clear timetable and benchmarks.

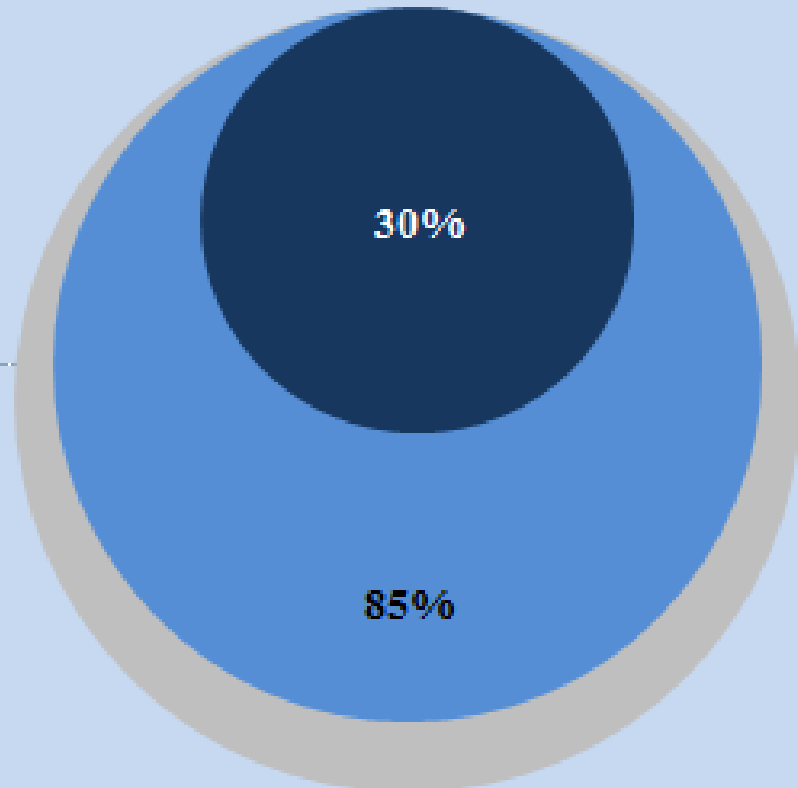
On 3/26, the House passed H.R. 2 by 392-37 vote.

On 4/14, the Senate passed the House bill by a vote of 92-8, and the President signed the bill.

Transforming to Value Based Healthcare

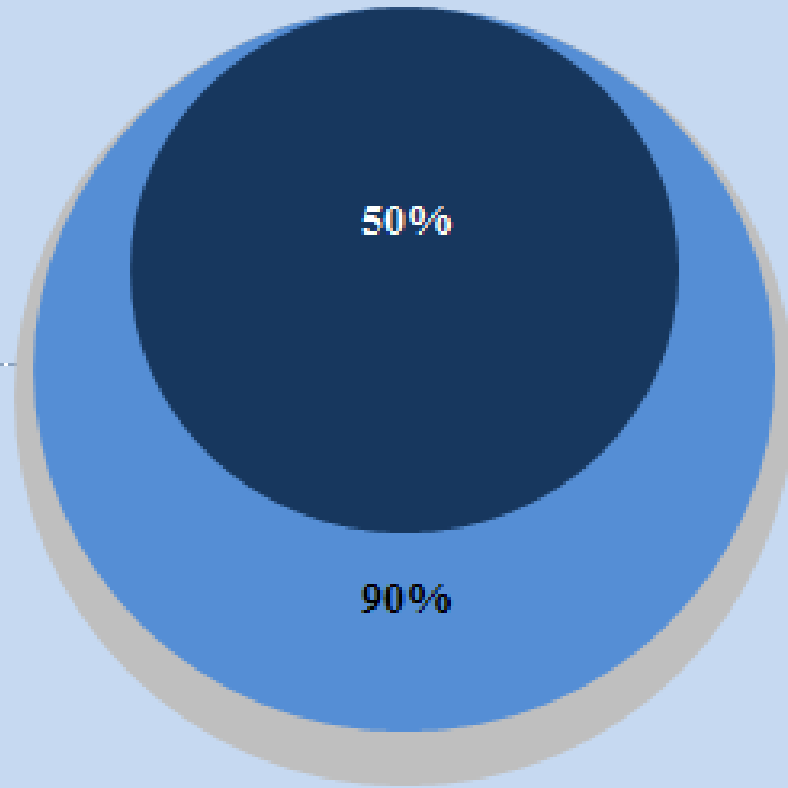
- All Medicare FFS (Categories 1-4)
- FFS linked to quality (Categories 2-4)
- Alternative payment models (Categories 3-4)

2016



All Medicare FFS

2018



All Medicare FFS

Quality Payment Program

Eligible Clinicians

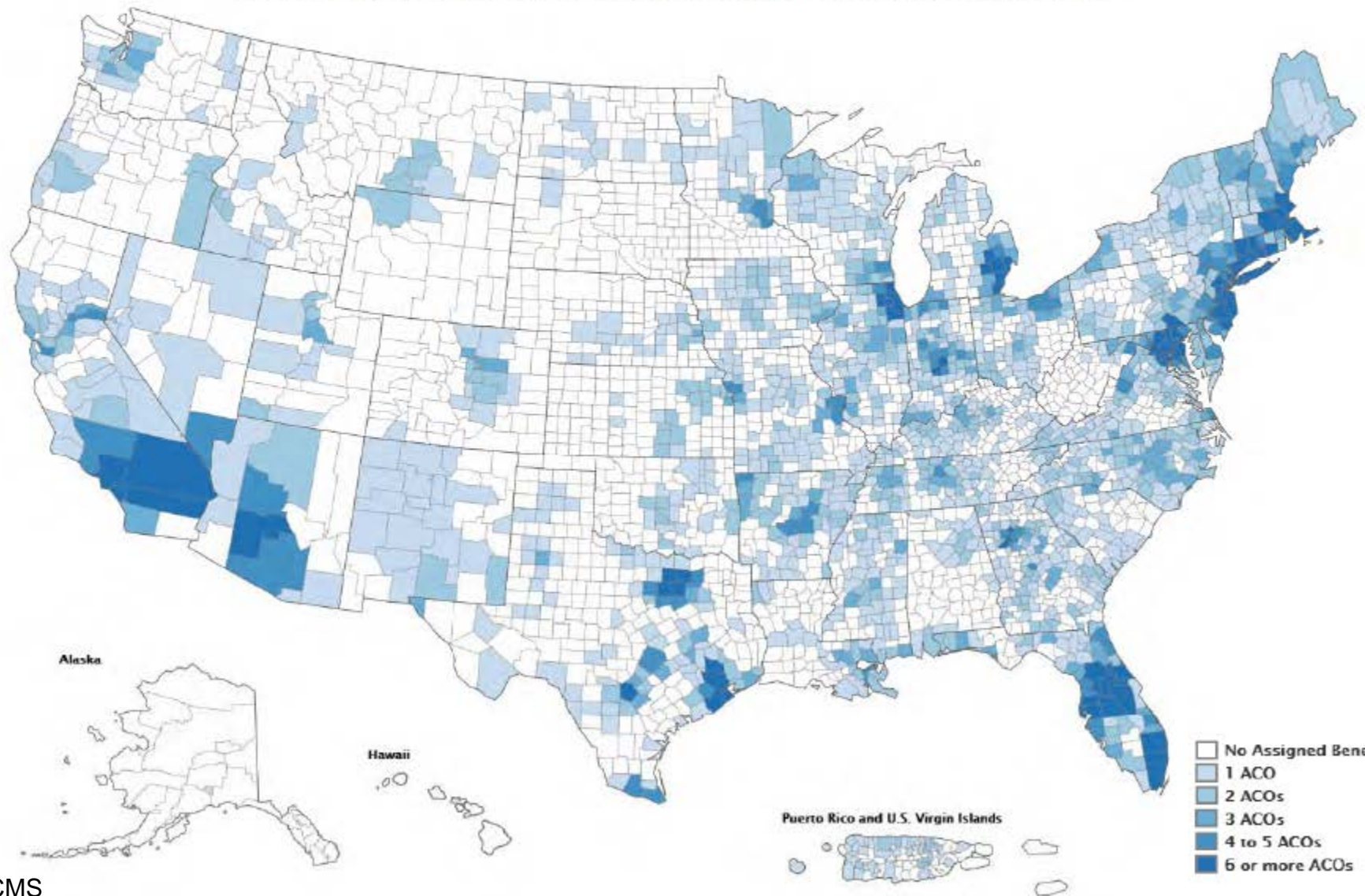


Merit-Based Incentive
Payment System (MIPS)





Alternative Payment
Models (ACOs)

Medicare Shared Savings Program ACO and Pioneer ACO Assigned Beneficiary Population by ACO by County

(counties with more than 1 percent of an ACO's assigned beneficiaries)



MIPS Scoring

Summary of MIPS Performance Categories		
Performance Category	Maximum Possible Points per Performance Category	Percentage of Overall MIPS Score (Performance Year 1 - 2017)
 <p>Quality: Clinicians choose six measures to report to CMS that best reflect their practice. One of these measures must be an outcome measure or a high-value measure and one must be a crosscutting measure. Clinicians also can choose to report a specialty measure set.</p>	80 to 90 points depending on group size	50 percent
 <p>Advancing Care Information: Clinicians will report key measures of patient engagement and information exchange. Clinicians are rewarded for their performance on measures that matter most to them.</p>	100 points	25 percent
 <p>Clinical Practice Improvement Activities: Clinicians can choose the activities best suited for their practice; the rule proposes over 90 activities from which to choose. Clinicians participating in medical homes earn “full credit” in this category, and those participating in Advanced APMs will earn at least half credit.</p>	60 points	15 percent
 <p>Cost: CMS will calculate these measures based on claims and availability of sufficient volume. Clinicians do not need to report anything.</p>	Average score of all cost measures that can be attributed	10 percent

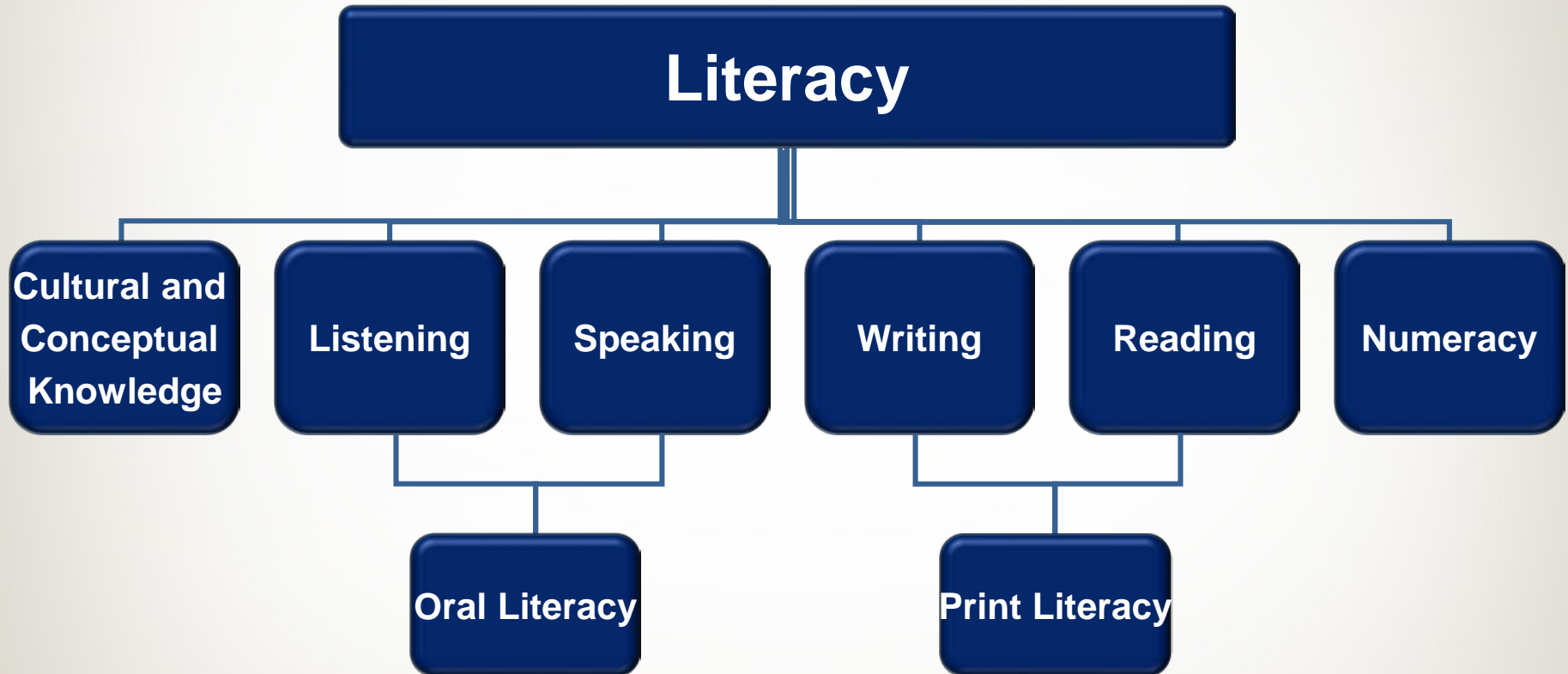
Other Drivers Towards Population Health

- Private Insurance Contracts
 - Pay for Performance
 - Risk-Based Contracting
 - Total Cost of Care Contracts
- Medicaid Payment Report
 - State Innovation Models
 - Bundled Payments
- IRS Requirements for Non-Profit Hospitals
 - Community Health Needs Assessment

Approaches to Population Health

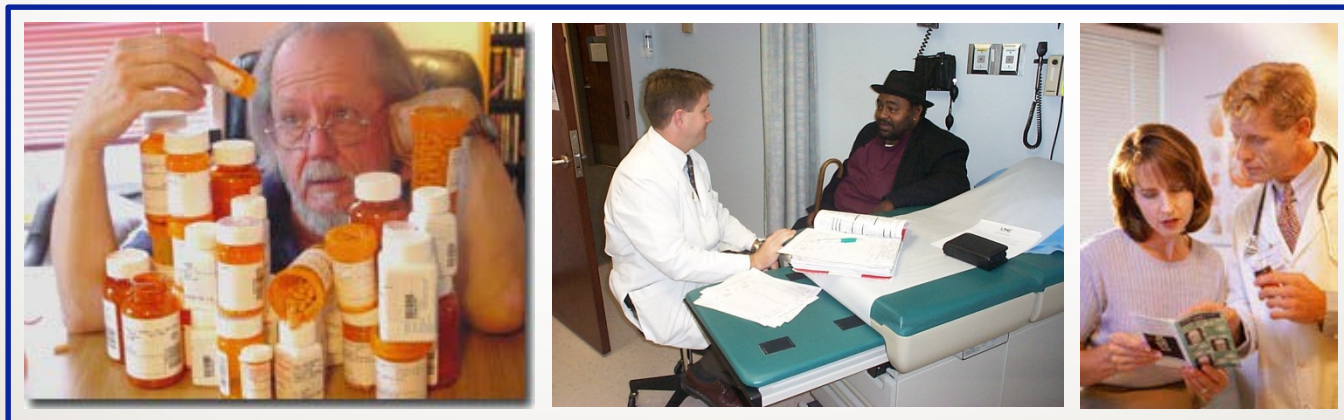
- **Health System**
 - Accountable Care Organizations
 - Clinically Integrated Networks
 - Health Maintenance Organizations
 - Population Health Offices
 - Patient Experience Offices
 - Capitated and Value-Based Reimbursement
- **Leveraging Big Data**
 - Identify Gaps in Care
 - Predictive Analytics; Geocoding analyses
 - Collection of social and behavioral determinants
 - Collection of Patient Reported Outcomes
- **Targeted Programs**
 - Focus on chronic disease management and prevention
 - Focus on high utilizers
 - Patient Centered Medical Homes
 - Address social and behavioral determinants
 - Community efforts

Literacy is a Complex Skill



Who Has Poor Literacy/Numeracy ?

- NALS (1992) and NAAL (2003)
 - 40-44 million Americans are functionally illiterate
 - 50 million have marginal literacy & numeracy skills
- Average American reads at 8th-9th grade level
- Quantitative skills are often worse



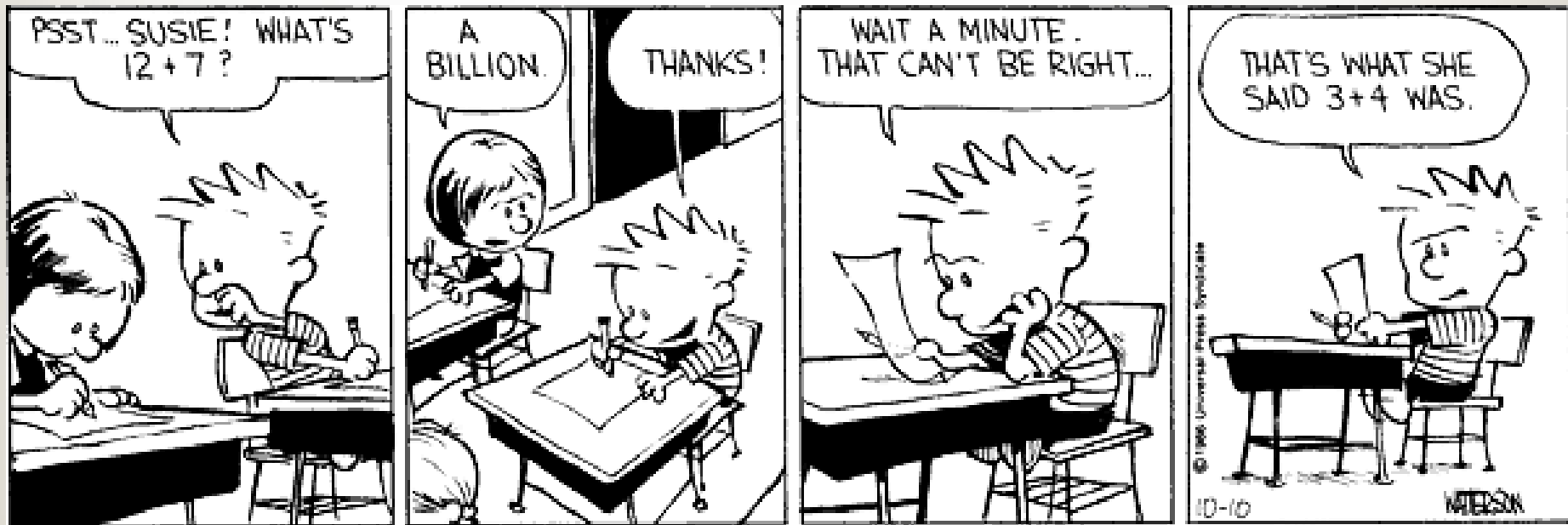
Numeracy

- A component of overall literacy
- “The ability to understand and use numbers and math skills in daily life”
- Calculations, deduction/logic, interpretation of graphs/labels, time, probability, etc.

Rothman et al, J Health Comm, 2009

Numeracy vs Literacy

- Highly correlated with literacy, but not perfect



Calvin and Hobbs, Bill Watterson, Universal Press Syndicate, Released on: Friday, Oct 10th 1986.

Many Outcomes Associated with Literacy

Behaviors

- Breastfeeding
- Behavioral problems
- Adherence to medication
- Smoking, Substance abuse

Knowledge

- Food label and portion size understanding
- Birth control knowledge
- Emergency department instructions
- Asthma knowledge
- Hypertension knowledge

Health Outcomes/Services

- General health status
- Hospitalization
- Mortality
- Emergency department use
- Depression
- Diabetes control
- HIV control
- Prostate Cancer Stage
- BMI
- Mammography
- Pap smear, STD Screening
- Immunizations
- Cost

Low Literacy and Numeracy Linked to Worse Knowledge of Child Healthcare Issues

Infants & Children

LITTLE COLDS

REUSABLE FOREHEAD THERMOMETER
BONUS INSIDE!

MULTI-SYMPTOM COLD FORMULA

Nasal Decongestant | Cough Suppressant | Fever Reducer | Pain Reliever

Safely & Gently Relieves

- ✓ Stuffy Noses
- ✓ Coughs
- ✓ Fever & Pain

NO SACCHARIN, ALCOHOL OR PPA
NATURAL BERRY FLAVOR

DYE FREE ORAL DROPS

1 FL OZ (30 mL)



Easy Directions for Preparation & Use

Your baby's health depends on carefully following these directions. Ask your baby's doctor about infant formula use including the need to boil water for formula, bottle, and nipple assembly.

Pour desired amount of warm water into bottle. Add powder, cap bottle and shake vigorously. Use the following chart for correct amounts of water and powder.

To Make	Water	Powder
2 oz bottle	2 fl oz	1 unpacked level scoop (8.5 g)
4 oz bottle	4 fl oz	2 unpacked level scoops (17 g)
6 oz bottle	6 fl oz	3 unpacked level scoops (25.5 g)
8 oz bottle	8 fl oz	4 unpacked level scoops (34 g)
1 quart	29 fl oz	1 unpacked level household measuring cup (124 g)

Feed immediately, or cover and refrigerate prepared formula. Use within 48 hours. Throw away prepared formula left in feeding bottle or cup 2 hours.

Warm formula. Store after in dry place. Avoid use.

Enfamil

with Iron

Infant Formula

Milk-Based for Baby's First 12 Months

Powder

Makes 105 fl oz

06 g)

MeadJohnson Nutri

NEW LABEL INFORMATION

Concentrated TYLENOL

Infants' Drops Plus

Nasal Decongestant
Pain Reliever
Fever Reducer
Cough Suppressant

COLD & COUGH

CONTAINS 3 INGREDIENTS:
Fever and Pain → Acetaminophen
Cough → Dextromethorphan HBr
Stuffy Nose → Pseudoephedrine HCl

Cherry FLAVOR

1/2 FL OZ (15 mL)



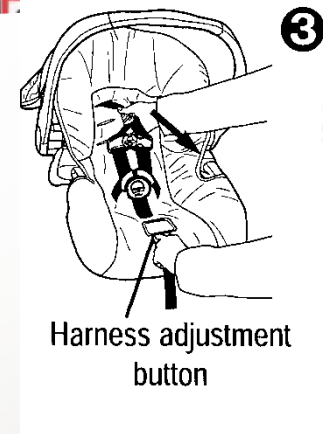
Drug Facts (continued)

Directions

- shake well before using
- find right dose on chart below. If possible, use weight to dose; otherwise, use age.
- if needed, repeat dose every 4 hours
- do not use more than 5 times in 24 hours
- only use enclosed measuring cup

Weight (lb)	Age (yr)	Dose (tsp or mL)
under 24	under 2	call a doctor
24-35	2-3	1 tsp or 5 mL
36-47	4-5	1 1/2 tsp or 7.5 mL
48-59	6-8	2 tsp or 10 mL
60-71	9-10	2 1/2 tsp or 12.5 mL
72-95	11	3 tsp or 15 mL

Attention: Specifically designed for use with enclosed measuring cup. Use only enclosed measuring cup to dose.



Health Literacy/Numeracy Linked to Poor Understanding of Nutrition

- Over 90% of patients struggle to understand food labels
- Over 2/3 of patients have poor estimation of portion sizes
- Subjects with lower Literacy/Numeracy had more difficult time understanding health information.

Nutrition Facts	
Serving Size ½ cup (114g)	
Servings Per Container 4	
Amount Per Serving	
Calories 90	Calories from Fat 30
% Daily Value*	
Total Fat 3g	5%
Saturated Fat 0g	0%
Cholesterol 0mg	0%
Sodium 300mg	13%
Total Carbohydrate 13g	4%
Dietary Fiber 3g	12%
Sugars 3g	
Protein 3g	
Vitamin A 80%	Vitamin C 60%
Calcium 4%	Iron 4%

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

	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Sat Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g

Calories per gram:
Fat 9
Protein 4
Carbohydrate 4



The New York Times
Fitness & Nutrition

WORLD | U.S. | N.Y. / REGION | BUSINESS | TECHNOLOGY | SCIENCE | HEALTH | SPORTS | OPINION

FITNESS & NUTRITION | HEALTH CARE POLICY | MENTAL HEALTH

VITAL SIGNS
Labeling: Nutritional Information Leaves Many Uninformed
By ERIC NAGOURNEY
Published: September 20, 2006

Nutrition labels contain a wealth of information for people watching their weight or keeping an eye on other health issues.

But a new study has found that the messages are not getting through to many people who lack the reading or math skills needed to decipher them.

"Many patients were confused by the complexity of the nutrition label and could not find the proper information," said the study, which appears in The American Journal of Preventive Medicine.

ARTICLE TOOLS
E-MAIL
PRINT
REPRINTS
SAVE
THE LAST KING OF SCOTLAND NOW PLAYING



Health Numeracy Linked to Worse Diabetes Knowledge and Control

- Difficulties performing many literacy and numeracy related diabetes tasks:
 - Over 25% of patients could not interpret glucose meter
 - Over 40% could not calculate carbohydrate intake
 - Over 30% could not dose insulin correctly
- Self-care skills linked to underlying numeracy.
- Diabetes numeracy skills associated with self-management, self-efficacy, and A1C.



Amount Per Serving	
Serving Size 1 oz. (28g/About 10 chips)	
Servings Per Container 3.5	
Calories 140	Calories from Fat 60
% Daily Value*	
Total Fat 6g	10%
Saturated Fat 0.5g	4%
Cholesterol 0mg	0%
Sodium 160mg	7%
Total Carbohydrate 18g	6%

Assessing Literacy Status

- Not Reliable
 - Asking directly
 - Asking educational status
- Quick Techniques
 - Pill bottle
 - Signing name
 - Red Flags (Missed Appts, noncompliance, etc)
- Validated Techniques
 - REALM
 - TOFHLA
 - The Newest Vital Sign
 - WRAT, SORT, PIAT

Communicating: What can you do?

- Use low literacy and picture based materials
- Individualize education
- Teach concepts in a simplified manner
- Use teach back technique
- Address cultural issues
- Shared goal setting

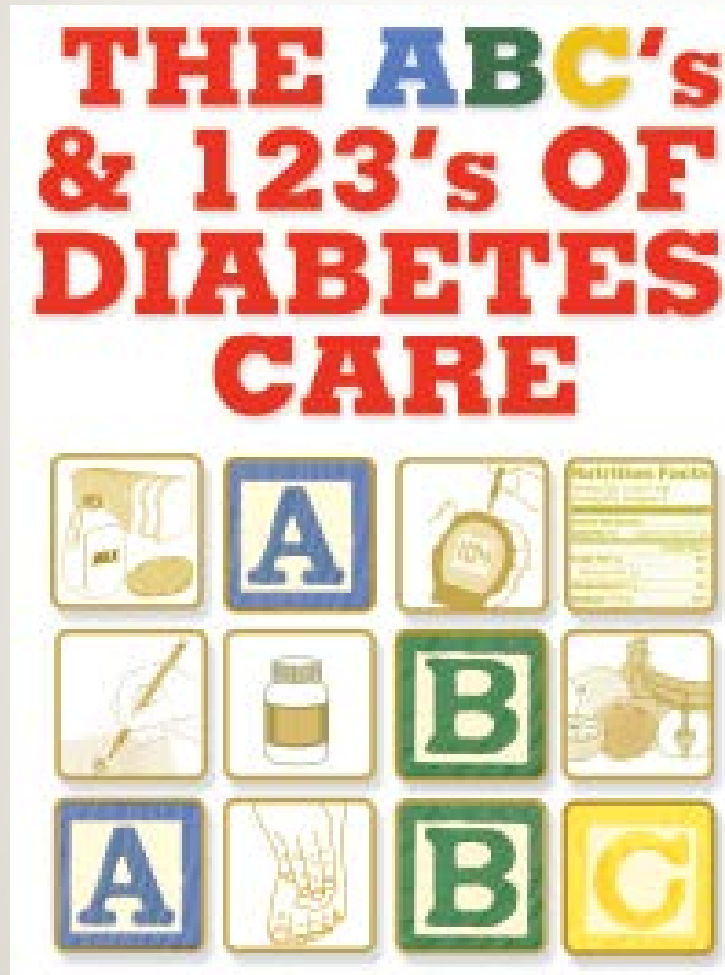
Low literacy Information

- Most patient information is written at or above the 10th grade levels
- Low literacy materials can improve patient knowledge and outcomes.
- When making materials:
 - Avoid pathophysiology and jargon and focus on key concepts/actions.
 - Use figures to simplify text
 - Increase white space
 - Try to write for the 4th-6th grade level
 - Use SMOG, FRY, Flesh-Kincaid Methods to assess your materials

Resources for Low Literacy Material

- Writing your own:
 - <http://www.pfizerhealthliteracy.com/>
 - <http://www.usability.gov/>
 - <https://www.cdc.gov/healthliteracy/learn/Resources.html>
 - <https://www.ahrq.gov/topics/health-literacy.html>
- Available Materials:
 - <http://www.fda.gov/opacom/lowlit/englow.html>
 - <http://www.nlm.nih.gov/medlineplus/healthtopics.html>
 - www.niddk.nih.gov/health/eztoread.htm#dia
 - <http://diabetes.niddk.nih.gov/dm/a-z.asp>

Sample Materials



Teaching Concepts

- Limit advice to key concepts. Focus on behaviors and actions
- Simplify concepts
- Focus on one concept at a time; partition information
- Use concrete terms and examples
- Make info culturally relevant and personal
- Avoid Jargon!

Teachback Technique

**New Concept:
Health Information,
Advice, or Change
in Management**

**Clinician Explains
New Concept
Patient Recalls and
Comprehends**

**Clinician Assesses
Patient recall and
Comprehension**

**Clinician Clarifies and
Tailors Explanation**

**Clinician
Reassesses Patient
Recall and
Comprehension**

Adherence

Shared Goal Setting

- Let patient or family initiate
 - Practice “reflective” listening”
 - Provide affirmation of positive behaviors
 - Show empathy for challenges
- Choose goal that is realistic and attainable
 - Can offer a few choices and settle on goals together
 - Roll with resistance (don’t challenge patients who resist change; instead ask them to come up with solutions)
- Be concrete
- Set a time for accomplishing goal
 - Let them know it is up to them to make change!
 - Promote a “you can do it” approach!

Cultural Challenges

- Language
 - Limited English proficiency
- Family Structure
 - Multiple caregivers
- Health Beliefs
 - Dissonance from the “biomedical model”

Campinha-Bacote, 2003

Addressing Language Barriers

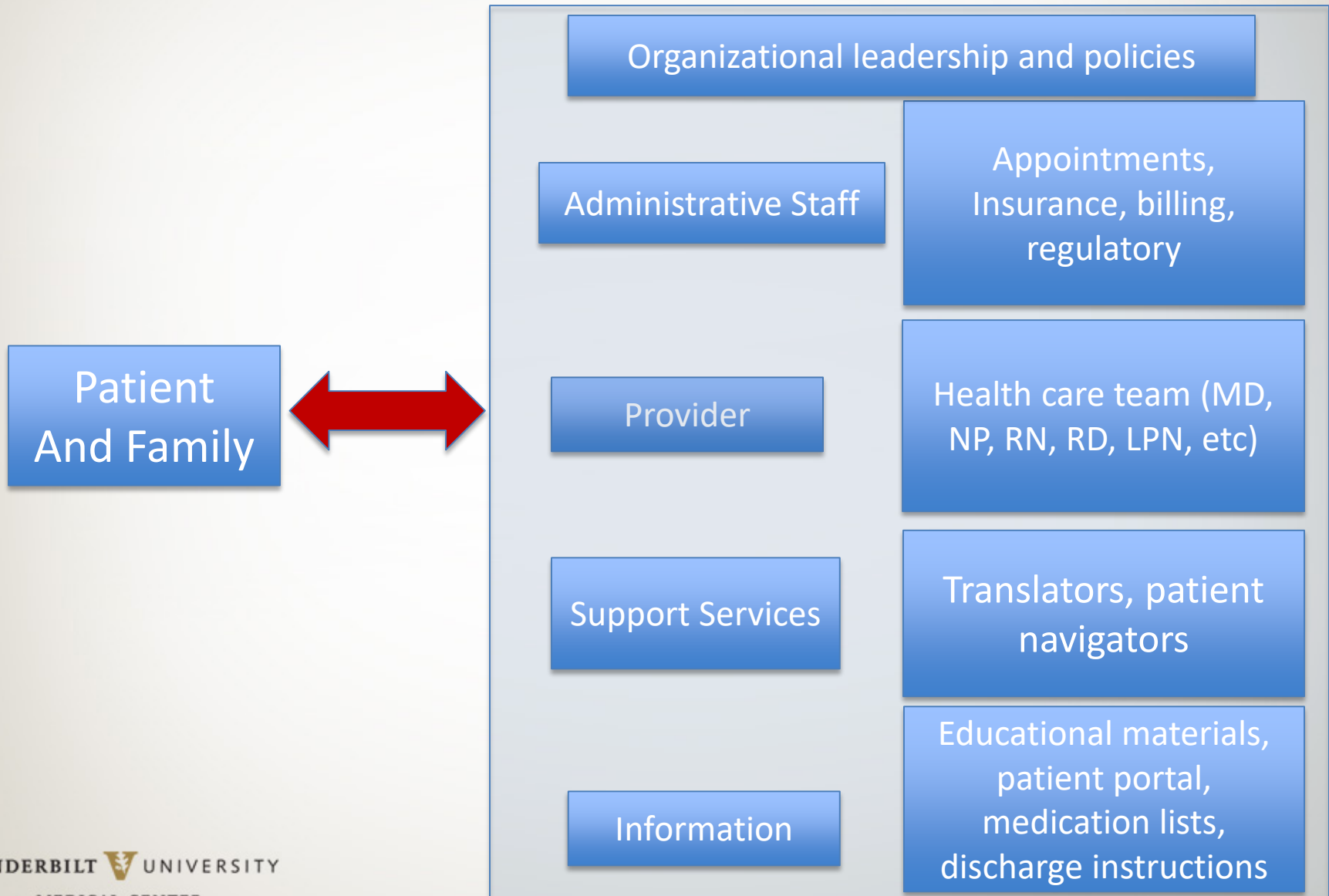
- Improve your language proficiency
- Use language-appropriate handouts
- Use a language interpreter ...
 - If you are not “natively fluent”
 - If you cannot “tell a joke” in that language

Health Literate Organization

- “Health care organizations that make it easier for people to navigate, understand, and use information and services to take care of their health.”



Patient Interactions



Measuring Organizational Health Literacy

Health Literacy Universal Precautions Toolkit



COCAT

Communication Climate Assessment Toolkit



THE HEALTH LITERACY ENVIRONMENT OF HOSPITALS AND HEALTH CENTERS

Rima E. Rudd | Jennie E. Anderson



*Partners
for Action:*
Making Your
Healthcare Facility
Literacy-Friendly

enliven

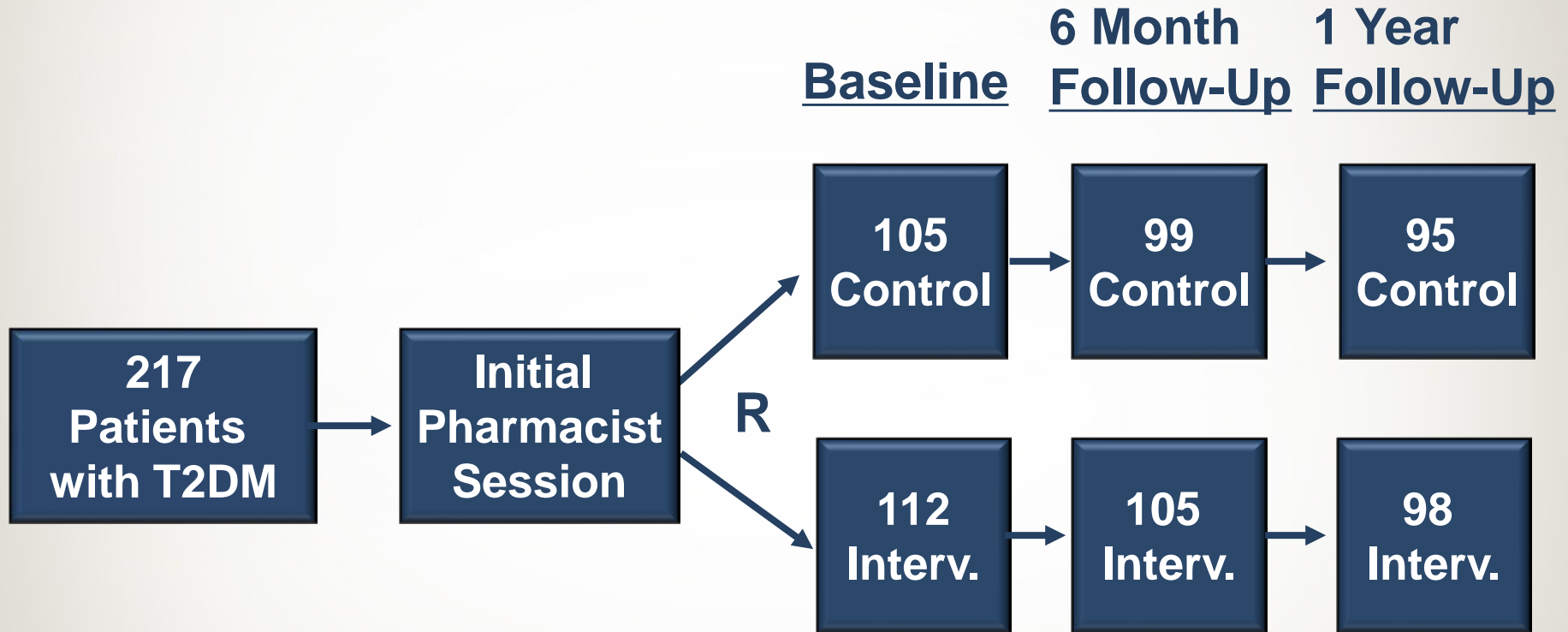
ENHANCING SOCIAL HEALTH

ENLIVEN ORGANISATIONAL HEALTH LITERACY Self-assessment Resource

Literacy Interventions



Initial Diabetes Intervention



Intervention

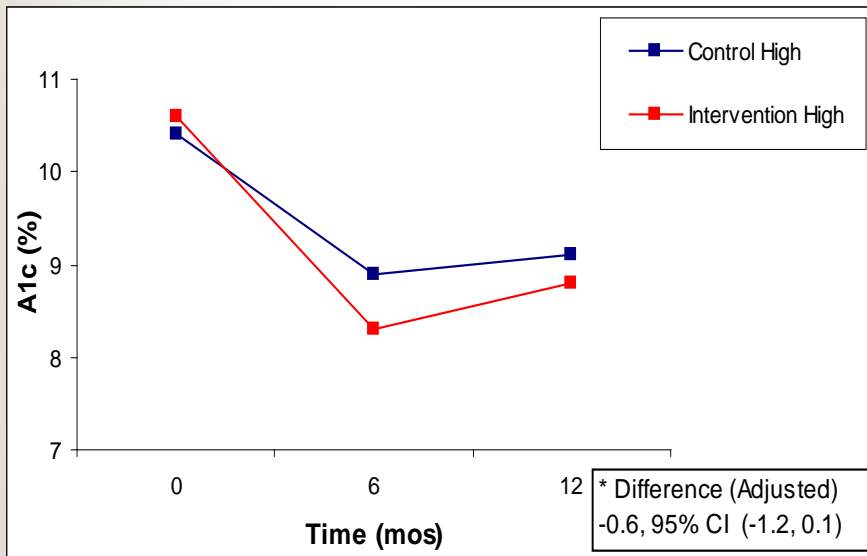
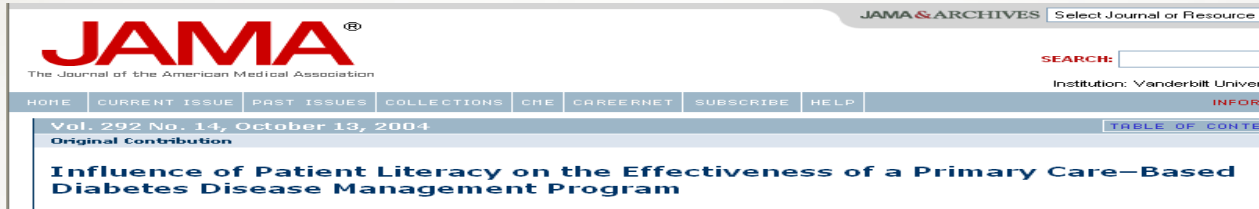
- Diabetes Education
- Evidence-based medication algorithms
- Database to track and manage patient outcomes
- Diabetes Care Coordinator

- Addressed literacy by using:
 - Individualized verbal education
 - Low literacy material
 - Teaching concepts in a simplified manner
 - “Teach back” techniques to confirm learning

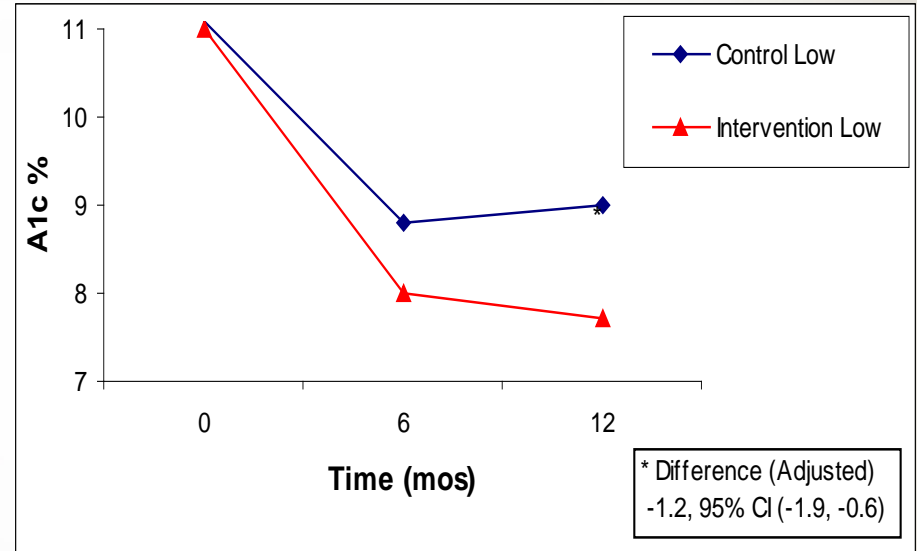
Significant Clinical Improvements at 12 months

Variable	Control (n=95)	Intervention (n=98)	Difference
A1C (%)	-1.2%	-2.1%	0.9% (0.8,1.0)
SBP (mmHg)	+2.3	-6.9	9.2 (2.3,16.1)
DBP (mmHg)	+1.2	-3.6	4.8 (1.1,8.6)
ASA (mmHg)	+6%	+47%	41% (25-55)
T. Chol. (mg/dL)	-12	-27	15 (-4, 35)

Literacy was an Important Factor



High Literacy Patients



Low Literacy Patients

Diabetes and Numeracy RCT

THE ABC'S & 123'S OF DIABETES CARE



Taking care of your diabetes

If you have diabetes, you need to:

- Check your blood sugar every day.



- Be aware of how much starch and sugar (carbohydrates) you eat at every meal.



- Be active every day!



- Take your diabetes medicines every day.



- Clean and look at your feet every day.



- Go to your doctor's office for regular check-ups.

DLNET Toolkit

PART 2

TESTING YOUR BLOOD SUGAR

Test Your Blood Sugar Every Day

Why should I test my blood sugar?

- To know if your blood sugar is too high or too low
- So your doctor or nurse will know how your diabetes is doing to help control your diabetes



What does my blood sugar test result mean?

	If Blood Sugar Is: Over 300.....This is very high. Call your doctor or nurse at _____ if it stays this high for 2-3 days.
	181-300.....This is too high. Call your doctor or nurse if it stays high for over a week. 121-180.....This is a little high before meals.
	70-120.....This is perfect before meals.
	Below 70.....This is too low. Eat 3-4 glucose tablets or _____ Call your doctor or nurse at _____ if you have more than _____ lows in a week.
If you are worried that your blood sugar is too high or too low, call your doctor or nurse at _____	

1

PART 2

Text at 5th grade reading level

Color coding

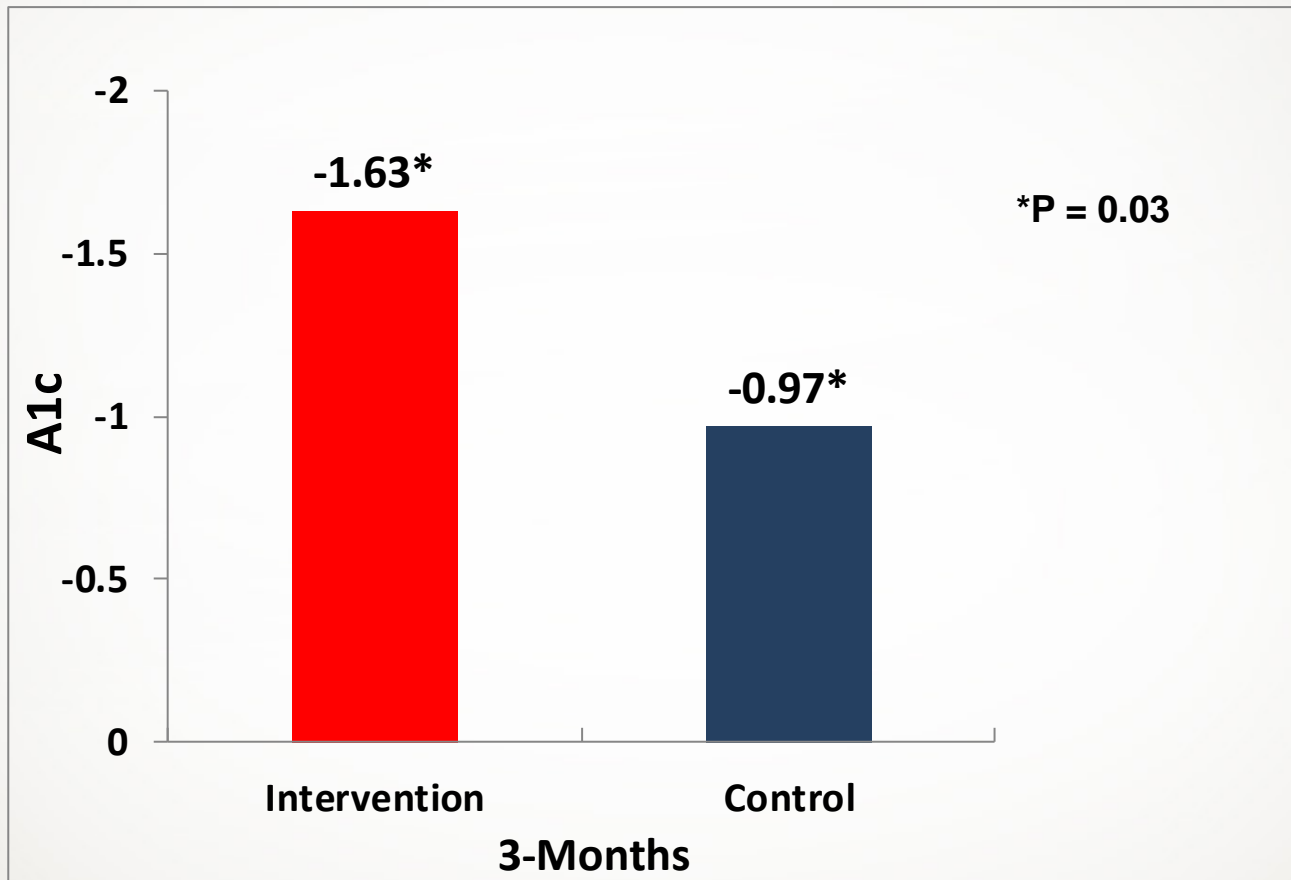
Pictures for key concepts

Step-by-step instructions

Simplified medication instructions

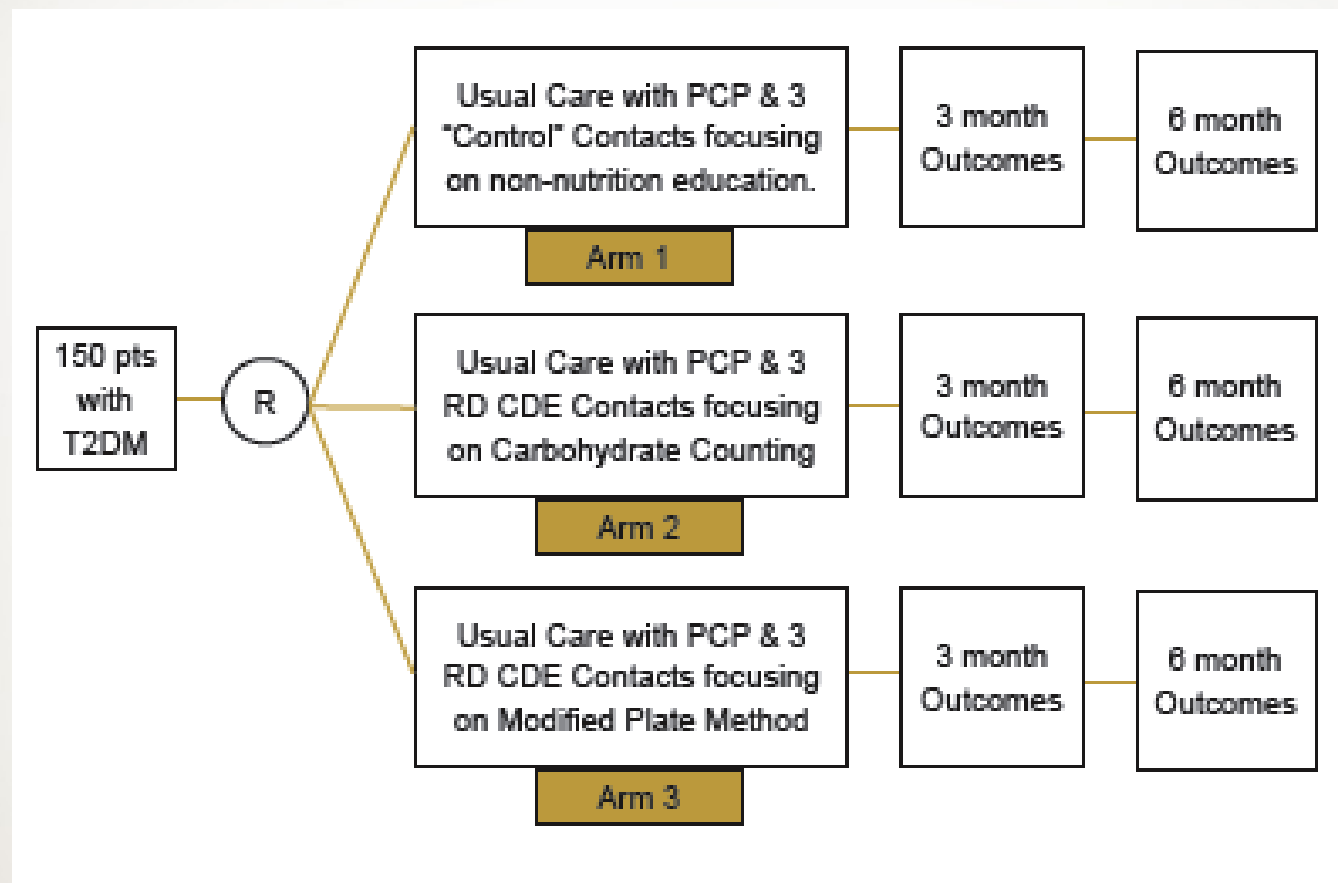
Practice skills worksheets

Study Demonstrates Value of Addressing Health Literacy



*Adjusting for age, gender, race, type of diabetes, income level, site of intervention and baseline DNT score and Hba1c levels

Diabetes Nutrition Education Study (DINES)



Carb Counting vs Plate Method

Practice One Serving Size

Use the label below:

What is the serving size? _____

How many carbohydrate grams are in each serving? _____

If you eat one serving, you will get _____ grams of carb.

Nutrition Facts

Serving Size 2 crackers (14 g)
Servings Per Container About 21

Amount Per Serving

Calories 60 Calories from Fat 15

% Daily Value*

Total Fat 1.5g 2%

Saturated Fat 0g 0%

Trans Fat 0g

Cholesterol 0mg 0%

Sodium 70mg 3%

Total Carbohydrate 10g 3%

Dietary Fiber Less than 1g 3%

Sugars 0g

Protein 2g

Vitamin A 0% • Vitamin C 0%

Calcium 0% • Iron 2%

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

Calories: 2,000 2,500

Total Fat Less than 65g 80g

Total Fat Less than 50g 70g

Cholesterol Less than 300mg 300mg

Sodium Less than 2400mg 2400mg

Total Carbohydrate 300g 375g

Dietary Fiber 25g 30g

2 servings is _____ crackers

Add

_____ grams of carb from 1 serving

+ _____ grams of carb from 1 serving

= _____ grams of carb from 2 servings

1/2 serving is _____ crackers

_____ grams of carb from 1 serving

divided by 2

= _____ grams of carb from 1/2 serving

3

PART 3

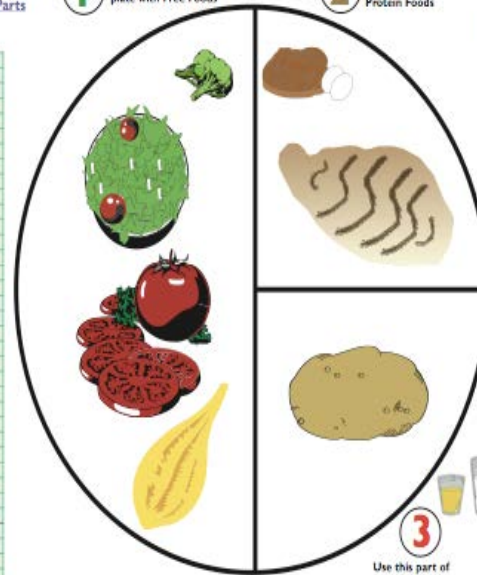
For Lunch And Dinner You Should Divide Your Plate Into 3 Parts

1 Free Foods

- Asparagus
- Artichoke, Artichoke hearts
- Asparagus
- Beans, green or yellow
- Bean sprouts
- Beets, boiled
- Broccoli
- Brussels sprouts
- Cabbage, any kind
- Cauliflower
- Celery
- Cucumber
- Eggplant
- Green beans
- Greens, any kind, salad greens
- Lettuce, any kind
- Lentils
- Mushrooms, button, raw or cooked
- Oats, boiled
- Onion
- Pepper, any kind
- Potato
- Rhubarb
- Sauerkraut
- Snow peas
- Sonch, raw
- Sprouts
- Squash, yellow or spaghetti
- Turnips
- Sugar snap peas
- Turnip
- Water chestnuts
- Zucchini

2 Fill up this part of your plate with Free Foods

2 Use this part of your plate for Protein Foods



2 Protein should be about the size of your palm

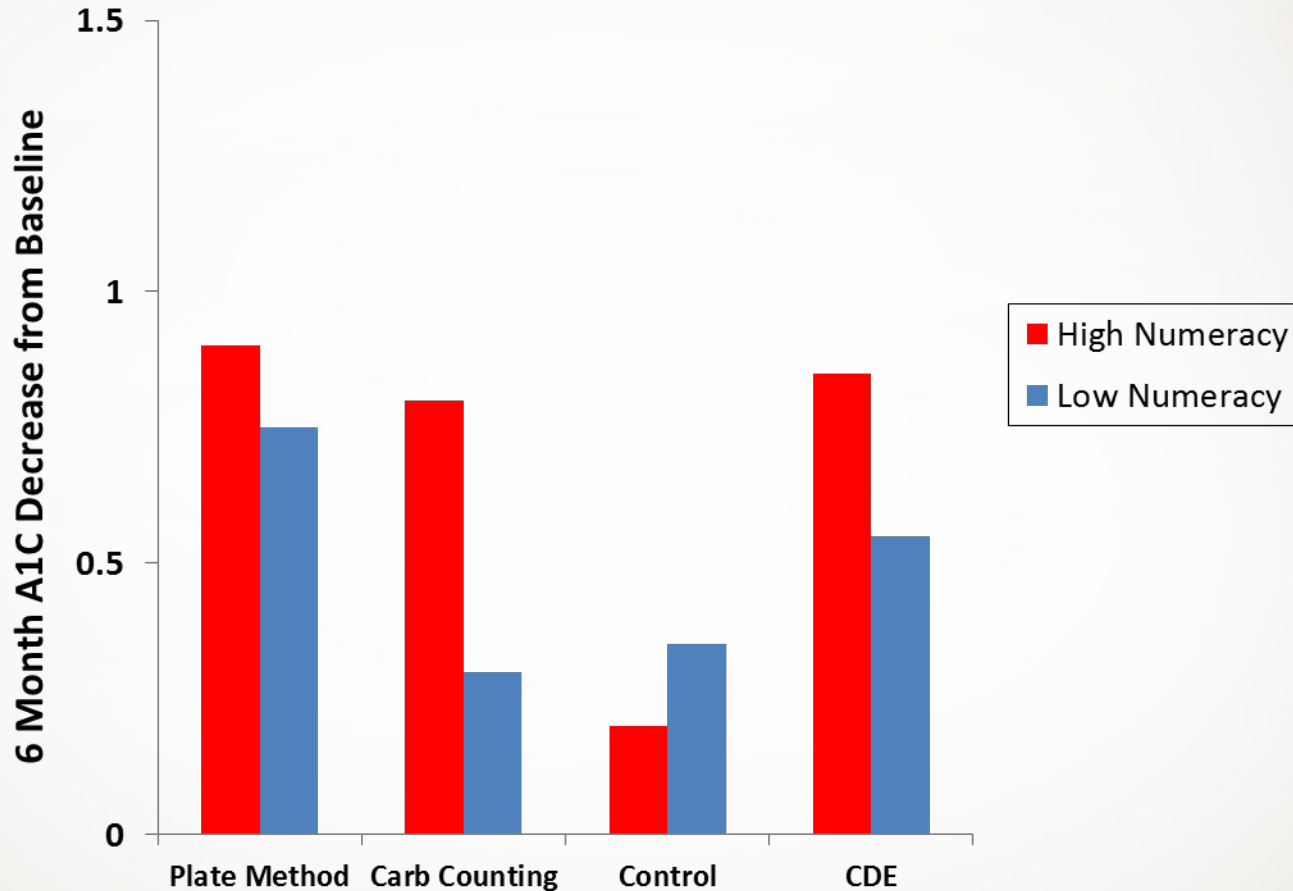
- Meat
- Chicken
- Fish
- Low-fat Cheese
- Egg
- Turkey
- Cottage cheese
- Shrimp

3 For Carbs you can have any _____ from this list

- 1 small bowl Potatoes
- 1 small bowl Rice
- 1 small bowl Beans, red, pinto or white
- 1 small bowl Corn
- 1 small bowl Peas
- 1 small bowl Noodles or macaroni
- 3 crackers
- 1 piece of bread or roll
- 1 cup of Milk
- 1 small bowl of Fruit
- 1 small glass of Juice
- 1 small bowl of low-fat, sugar-free Ice Cream
- 1 small bowl of sugar-free Pudding

3 Use this part of your plate for Carb Foods

Results Demonstrate Value of Simpler Diabetes Education



New Standards for Diabetes Education

National Standards for Diabetes Self-Management Education and Support

LINDA HAAS, PHC, RN, CDE (CHAIR)¹
MELINDA MARYNIUK, MED, RD, CDE (CHAIR)²
JONI BECK, PHARM D, CDE, BC-ADM³
CARLA E. COX, PHD, RD, CDE, CSSD⁴
PAULINA DUKER, MPH, RN, BC-ADM, CDE⁵
LAURA EDWARDS, RN, MPA⁶
EDWIN B. FISHER, PHD⁷
LENITA HANSON, MD, CDE, FACE, FACP⁸
DANIEL KENT, PHARM D, BS, CDE⁹
LESLIE KOLB, RN, BSN, MBA¹⁰

SUE McLAUGHLIN, BS, RD, CDE, CPT¹¹
ERIC ORZECK, MD, FACE, CDE¹²
JOHN D. PIETTE, PHD¹³
ANDREW S. RHINEHART, MD, FACP, CDE¹⁴
RUSSELL ROTHMAN, MD, MPP¹⁵
SARA SKLAROFF¹⁶
DONNA TOMKY, MSN, RN, C-NP, CDE, FADE¹⁷
GRETCHEN YOUSSEF, MS, RD, CDE¹⁸
ON BEHALF OF THE 2012 STANDARDS
REVISION TASK FORCE

nonaccredited and nonrecognized providers and programs.

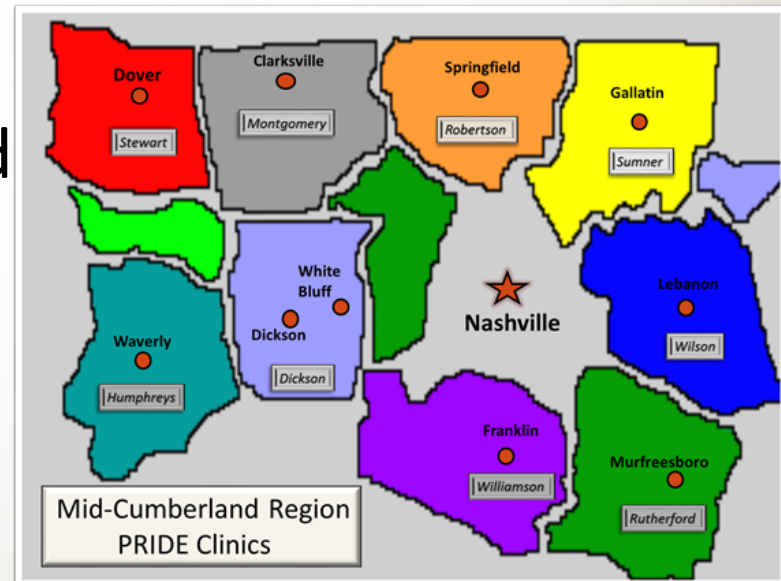
Because of the dynamic nature of health care and diabetes-related research, the Standards are reviewed and revised approximately every 5 years by key stakeholders and experts within the diabetes education community. In the fall of 2011, a Task Force was jointly convened by the American Association of Diabetes

Diabetes Care, 2012

PRIDE Study



- PaRtnering to Improve Diabetes Education
- Goal to address health communication issues to improve diabetes care in middle TN
- Collaboration between TN Dept. of Health, Vanderbilt, and Meharry
- 5 year NIDDK R18 study
- Cluster RCT with 10 Clinics and 400 diabetes patients



Pride Materials



	If Your Patient needs help with:	Consider these handouts:
1	General Information For all Patients with Diabetes:	<ul style="list-style-type: none"> What is Diabetes Low Blood Sugar
2	Glucose Monitoring	<ul style="list-style-type: none"> Blood Sugar Checks Blood Sugar Log Sheet - Simple Blood Sugar Log Sheet - Advanced
3	Nutrition Information	<ul style="list-style-type: none"> Nutrition for Diabetes Using your Plate to Manage your Carbs Counting your Carb grams What Can I Eat for a Snack? What Should I Eat When I Eat Out?
4	Oral Diabetes Medication	<ul style="list-style-type: none"> Diabetes Pills Taking Your Medicines
5	Insulin and Byetta	<ul style="list-style-type: none"> Drawing and Self-Injecting Insulin (BD) Mixing Insulin for Self-Injecting (BD) How To use an Insulin Pen Set Dose Insulin Insulin for Set Dose Plus Correction Long Lasting Insulin Dose Chart How To Take Byetta Taking Your Medicines
6	Lifestyle Management and Behavior Change	<ul style="list-style-type: none"> Be Active How Can Losing Weight Help Me? Smoking and Diabetes
7	Foot Care	<ul style="list-style-type: none"> Foot Care Do's and Don'ts (BD)
8	Cardiovascular Risk Factors	<ul style="list-style-type: none"> Blood Pressure Control Cholesterol Taking Your Medicines
9	Coping with Stress and Depression	<ul style="list-style-type: none"> Stress and Depression
10	Oral Health	<ul style="list-style-type: none"> Problems With Your Teeth and Mouth
11	Women's Health	<ul style="list-style-type: none"> How Diabetes Can Affect Women

HOW TO USE AN INSULIN PEN
Be sure to take your insulin every day to help keep your blood sugar in good control.

How to Get Your Pen Ready

- Pull off plastic cover or pen cap.
- If insulin is cloudy gently turn pen up and down 10 times to mix insulin.
- Wipe rubber piece on the end of pen with alcohol.
- Screw on pen needle and remove.
- Turn knob on end of pen and dial units the first time you use your pen that, dial up 1 unit when you use pen.
- Shoet 1 unit of insulin into the air.

SET DOSE INSULIN

What kind of insulin do I take?

My long lasting insulin is: _____ (Brand Name)

My short lasting insulin is: _____ (Brand Name)

My 75/25 mix insulin is: _____ (Brand Name)

When should I take my insulin and how much should I take?

Before Breakfast
Take _____ units of _____ insulin right before breakfast (long lasting or mix insulin)

Before Lunch
Take _____ units of _____ insulin right before lunch (short lasting insulin)

Before Supper
Take _____ units of _____ insulin right before supper (long lasting or mix insulin)

EATING OUT

I CAN DO IT!

I can choose healthier foods when I eat in a restaurant. I will pick a few things from the list below to start this week and continue until I talk about it with my doctor or nurse.

- I will choose foods from the list on this handout if I eat in a restaurant.
- I will order small portions and avoid "supersize" servings.
- I will only eat food in a restaurant _____ times per week.
- If I am served a large amount of food, I will _____ (be the go container) and take the other _____.

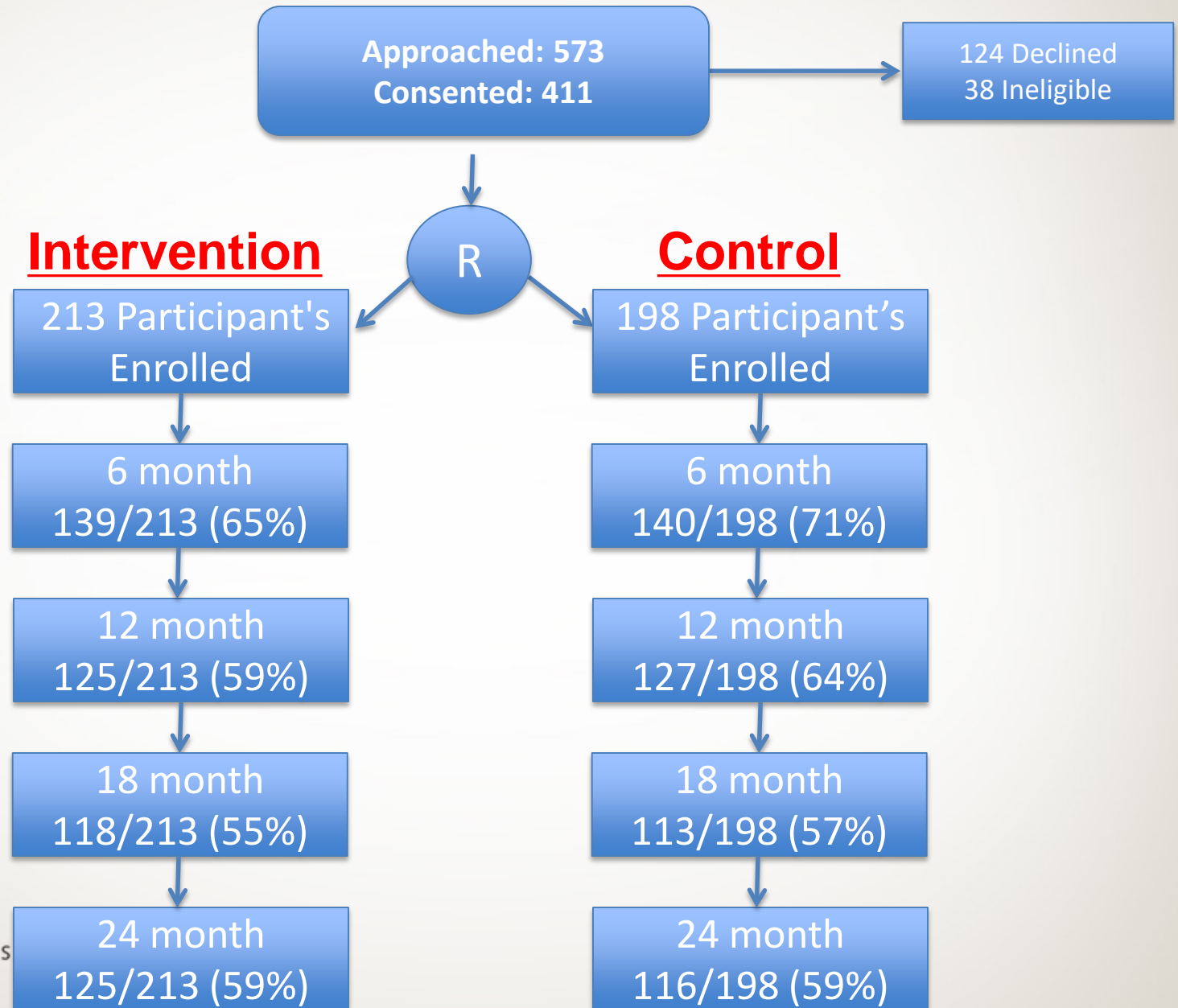
BLOOD PRESSURE CONTROL

I CAN DO IT!

I can help control my blood pressure! I will pick a few things from the list below to start this week and continue until I talk about it with my doctor or nurse.

- Put my pills in a pill box to help me remember.
- Watch my salt by _____.
- Limit fast food to _____ meals per week.
- Use low salt spices like lemon juice, black pepper or hot sauce instead of plain salt, very sauce and garlic salt. I will use _____ instead of _____.
- I will walk 15-30 min every day. I will start walking on this date: _____.

Results: PRIDE Study Flow



Demographics

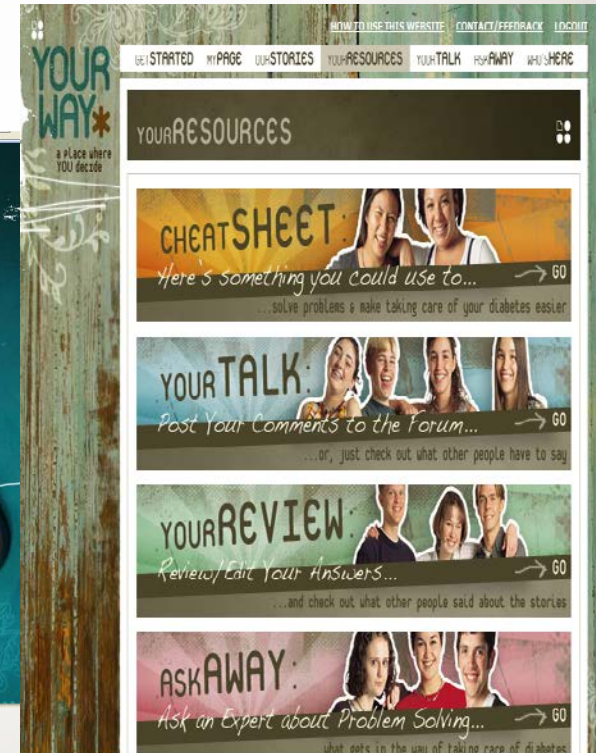
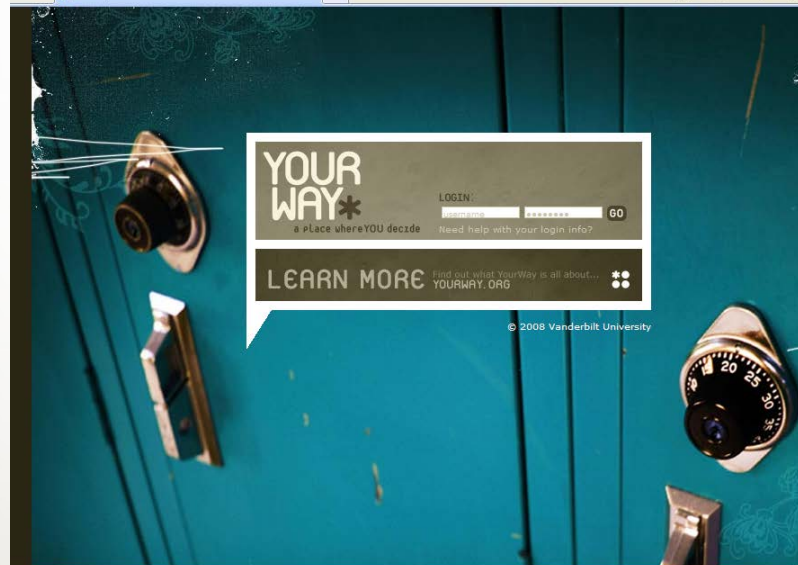
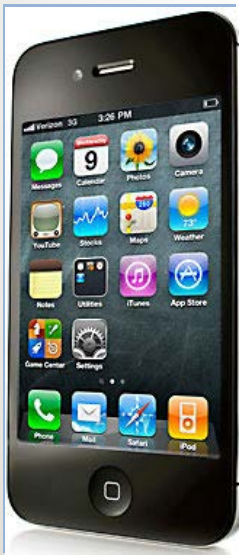
Variable (n=410)	Mean(SD) or n(%)
Age, yrs (SD)	51.0 (9.6)
Female, No. (%)	249 (61)
Hispanic, No. (%)	98 (24)
Race, No. (%)	
White	258 (63)
Black	72 (18)
Other	80 (20)
Without Health Insurance (%)	359 (88)
Annual Family Income ≤ 20,000 (%)	335 (83)
Education, yrs (SD)	11.1 (3.4)
Literacy Skills (S-TOFHLA), No. (%)	
Inadequate	59 (15)
Marginal	10 (2)
Adequate	333 (83)
Subjective Literacy Skills (SLS), mean total (SD)*	10.7 (3.3)
Subjective Numeracy Skills (SNS), mean (SD)*	3.3 (1.2)
Diabetic Numeracy Skills, DNT, mean (SD)*	46.1% (37.5)

Clinical Characteristics

Variable (n=410)	Mean(SD) or n(%)
BMI (SD)	35.8 (9.0)
On Pills to Lower Blood Sugar (%)	364 (89)
A1C (SD)	9.6 (2.1)
Yrs of diabetes	9.0 (7.1)
On Insulin (%)	242 (59)
Takes insulin 1x per day	65 (27)
Takes insulin 2x per day	101 (42)
Takes Insulin 3-4x per day	77 (32)
Adjusts Insulin for Blood Glucose (%)	104 (42)
Adjusts Insulin for Carbohydrates (%)	33 (13)
Blood Glucose Monitoring, No. (%)	
< 1x per day	92 (23)
1x per day	87 (21)
≥ 2x per day	228 (56)

HIT approaches for Diabetes

- Web-based and mobile phone interventions to promote problem solving skills and self-care in adolescents with diabetes
- Use of electronic patient portal to address medication adherence



Childhood Obesity

- 1 in 4 preschoolers in the US are overweight/obese
- Overweight in infancy associated with increased risk for overweight in adulthood
- Weight gain in first few months of life associated with increased CV risks in adulthood
- “Obesogenic” behaviors start early in infancy and are very common!



Greenlight Study



- NIH (NICHD) Funded R01
- **Design:** Cluster Randomized Trial of Literacy Sensitive Obesity Prevention intervention vs Active Control (Injury Prevention)
- **Setting:** 4 academic primary care resident clinics (Vanderbilt, NYU, UNC, and U Miami)
- **Participants:**
 - Over 400 pediatric residents at the 4 sites
 - 865 English and Spanish speaking families with children enrolled at 2 months of age and followed until 2 years of age
 - Children with weight/length z score >3% (WHO Criteria) without significant chronic health issues or FTT or history of prematurity (<35 weeks)



Resident Training in Effective Health Communication

- Lectures, pre-clinic conference, role-playing
- Use effective health communication principles
 - Use plain language. Avoid jargon
 - Limit advice to 1-3 key concepts
 - Use “teach back” technique to confirm understanding
 - Address culture, language and family issues
 - Perform shared goal setting
- Perform in-room observations (“certifications”)

Greenlight Toolkit Materials

- 1-2 Booklets per Well Child Visit
 - 1 CORE booklet focused on key behaviors
 - 1-3 SUPPLEMENTAL booklets (*Provider Chooses*)
 - Booklets are 2-6 pages and end with goal setting
- Designed to be used interactively during the visit
- Available in English and Spanish

Keep Your 2 Month Old Growing Healthy! 

Learn how your baby shows you he's hungry or full.
So you give the right amount - not too much and not too little!
pages 2-4

Breast milk or formula is best.
Your baby does not need juice or solid foods.
pages 5-9

Put your baby on her tummy to play every day.
Help keep your baby growing strong!
pages 10-11


2 Month Core Booklet - English

Keep Your 4 Month Old Growing Healthy! 

Learn how your baby shows you he's hungry or full.
So you give the right amount - not too much and not too little!
pages 2-3

Breast milk or formula is best.
Your baby does not need juice.
pages 4-8

Wait to start solid foods.
Most babies are not ready until they are close to 6 months old.
pages 9-11


4 Month Core Booklet - English

Keep Your 6 Month Old Growing Healthy! 

Start solid foods the right way.
Give healthy foods - and the right amount - from the start!
pages 2-7

Breast milk or formula are the only drinks your baby needs.
Your baby does not need juice.
pages 8-10

Be active with your baby.
Put her on a blanket on the floor with some toys and play together!
page 11


6 Month Core Booklet - English

Keep Your 9 Month Old Growing Healthy! 

Give your baby small amounts of healthy, soft "finger foods."
Your baby is learning to feed himself!
pages 2-6

Breast milk, formula and water are best.
Your baby does not need juice or other sugary drinks.
pages 7-10

Join your baby on the floor for active play time.
TV time is not active time.
page 11


9 Month Core - English

Sample Materials: 15 months

Keep Your Toddler Growing Healthy!



Milk and water are best.

Your toddler does not need juice or other sugary drinks.

pages 2 - 5

Choose healthy foods and offer the right amount.

Teach your child to like healthy foods from the start!

pages 6 - 13

Be active with your toddler.

TV time is not active time.

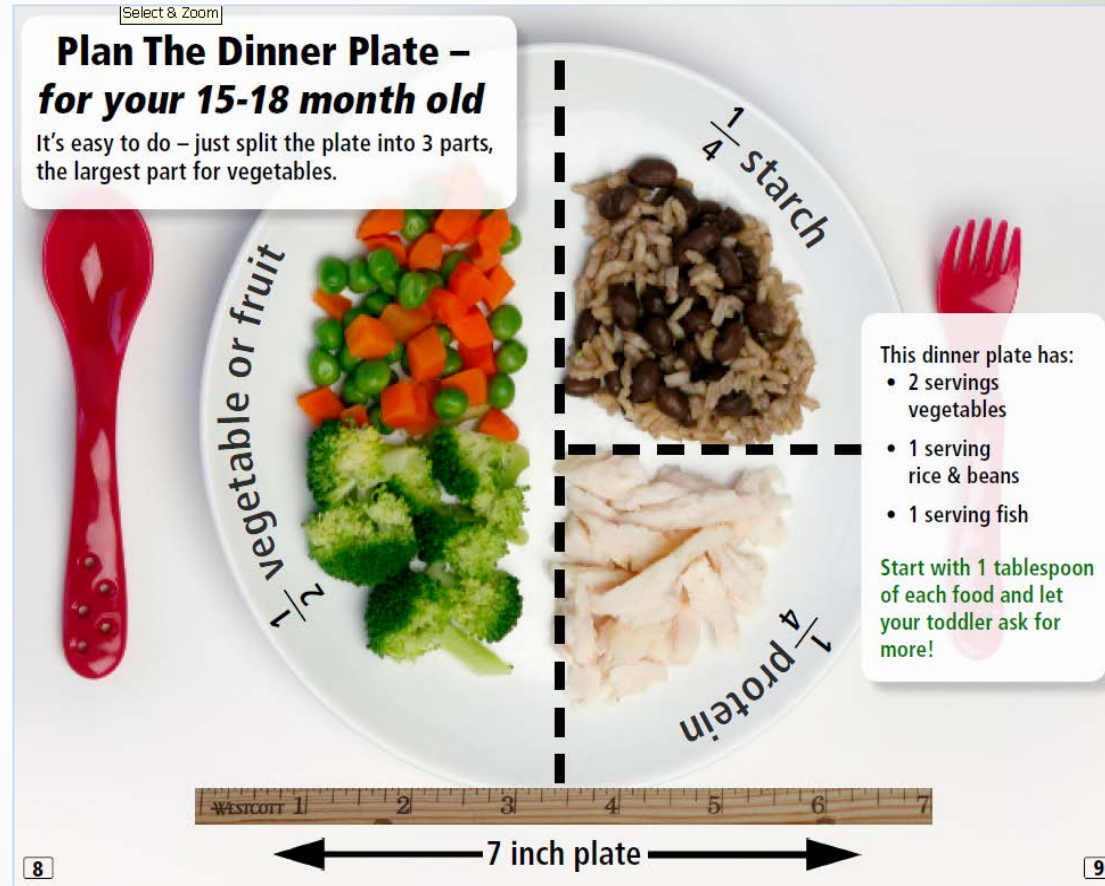
pages 14 - 15



15-18 Month Core- English

Plan The Dinner Plate – for your 15-18 month old

It's easy to do – just split the plate into 3 parts, the largest part for vegetables.



Goal Setting with the Toolkit

- **Last page of each CORE booklet**
 - Parent-centered
 - Do-able; “baby step”
 - Make goal with specific time frame
 - Can choose from examples or can **WRITE ONE DOWN**

I *Can* Keep My Baby Growing Healthy!

- ✓ Pick one of these ideas or write down 1 or 2 things you would like to do in the next few weeks.



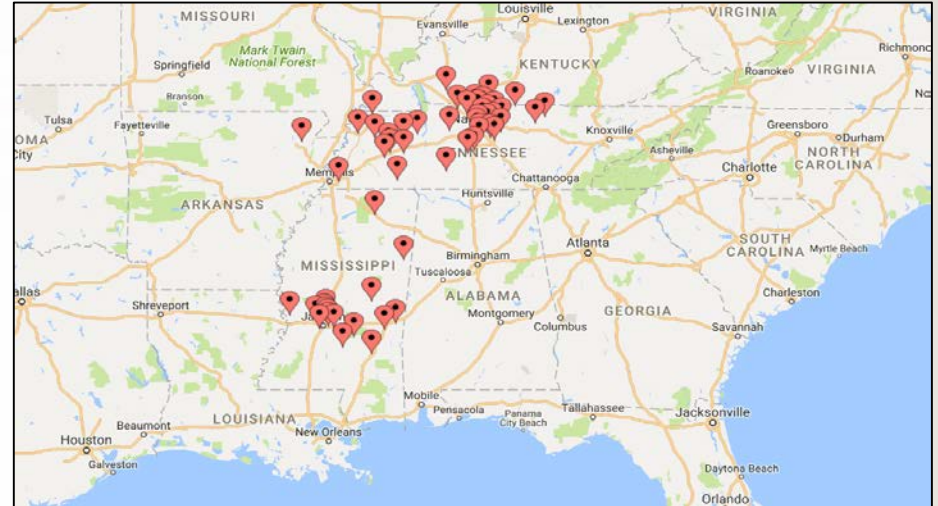
- I will let my baby feed himself for part of the meal ___ times this week.
- Next week, when I leave the house, I will bring _____ as a healthy snack for my baby.
- Tomorrow, when I give _____ to my baby, I will start with 2 tablespoons and see if he wants more.
- I will only give my baby ___ ounces of juice each day, ___ times next week.
- I will turn off the TV when my baby is in the room ___ afternoons next week.

- _____

- _____

Mid-South Practice Transformation Network

- CMS contract for \$28 million over four years to help more than 4,000 clinicians transform their clinical practices to improve quality of care and reduce costs.
- Partnership between Vanderbilt, the Vanderbilt Health Affiliated Network (VHAN), the Mississippi Affiliated Health network, and the Safety Net Consortium of Middle Tennessee.
- Engaging 116 primary and specialty care practices across Tennessee, Arkansas, Mississippi, and Kentucky, representing over 4,200 clinicians



Our Goal: Transformed, High Performing Practices



Summary

- Population health is a growing field aimed at improving care for individuals and populations
- Health Literacy/numeracy and health communication are important components to addressing population health
- Significant opportunities to advance the science of health literacy/health communication in population health

Acknowledgements

- Vanderbilt/ Meharry
 - Tom Elasy MD MPH, Robert Dittus MD MPH
 - Kerri Cavanaugh MD MPH, Mimi Huizinga MD MPH
 - Dianne Davis RD CDE, Becky Gregory RD CDE
 - Ken Wallston PhD, David Schlundt PhD, Phil Ciampa MD
 - Ayumi Shintani PhD, Tebeb Gebretsadik MPH
 - Andrea Bronaugh, Disha Kumar BS, Jessica Sparks BA, Ryan Housam BA, Hilary Weiss BS, Kirbee Bearden
 - Sunil Kripalani MD MSc, Bill Heerman MD MPH, Thomas Spain MD MPH
 - Kathleen Wolf MSN, FNP-BC, ADM-BC
 - Aileen Ciampa JD, Kerri Wolfe MA, Katie Worley MS, Lexie Lipham
 - Richard White MD, Vanessa Elliot PhD (Meharry)
- NYU
 - Shonna Yin MD MSc
 - Linda van Schaick PhD, MaryJo Messito MD
 - Elaine Galland RD , Benard Dreyer, MD
 - Alan Mendelsohn, MD
- Duke
 - Ian Sanderson MD, Ebony Boulware MD
 - Schulyer Jones MD, Gene Odddone MD
- UNC
 - Tim Carey MD MPH
 - Eliana Perrin MD MPH
 - Joanne Propst-Finkle JD
 - Alice Ammerman PhD RD
 - Michael Pignone MD MPH, Darren DeWalt MD MPH, Morris Weinberger PhD, John Buse MD PhD CDE
 - Robb Malone PharmD CDE, Betsy Bryant PharmD CDE, Victoria Hawke RD
 - Britton Crigler BS, James Joyner BA
- Health Sciences of South Carolina
 - Katrian Fryar
 - Les Lenert MD (MUSC)
- Miami/Stanford
 - Lee Sanders MD MPH, Alan Delamater PhD
 - Anna Maria Patino Fernandez, PhD
 - Daniela Quesada, MPH, Vivian Franco MPH, Sheah Rarback, RD, Sarah Messiah, PhD, Lourdes Forster, MD
- TDOH
 - Cathy Taylor RN PhD, Lori MacDonald MD MPH, Laura Harris RD CDE