Update on Diabetes and Nutrition Part 1

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January 25, 2012

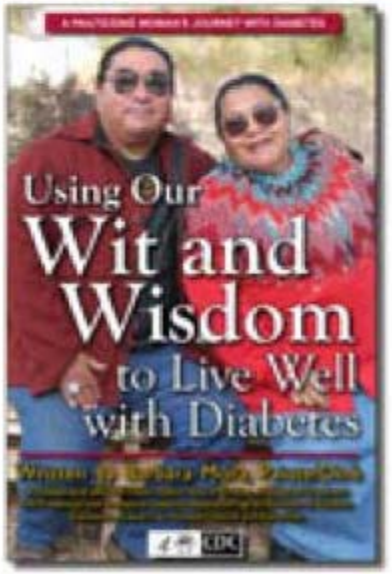
IHS DDTP Advancements in

Diabetes Seminars

Barbara Mora

(Paiute/Dinè)

- *Using Our Wit and Wisdom to Live Well with Diabetes* (book, CD, podcast, available through Online Catalog – IHS Division of Diabetes)
- http://www.ihs.gov/MedicalPrograms/Diabetes/RESOURCES/Catalog/rde/index.cfm



Context: "Our model has been too small!"

- **Genetics**
- **Lifestyle**
- **Fetal Origins**
- **Stress**
- Prenatal and Early Life Risk Factors for Chronic Disease.

Online at:
http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=prenatal_pt_1

Ann Bullock, MD, Clinical Consultant, IHS Clinical Consultant for Family Medicine

Challenges

Frank LD, et al. Am J Prev Med. 2004;27(2):87-96

Community Food Security

- A situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes self-reliance and social justice, without resorting to emergency food sources.

- **Food insecurity is prevalent in US, esp. AI/AN communities**

Position of the American Dietetic Association: Food Insecurity in the United States. *J Am Diet Assoc. 2010;110: 1368-1377.*

Food Insecurity

American Dietetic Association

RESEARCH

Research and Professional Briefs

Food Access and Cost in American Indian Communities in Washington State

MEGHAN O'CONNELL, MD, MPH; DEDRA S. BUCHWALD, MD; GLEN E. DUNCAN, PhD

ABSTRACT

Limited access to foods that make up a nutritious diet at minimal cost may influence eating behaviors and, ultimately, obesity. This study examined the number and type of food stores (convenience, grocery, supermarket) on federal reservations in Washington State, and the availability and cost of foods in the US Department of Agriculture Community Food Security Assessment Toolkit market basket, to describe the food environment of American Indians. Stores were identified by telephone survey of tribal headquarters, a commercial database, and on-site visitation. Foods were assessed using a standardized instrument containing 68 items in seven major food groups during April and May 2009. Store type and availability and cost of foods were recorded on a checklist. Fifty stores were identified on 22 American Indian reservations, including 25 convenience, 16 grocery, and 9 supermarkets. Across all stores, about 38% of checklist items were available, with supermarkets having the most and convenience stores the fewest. Foods from the dairy and sugars/sweets groups were the most prevalent, while fresh fruits/vegetables were the least. Cost of the most commonly available items was lowest in supermarkets. Seventeen reservations did not have a supermarket on their reservation, and the nearest off-reservation supermarket was about 10 miles from the tribe's headquarters, which was used as the standard for distance calculations. These results demonstrate that American Indians living on federal reservations in Washington State may have limited access to foods that make up a nutritious diet at minimal cost.

J Am Diet Assoc. 2011;111:1375-1379.

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Manuscript accepted: March 2, 2011.

0002-8223/$36.00

doi: 10.1016/j.jada.2011.06.002

The benefits of eating a healthy diet are well-established, yet long-term dietary changes in the population remain elusive. Food cost and availability influence dietary behaviors (1), particularly for individuals of low-income, members of minority groups, and those living in rural settings (2-4). Furthermore, energy-dense foods are less expensive on a per-calorie basis than low-calorie, nutritious foods (5). This suggests that individuals with limited financial resources may choose to purchase cheaper energy-dense foods to maximize their spending power.

Addressing food availability and cost in low-income minority communities that suffer disproportionately from chronic diseases could influence eating habits and, ultimately, health. Epidemic rates of obesity and type 2 diabetes among American Indian communities have been documented (6-8), and poverty among this group is widespread (9). American Indians have undergone a "nutrition transition" during the past several decades, characterized by a loss of traditional food practices and reduced physical activity supplanted by abundant energy-dense foods and sedentary lifestyles (10). Similar to reports in other low-income minority groups, evidence suggests that the nutrition environment on American Indian reservations is characterized by few supermarkets and many gas station–type stores, moderate availability of fresh produce, and a reliance on off-reservation stores for regular or bulk shopping (11).

The purpose of this short report was to characterize the nutrition environment of American Indian reservations in Washington State using the US Department of Agriculture (USDA) Food Security Assessment Toolkit, Food Store Survey Instrument market basket (12). For each reservation, the number, type, and location of food stores was determined; the availability and cost of the market basket was determined; and the availability and cost of the market basket on reservation and nearby off-reservation supermarkets was compared to each other and the market basket reference price. Finally, using Geographic Information Systems data, the distance from each tribe's headquarters to the nearest on-reservation or off-reservation supermarket was estimated.

METHODS

Setting

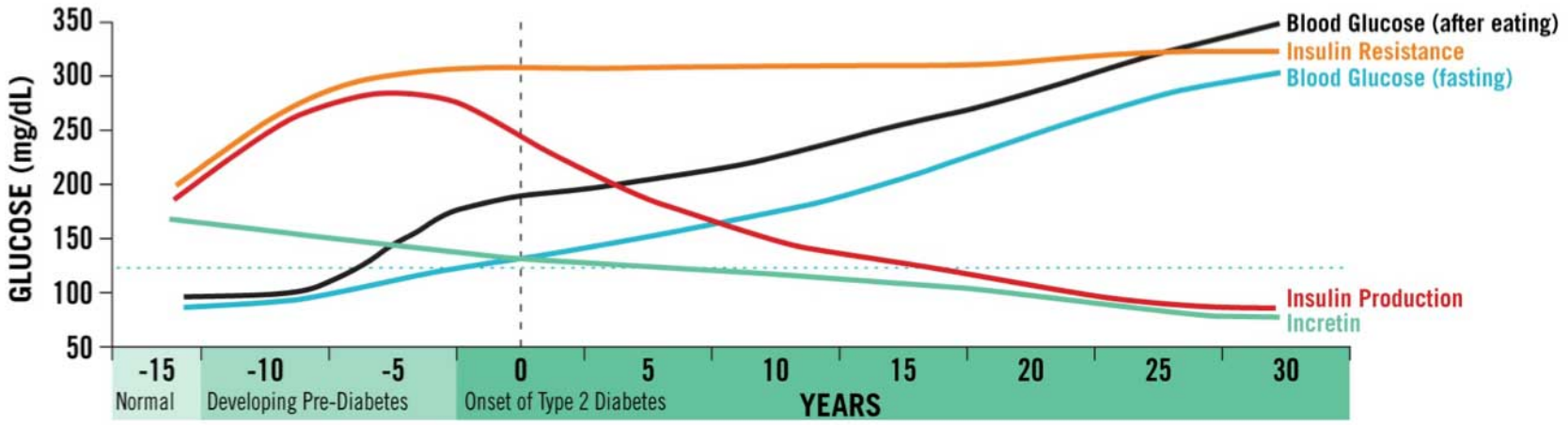
All food stores on all federally recognized American Indian tribes with reservation lands in Washington State (13) were assessed during April and May 2009. Reservation boundaries were defined using geospatial data. There are 29 federally recognized tribes in Washington State, 7 of which are landless, leaving 22 eligible tribes. Before collecting data, the researchers mailed a letter to

O'Connell M, et al.J Am Diet Assoc. 2010;110:1368-77.

"Bad Sugar" focuses on the Pima and Tohono O'odham Indian communities – from the documentary series: ***Unnatural Causes: Is Inequality Making Us Sick?*** : 29 min.

www.unnaturalcauses.org

MNT & Diabetes Progression



Primary Prevention of T2:

Use MNT and public health interventions in those with obesity and pre-diabetes

Secondary Prevention of complications:

Use MNT for metabolic control of diabetes (ABCs)

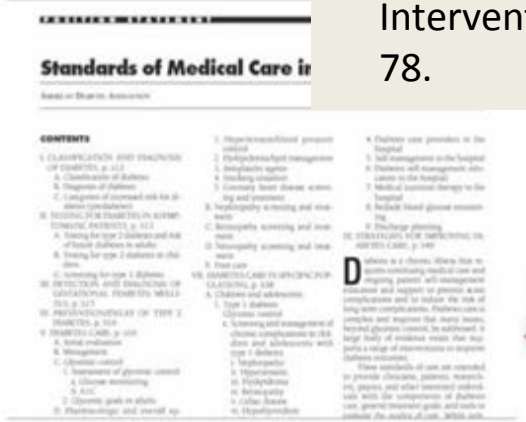
Tertiary Prevention:

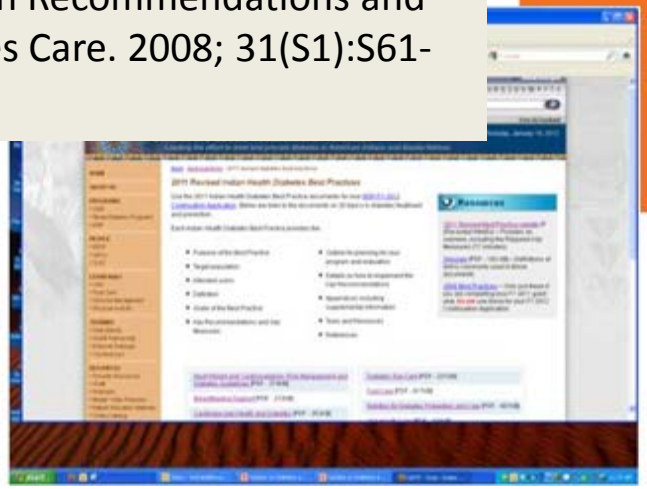
Use MNT to delay and manage complications of diabetes

American Diabetes Assoc. Nutrition Recommendations and Interventions for Diabetes. Diabetes Care. 2008; 31(Supp1):S61-78.

The Evidence-Base: Diabetes & Nutrition

1. Diabetes 1 & 2 Evidence Analysis Project. www.adaevidencelibrary.com
2. Franz et al. Evidence for MNT for T1DM & T2DM in Adults, J Am Dietetic Assoc. 2010; 12(110):1852-1889.
3. American Diabetes Assoc. Standards of Medical Care in Diabetes-2012. Diabetes Care. 2012;35(Suppl 1): S11-S63.
4. IHS DDTP. Standards of Care and Clinical Practice Recommendations: Type 2 Diabetes. Dec. 2011. **Now online.**
5. Indian Health Diabetes Best Practice: Nutrition for Diabetes Prevention and Care. 2011.
6. Report of the Dietary Guidelines Advisory Committee, 2010.
7. American Diabetes Assoc. Nutrition Recommendations and Interventions for Diabetes. Diabetes Care. 2008; 31(S1):S61-78.





"ABC" Measures	Targets for Metabolic Control
A1C (ADA, 2012) (IHS, 2011)* Pre-meal glucose Peak post-meal glucose	< 7.0% *Individualize goal: < 7%, 7-8%, 8-9% 90-130 mg/dL <180 mg/dL
Blood Pressure (ADA, 2012) (IHS, 2011)*	<130/80 mmHg *Individualize goal: < 130/80 mmHg, < 140/90 mmHg
Cholesterol (ADA, 2012) (IHS, 2011)*	LDL-c <100mg/dL HDL-c > 40 mg/dL Triglycerides <150 mg/dL *Total cholesterol < 200 mg/dL *Triglycerides < 150 mg/dL *Non-HDL cholesterol < 130 mg/dL, < 100 mg/dL (for very high risk) *LDL < 100 mg/dL (optimal goal), LDL < 70 mg/dL (for very high risk)

ADA. Standards of Medical Care in Diabetes. Diabetes Care. January 2012;35(Suppl 1):S11-S63.

*IHS Standards of Care and Clinical Practice Recommendations: Type 2 Diabetes, Dec. 2011.

Nutrition & Type 2 Diabetes – General Recommendations

- Nutrition counseling should be sensitive to the personal needs, willingness to change, and ability to make changes of the individual with pre-diabetes or diabetes. (E)
- To maintain the pleasure of eating by only limiting food choices when indicated by scientific evidence.
- Individuals who have pre-diabetes or diabetes should receive individualized MNT; such therapy is best provided by a registered dietitian familiar with the components of diabetes MNT. (A)

Standards of Medical Care in Diabetes – 2012. American Diabetes Association. Diabetes Care. 2008;31(S1):S61-78.

IHS Standards of Care and Clinical Practice Recommendations: Type 2 Diabetes

Updated December 2011.

http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsClinicalGuidelines

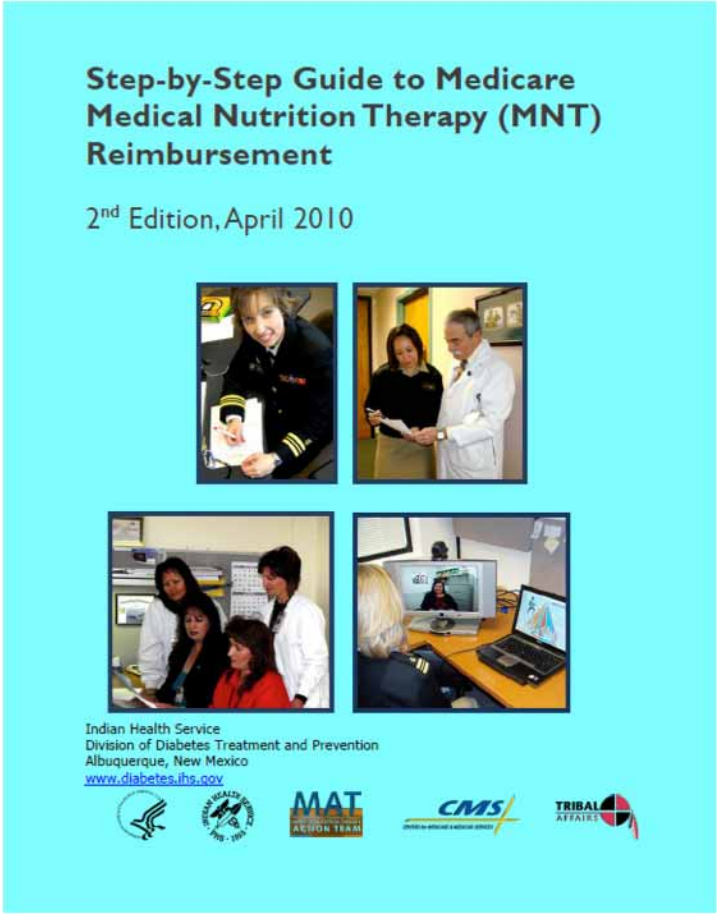
- Medical Nutrition Therapy (MNT)
  - Refer for MNT provided by a registered dietitian at diagnosis and at least yearly, or more as needed.

Medicare Coverage for MNT

Because MNT can result in cost-savings and improved outcomes (B), MNT should be adequately covered by insurance and other payers. (E)

http://www.ihs.gov/MedicalPrograms/Diabetes/RESOURCES/Catalog/rde/index.cfm

Questions – contact: IHSMNTActionTeam@ihs.gov



MNT Studies	A1C ↓	# Visits	Interventions
UKPDS, 1990	1.9% (new diagnosis)	3 (1 month intervals	Reduced energy & fat
Franz, 1995	0.9% (4-y) 1.7% (new)	3 within first 6 weeks	Reduced energy & fat
LOADD, Coppell, 2010	0.4% (optimized drug therapy)	7 over 6 months	EASD evidence based recommendations, individualized

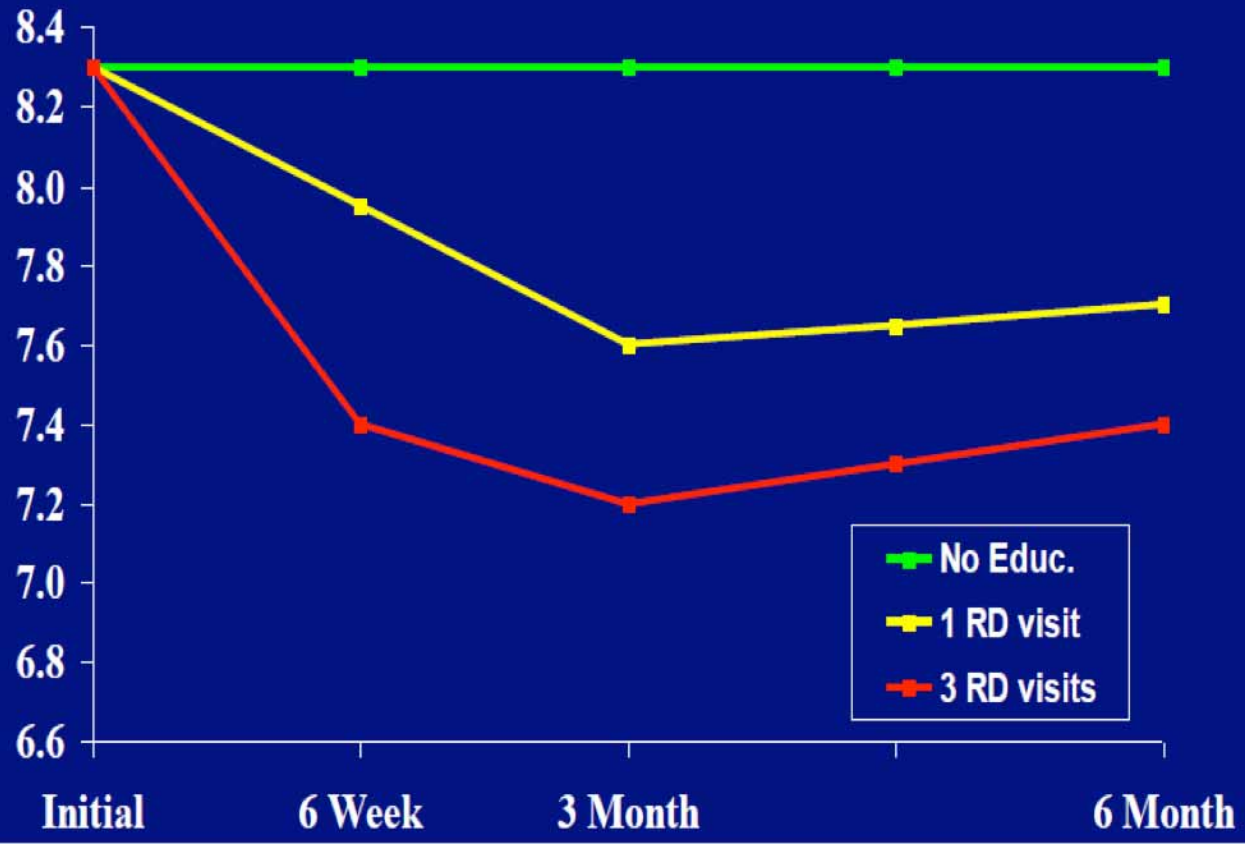
Effectiveness of MNT: What to Expect

Franz et al. J Am Diet Assoc. 2008;108(4 Suppl 1):S52-8.
UK Prospective Diabetes. Metabolism 39:905–12, 1990;
Franz et al. J Am Diet Assoc J Am Diet Assoc 95:1009–17, 1995;
Coppell et al. BMJ 2010;341:c3337

Effectiveness of medical nutrition therapy provided by dietitians in the management of type 2 diabetes: a randomized, controlled clinical trial

A1C ↓ 0.9% 4-yr duration of diabetes

(A1C ↓ 1.7% newly diagnosed)



Recommendations to Prevent/Delay of Type 2 Diabetes

- Patients with IGT (A), IFG (E), or an A1C of 5.7–6.4% (E) should be referred to an effective ongoing support program targeting weight loss of 7% of body weight and increasing physical activity to at least 150 min per week of moderate activity such as walking.
  - **DPP – 58% reduction after 3 years, intensive lifestyle intervention.**
  - **DPPOS – 34% reduction at 10 years.**
- Follow-up counseling appears to be important for success. (B)

ADA. Standards of Medical Care in Diabetes. Diabetes Care. January 2012;35(Suppl 1):S11-S63.

Recommendations - Energy Balance, Overweight, and Obesity

- Weight loss is recommended for all overweight or obese individuals who have or are at risk for diabetes. (A)
- For weight loss, either low-carbohydrate, low-fat calorie-restricted, or Mediterranean diets may be effective in the short-term (up to 2 years). (A)
- Physical activity and behavior modification are important components of weight loss programs and are most helpful in maintenance of weight loss. (B)

Intensive Lifestyle Intervention (ILI) in Look AHEAD Trial: 1-y and 4-y Results

- 5,145 subjects with T2DM aged 45-74 y, 16 centers, RCT; Intensive Lifestyle Intervention (ILI) vs Diabetes Support and Education.
- Study to extend to 2014.

– Weight loss at 1-y: 8.6% (ILI) vs 0.7%
– Weight loss at 4-y: 6.1% (ILI) vs 0.9%
– Fitness at 1-y: ↑ 20.9% (ILI) vs 5.8%
– A1C at 1-y: ↓ from 7.3 to 6.6% (ILI) vs 7.3 to 7.2%
– A1C at 4-y: 7.0% (ILI) vs 7.2%

The Look AHEAD Research Group. Diabetes Care 2007;30:1374-83;
Arch Intern Med 2010;170:1566-75.

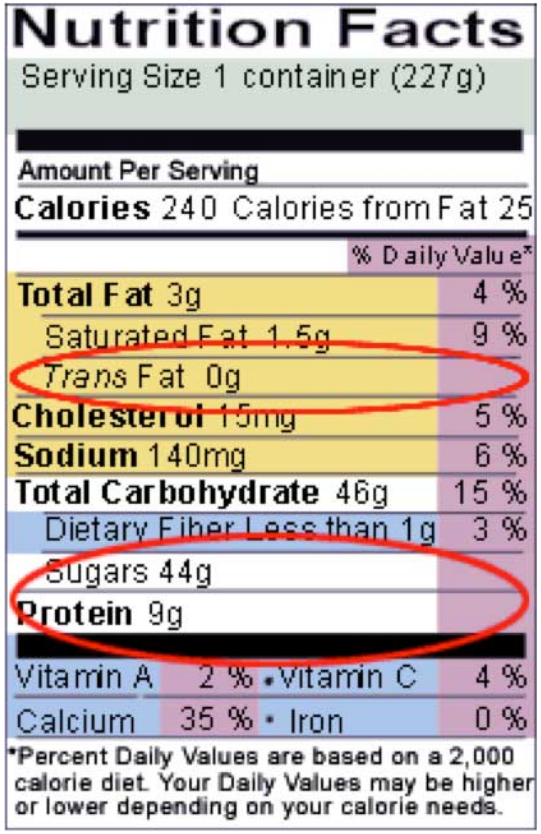
Linda Delahanty, MS, RD - (DCCT/DPP/Look AHEAD)

- “The most compelling evidence for use of carbohydrate counting is seen in people with T1DM.”
- “While attention to carbohydrate counting definitely helps manage glycemia in patients with T2DM, it is possible that weight loss and increased activity may actually target the underlying causes of T2DM by improved insulin sensitivity as was seen in the DPP. “
- “Research using a low-fat low-calorie diet in obese patients with T2DM has shown that moderate weight loss normalizes fasting hyperglycemia in patients with poorly controlled T2DM.”

Delahanty LM. On the Cutting Edge (peer-reviewed newsletter, Academy of Nutr & Dietetics Diabetes Care and Education Practice Group). 2011;32(4):5-8.

Macronutrients – What's the Right Mix?

- The mix of carbohydrate, protein, and fat may be adjusted to meet the metabolic goals and individual preferences of the person with diabetes. (C)
- Monitoring carbohydrate, whether by carbohydrate counting, choices, or experience-based estimation, remains a key strategy in achieving glycemic control. (B)
- Saturated fat intake should be <7% of total calories. (B)
- Reducing intake of *trans* fat lowers LDL cholesterol and increases HDL cholesterol (A), therefore intake of *trans* fat should be minimized. (E)



ADA. Standards of Medical Care in Diabetes. Diabetes Care. January 2012;35(Suppl 1):S11-S63.

Advanced Glycation End-Products (AGEs)

- AGEs have been linked to inflammation, insulin resistance, diabetes
- Class of glycotoxins are absorbed into the body through diet of highly processed foods, high protein/high fat foods.
- "Current data support the need for a paradigm shift that acknowledges that how we prepare and process food may be equally important as nutrient composition."
- A safe and optimal dAGE intake – not yet established
- Implications for Practice:
  - Increase fruits, vegetables, whole grains, low/non-fat milk, legume
  - Decrease solid fats, fatty meats, full fat dairy products, highly processed foods-crackers, chips
  - Increase poaching, stewing, steaming, boiling
  - Decrease broiling, frying, grilling, roasting (high heat)

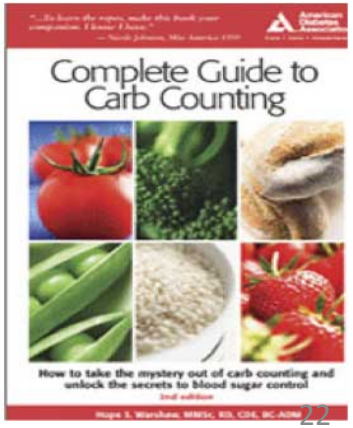
Uribarri J et al. J Am Diet Assoc. 2010;110(6):911-6.
Peppa M, et al. Clinical Diabetes, 2003;21(4):186-7.

Sugar-Sweetened Beverages and Risk of Metabolic Syndrome and Type 2 Diabetes A meta-analysis.

Malik VS, et al. Diabetes Care. 2010(33(11):2477-83

Carbohydrate (CHO) Counting

- Start with:
  - 3 to 4 servings/meal for women (45-60 g CHO);
  - 4 to 5 for men (60-75 g CHO);
  - 1 to 2 for a snack (15-30 g CHO)
- Emphasize day-to-day consistency
- Use food/BG records - Test post-meal; goal blood glucose <160-180 mg/dL
- Good advice: make healthful CHO choices and be vigilant about portion sizes



Low-Carb vs Low-Fat for Glycemic Control? Fast-Fast?

- **Meta-analysis** of 19 short-term (10 d-6wk) studies with individuals with T2DM:
  - CHO to fat ratios: 58%/24% vs 40%/40%
  - No differences in lowering A1C

Kodama et al. Diabetes Care 2009; 32:959-65.

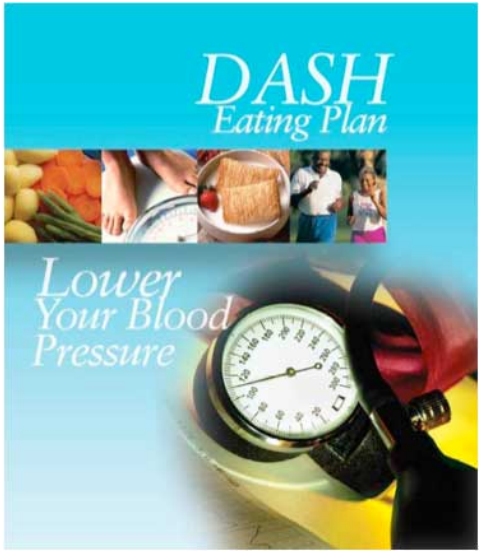
- In American Indian participants with T2DM in the **Strong Health Study**, diets lower in CHO and higher in total and saturated fat associated with worse glycemic control, 1 y. study
  - CHO to Fat ratios:

    35-40% vs 25-30% (of energy)

Xu et al. Am J Clin Nutr. 2007;86:480 -7.

What Nutrition Therapy Interventions Are Effective?

- Low fat/Low calorie
- Carbohydrate counting
- Insulin to carbohydrate ratios
- Simplified meal plans
- Healthy food choices
- Meal patterns including
  - Mediterranean-style
  - Plant-based (vegan or vegetarian)
  - DASH Eating Plan
  - Dietary Guidelines



Starting The Conversation: Diet

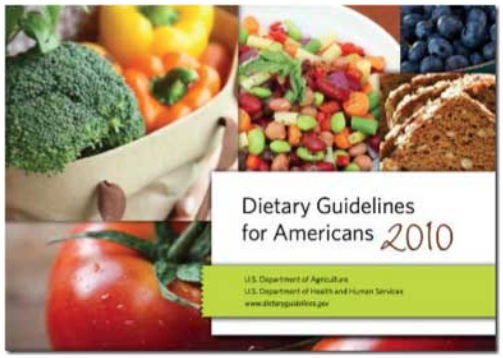
(Scale developed by: the Center for Health Promotion and Disease Prevention, University of North Carolina at Chapel Hill, and North Carolina Prevention Partners)

Over the past few months:

1.	How many times a week did you eat fast food meals or snacks?	Less than 1 time ☐ 0	1–3 times ☐ 1	4 or more times ☐ 2
2.	How many servings of fruit did you eat each day?	5 or more ☐ 0	3–4 ☐ 1	2 or less ☐ 2
3.	How many servings of vegetables did you eat each day?	5 or more ☐ 0	3–4 ☐ 1	2 or less ☐ 2
4.	How many regular sodas or glasses of sweet tea did you drink each day?	Less than 1 ☐ 0	1–2 ☐ 1	3 or more ☐ 2
5.	How many times a week did you eat beans (like pinto or black beans), chicken, or fish?	3 or more times ☐ 0	1–2 times ☐ 1	Less than 1 time ☐ 2
6.	How many times a week did you eat regular snack chips or crackers (not low-fat)?	1 time or less ☐ 0	2–3 times ☐ 1	4 or more times ☐ 2
7.	How many times a week did you eat desserts and other sweets (not the low-fat kind)?	1 time or less ☐ 0	2–3 times ☐ 1	4 or more times ☐ 2
8.	How much margarine, butter, or meat fat do you use to season vegetables or put on potatoes, bread, or corn?	Very little ☐ 0	Some ☐ 1	A lot ☐ 2

SUMMARY SCORE (sum of all items): _____

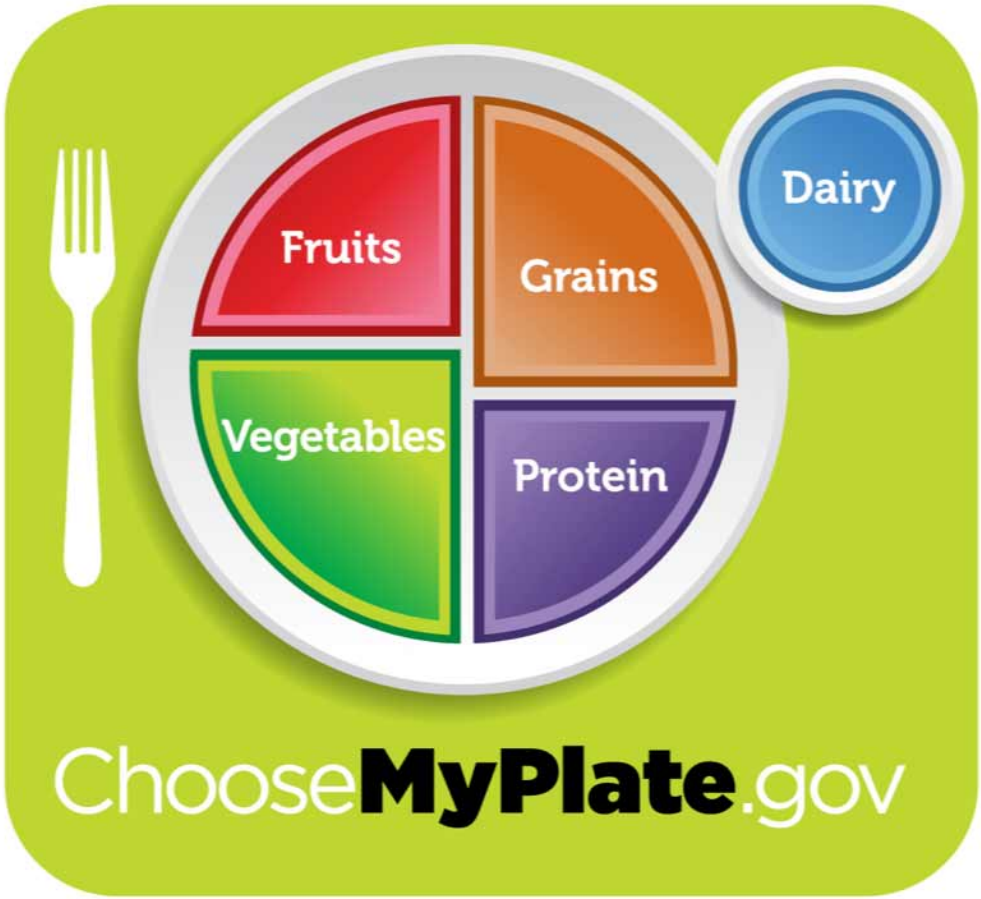
Dietary Guidelines Key Messages:



- Healthy eating pattern…emphasizes consuming nutrient-dense foods and beverages – vegetables, fruits, whole grains, fat-free/low fat dairy foods, seafood, lean meats…
  - Vegetable goal: 2 ½ cups/day
  - Fruit goal: 2 cups/day
- Consume too much sodium; many calories from solid fats, add sugars, refined grains; yet remain undernourished
- Consume too little dietary fiber, vitamin D, calcium, potassium, and unsaturated fatty acids (esp: omega-3s)

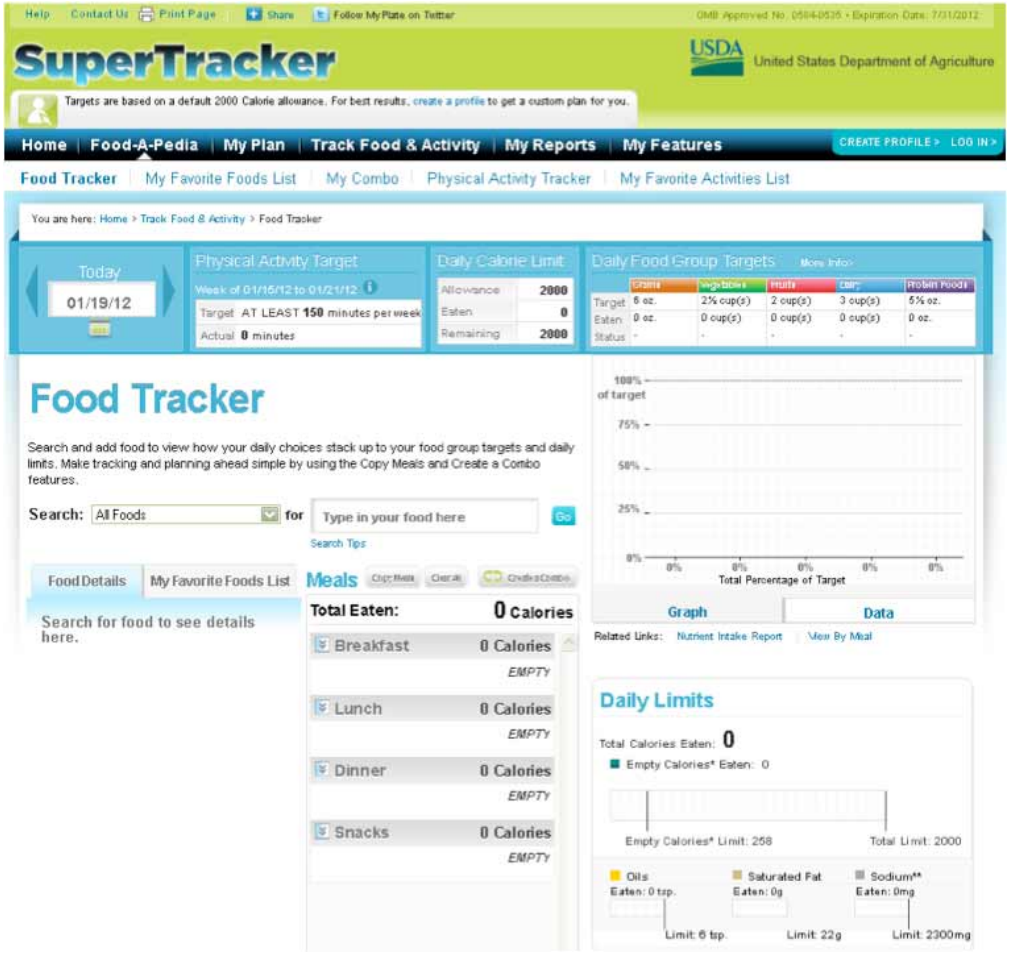
Dietary Guidelines for Americans, 2010 (Released 1/31/11)
www.dietaryguidelines.gov

ChooseMyPlate.gov



SuperTracker

http://www.choosemyplate.gov/supertracker-tools/supertracker.html



My Native Plate

An Easy Way to Help Your Family Know How Much to Eat

Helping your family eat in a healthy way is EASY!

Remember these 3 steps:

1. 9-inch plate
2. Divide into quarters
   - 1/4 plate is **fruits**
   - 1/4 plate is **vegetables**
   - 1/4 plate is **starch** or **grain**
   - 1/4 plate is **meat, fish,** or **poultry**
3. Set food on the plate no higher than 1–1 1/2 inches.

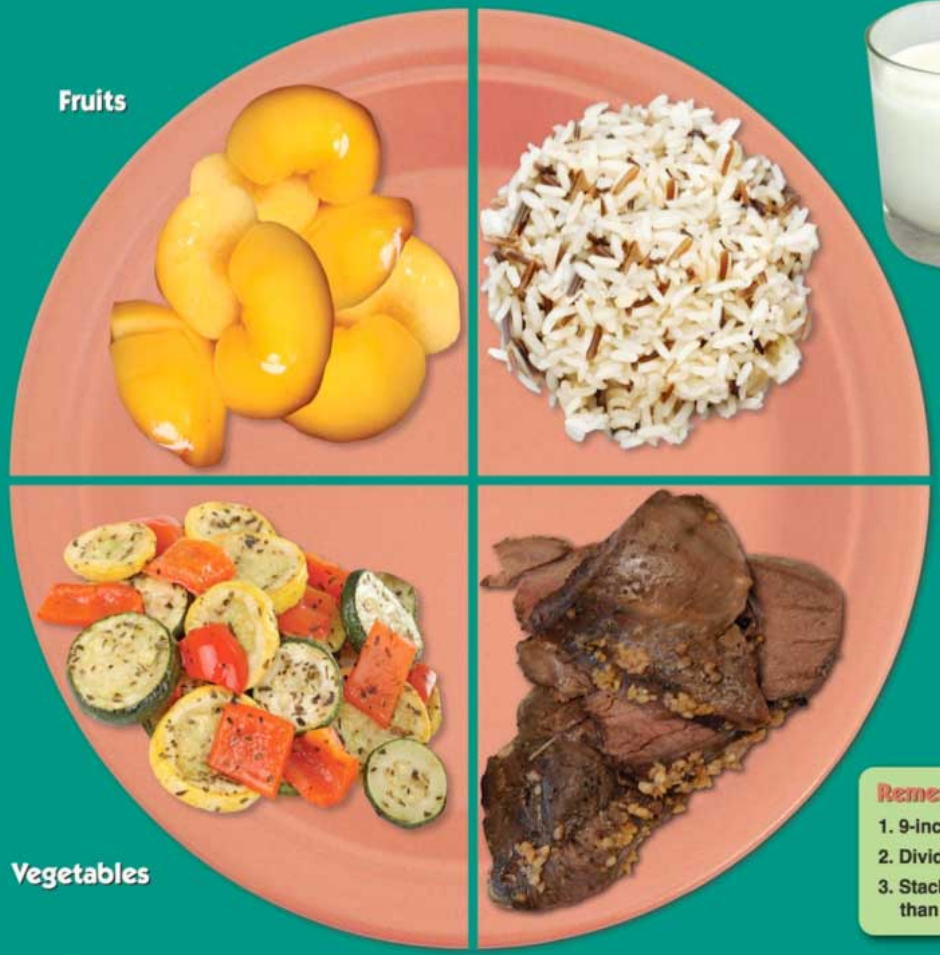
Pictured Here

- canned peaches, no syrup
- baked squash and peppers
- steamed white and brown rice
- baked deer meat with garlic
- low-fat or skimmed milk

To Order Placemats

To order large, full-color placemats for your family or clients, go to the website www.diabetes.ihs.gov and click on "Online Catalog." There is no charge for placemats or shipping.

Produced by: Indian Health Service, Division of Diabetes Treatment and Prevention, and based on the USDA My Plate. For more information, go to MyPlate.gov



Indian Health Service Division of Diabetes Treatment and Prevention

Balancing Your Food Choices: Nutrition and Diabetes

ORDER ONLINE! (See p. IV)

Department of Health and Human Services
Public Health Service

Indian Health Service
Division of Diabetes Treatment and Prevention
5300 Homestead Road NE
Albuquerque, NM 87110
Telephone: 505-248-4182
Fax: 505-248-4188
Email: diabetesprogram@ihs.gov
Web Site: www.diabetes.ihs.gov

August 2011


Division of Diabetes Treatment and Prevention
Leading the effort to treat and prevent diabetes in American Indians and Alaska Natives
Tuesday, January 24, 2012
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• Additional Resources
TOOLS
• Clinical Guidelines
• Best Practices
• Curricula
• Quick Guide Cards
• DM Treatment Algorithms
SITE MAP
resources : online catalog
Online Catalog
Home
Catalog
Your Order
Admin
Instructions ?
1 Educational Resources for Patients with Diabetes
2 Resources for Use by Teachers and other Educators of Children/Youth Grades K–12
3 Resources for Use by Health Care Providers
Resources for Use by Health Care Providers
General
Title (Click Title name for item description)
Quantity
Click to Add
IHS Standards of Care for Patients with Type 2 Diabetes
Out of Stock
Balancing Your Life and Diabetes - Curriculum
0
+Add to Order
Balancing Your Life and Diabetes Curriclum - CD ROM
Out of Stock
Measuring Diabetes Care: Improving Data Quality and Data Use in AI/AN Communities
0
+Add to Order
Youth Staying Healthy: A Type 2 Diabetes Curriculum for Teens - Binder
0
+Add to Order
Youth Staying Healthy: A Type 2 Diabetes Curriculum for Teens -
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Teens Talk About Diabetes - DVD
0
+Add to Order
Youth Staying Healthy: A Diabetes Prevention Curriculum for Youth Ages 8-12 - Binder
0
+Add to Order
Youth Staying Healthy: A Diabetes Prevention Curriculum for Youth ages 8-12 - CD ROM
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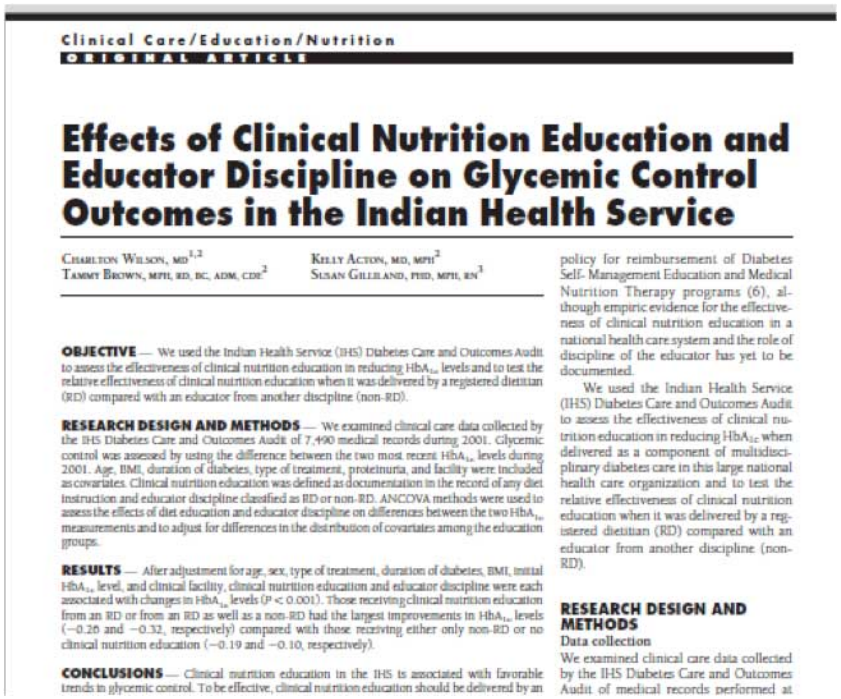
Foot
Title (Click Title name for item description)
Quantity
Click to Add
Basic Approach to the Diabetic Foot
0
+Add to Order

“To be effective, clinical nutrition education should be delivered by an RD or a team that includes an RD.”

Wilson C et al. Diabetes Care 2003;26:2500–04.



Clinical Care/Education/Nutrition

ORIGINAL ARTICLE

Effects of Clinical Nutrition Education and Educator Discipline on Glycemic Control Outcomes in the Indian Health Service

Charlton Wilson, MD[1,2]
Tammy Brown, MPH, RD, BC, ADM, CDE[2]
Kelly Acton, MD, MPH[2]
Susan Gilliland, PHD, MPH, RN[3]

OBJECTIVE — We used the Indian Health Service (IHS) Diabetes Care and Outcomes Audit to assess the effectiveness of clinical nutrition education in reducing HbA_{1c} levels and to test the relative effectiveness of clinical nutrition education when it was delivered by a registered dietitian (RD) compared with an educator from another discipline (non-RD).

RESEARCH DESIGN AND METHODS — We examined clinical care data collected by the IHS Diabetes Care and Outcomes Audit of 7,490 medical records during 2001. Glycemic control was assessed by using the difference between the two most recent HbA_{1c} levels during 2001. Age, BMI, duration of diabetes, type of treatment, proteinuria, and facility were included as covariates. Clinical nutrition education was defined as documentation in the record of any diet instruction and educator discipline classified as RD or non-RD. ANCOVA methods were used to assess the effects of diet education and educator discipline on differences between the two HbA_{1c} measurements and to adjust for differences in the distribution of covariates among the education groups.

RESULTS — After adjustment for age, sex, type of treatment, duration of diabetes, BMI, initial HbA_{1c} level, and clinical facility, clinical nutrition education and educator discipline were each associated with changes in HbA_{1c} levels ($P < 0.001$). Those receiving clinical nutrition education from an RD or from an RD as well as a non-RD had the largest improvements in HbA_{1c} levels (−0.26 and −0.32, respectively) compared with those receiving either only non-RD or no clinical nutrition education (−0.19 and −0.10, respectively).

CONCLUSIONS — Clinical nutrition education in the IHS is associated with favorable trends in glycemic control. To be effective, clinical nutrition education should be delivered by an

policy for reimbursement of Diabetes Self- Management Education and Medical Nutrition Therapy programs (6), although empiric evidence for the effectiveness of clinical nutrition education in a national health care system and the role of discipline of the educator has yet to be documented.

We used the Indian Health Service (IHS) Diabetes Care and Outcomes Audit to assess the effectiveness of clinical nutrition education in reducing HbA_{1c} when delivered as a component of multidisciplinary diabetes care in this large national health care organization and to test the relative effectiveness of clinical nutrition education when it was delivered by a registered dietitian (RD) compared with an educator from another discipline (non-RD).

RESEARCH DESIGN AND METHODS

Data collection

We examined clinical care data collected by the IHS Diabetes Care and Outcomes Audit of medical records performed at

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CDR, US Public Health Service

Senior Clinical Dietitian

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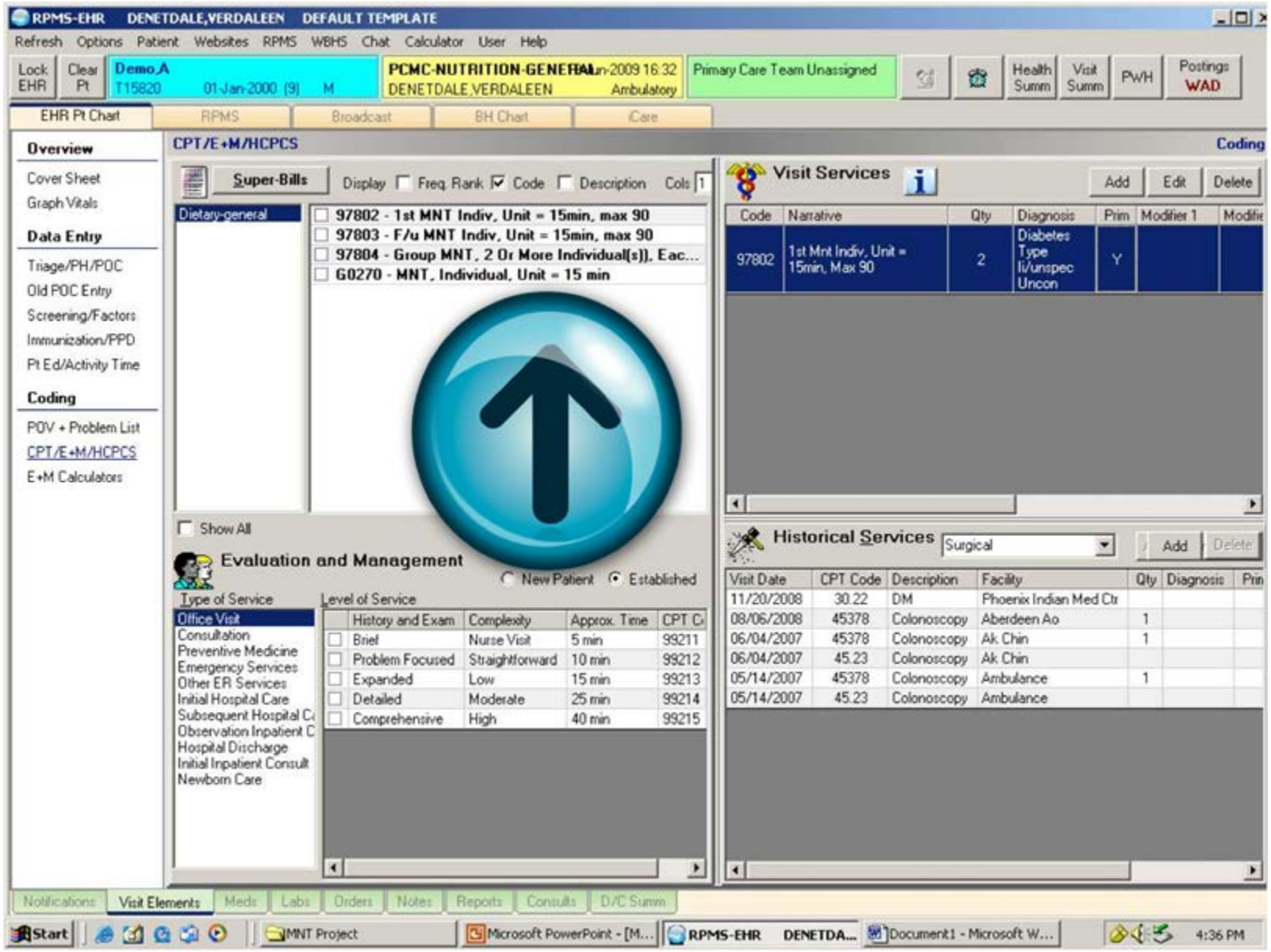
Access to MNT in Indian Health

IHS Diabetes Care and Outcomes Audit, 2009

- Most AI/AN communities do not have adequate access to nutrition services.
- 50% of AI/AN people with diabetes received diet education.
- 26% were seen by a registered dietitian for medical nutrition therapy (MNT).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http://www.eatright.org/Media/content.aspx?id=6442467001&terms=iphone

Mobile Apps

Watch the video: http://www.gomeals.com/demo.aspx

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A C T I O N
It only takes a single thought to move the world.