

# Clinical Update for Doctors' Clinic Physicians and Staff

## Medical Nutrition Therapy for Diabetes: Current Controversies and Evidence-Based Recommendations

8/25/08

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### Topics:

- A) Evidence-based interventions currently recommended for MNT.
- B) Best practice for delivery of MNT.
- C) Current controversies and research directions in diabetes MNT.

## A) Evidence-based interventions currently recommended for medical nutrition therapy (MNT) for Diabetes:

Nutrition therapy for diabetes has evolved through many different stages in the past 87 years since the discovery of insulin. In the 20<sup>th</sup> century, nutrition therapy for diabetes progressed from almost-no-carbohydrate diets in the early years, to various exchange systems beginning in the 1940s, to the 1980s "ADA diet" (50% carbohydrate—30% fat—20% protein) and on to the 1994 "A Dietitian's Assessment" diet guidelines, which suggested up to 20% protein and a range of 40-60% each of carbohydrate or fat, based on the RDs' assessment of the patients' metabolic parameters. Now, in 2008, we see some further evolution:

### A few relevant highlights from 2008 Nutrition Recommendations and Interventions for Diabetes: A Position Statement of the American Diabetes Association <sup>(6)</sup>:

- 1) **Carbohydrate:** "A dietary pattern that includes carbohydrate from fruits, vegetables, whole grains, legumes and low-fat milk is encouraged for good health".
- 2) **Glycemic Index/Load:** For the first time, ADA recognizes "the use of glycemic index and glycemic load may provide a modest additional benefit", given that "the amount of carbohydrate ingested is usually the primary determinant of post-prandial response, but the type of carbohydrate also affects this response...it appears that in individuals consuming a high-GI diet, low GI diets can produce a modest benefit in controlling pp hyperglycemia".
- 3) **Low-Carb diets:** "For weight loss, either low-carbohydrate or low-fat calorie restricted diets may be effective in the short term (up to 1 year. For patients on low-carb diets, monitor lipid profiles, renal function, and protein intake (in those with nephropathy)".

ADA also notes: "the RDA for digestible carbohydrate is 130 g/day and is based on providing adequate glucose as the required fuel for the central nervous system... Although brain fuel needs can be met on lower-carbohydrate diets, long-term metabolic effects of very-low-carb diets are unclear and such diets eliminate many foods that are important sources of energy, fiber, vitamins and minerals and are important in dietary palatability".

(As an aside: For pregnant women, the IOM recommendation is a minimum of 175 gm CHO per day. For GDM or diabetes in pregnancy, a diet restricted in carbohydrate (usually to no less than 40% of calories) will help control blood glucose, but there is presently no evidence that a very-low-carb diet is safe for optimal fetal development and some animal and human studies suggest possible risks such as higher cortisol levels in the fetus.)

## **B) Best practice for delivery of MNT:**

The ADA position statement on MNT recommends that “individuals with both diabetes and pre-diabetes receive individualized MNT, best provided by a Registered Dietitian familiar with diabetes MNT”. This counseling “should be sensitive to the personal needs, willingness to change and ability to make changes of the individual” (6).

Salem Hospital Diabetes and Education OP RD’s have many years of training and experience in assessing the patients’ needs, learning style, and ability to change as well as nutritional and metabolic status. We make plans that fit the patient and coach for lifestyle change. The patient is the center of a treatment team because she/he is making the hourly decisions every day which determine outcomes. Patients need more than just information, they need an RDs’ guidance in turning the information into achievable plans, based on actions which can be maintained. Patients tell all of us that nutrition and exercise, the foundation of DM management, are the most difficult aspects of DM care because of all the temptations, distractions, and competing priorities of daily life. RD’s not only provide education, we also help them problem-solve for daily life.

After MNT sessions, we communicate the individual MNT goals and progress to you in written communication and will fax or call you if there are urgent issues which we think you would want to know about promptly.

The Salem Hospital Diabetes Education Program meets the rigorous standards for ADA accreditation. An ADA Recognized Program must include both an RD and an RN with either extensive DM experience or the Certified Diabetes Educator credential, and our staff are CDE’s. Curriculum must address the following 9 content areas (5):

- Describing the *diabetes disease process* and *treatment options*
- Incorporating *nutritional management* into lifestyle
- Incorporating *physical activity* into lifestyle
- Using *medication(s)* safely and for maximum therapeutic effectiveness
- *Monitoring blood glucose* and other parameters and interpreting and using the results for self-management decision-making
- Preventing, detecting, and treating *acute complications*
- Preventing detecting, and treating *chronic complications*
- Developing personal strategies to address psychosocial issues and concerns
- Developing personal strategies to promote health and behavior change

Only ADA Recognized Programs may bill Medicare for MNT, and third-party payers also often prefer to reimburse for an ADA Recognized Program.

Diabetes MNT is both medically effective *and* cost effective, if provided in more than one session. Randomized controlled trials (including data from the UKPDS) have demonstrated A1C reductions ranging from 0.7% to 1.9% with intensive nutrition therapy (4). The Urban

Diabetes Study linked primary care encounters with hospital data for 18,000 patients and demonstrated that any type of educational visit was associated with lower hospitalization rates, yet nutrition visits offered the strongest cost benefits (7).

The protocol for diabetes MNT as described in the ADA Evidence Analysis Library (1) is:

### **“DM: MNT and Number/Length of Initial Series of Encounters**

Medical nutrition therapy (MNT) provided by a registered dietitian (RD) is recommended for individuals with Type 1 and Type 2 diabetes. An initial series of three to four encounters each lasting from 45 to 90 minutes is recommended. This series, beginning at diagnosis of diabetes or at first referral to an RD for MNT for diabetes, should be completed within three to six months.

The RD should determine if additional MNT encounters are needed after the initial series based on the nutrition assessment of learning needs and progress towards desired outcomes. Studies based on a range in the number (1-5 individual sessions or a series of 6-12 group sessions) and length (45-90 minutes) report sustained positive outcomes at one year and longer. Studies implementing a variety of nutrition interventions report a reduction in A1C levels, and some studies also report improved lipid profiles, improved weight management, adjustments in medications, and reduction in the risk for onset and progression of co-morbidities.

Evidence Rating: Strong, Imperative”

### **“DM: MNT Long-Term Follow-up Encounters**

At least one follow-up encounter is recommended annually to reinforce lifestyle changes and to evaluate and monitor outcomes that impact the need for changes in MNT or medication. The RD should determine if additional MNT encounters are needed. Studies involving regular lifestyle intervention sessions (up to 1 per month) report sustained positive outcomes at one year and longer.

Evidence Rating: Strong, Imperative”

This evidenced-based protocol was the basis for the Medicare regulation for coverage of DM MNT, which allows 3 hours of 1:1 MNT in the first year of diagnosis plus 2 hours each year thereafter, plus additional hours each year, if the physician orders, when there is a change in treatment regimen such as starting oral agents, changing medication, starting insulin, or any other change in DM treatment.

## **C) Current controversies and research directions in diabetes MNT**

Now we are seeing editorials with titles such as “Are You What You Eat, or How Much You Eat?” (2) and this is probably the most interesting current debate in diabetes nutrition. But is the answer to that question going to be black-and-white, or will it be more complex?

No RD or other healthcare professional would argue that “How Much You Eat” is not a crucial factor in health. Certainly the evidence demonstrates that the epidemic of Type 2 diabetes is

paralleling the epidemic of obesity worldwide. However, controversy continues re the causes of obesity and the best diets for weight loss. Leaving the discussion of etiology (sedentary lifestyles? HFCS? fast food? overwork?) to those in the public health arena, we who see patients on a daily basis need evidence-based information about how to treat obesity and diabetes now.

## **How Much You Eat**

On the "How Much You Eat" side of the debate, a new study published 8/12/08 in Diabetes Care online (9) by Dr. Adrienne Feldstein and the Portland OR Kaiser Permanente Center for Health Research, offered some interesting evidence. The study looked at EMRs of 2574 Kaiser patients newly diagnosed with Type 2 diabetes. About 12% of these patients achieved "clinically significant weight loss" of 9.8% of initial body weight by 18 months. Patients who lost weight demonstrated improved glycemic and blood pressure control--and even if they regained weight, these improvement remained three years later.

Dr. Feldstein and group concluded "Even in the face of weight regain, losing weight can have long lasting benefits in type 2 diabetes. The therapeutic advantage achieved through hweight loss is exceedingly important given the close connection between glycemic and blood pressure control (especially in the first years post diagnosis) and cardiovascular outcomes." The conclusions also stated: "The lasting benefit, in spite of weight regain, may derive from increased insulin sensitivity remaining from weight loss; mechanisms related to "metabolic memory" ; lifestyle changes accompanying weight loss, such as improved diet or increased activity; or other unmeasured factors that differed among the weight-trajectory groups. We did not evaluate which behaviors led to weight change. These areas should be the focus of future research."

## **What You Eat**

The "what" dialog most often revolves around the amount of carbohydrate in the diet, with recent attention to the quality (or type) in addition to the quantity of carbohydrate.

One difficulty when discussing "low-carb diets" research is the complete lack of consensus regarding the definition of "low-carb". The ADA Position Statement reminds us that the RDA for carbohydrate is approx 130 gm/day, but diets in this range are significantly lower-carb than the typical US diet. For patients eating large amounts of starches, snacking on sweets and drinking beverages containing CHO (soda, juice drinks, juice, large amounts of milk), following a 130-gm carb diet will indeed be a "low carb" diet, reducing total daily carb intake by as much as 50-60%!

The recent DIRECT (Dietary Intervention Randomized Controlled Trial) study published July 17, 2008 in the New England Journal of Medicine (10) provided interesting data about lower-carb diets. However, headlines in the popular media touted this study as proof that "the controversial Atkins diet is just as effective and safe as a conventional low-fat diet". In reality, the "low-carb" arm of this trial was a 120 gm CHO/day diet, approx 40% of calories (20 gm/day in the initial phase, which lasted only 2 months of the 2 yr study). Forty percent of calories from carbohydrate is just slightly lower than the RDA for carbohydrate and would fit exactly within the 1994 to present ADA/ADA MNT guidelines, i.e. this was definitely not

the conventional Atkins diet plan. Indeed, some Atkins blogs complained that they would have expected better results if the carb had been restricted to a lower percentage of calories.

Compare the DIRECT study diet groups:

	<b>Low-Fat Diet</b>	<b>Mediterranean Diet</b>	<b>"Low CHO" Diet</b>
% CHO	50.7	50.2	40.4
% Protein	19.0	18.8	21.8
% Fat	30.0	33.1	39.1
% saturated fat	9.6	9.6	12.3
Mean weight loss	2.9 kg (6.4 lb)	4.4 kg (9.7 lb)	4.7 kg (10.3 lb)

What is most notable is that both the Mediterranean Diet and the 120-gm carb diet led to approx the same amount of weight loss, both significantly greater than the low-fat diet.

The Mediterranean diet was the only group with a drop in fasting plasma glucose, which was significantly different from the FPG increase in the low-fat arm. There were few women enrolled in the study, but women lost more weight on the Mediterranean diet and men lost more weight on the 40% carb diet.

Perhaps most interesting re new directions in the 21<sup>st</sup> century research world: compared to the low-fat diet, both the Mediterranean diet and the 40% carb diet resulted in lower systemic inflammation levels, as measured via high-sensitivity C-reactive protein. The 40% carb diet used in this Israeli study included many vegetables, fruits, nuts, olive oil—many components of the Mediterranean diet. These components are known to have anti-inflammatory effects which apparently were strong enough to counterbalance the moderate amount of saturated fat (12% of calories, definitely higher than the ADA and AHA recommendation of 7% of calories for primary prevention) consumed in the 40% carb diet.

The Mediterranean diet as studied in epidemiological and intervention studies is not simply an American diet with some farmed fish, smaller amounts of red meat, and larger amounts of olive oil. The Mediterranean diet also emphasizes whole grains, minimally processed foods, nuts, legumes, a little wine, large amounts of fruits and vegetables, and very little saturated fat—it doesn't include processed foods with large amounts of sugar, refined grains, trans fats or inter-esterified fats. The Mediterranean lifestyle has also been more physically active than the American lifestyle, and diets always need to be considered in context.

This certainly suggests that simply manipulating the amount of carbohydrate in the diet is too simplistic an approach, and the whole picture is larger. It's no surprise to discover that human nutrition is complex and human physiology responds to many inputs. Even after much more research on carb/protein/fat diet components, there will be no one-size-fits all diet for diabetes management or prevention. And the answer to the question "Is It What You Eat, or How Much You Eat?" is most likely to be "both". Registered Dietitians skilled in DM MNT will assist your patients in making changes in both, based on their individual needs/metabolic status/lifestyles.

## References:

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