

QUICK REFERENCE GUIDE TO DIABETES FOR HEALTH CARE PROVIDERS

A special project of the Michigan Diabetes Outreach Network

Chapter 3 Nutrition and Diabetes

Meal planning is a cornerstone in the treatment for all types of diabetes. It involves a team effort, combining the goals of the person with diabetes with the expertise of a Registered Dietitian (RD) to provide a foundation for a meal plan. Goals of meal planning are to:

- A. Achieve optimal blood glucose, blood pressure and blood lipid levels.
- B. Prevent or slow the development of chronic complications.
- C. Improve health through eating a variety of healthy food choices.
- D. Individualize the meal plan, based on nutritional assessment, cultural preferences and lifestyle and ones willingness to change.

MNT Goals for Special Populations

Population	Additional MNT Goals
Youth with type 1 diabetes	<ul style="list-style-type: none">• Maintain normal growth and development without excessive hypoglycemia.• Adjust insulin regimens for usual eating and activity patterns.
Youth with type 2 diabetes	<ul style="list-style-type: none">• Facilitate changes in eating and activity patterns that promote a healthy weight, reduce insulin resistance and improve A1C, blood pressure, cholesterol, etc.
Pregnant or lactating women	<ul style="list-style-type: none">• Provide adequate maternal and fetal nutrition• Assist in maintaining appropriate rate of weight gain (pregnancy) or weight loss (lactation).
Older adults	<ul style="list-style-type: none">• Provide adequate nutritional needs.• Monitor changes in body weight.
Those on insulin or oral hypoglycemia agents	<ul style="list-style-type: none">• Educate on the treatment and prevention of acute illness, hypoglycemia and activity-related problems.
Those at risk for type 2 diabetes	<ul style="list-style-type: none">• Encourage physical activity and food choices that facilitate moderate weight loss or prevent weight gain in those who are overweight.

Carbohydrate

Although carbohydrate-containing foods will raise blood glucose, they are an important component of meal planning. The total amount of carbohydrate in meals and snacks is the primary determinant of post meal blood glucose levels. Factors that affect glycemic response are the other types of food eaten, type of carbohydrate eaten, cooking preparation style, ripeness of food, degree of food processing and alcohol consumed with a meal. Additional factors are pre-meal BG readings, time of day, meal composition, available insulin and degree of insulin resistance.

Most persons with diabetes can also include some sugar in their meal plan; however, it must be substituted for some of the other carbohydrate (bread and starches, fruits, vegetables or milk) at a meal. Beware of “sugar-free” and “no sugar added” foods. Compare the total carbohydrate content of a sugar-free food with that of the standard product. If there is a big difference in carbohydrate content between the two foods, consider the sugar-free food. If there is little difference in total carbohydrate between the two foods, choose item based on price, taste and other nutrients (fat, sodium). Read the nutrition label carefully to make the best choice.

Fat

While eating small amounts of fat does not have a direct effect on BG levels, excess consumption increases insulin resistance and increases the time it takes food to travel through the intestines. This can elevate blood glucose levels hours after eating. Limiting fat intake, especially saturated and trans fats, is helpful in reducing the risk of heart disease.

Protein

Protein has little or no affect on the rise and fall of blood glucose levels. Some protein sources, such as soy, breads/grains, legumes, vegetables and dairy products, contain carbohydrate. This extra carb must be taken into consideration as it can elevate blood glucose levels.

Protein intake should be limited in those with impaired kidney function. In those with type 2 diabetes, protein has a short-term effect on increasing insulin levels (without increasing blood glucose). Therefore, protein should not be used in combination with carb to treat acute hypoglycemia, nor to prevent nocturnal hypoglycemia.

Alcohol

Alcohol supplies empty calories. Moderate consumption (less than 3 servings) doesn't directly affect blood glucose levels; however, excess consumption (more than 3 servings) can contribute to high triglycerides and weight gain. One serving of an alcoholic beverage is 12 oz beer, 5 oz wine, or 1-1½ oz distilled spirits. There is also a risk of dehydration and hypoglycemia with excess intake in the fasting state. General principles for consuming alcohol for adults with diabetes are as follows:

- Avoid/limit alcohol intake when blood glucose is not well controlled; triglyceride levels are elevated; during pregnancy, history of alcohol abuse, pancreatitis or neuropathy.
- Limit daily alcohol intake to one per day (women) and two per day (men)
- To prevent hypoglycemia when consuming alcoholic beverages: DO NOT skip meals, decrease food intake, drink alone or drink on an empty stomach.
- Always carry diabetes identification. Signs/symptoms of hypoglycemia can be misidentified as intoxication.
- Test blood glucose frequently, especially before sleeping.
- If trying to lose weight, count one serving as 2 fat servings.
- Non-alcoholic beer, regular beer, wine coolers and drink mixers (soda, juice, tonic, margarita/daquari mix) contain carbohydrate and can elevate blood glucose levels.

Type 1 Diabetes

The meal plan and insulin regimen should be designed around one's appetite, preferred foods and usual meal schedule. It is also important to learn how to adjust insulin for differences in meal sizes, timing of meals and physical activity.

- For those on fixed insulin schedules and do not adjust insulin based on carbohydrate intake, it is important to eat consistent carbohydrate at regular times.
- For those on intensive insulin therapy or insulin pumps have more flexibility in the amount of carbohydrate eaten as well as the timing and frequency of meals.

Type 2 Diabetes

Meal planning involves lowering one's blood glucose, along with controlling one's blood lipids, blood pressure and body weight. Carbohydrate controlled meals and snacks spaced throughout the day can help control postprandial hyperglycemia.

Nutritional management of dyslipidemia involves losing 5-10% of their body weight (if overweight), consuming adequate fiber (especially soluble fiber) and limiting saturated fats, trans fats and cholesterol. Those with elevated triglyceride levels should also limit

excess consumption of sugars, alcohol and calories. Some also benefit from eating more fatty fish or using monounsaturated fats in place of a portion of saturated fats and/or carbohydrate.

For those with high blood pressure, the Dietary Approaches to Stop Hypertension (DASH) meal plan has been shown to lower systolic blood pressure 8-14 mmHg. DASH is a meal plan low in total fat, saturated fat and cholesterol that encourages intake of fruits, vegetables, low-fat dairy and whole grains. *See Chapter 13 for DASH meal planning information.*

Since up to 90% of those with type 2 diabetes are overweight, a 5 -10% weight loss (from starting weight) has been shown to improve BG, lipids and blood pressure. Calorie restriction alone improves glucose control before any weight loss occurs. Regular physical activity is key to successful weight loss, maintenance of weight loss and BG control.

In general, all persons with diabetes benefit from...

- Eating a wide variety of foods in moderation.
- Eating on a regular basis
 - Meals spaced every 4-5 hours
 - Snacks can be added if meals are spaced longer than 5 hours
 - Snacks should be at least 2 hours after meals
- Eating consistent amounts of carbohydrates (from fruit, milk, breads, grains, starchy foods and sweets) at meals and snacks.
- Eating high fiber foods daily (dried beans, legumes, fruits, vegetables and whole grains).
- Decreasing portion sizes, if weight is a concern.
- Limiting alcohol and if drinking, only drinking with meals. Limit to 1 servings per day (women) and 2 servings per day (men).
- Limiting intake saturated fat and trans fats (found in animal products: cheese, hamburger, bacon, butter, processed snack foods, shortening and other fats which are solid at room temperature).
- Do not need any special diet foods (some reduced calorie items can be useful).
- May benefit from taking a multivitamin; however, dietary supplements (single dose vitamins, minerals, herbs) are not generally needed by those who eat a variety of foods from each of the food groups.

Additional Help for the Overweight Client

- Determine if your client is truly ready to lose weight. Are they intending to make changes within the next six months to lose weight? If no, client may need to explore in more detail the benefits of weight loss.
- Set reasonable goals. A 7-10% weight loss is generally achievable.
- Mild caloric restrictions are easier to adapt to (250-500 calorie deficit.)
- Do they have a problem with binge eating or bulimia? An eating disorder clinic or specially trained counselor may be needed.
- Surgical intervention or medication may be options for some obese persons.
- Regular physical activity is key in helping maintain weight loss.
- Regular meetings with a registered dietitian are recommended to help those with diabetes develop a meal plan that works for them.

Many nutrition handouts are available through the Diabetes Outreach Networks (go to www.diabetesinmichigan.org).

References:

American Diabetes Association (2008). Clinical Practice Recommendations. *Diabetes Care*, Vol 31 (1).