

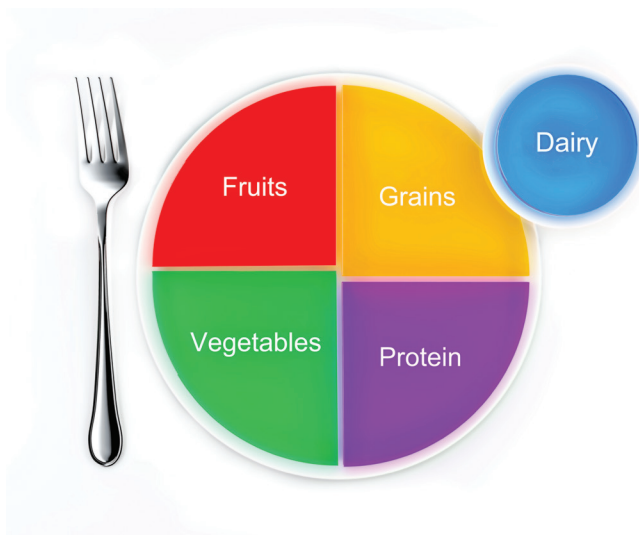


# Healthy Eating

**One of the most important tools for controlling diabetes progression is the achievement and maintenance of healthy eating habits.**

The goals of nutrition therapy in diabetes are to promote and support healthful eating patterns, emphasizing a variety of nutrition dense foods in appropriate portion sizes to improve overall health, and specifically to:

- Attain individualized glycemic, blood pressure and lipid goals
- Achieve and maintain body weight goals
- Delay or prevent complications of diabetes



A healthy diet will lead to an immediate positive effect on patients' blood glucose levels. Over time this will also improve patients' weights and minimize long term complications like kidney damage and retinopathy.

Evert, AB, Boucher, JL, Cypress, M, et al. Nutrition Therapy Recommendations for the Management of Adults With Diabetes. *Diabetes Care*. 2013;36(11):3821-3842. doi:10.2337/dc13-2042.

did you know?

**There is an emerging global epidemic of diabetes that can be traced back to rapid increases in obesity and physical inactivity.**

10 facts about diabetes. WHO. 2014. Available at: <http://www.who.int/features/factfiles/diabetes/en/>. Accessed January 21, 2015.

## ADA Goals for Diabetes Nutrition



1. Achieve and maintain:
  - Blood glucose levels in the normal range or as close to normal as is safely possible
  - A lipid and lipoprotein profile that reduces the risk for vascular disease
  - Blood pressure levels in the normal range or as close to normal as is safely possible
2. Prevent, or at least slow, the rate of development of the chronic complications of diabetes by modifying nutrient intake and lifestyle
3. Address individual nutrition needs, taking into account personal and cultural preferences and willingness to change
4. Maintain the pleasure of eating by only limiting food choices when indicated by scientific evidence



# Healthy Eating

## Carbohydrates

The body uses carbohydrates as its main fuel source. Carbohydrates are digested and then absorbed into your blood stream, where they are known as blood sugar or blood glucose. The glucose enters the body's cells with the help of insulin. Extra glucose is stored in the liver, muscles and other cells for later use or if unused, it is converted to fat.

### Managing Carbohydrate Intake

Regulating the amounts of carbohydrate and available insulin is the key strategy for glycemic control. Patients should count carbohydrates and adjust insulin accordingly.

A balanced diet should consist of healthy carbohydrates such as:

- Fiber-rich fruits and vegetables
- Whole grains
- Low-fat dairy products
- Beans and legumes

Products containing added sugars should be avoided.

Evert, AB, Boucher, JL, Cypress, M, et al. Nutrition Therapy Recommendations for the Management of Adults With Diabetes. *Diabetes Care*. 2013;36(11):3821-3842.

### Carbohydrate Counting

Monitoring carb intake by carb counting is a key strategy in achieving blood sugar control. Since carbs raise blood sugar, you may be asked to count them. Examples of carbohydrates are beans, grains, starchy vegetables, fruit, dairy products, sweets, and snacks.

Should you avoid carbohydrates? Absolutely not! Carbohydrates are your body's main source of fuel. By counting your carbs, you can make decisions that can help you control your weight and your blood sugar.

Consult with your HCP about limiting the carbs you eat each day.

Evert AB, Boucher JL, Cypress M, et al; for American Diabetes Association. Nutrition therapy recommendations for the management of adults with diabetes. *Diabetes Care*. 2013;36(11):3821-3842.

## EXAMPLES OF CARBOHYDRATES

**TYPE: CEREAL**  
**1 SERVING SIZE: TENNIS BALL**  
**APPROX. # OF CARBS: 15g**



**TYPE: PASTA & RICE**  
**1 SERVING SIZE: LIGHT BULB**  
**APPROX. # OF CARBS: 23g**



**TYPE: BREAD**  
**1 SERVING SIZE: CASSETTE TAPE**  
**APPROX. # OF CARBS: 15g**



**TYPE: BAKED WHITE POTATO**  
**1 SERVING SIZE: COMPUTER MOUSE**  
**APPROX. # OF CARBS: 15g**



**TYPE: FRUIT**  
**1 SERVING SIZE: BASEBALL OR WOMAN'S FIST**  
**APPROX. # OF CARBS: 20g**



**TYPE: SODAS & JUICES**  
**1 SERVING SIZE: 1/2 CAN OF SODA**  
**APPROX. # OF CARBS: 14g**



**TYPE: DESSERTS & SWEETS**  
**1 SERVING SIZE:**  
CAKE: DECK OF CARDS  
BROWNIE: DENTAL FLOSS PACKAGE  
**APPROX. # OF CARBS: 20g**



Clinical Diabetes. Carbohydrate Counting: The Basics. 23(3):123-124.



# Healthy Eating

## Glycemic Index

Glycemic index (GI) is a way of expressing how carbohydrate-containing foods raise blood glucose. It is based on the principle that some carbohydrate-containing foods will raise blood glucose more rapidly than others. This is due to the rate at which the body breaks them down.

- High GI foods ( $\geq 70$ ) will raise blood glucose quickly.
- Low GI foods ( $\leq 55$ ) will generally raise blood glucose more slowly.

## GI Considerations

- Only foods containing carbohydrates have a glycemic index; fats and proteins do not.
- Pairing low GI foods with high GI foods can help to balance out effects on blood glucose levels.
- Even though Glycemic Index is a great indicator for healthy eating, food choices cannot be based on the GI values alone. For example, a baked potato has a high GI and ice cream has a low GI, yet a baked potato is a healthier food choice compared to ice cream. Therefore, it is important to combine different meal planning tools to maintain a healthy and balanced diet.

Glycemic Index and Diabetes. *American Diabetes Association*. 2014. Available at: <http://www.diabetes.org/food-and-fitness/food/what-can-i-eat/understanding-carbohydrates/glycemic-index-and-diabetes.html>. Accessed January 20, 2015.

### HIGH GI FOODS

#### “WHITE STARCHY FOODS”

- WHITE BREAD
- WHITE RICE
- WHITE POTATOES

#### SOME FRUITS INCLUDING:

- GRAPES
- WATERMELON
- BANANAS

### MEDIUM GI FOODS

- BROWN RICE
- PITA BREAD
- WHOLE WHEAT BREAD
- COUSCOUS
- QUICK OATS

### LOW GI FOODS

- PASTA
- BARLEY
- SWEET POTATOES
- LIMA BEANS
- ROLLED OATS
- NON-STARCHY VEGETABLES
- MOST FRUITS

## FACTORS THAT AFFECT GI OF FOODS

- **Ripeness** - the more ripe a fruit or vegetable is, the higher the GI
- **Processing** - foods that are more natural and less processed tend to have lower GI, for example:
  - Juice has a higher GI than whole fruit
  - A mashed potato has a higher GI than a whole baked potato
- **Cooking method** - the longer a food is cooked (e.g. al dente pasta vs. soft-cooked pasta) may increase its GI

Glycemic Index and Diabetes. *American Diabetes Association*. 2014. Available at: <http://www.diabetes.org/food-and-fitness/food/what-can-i-eat/understanding-carbohydrates/glycemic-index-and-diabetes.html>. Accessed January 20, 2015.



# Healthy Eating

## Proteins

The body breaks down proteins into amino acids, which are used to build new proteins. When carbohydrates and fats are not readily available, the body will use dietary protein as energy.

- Proteins include meats, fish, cheese and beans.
- Proteins function as building blocks for bones, muscles, cartilage, skin, and blood.
- They are also building blocks for enzymes, hormones, and vitamins.
- Proteins, fat and carbohydrates are nutrients that provide calories.
- Taking fruits, juice or sweets with proteins, slows absorption of carbohydrates.

Lean proteins are an ideal food option for patients with diabetes because they offer filling, healthy food choices that contain no carbohydrates. This means they do not raise blood glucose.

- Lean protein examples:
  - Fish, chicken (without the skin), and eggs.

*USDA MyPlate Protein Foods Group -- Nutrients and health benefits.*  
Available at: <http://www.choosemyplate.gov/food-groups/protein-foods-why.html>.  
Accessed January 22, 2015.

*Protein Foods. American Diabetes Association. 2014.*  
Available at: <http://www.diabetes.org/food-and-fitness/food/what-can-i-eat/making-healthy-food-choices/meat-and-plant-based-protein.html>.  
Accessed January 21, 2015.





# Healthy Eating

## Fats

Fat in food is broken down into fatty acids that travel through the bloodstream for the cells to use. Excess fatty acids are packaged for storage in fat cells as triglycerides.

*Saturated fats and trans fats* (e.g. butter, lard, chocolate, poultry skin, palm oil, margarine, shortenings) raise the body's cholesterol levels.

- High cholesterol is a risk factor for heart disease
- Patients with diabetes are at an increased risk of cardiovascular disease and many already have the comorbidity of dyslipidemia.

A decrease in the amount of saturated fat, and the replacement of saturated fat with healthy, unsaturated fats will reduce the risk of cardiac complications in these patients.

- Monounsaturated fats and polyunsaturated fats (e.g. avocado, canola, nuts, olive oil, peanut butter) are preferred
- EPA and DHA (fatty fish) and n-3 linolenic acid (ALA) are recommended for prevention of heart disease

Evert, AB, Boucher, JL, Cypress, M, et al. Nutrition Therapy Recommendations for the Management of Adults With Diabetes. *Diabetes Care*. 2013;36(11):3821-3842. doi:10.2337/dc13-2042.

Franz, MJ. Protein Controversies in Diabetes. *Protein Controversies in Diabetes*. Available at: <http://journal.diabetes.org/diabetesspectrum/00v13n3/pg132.htm>. Accessed January 21, 2015.



## Meal Planning Tools

A diabetes meal plan is a guide for how much and what kinds of food patients with diabetes can choose to eat at meals and snack times.

A good meal plan should fit in with a patient's schedule and eating habits.

The right meal plan will help improve blood glucose, blood pressure, and cholesterol numbers and also help keep weight on track, whether a patient needs to lose or maintain weight.

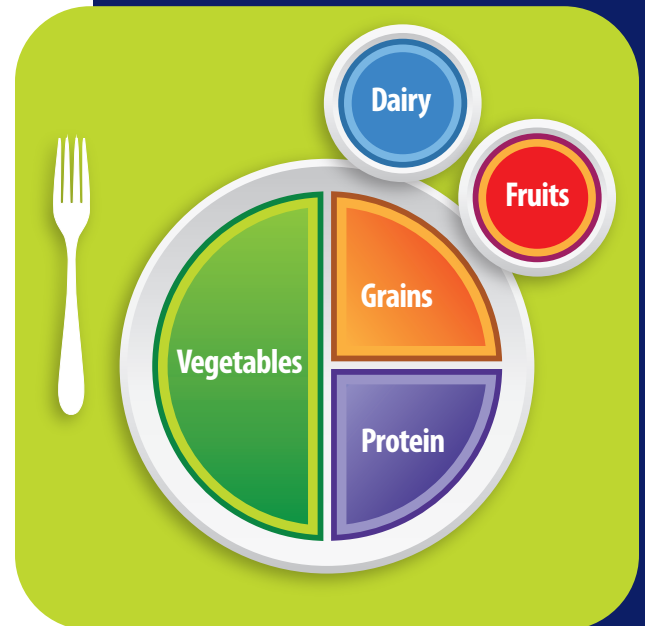
The plate method is one example of a meal planning tool.

Evert, AB, Boucher, JL, Cypress, M, et al. Nutrition Therapy Recommendations for the Management of Adults With Diabetes. *Diabetes Care*. 2013;36(11):3821-3842. doi:10.2337/dcl3-2042.

### Six steps to filling a meal plate:

1. Divide the plate in half and then divide one side in half (See diagram to the right)
2. Fill the largest section ( $\frac{1}{2}$  of the plate) with non-starchy vegetables
  - eg. spinach, carrots, lettuce, greens, green beans, mushrooms, peppers, broccoli
3. Fill one of the smaller sections ( $\frac{1}{4}$  of the plate) with grains and starchy foods (carbohydrates)
  - eg. bread, rice, pasta, green peas, potato, beans, tortilla
4. Fill the other smaller section ( $\frac{1}{4}$  of the plate) with protein
  - eg. chicken, turkey, fish, lean beef, eggs, tofu
5. Add a small serving of fruit or dairy if allotted
6. Drink a low-calorie or zero calorie beverage such as water, unsweetened tea, or coffee

Create Your Plate. *American Diabetes Association*. 2014. Available at: <http://www.diabetes.org/food-and-fitness/food/planning-meals/create-your-plate/>. Accessed January 21, 2015.





# Healthy Eating

## How To Read A Food Label

When reading the nutrition facts on a food label, patients with diabetes should:

- Start at the top with the serving size.
- The most important item on the label is the amount of “Total Carbohydrates”.
- Try to avoid foods with a high amount of saturated fat, trans fat, cholesterol, and sodium.
- Foods with a high amount of potassium, dietary fiber, vitamins A and C, calcium and iron are good.
- Daily Value (DV): Based on a 2,000 calories/day, 20% or more is high.

Pay attention to the serving size.

This bag of trail mix contains 5 individual servings (1 oz per serving) that are 140 calories each.

Patient should talk to HCP about the amount of cholesterol to have per day.

Every 15 Grams Total Carbohydrate = 1 Carbohydrate Serving

### Trail Mix

#### Nutrition Facts

Serving Size 1 oz (28g/About 6 pieces)  
Servings Per Container About 5

Amount Per Serving		% Daily Value*	
<b>Calories</b>	<b>140</b>	<b>Calories from Fat</b>	<b>80</b>
<b>Total Fat</b>	<b>9g</b>		<b>14%</b>
Saturated Fat	1.5g		6%
Trans Fat	0g		
<b>Cholesterol</b>	<b>0mg</b>		<b>0%</b>
<b>Sodium</b>	<b>95mg</b>		<b>4%</b>
<b>Total Carbohydrate</b>	<b>12g</b>		<b>4%</b>
Dietary Fiber	1g		6%
Sugars	7g		
<b>Protein</b>	<b>3g</b>		
Vitamin A	0%	Vitamin C	0%
Calcium	2%	Iron	6%

\*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
Saturated 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 • Carbohydrate 4 • Protein 4

No more than 30% of total calories should come from fat in a daily diet. For example, no more than 600 calories for a 2000-calorie diet.

Patients with diabetes should avoid saturated and trans fats. “Monounsaturated” and “polyunsaturated” fats are better.

Patient should talk to HCP about the total amount of dietary fiber per day based on the number of calories consumed each day.

Use the Nutrition Facts Label. *How to Use the Nutrition Fact Label, Eat Right, NHLBI, NIH.* 2013. Available at: <http://www.nhlbi.nih.gov/health/educational/wecan/eat-right/nutrition-facts.htm>. Accessed January 21, 2015.

III - 15





# Healthy Eating

## Sweeteners

Nutritive sweeteners including sucrose, fructose, dextrose, corn sugar, maltose and honey, add carbohydrates and calories to diets. While called “nutritive”, they are low in nutritional value.

- Patients with diabetes should avoid intake of nutritive sweeteners
- High intake of nutritive sweeteners contributes to cardiovascular disease, obesity and increase in blood glucose

Evert, AB, Boucher, JL, Cypress, M, et al. Nutrition Therapy Recommendations for the Management of Adults With Diabetes. *Diabetes Care*. 2013;36(11):3821-3842. doi:10.2337/dcl3-2042.

Artificial sweeteners can be used in place of nutritive sweeteners to sweeten foods or beverages without adding calories or affecting blood glucose levels.

Substituting artificial sweetener for sugar may help maintain healthy body weight.

The current FDA tested and approved artificial sweeteners are:

- acesulfame potassium (Sweet One)
- aspartame (NutraSweet or Equal)
- saccharin (Sweet ‘N Low)
- sucralose (Splenda)
- neotame
- advantame

The FDA has also claimed rebaudioside A (Truvia or PureVia) as generally recognized as safe for consumption.

Low-Calorie Sweeteners. *American Diabetes Association*. 2014. Available at: <http://www.diabetes.org/food-and-fitness/food/what-can-i-eat/understanding-carbohydrates/artificial-sweeteners/>. Accessed January 21, 2015.

did you know?

Many foods containing low-calorie sweeteners will provide some calories and carbohydrates from other ingredients. Foods that carry claims like “sugar-free”, “reduced sugar” or “no sugar added” are not necessarily carbohydrate-free or lower in carbohydrate than the original version of the food. Check the nutrition facts panel for more information.

Low-Calorie Sweeteners. *American Diabetes Association*. 2014. Available at: <http://www.diabetes.org/food-and-fitness/food/what-can-i-eat/understanding-carbohydrates/artificial-sweeteners/>. Accessed January 21, 2015.

### POSSIBLE SIDE EFFECTS:

- Due to a lack of studies about the long term effects, artificial sweeteners should be avoided or used in limitation in children and pregnant women.
- Aspartame is the only artificial sweetener which is digested by the body
- Some people cannot tolerate aspartame, especially people with PKU metabolism disorder.

Low-Calorie Sweeteners. *American Diabetes Association*. 2014. Available at: <http://www.diabetes.org/food-and-fitness/food/what-can-i-eat/understanding-carbohydrates/artificial-sweeteners/>. Accessed January 21, 2015.







# Healthy Eating

## Other Considerations

### Alcohol:

- The ADA has very specific recommendations for patients with diabetes who consume alcohol. Alcohol can have a negative effect on a patient's blood glucose for up to 24 hours.
- The ADA recommends:
  - Only drink with food and never replace the carbohydrate portion of a meal with alcohol
  - Drink only when blood glucose is under control

### Eating Away from Home:

- Eating out can be tricky for patients with diabetes as many foods contain "hidden" fats and carbohydrates
- The American Diabetes Association (ADA) recommends:
  - Eat only recommended portion sizes and take the rest home or share
  - Ask for sauces on the side
  - Avoid breaded foods and breads brought to the table
  - Request restaurant nutrition information

Ordering Tips. *American Diabetes Association*. 2013. Available at: <http://www.diabetes.org/food-and-fitness/food/what-can-i-eat/food-tips/eating-out/ordering-tips.html>. Accessed January 22, 2015.

Alcohol. *American Diabetes Association*. 2014. Available at: <http://www.diabetes.org/food-and-fitness/food/what-can-i-eat/making-healthy-food-choices/alcohol.html>. Accessed January 21, 2015.



## ADA RECOMMENDATIONS FOR MAXIMUM ALCOHOL CONSUMPTION PER DAY BY PATIENTS WITH DIABETES

