



# *X-Plain™*

## *Diabetes and Meal Planning*

### **Reference Summary**

A healthy diet helps to control and sometimes prevent diabetes.

Your doctor may have told you that you have diabetes or are at risk of developing diabetes. Changes in your diet will help control your blood sugar.

This patient education program will help you understand healthy eating habits, especially related to diabetes.

### **Diabetes**

The body is made of millions of cells that need energy to function. Some of the food we eat is turned into sugar, called glucose.

The blood stream carries glucose to the cells. It is one of the most important substances the cells need to make energy.

For glucose to enter a cell, 2 conditions must be present.

The cell must have enough “doors,” called receptors.

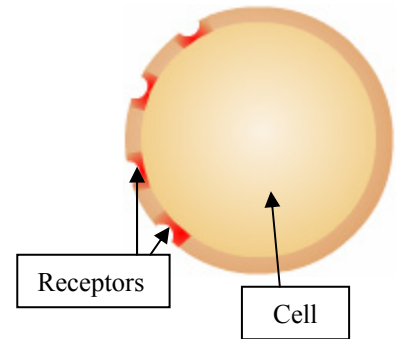
A substance called insulin must be available to “unlock” the receptors.

With enough receptors and insulin to “unlock” them, glucose enters the cell and is used to make energy. Without energy, all cells die.

Insulin is a chemical hormone the pancreas makes. Insulin levels in the blood change depending on how much glucose is in the blood.

Diabetes is a disease that makes it hard for cells to get the glucose they need to make energy.

Type 1 diabetes occurs when the cells in the pancreas that make insulin are destroyed. Type 1 diabetics lack insulin, which causes them to have high blood sugar.



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Type 2 diabetes occurs when a body has enough insulin but there are not enough receptors on the cells to allow glucose to enter. This results in high blood sugar also.

## Diet & Diabetes

A healthy and balanced diet is very important for everybody, but even more so for diabetics.

You can control your blood sugar successfully if you

1. maintain an optimal weight
2. pay attention to WHAT you eat
3. consider HOW MUCH you eat

For type 2 diabetics, diet and lifestyle changes can control blood sugar so well that for some patients, medication is not needed.

The body constantly uses energy to keep itself at a normal temperature and to carry out bodily functions. Energy is measured in calories. A calorie is a unit of energy that is made available to the body by the food we eat.

The amount of calories that a person needs depends on their age, size, level of activity and metabolism. A large person needs more calories than a small person because a bigger body needs more energy than a smaller body. Physically active people need more calories than inactive people.

People of the same age, size and activity level may require a different amount of calories per day, because some people naturally burn more calories than others.

Medical conditions can also affect metabolism. For example, a person with a thyroid gland that does not secrete enough thyroid hormone will have a slower metabolism.

When a person eats more calories than they need, the extra calories are stored in the fatty tissues of the body and can lead to increased weight. When a person eats fewer calories than they need, the body burns fat to supply the needed calories and the person loses weight.



One way to control sugar levels is to keep body weight as close as possible to an ideal weight.

Your doctor and registered dietitian can help you to know your ideal body weight. After determining your ideal body weight, they can help you figure out how many calories you need in one day.

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People who are 20% heavier than their ideal weight are medically “obese.” To reduce weight, they should eat fewer calories than their body needs.

## Food Groups

Food is commonly divided into the following 6 food groups.

1. fat and cholesterol
2. proteins
3. carbohydrates
4. vitamins
5. minerals
6. fibers

Too much fat and cholesterol in the blood can lead to blocked arteries in the heart and brain, as well as other organs. Blocked arteries very often lead to heart attacks and strokes.

1 gram of fat = 9 calories. Carbohydrates and protein only have 4 calories per gram. Less than 30% of your total calories should come from fat.

There are 2 types of carbohydrates: simple and complex.

Simple carbohydrates are found in candies, honey, syrup and soda.

Complex carbohydrates are found in fruits, vegetables, whole-grain breads and cereals, dried beans and peas, lentils and legumes. Simple carbohydrates tend to increase blood sugar much faster than complex ones.

Complex carbohydrates satisfy a person’s hunger for a longer period of time. Complex carbohydrates like whole grains are better choices due to the high fiber content.

1 gram of carbohydrate = 4 calories. 50-60% of total calories should come from carbohydrates.

Proteins are very important for the body. Protein can be found in:

1. meat
2. poultry
3. fish
4. dry beans
5. eggs
6. nuts

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1 gram of protein = 4 calories. No more than 10-20% of calories should come from protein.

The body cannot make vitamins and minerals; we have to consume them. Without enough vitamins and minerals, the body could contract serious diseases.

Too much vitamins can sometimes lead to disease; this is why it is important to discuss the use of any vitamins, even over-the-counter, with your doctor.

Common vitamins include:

1. Vitamin A
2. Vitamin B
3. Vitamin C
4. Vitamin D
5. Vitamin K

Common minerals include

1. Salt, sodium or NaCl
2. Potassium or KCl
3. Calcium
4. Iron

Fiber is mainly found in non-animal products, such as vegetables and fruits.

Fiber, also known as roughage, helps to keep bowels regular and possibly protect against colon cancer.

Since the human body does not absorb fiber, it is not counted as consumed calories.

## A Healthy Diet

A healthy diet is a diet that provides the nutrients your body needs in sufficient amounts. Different people need different amounts of calories. Here are 6 general guidelines that apply to all people and more importantly, to diabetics.

1. *Eat a variety of foods.* No single category of food can give you all the nutrients you need. A healthy diet always includes food from each of the different food *groups*.



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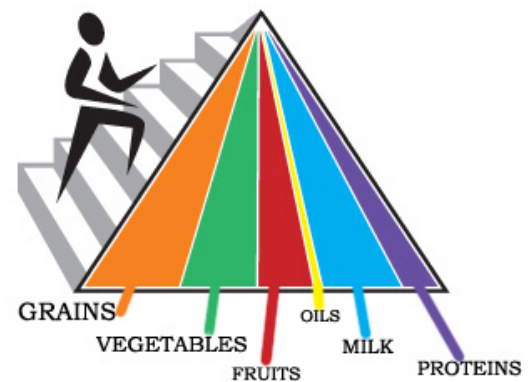
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2. *Eat the amount of food your body needs.* When you eat more food than your body needs, the extra calories are stored as fat. Find your ideal weight and activity level, and strive to reach and keep that weight.
3. *Eat a lot of grain products, vegetables and fruits.* Dietitians recommend plant foods because they include few calories and a lot of fiber, vitamins and minerals. In addition, they have no cholesterol and are low in fat.
4. *Eat a diet low in fat and cholesterol.* Less than 30% of the calories eaten by diabetics should come *from fat*.
5. *Consume certain foods and drinks in moderation.* Carbohydrates, specifically candy, desserts, sweetened drinks, salt, and alcohol, should be consumed in moderation.
6. Refrain from smoking!!

## The Pyramid

The Food Pyramid is a guide for healthy eating that suggests eating a variety of food while eating the appropriate amount from each group of food.

The Food Guide Pyramid created by the US Department of Agriculture has 6 colors. Each color represents a food group. The larger the area of the color category, the more servings you need from this food group.



### Grains (Orange):

Orange represents grains. Eat at least 3 ounces of whole grain bread, cereal, crackers, rice or pasta every day. Look for “whole” before the grain name on the list of ingredients. Grains are divided into 2 subgroups: whole grains and refined grains.

Whole grains contain the entire grain kernel -- the bran, the germ and endosperm.

Examples include:

- whole-wheat flour
- bulgur (cracked wheat)
- oatmeal
- whole cornmeal
- brown rice

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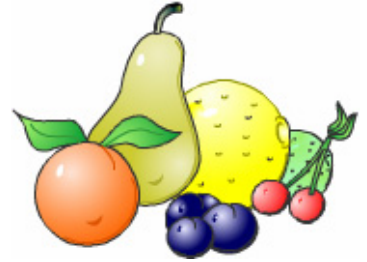
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## Vegetables (Green):

Vegetables are organized into 5 subgroups, based on their nutrient content: dark green vegetables, orange vegetables, dry beans and peas, starchy vegetables and other vegetables.

## Fruits (Red):

Eat a variety of fruit. Choose fresh, frozen, canned, or dried fruit. Go easy on fruit juices. Any 100% fruit juice counts as part of the fruit group.

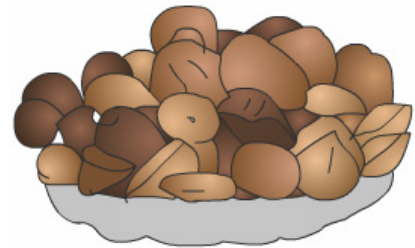


## Oils (Yellow):

Yellow represents the oils. They are the smallest category. Make most of your fat sources from fish, nuts and vegetable oils. Limit solid fats such as butter, stick margarine, shortening and lard.

Some common vegetable oils are:

- canola oil
- corn oil
- cottonseed oil
- olive oil
- safflower oil
- soybean oil
- sunflower oil



## Milk (Blue):

Blue represents milk. Pick low-fat or fat-free milk. If you can't consume milk, choose lactose-free products or other calcium sources.

## Proteins (Purple):

Purple is the last category and it represents protein. Choose low-fat or lean meat and poultry. Bake it, boil it or grill it. Vary your choices with more fish, beans, peas, nuts and seeds. Dry beans and peas are part of this group as well as the vegetable group.



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The amount of food eaten is measured in a unit called a "serving." Depending on the food group, the serving size may be measured in cups, grams, slices or whole fruits.

The number of servings from each food group depends mostly on the person's age, sex, height and level of physical activity. How many servings you need from each group depends on the amount of calories you need each day. The stairs in the food pyramid are to remind you to be physically active. You should be physically active for at least 30 minutes most days of the week. Children and teenagers should be physically active for 60 minutes every day, or most days.

## Blood Sugar Levels

It is important to check your blood sugar levels regularly as directed by your doctor. These checks may have to be done more frequently when changing diet, levels of activities or during sick days.

You may need to increase or decrease your medication, depending on the blood sugar levels. You should call your doctor or diabetic care team if you have any questions.



## Summary

When eating healthy becomes a life habit, it can help prevent diseases. To make a healthy diet part of your life, you need information and motivation.

Healthy eating does not have to be difficult. There are lots of tasty and healthy foods! Here are some tips for healthy eating:

Do not skip meals. Eat something every 4 to 5 hours.

No special or diet food are needed. It is the total amount of carbohydrates per meal or snack that matter. Watch the size of the portion you eat.

Choose foods lower in total fat (especially saturated fat), lower in cholesterol and lower in sodium.

Cooking and eating healthy so you can control your diabetes is not only good for you; it is also good for your family!



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Sex and Age	Use This Equation to Figure Out Your Daily Calorie Intake
<b>Males</b>	
10-18 years	(17.5 x weight in kg) + 651
18-30 years	(15.3 x weight in kg) + 679
30-60 years	(11.6 x weight in kg) + 879
> 60 years	(13.5 x weight in kg) + 487
<b>Females</b>	
10-18 years	(12.2 x weight in kg) + 746
18-30 years	(14.7 x weight in kg) + 496
30-60 years	(8.7 x weight in kg) + 829
> 60 years	(10.5 x weight in kg) + 596

How Much Should You Weigh?	
Height (feet and inches)	Weight (pounds) for 19-34 Year Olds
5'	97 – 128
5'1"	101 – 132
5'2"	104 – 137
5'3"	107 – 141
5'4"	111 – 146
5'5"	114 – 150
5'6"	118 – 155
5'7"	121 – 160
5'8"	125 – 164
5'9"	129 - 169
5'10"	132 - 174
5'11"	136 - 179
6'	140 - 184
6'1"	144 - 189
6'2"	148 - 195
6'3"	152 - 200
6'4"	156 - 205
6'5"	160 - 211
6'6"	164 - 216

How Much Should You Weigh?	
Height (feet and inches)	Weight (pounds) for 35+ Year Olds
5'	108 – 138
5'1"	111 - 143
5'2"	115 - 148
5'3"	119 - 152
5'4"	122 - 157
5'5"	126 - 162
5'6"	130 - 167
5'7"	134 - 172
5'8"	138 - 178
5'9"	142 - 183
5'10"	146 - 188
5'11"	151 – 194
6'	155 - 199
6'1"	159 - 205
6'2"	164 - 210
6'3"	168 - 216
6'4"	173 - 222
6'5"	177 - 228
6'6"	182 - 234

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