Carbohydrate Counting Basics

A carbohydrate is a nutrient in food that breaks down into sugar (glucose) when eaten, and causes blood sugar levels to rise. Foods that contain the most carbohydrates are grains, fruit, starchy vegetables, milk, and any food that is sweetened with sugar. Carbohydrates are measured in grams.

In the past, many people with diabetes used the "exchange" system of meal planning. In the exchange system, people eat one fruit, one starch, one milk, etc. in each meal. One exchange equals 15 grams of carbohydrate. They can substitute one vegetable exchange for another, one starch exchange for another, one protein exchange for another, etc. Although this system is still used by some, many found it rigid and limiting in the variety of foods that they could have.

There is no longer a standard "diabetic diet". Recommendations now are for a low-fat healthy meal plan that provides consistent amounts of carbohydrates throughout the day. Healthy meals include foods with carbohydrate, protein/meat, and some fat. **Carbohydrates are the nutrient that people with diabetes need to be most concerned about for blood sugar regulation.**   (Protein and fat should be considered as far as over-all health and weight issues, but they do not have a dramatic effect on blood sugars, and so do not need to be "counted".) All persons with diabetes are encouraged to consult with a dietitian for the correct meal plan for their individual needs and preferences.

Most students in our schools are using the carbohydrate counting method (carb counting) for their meal plans. This system is more flexible, and can include sweets as long as they are counted as part of the total carbohydrate intake for the day. This does not condone a sugar free-for-all. **It means that foods containing sugar can be substituted for other carbohydrate foods in a meal or snack.**

For example, on the nutrition label for a loaf of bread, the label says that one slice of bread contains 15 grams of carbohydrate. If you ate one serving you would have one slice, or 15 grams of carbohydrate. If you decide to make a sandwich, you would have 2 slices of bread, or 30 grams of carbohydrate. You would now have 2 carb choices, since one carb choice always = 15 grams of carbohydrate.

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1 carbohydrate choice = 1 starch exchange (15 grams)
or 1 fruit exchange (15 grams)
or 1 milk exchange (12 grams)

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1 carbohydrate choice = 15 grams carbohydrate.

A "free" food is any food or drink that contains less than 20 calories and 5 grams or less of carbohydrate per serving.

Examples of very different meals with 3 carb choices are:

#1	Grams of Carbohydrate	Carb Choices
¾ cup dry cereal	21	1
Carton white milk	11	1
1/2 banana	14	1
Total	46	3

#2	Grams of Carbohydrate	Carb Choices
1 slice cheese pizza	30	2
1 small bread stick	19	1
Lettuce salad with no cal drsg.	Free	0
Total	49	3

#3	Grams of Carbohydrate	Carb Choices
1 ½ cups chicken stir fry	Free	0
2/3 cup rice	35	2
½ piece cake	14	1
	49	3

If a student is on a <u>flexible</u> meal plan, he can eat however many carbohydrates he chooses, and he then adjusts his insulin dose accordingly. He gives himself more insulin if he eats more carbohydrates and less if he eats fewer carbohydrates, according to his prescribed carb:insulin formula.

If a student is on a <u>fixed</u> dose of insulin, he will have a specified amount of carbohydrates for each meal and snack. His meal plan may call for:
- Breakfast: 4 carb choices
- Snack: 1 carb choice
- Lunch: 4 carb choices

4 carb choices equals 60 grams of carbohydrate. (15 grams in each carb choice x 4 carb choices). To make a meal, count up the total grams of carbohydrate, mixing and matching until you end up with food the child will eat that equals approximately 60 grams of carbohydrate.

For example for breakfast, the child could have either one of the following:

#1	Grams of Carbohydrate	Carb Choices
2 cereals	17 x 2 = 34	2
1 carton of white milk	11	1
1 orange juice	15	1
Total	60	4

#2	Grams of Carbohydrate	Carb Choices
1 cereal	17	1
1 carton of white milk	11	1
2 orange juices	15 x2 = 30	2
Total	58	4

For a snack he could have one of the following snacks which each equal 1 carb choice:

#1	Grams of Carbohydrate	Carb Choices
1 small package of raisins	15	1

#2	Grams of Carbohydrate	Carb Choices
1 granola bar	19 grams	1

#3	Grams of Carbohydrate	Carb choices
1 small apple	15 grams	1

For lunch the school menu calls for:

	Grams of Carbohydrate	Carb choices
Cheese pizza, 1 slice	30	2
Baby carrots	3	0
Pineapple tidbits, ¼ cup	47	3
Peanut butter cookie	14	1
White Milk	11	1
Total	105	7

But if the child can only have 60 grams of carbohydrates or 4 carb choices, he will not be able to eat everything on the menu. He could have one of the following lunches depending on what he likes:

#1	Grams of Carbohydrate	Carb Choices
1 slice pizza	30	2
Carrots	3	0
Peanut butter cookie	14	1
White milk	11	1
Total	58	4

(Skips pineapple)

#2	Grams of Carbohydrate	Carb Choices
½ slice pizza	15	1
Carrots	3	0
¼ cup pineapple tidbits	47	3
Total	65	4

(Only has ½ pizza and skips the cookie)

#3	Grams of Carbohydrate	Carb Choices
1 slice pizza	30	2
Carrots	3	0
1/8 cup pineapple tidbits	24	1 1/2
½ carton white milk	6	1/2
Total	63	4

(Skips cookie, eats ½ of the pineapple serving, and drinks ½ of the milk)

This "carb counting" method takes away some of the rigidity of the old meal plans for people with diabetes. It allows them to eat almost any foods, but the carbohydrates need to be counted and the insulin given accordingly. The insulin is matched to the number of carbohydrates eaten, instead of having the carbohydrates matched to the insulin. Eating the carbohydrates at consistent times throughout the day gives the body the energy it needs. Wide swings in blood sugars can be decreased by creating a balance between the carbohydrates eaten and the insulin given.