WaterlooWellington DIABETES

An Easy Guide to Carb Counting

What is "Carb" Counting?

Carb (carbohydrate) Counting is a meal planning method for people with diabetes. It focuses on the amount of carbohydrates being eaten.

Why Should You Count Carbs?

Energy in food comes from 3 sources: carbohydrate, protein and fat. When you eat foods with carbs, they are broken down by the body into blood sugar. The amount of carbs you eat will determine how high you blood sugar will rise after a meal or snack.

Food (carbohydrate) is one of the factors that affect blood sugar levels (stress, activity, alcohol and illness do too). By being more consistent with your carbohydrate intake, you can help reduce the variability in your blood sugars.

Counting carbohydrates also allows you to add flexibility to your food choices without compromising your blood sugar control. You can choose foods according to your likes/dislikes, appetite and health goals.

At meals and snacks, insulin doses are matched to the amount of carb you choose to eat. The dose of insulin you take before food is based on your current blood sugar level, your target blood sugar before a meal and the amount of carb you are about to eat.

At first, it takes a little work (record keeping) but many people find the results worth the effort. If you think carbohydrate counting may help you, read on….

Steps to Carb Counting

Level 1: Learning to Count Carbs

Step 1: Record your food intake for 3 days.

Try to be as detailed as possible, including everything that you eat and drink at meals and snacks. Remember to write down the portion sizes. Measuring items like cereal, rice, pasta, juice or milk are very important.

After you have recorded your food intake for 3 days, read on……

Step 2: Identify carb containing foods.

Knowing which foods contain carbohydrate and knowing the amounts found in different portions is very important.

Where Are Carbohydrates Found?

The following food groups contain carbohydrates:

- Grains and Starches
  -rice, potatoes, bread, pasta, cereal
  -dried or canned beans, peas, lentils, corn
  -crackers, cookies, popcorn, pie crust, chips, pretzels
  -anything made with flour

- Fruits

- Vegetables
  Most vegetables are classified as “extra or free” as they contain very little carbohydrate and do not need to be counted as part of your carb intake.

  However:
  Peas, parsnips, and winter squash, provide 15 g carbohydrate per 1 cup serving.

- Milk and Alternatives

- Sugar and sugar containing foods (jam, candy, pop, chocolate, ice cream, cake, pie)

What About Protein and Fat?

Protein and fat **do not** raise your blood sugar levels like carbohydrate does. That's why you don't have to count them. But remember, they still have calories and fat and will increase your weight and blood cholesterol if eaten in excess. Examples of protein and fat foods include:

meat	eggs	salad dressing
chicken	bacon	mayonnaise
fish	gravy	butter, margarine, oil
cheese	nuts, seeds	sour cream

Now take a second to look at your food diary. Circle all the foods that contain carbohydrates.

Step 3: Calculate the grams of carbohydrate in the foods you ate.

After you know which food groups contain carbohydrates, the next step is to find out the amount of carbohydrates each food contains.

Using the sources suggested below, your next task is to find out how many carbohydrates are in each of the foods you circled on your food diary.

Where Do You Find the Carbohydrate Information?

(1) Label Reading

This gives you the most accurate information. Nutrient labels are mandatory in Canada. They all follow the same standard format.

Tip ⟶ Look on the **Nutrition Facts Panel** for the word serving size.

Be sure that you use the correct serving size. The serving size on the label may not be the same as the serving size you actually eat!!

For example:

Triscuit Thin Crisps

Nutrition Facts
Per 10 crackers
Calories 90
Fat 3.5 g
Carbohydrates 13 g ←
Fibre 2 g
Sugars 0 g
Starch 11 g
Protein 2 g

Tip → Only look at the word **carbohydrates.** Fibre, sugars and starch all make up part of the **total** carbohydrates.

If you ate 20 crackers = 13 g of carb x 2 servings = 26 grams carb.

Note: Fibre does not raise blood sugars and should be subtracted from the total carbohydrates.
Therefore the **available carbs (**the carbs that affect your blood sugar) = 26 – 4 = 22 g

Sometimes you may not have the food package. There are books, apps and web sites which list the carbohydrate content of foods found in the grocery store and at some restaurants.

<u>Sources that might help you include:</u>
Books
My Calorie Counter. Maureen Namkoong. Sterling, NY; 2014.

The Calorie King Calorie, Fat and Carbohydrate Counter. Allan Borushek. 2015.

The Complete Food Counter 4th ed. Nolan & Heslin. Pocket Books Health. 2012.

The Corinne T. Netzer Carbohydrate Counter. Netzer C., Dell Publishing; N.Y; 2002.

The Ultimate Calorie, Carb and Fat Gram Counter. Holzmeister LA., American Diabetes Association; 2011.

Beyond the Basics: Meal Planning for Healthy Eating. Canadian Diabetes Association; Toronto
Poster and Binder resource available from: orders.diabetes.ca

Websites
www.calorieking.com

Nutrient Value of Some Common Foods
http://www.hc-sc.gc.ca/fn-an/nutrition/fiche-nutri-data/nutrient_value-valeurs_nutritives-tc-tm-eng.php

BC Children's hospital
Food by percent and carbohydrate content of various foods
http://www.bcchildrens.ca/health-info/coping-support/diabetes

Restaurant websites, look for the nutrition information (eg. Swiss Chalet, Tim Horton's)

Apps
Apps are constantly being changed. This list provides some food related apps available in Canada as of September 2015.

	iPhone	Android	Cost
Calorie Counter & diet tracker by My Fitness Pal	X	X	
Calorie King Food Search	X		
Calorie Counter by My Net Diary	X		
Diet and Calorie Tracker by Sparks People		X	
Calorie Counter by Fat Secret	X	X	
Canadian Fast Food Calorie	X		$3.49
Carbs & Cals	X	X	$4.99

(2) Choice System

For foods that do not have nutrition information, you may find the "Choice System" helpful.

- Beyond the Basics: Meal Planning for Healthy Eating :Places foods into categories and serving sizes based on grams of carbohydrate.
  There are 2 parts to this resource:
  - poster
  - booklet

- The Choice System uses **averages** to **estimate** quantities of carbohydrate.

Food Choice	Grams of Carb in One Choice
Grains & Starches	15
Fruits	15
Milk & Alternatives	15
Other Choices (sweet foods and snacks)	15

Tip ⟶ It is often a good idea to weigh or measure certain foods until you have a good idea of portion sizes. For example, you may find measuring cereal, pasta, rice and other starchy foods with a measuring cup helpful at the beginning. Try figuring out the size of your favorite bowls, glasses etc.

☺ **Free Foods**

- A free food is any food or drink that contains less than 5 grams of carbohydrate per serving. This amount will not affect your blood sugar levels. For example, ½ cup of non-starchy vegetables or small amounts of nuts and seeds.

Vegetables		**Extras**
artichokes	eggplant	coffee/tea
asparagus	lettuce, spinach	diet pop
bean sprouts	mushrooms	spices and herbs
string beans	onions	mustard
cabbage	peppers	soy sauce
cauliflower	radish	vinegar
celery	tomato	lime juice
cucumber	zucchini	lemon juice

Example Carb Calculation:

Breakfast Day 1

Food	Portion	Grams of Carb By Choice System	Grams of Carb By Label
Toast	2 slices	30	37
Cheese	2 oz	0	0
Milk	1 cup	15	12
Apple	Medium	15	15
Margarine	1 Tbsp	0	0
Total		**60 g**	**64 g**

The "Key to Success" is Consistency

- Eating a set amount of carbohydrates at each meal and snack can help you manage your blood sugar levels throughout the day
- Eventually, you can even learn how to adjust your dose of insulin to match the amount of carbohydrate you eat.

<u>Step 4</u>: Calculate the grams of carbohydrate you ate at each meal or snack.

Go through each meal or snack in your food diary where you ate carb containing foods and total up the carbs each time.

Tip → In general, try to stay within 5 grams (plus or minus) of your carbohydrate goal at each meal time. This will make it easier to control your blood sugar levels.

<u>Step 5</u> : Calculate your target carbohydrate range at each meal.

Now it is your turn! After you have added up the amount of carbohydrates you ate at each meal and snack time (take an average over the 3 days), determine your target carbohydrate range for each meal and snack.

For example:

Breakfast:	80-90 grams	Afternoon snack:	15 – 20 grams
Lunch:	65-75 grams	Evening snack:	15 – 20 grams
Dinner:	82-92 grams		

Tip → Keeping your carbohydrates consistent at meal times, will help to decrease fluctuations in your blood sugar levels. You may need to work with a diabetes nurse to find the best match of insulin dose with your new carbohydrate range.

To help you remember your range, record below:

Breakfast_____grams of carb AM snack _____grams of carb

Lunch_____grams of carb PM snack _____grams of carb

Dinner_____ grams of carb Bedtime snack _____grams of carb

Just a reminder about healthy eating:

Although you are focusing on carbohydrates to help manage your blood sugars, don't forget about nutrition for good health. Carbohydrate quality is important too! An apple and a cookie may have the same grams of carbohydrate, but they contain very different amounts of vitamins, fibre, and fat.

For optimal heath and energy choose foods from each of the 4 food groups each day:

(1) Vegetables and Fruit
(2) Grain Products
(3) Milk and Alternatives
(4) Meat and Alternatives

If you have any questions regarding carbohydrate counting, please don't hesitate to call your dietitian for assistance.

Name:_____ Phone:_____

Level 2: Calculating Your Insulin:Carbohydrate Ratio

Congratulations!!!! Once you have mastered the first level in carbohydrate counting, you may be interested in determining how much insulin you need for changes in your regular diet. To do this, you must determine your insulin:carbohydrate ratio.

- To determine a ratio, you should have blood sugars in your desired target range. If there are large fluctuations in your blood sugar levels, the ratio will not work.

Identify meals when both before and after meal blood sugars are within target, that is:

Before meal: 4 – 7 mmol
Rise: 2 – 4 mmol 2 hours after meal
4 – 5 hours later: End up within 2 mmol of before meal blood sugar

Insulin: Carbohydrate Ratio = grams of carbohydrate at one meal time
# of units of rapid insulin at that meal time

For example: 60 grams of carbohydrate at breakfast
10 units of rapid insulin at breakfast

= 1 unit of insulin covers 6 grams of carbohydrate at breakfast

So, if you wanted to eat extra, let's say, 72 grams at breakfast you would need to take 2 extra units (12 units total) for the extra 12 grams of carbohydrate.

- The ratio for each meal may be different.
- You will need to determine a ratio for breakfast, lunch and supper.

Your Insulin: Carbohydrate Ratios:

Breakfast: _____ AM Snack: _____

Lunch: _____ PM Snack: _____

Dinner: _____ Bedtime Snack: _____

Insulin:Carb ratios can change with….

- weight gain or loss
- exercise, stress, illness
- hormonal changes ie. menstruation, puberty, menopause

If you are having difficulty determining your ratio, contact your nurse and dietitian. Experience helping others with diabetes has taught us a few tricks that might help you.

Level 3: Calculating Your Correction Dose

Now that you have a good understanding of carb counting, you can really fine-tune your blood sugars by correcting your high blood sugars.

In addition to carbohydrate counting, you can also look at your blood sugar before your meal. If it is outside of target, you can add in a correction dose (also called an insulin sensitivity factor) to your pre-meal dose of insulin.

The correction dose measures the drop in your blood sugar that occurs per unit of insulin. This calculation is based on the "100 Rule".*

First you need to add up the total amount of insulin you take in a day, your TDD (total daily dose).

My Total Daily Dose (TDD) = _____

Correction Bolus (The 100 Rule for Rapid Acting Insulin):

100 divided by the Total Daily Dose (TDD) = Your correction dose

For example: If your TDD = 25 u
100 ÷ 25 = 4
Therefore your blood sugar will drop 4 mmol with each unit of NovoRapid or Humalog. (**Correction Dose**)

For example: If your blood sugar is 10 mmol before dinner and your target blood sugar is 6 mmol
10 - 6 = 4 mmol/l
(This is the amount you want your blood sugar to drop)

Your correction factor is 1u for 4 mmol
Therefore, you need to add 1 u of insulin to your dose.
If you were going to take 5 u of insulin with your meal, based on your carbohydrate counting, you would add 1 u and give yourself 6 u.

☺ Now, it is time to calculate **your** correction dose:

My Total Daily Dose (TDD) of insulin is = _____

100 ÷ _____(TDD) = _____

My Correction Dose:
1 unit of insulin will lower my blood sugar by _____ mmol/L

Summary

We hope this guide has helped you understand the concept of carb counting. In addition to the skills you have learned so far, keep in mind that exercise, stress, and sick days all interfere with these calculations.

The general rule of thumb for exercise is to monitor your blood sugars regularly, and observe trends. Your educators will help you determine the best way to adjust your food or insulin, based on these trends.

Stress increases your blood sugars, therefore it is important to monitor and use your correction factor.

Sick days are a challenge, and you should refer to your "Sick Day Management Guidelines".

Always remember to keep in touch with your Diabetes Educators. We are there to help and support you with your day to day challenges.

Good luck!

My Diabetes Educator is: _____

Her phone number is: _____

Her email is: _____

* Walsh,J, Roberts,R, Pumping Insulin, Everything You Need for Success With an Insulin Pump, 3rd edition, Torrey Pines Press, San Diego, 2000.