Hamilton Health Sciences
PATIENT EDUCATION

Basal-Bolus Insulin and Carbohydrate Counting



Diabetes Care and Research Program

Important telephone numbers

Diabetes Clinic:	
Diabetes Specialist:	
Nurse Practitioner/Nurse:	
Registered Dietitian:	
Pharmacist:	
Family Doctor:	

Table of contents

Page

How will this class help me?

This class will help you:

1. Understand what happens in your body when you have diabetes.
2. Learn about how a basal-bolus system works.
3. Learn about how Multiple Daily Injections (MDI) work versus using an insulin pump.
4. Set goals for your diabetes control and health to reduce health risks.
5. Identify foods that contain carbohydrate, also called “carbs”.
6. Learn how to count carbs at all of your meals and snacks using a variety of tools that include “Your Guide to Carbohydrate Counting”, food labels, scales, websites and restaurant guides.
7. Describe the effect of alcohol on blood sugars.
8. Think about problems or issues you may have with your current insulin plan.
9. Commit to collecting the information you need to evaluate your insulin doses.

Take a few minutes to think about how you are doing with your diabetes care now. What problems would you like to solve or is there anything you would like to discuss?

1. _____
2. _____
3. _____
4. _____

What is a Basal-Bolus system?

A basal-bolus system includes basal (background) insulin and bolus (carbohydrate or correction dose) insulin.

When you have diabetes, you take insulin by multiple daily injections or through an insulin pump because your pancreas is unable to make enough insulin.

Both ways mimic how a healthy pancreas works by matching insulin to the food you eat and activity you do.

For the system to be successful, you must:

- test your blood sugar
- count your carbohydrates, and
- adjust your insulin doses as needed

Types of insulin

Basal insulin

- Refers to small amount of insulin that is made by your pancreas and is present all the time when you do not have diabetes.
- Keeps your blood sugar constant throughout the day and night.
- Usually makes up about ½ of the insulin that your body needs.

Basal insulin is the slow long acting insulin that provides a foundation of insulin over 24 hours.

Bolus insulin (carbohydrate or correction dose)

- Is the amount of insulin that usually is made by your pancreas in response to the carbohydrate (food) that you eat when you do not have diabetes.
- Keeps your blood sugar from rising too high after you eat (carbohydrates). Rapid acting insulins do not have their full effect as quickly as many think. They start to work almost right away, but the full effect to lower blood sugar takes longer.
- Usually makes up about ½ of the insulin that your body needs.

Bolus insulin is the fast acting insulin to work with the carbohydrate at meal and snack time.

Take bolus insulin before you eat.

Circle or highlight which basal and bolus insulin(s) you are taking.

Basal Insulin	Onset	Peak	Duration
NPH or N	1 to 3 hours	5 to 8 hours	12 to 18 hours
Lantus	90 minutes	Peakless	24 hours
Levemir	90 minutes	Peakless	16 to 24 hours
Toujeo	90 minutes	Peakless	36 hours
Tresiba	90 minutes	Peakless	42 hours

Bolus Insulin	Onset	Peak	Duration
Novorapid Humalog Apidra	10 to 15 minutes	1 to 2 hours	3 to 5 hours
Novolin (R) Humulin (R)	30 minutes	2 to 3 hours	6.5 hours
Fiasp	2 to 5 minutes	45 minutes to 1 hour	3 to 4 hours

You may need a correction dose of bolus insulin if your sugars are out of the target range. An example of this is if you are sick or did not take enough insulin the last time you ate.

Your diabetes educator can help you determine when and how to correct high blood sugar.

Total Daily Dose (TDD) comes from adding up both basal and meal (carbohydrate) bolus baseline doses.

These things may affect the action of rapid acting insulin:

- The injection site used. Insulin injected into the thigh or buttock may be slower to start working than an injection given in the abdomen.
- Scarred areas from overused injection sites (called hypertrophy) will change absorption.
- The blood flow to a site is increased with exercise or extreme heat.
- The larger the dose of insulin used, the longer the duration of insulin will be. A larger dose lowers blood sugar for a longer period of time.

How do you know if your basal-bolus insulin system is working?

1. **Your blood sugar levels are as close to target** as possible without causing many low and high blood sugars.
    - For most adults this means:
        - 4 to 7 mmol/L before meals.
        - 5 to 10 mmol/L 2 hours after meals. Between 5 to 8 is even better if you can safely get there without many low blood sugars.

2. **Your quality of life is improved:**
    - You have flexibility with food choices.
    - You can exercise without having many low blood sugars.
    - Other personal goals _____

What is my A1C?

A1C is also called glycosolated hemoglobin. A1C shows the 3 month average blood sugar level before the test was taken. You do not have to fast before this test.

When your A1C result is less than 7%, you decrease your risk of complications.

The A1C is not the same as your blood sugar results.

The Canadian Diabetes Association recommends an A1C target of 7.0% or less for most adults.

Average blood sugar level (mmol/L)	Conversion chart	A1C%
19.5		12%
17.5		11%
15.5		10%
13.5		9%
11.5		8%
9.5		7%
7.5		6%

Caring for yourself

Here is list of target levels for tests that are common for people with diabetes. Work with your health care team to find the best way to reach your target levels. Talk to your health care team if you have questions about your test results.

Keeping track of your progress is a good way to take part in your care.

Test	My values	Target Level	When to Test
A **A**$_1$C (blood test)		Less than 7%	Every 3 months
Albumin to creatinine ratio (urine test)		Less than 2.0	Once a year
B **B**lood pressure		130/80 or under	Every visit
Blood sugar (glucose)		4.0 to 7.0	Before meals
		5.0 to 10.0	2 hours after meals
Blood and urine tests for kidneys	These tests are ordered by your health care team based on your needs.		
C **C**holesterol: Total		Less than 4.2	Once a year without treatment Every 3 to 6 months with treatment
Cholesterol: LDL (Bad)		Less than 2.0	Once a year without treatment Every 3 to 6 months with treatment

Test	My values	Target Level	When to Test
Cholesterol: HDL (Good)		Greater than 1.3	Once a year without treatment Every 3 to 6 months with treatment
Cholesterol: Total to HDL ratio		Less than 4.0	Once a year without treatment Every 3 to 6 months with treatment
Cholesterol: Triglycerides		Less than 1.7	Once a year without treatment Every 3 to 6 months with treatment

Other tests

Test	What to Monitor
D **D**ental	See your dentist once a year.
Diet	Follow a healthy eating plan to help manage your health and diabetes.
E **E**yes	Have a dilated eye examination once a year, or more often if needed. This annual exam is covered by the Ontario Ministry of Health when you have diabetes.
Exercise	Fit some activity that you can do and enjoy into your life. Aim for 150 minutes of exercise each week.
F **F**eet	Check your feet daily to identify any changes/issues. Have your health care provider check your feet at every visit.

Test	What to Monitor
S	
Smoking Cessation	Talk to your health care provider about reducing/ quitting smoking when you are ready.
Stress	Talk to your health care provider about stress and mental health that might be barriers to achieving your goals.
Self-Management	Set personalized goals that you feel you can achieve to help manage your diabetes.

Back to basics

Baseline insulin doses are the basal (background) and bolus (carbohydrate) insulin doses that get your blood sugars as close to target without many low and high blood sugars.

In order to determine your baseline insulin doses, it's important to get "back to basics" for a short period of time. This will give you more flexibility later on.

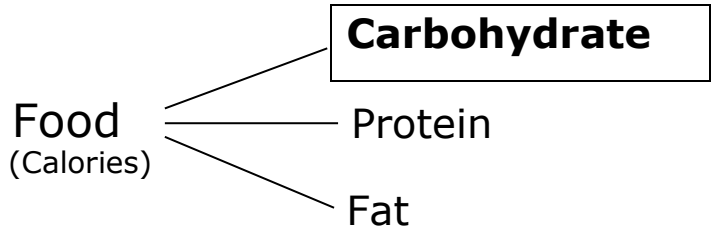
"Back to basics" means being consistent in your routine by:

- Eating meals and snacks with a consistent amount of carbohydrate or following a meal plan.
- Checking your blood sugar levels at least 4 times per day (before each meal and at bedtime) and 2 hours after meals as needed.
- Keeping activity consistent.

Understanding carbohydrate counting

What happens when you eat?

When you eat, food breaks down into carbohydrate, protein and fat.
Carbohydrates affect your blood sugar.



Carbohydrates include:

- fibre
- sugar
- starch

} increase your blood sugar

Carbohydrates are also called “carbs”.

Refer to your Guide to Carbohydrate Counting to:

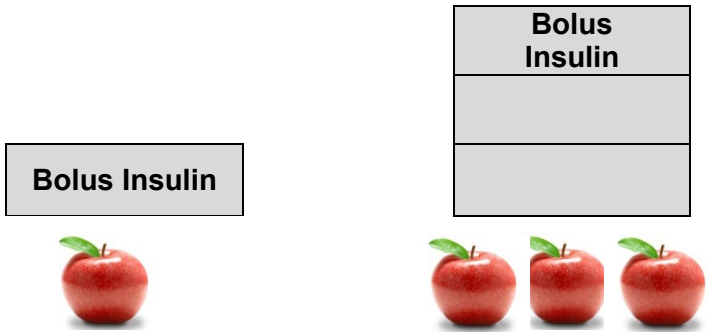
- identify foods that contain carbohydrate
- go over label reading

What is carbohydrate counting?

Carbohydrate counting is an approach to meal planning.

When you know the amount of carbohydrate in your meal, you can match the amount of bolus insulin you need to the carbohydrate that you will eat. Matching meals to insulin helps you to adjust the amount of insulin you take at each meal.

The amount of bolus insulin you will need will vary depending on the amount of carbohydrate you eat. For example, if you eat three apples, you will need three times the amount of insulin that you would need if you ate just one apple.



The more carbohydrate you eat, the more bolus insulin you need. Work with your health care team to determine your correct insulin dose.

Weight gain

One of the advantages of carbohydrate counting is flexibility of diet and lifestyle. With this flexibility, however, there is a risk of weight gain or unhealthy eating. Since you can increase your meal bolus to maintain good diabetes control, you may be tempted to treat yourself to high calorie desserts or large portions of your favourite foods. It is important for you to meet with a registered dietitian to discuss nutrition and exercise guidelines that are right for you.

Which foods contain carbohydrates?

Look at the foods in the meals and snacks below.

Place a check mark (✓) next to the foods that contain carbohydrate.

❒ corn	❒ potato
❒ sugar-free cookies	❒ honey
❒ skim milk	❒ coffee (black) with artificial sweetener
❒ green beans	❒ fish
❒ apple juice (unsweetened)	❒ chick peas
❒ french fries	❒ margarine
❒ rice	❒ crackers
❒ bread	❒ diet soda
❒ jello	❒ ice cream
❒ cereal	❒ popcorn
❒ orange	❒ peach
❒ yogurt	❒ broccoli
❒ cheese	❒ kidney beans
❒ chicken with breading	❒ gravy
❒ ketchup	❒ cashews

Practice time: label reading

How to count grams of carbohydrate on a food label:

1. Read the **Nutrition Facts**.
2. Look for serving size at the top.
3. Look for the carbohydrate grams. Subtract the fibre grams from the carbohydrate grams. This equals the available carbohydrate in the serving size.

Old Mill

Nutrition Facts	
Per 1 bagel (85 g)	
Amount	% Daily Value
Calories 220	
Fat 1.5 g	2%
Saturated 0.3 g + Trans 0 g	2%
Cholesterol 0 mg	0%
Sodium 430 mg	18%
Carbohydrate 39 g	13%
Fibre 4 g	15%
Sugars 3 g	
Protein 9g	

1. Serving size: 1 bagel
2. Carbohydrate grams: 39 g
   Subtract Fibre grams: 4 g
   = 35 grams of available carbohydrate

Dempster's

Nutrition Facts	
Per 1 bagel (90 g)	
Amount	% Daily Value
Calories 240	
Fat 2 g	3%
Saturated 0.2 g + Trans 0 g	1%
Cholesterol 0 mg	0%
Sodium 410 mg	17%
Potassium 60 mg	2%
Carbohydrate 47 g	16%
Fibre 2 g	8%
Sugars 4 g	
Protein 8 g	

1. Serving size: _____
2. Carbohydrate grams: _____
   Subtract Fibre grams: _____
   = ___ grams of available carbohydrate

Country Harvest

Nutrition Facts	
Per 1/2 bagel (56 g)	
Amount	% Daily Value
Calories 150	
Fat 1 g	2%
Saturated 0.2 g + Trans 0 g	1%
Cholesterol 0 mg	
Sodium 340 mg	14%
Potassium 75 mg	2%
Carbohydrate 30 g	10%
Fibre 1g	5%
Sugars 3 g	
Protein 5 g	

1. Serving size: _____
2. Carbohydrate grams: _____
   Subtract Fibre grams: _____
   = ___ grams of available carbohydrate

If I eat a whole bagel

= _____ grams available carbohydrate

More on Nutrition Labels

Example 1

Nutrition Facts
Ice Cream Bar
Per bar (80 g)
Amount
Calories 210
Carbohydrate 21 g
Fibre 2 g
Sugars 17 g

Carbohydrate: ____ **g**
Subtract Fibre: – ____ **g**
Available carbohydrate = ____ **g**

Example 2

Nutrition Facts
No Sugar Added Ice Cream Bar
Per 1 Bar (77 g)
Amount
Calories 210
Carbohydrate 20 g
Fibre 1 g
Sugars 8 g
Sugar Alcohol 6 g

Carbohydrate: ____ **g**
Subtract Fibre: – ____ **g**
= ____ **g**
Subtract Sugar Alcohol – ____ **g**
Available carbohydrate = ____ **g**

Combination foods

How much carbohydrate (carbs)?

Example 1

Minestrone soup (2 cups)

¼ cup kidney beans		____ g
¼ cup pasta		____ g
¾ cup vegetable stock		____ g
¼ cup stewed tomatoes		____ g
¼ cup carrots		____ g
¼ cup corn		____ g
Salt and pepper		____ g
Italian seasoning		____ g
1 tbsp onion		____ g
Total carbohydrate:	**=**	**____ g**

Example 2

1 small pizza slice

Crust	____ g
Sauce	____ g
Cheese	____ g
Pepperoni	____ g
Mushrooms	____ g
Peppers	____ g

Total carbohydrate: = ____ g

How many slices would I eat? _____

Total amount of carbohydrate:
____ slices x ____ g carbohydrate per slice = ____ g carbohydrate

Non-calorie sweeteners

Non-calorie sweeteners do not contain carbohydrates and do not affect blood sugar levels.

Common names for non-calorie sweeteners	
Generic name	**Trade name**
Acesulfame Potassium	Ace-K
Aspartame	Equal, Nutrasweet
Cyclamate	Sucaryl, Sugar Twin, Sweet N Low
Saccharin	Hermesetas
Sucralose	Splenda
Steriol Glycosides	Stevia, Truvia, Krisda, Pure Via

Eating out

Using measuring cups to measure your portions when eating at home will make carbohydrate counting much easier when eating out. Many restaurants, including fast food chains, provide nutrient information for their food items. If the carbohydrate content is not available, refer to a carbohydrate counting resource (book or website) and use it to find the food and the grams of carbohydrate.

Eating out exercise

1. Take a guess at the carbohydrate content when eating out.

2. Use nutritional information from restaurant to determine actual carbohydrate content.

Typical meal when eating out:

Food or drink and amount	Guess carbohydrate content	Actual carbohydrate content	Difference

Counting carbohydrates at restaurants

Many restaurants have nutrition information on their websites.

Do a Goggle search for the restaurant when you are looking for information about carbohydrates.

Search the “name of the restaurant” and the words “nutrition information” to find the carbohydrates.

Diabetes and alcohol

If you wish to drink alcohol when you have diabetes, you will need to ask your doctor these questions:

- Can I drink alcohol?
- How much should I drink?
- What can I drink?

Do not drink alcohol without talking to your doctor.
He or she knows your medical history, and how well your diabetes is controlled. Your doctor will let you know if you can have alcohol.

Once you know you can drink alcohol, it is important to learn about:

- The effect of alcohol on the control of your diabetes.
- How to avoid running the risk of having a low blood sugar.

> You must be 19 years of age or older to legally drink alcohol in Ontario.

How does alcohol affect my diabetes?

The alcohol moves from your stomach into your blood.

The liver starts to break it down.

If you drink alcohol faster than the liver is able to break it down, the alcohol builds up in your blood.

When your blood alcohol level is high, your liver will work very hard to lower it.

If in addition to drinking alcohol, your blood sugar goes low from lack of food or from extra activity like dancing, the pancreas will make a hormone called glucagon.

Glucagon causes the liver to make more sugar. If the liver is too busy breaking down the alcohol, it will **not react** to the glucagon to make more sugar.

The symptoms of low blood sugar can look like the signs of being drunk.

You and people around you may not even realize that your blood sugar is low.

If your blood sugar goes too low, you can become unconscious.

Glucagon by injection may not work if you have been drinking a lot of alcohol.

How do I help to prevent the risks?

Tips to drink alcohol safely:

- Follow your normal diabetes routine such as testing, taking insulin or other medications and regular meals. This will help you keep your blood sugars stable.
- Wear a bracelet showing you have diabetes and tell the people in your life that you have diabetes. Let them know the symptoms of a low blood sugar and what to do if it happens.
- Always carry:
    - your glucometer and test your sugar, especially if you start to feel the symptoms of low blood sugar.
    - a source of simple carbohydrate with you (such as hard candies, juice box, dextrose tablets) and tell people where it is.
- If you are going to drink alcohol, have it with food. Be sure to eat more if you are active, such as dancing.
- **Never take extra insulin for alcohol.**
- Drink slowly - this will prevent alcohol build-up in your blood.
- Stretch drinks with mixers that do not contain carbohydrates such as diet pop, water and soda water.
- Alternate alcoholic and non-alcoholic drinks.
- Limit your drinks to 1 or 2 at one time. Take no more than 14 drinks/week for a man and 9 drinks/week for a woman.
- Test your blood sugar before going to bed. If it is low, eat a snack with carbohydrate before you go to bed.
- When you wake up, follow your normal diabetes routine such as testing, taking insulin or other medications and regular meals. Carry a source of simple carbohydrate with you even after breakfast, because there is still a risk of low blood sugar.

Carbohydrate and alcohol content of selected drinks

Drink	Carbohydrate Content	Alcohol Content	Calorie Content
12 oz Regular Beer (5 to 6% alcohol)	10 to 13 g	15 g	135 to 150 kcal
12 oz Light Beer (3 to 4% alcohol)	5 to 9 g	10 to 11 g	90 to 120 kcal
12 oz Low Carb Beer, such as Sleeman Clear (4% alcohol)	2.5 g	11 g	90 kcal
1 ½ oz Whiskey, Rye, Scotch, Gin, Rum, Vodka	0 g	15 g	105 kcal
1 ½ oz Brandy or Cognac	0 g	15 g	105 kcal
5 oz Dry Red or White Wine (0)	0 g	13 g	100 kcal
3 oz Dry Sherry	0 g	15 g	105 kcal
12 oz Wine Cooler	30 to 43 g (flavours vary)	13 g	200 to 280 kcal

Never take extra insulin for alcohol.

Holiday Time – Let's Count Carbs

Let's put a meal together.

Now practice filling in the carbohydrate content of the following meals. Use a carbohydrate counting guide to look up the carbohydrate content of this meal.

Food	Carbohydrate
3 oz turkey	_____ grams
2 tbsp gravy	_____ grams
1 cup mashed potatoes	_____ grams
1 tbsp cranberry sauce	_____ grams
1 small dinner roll	_____ grams
1 tsp margarine	_____ grams
½ cup cooked asparagus	_____ grams
½ cup peas and carrots	_____ grams
½ cup stuffing	_____ grams
5 oz glass of wine or 1 bottle of beer (341 ml)	_____ grams
1 slice of pie	_____ grams
Total Carbohydrate:	**_____ grams**

Carbohydrate consistency

We encourage you to be consistent with the amount of carbohydrate that you eat at each of your meals and match it with set insulin doses. Carbohydrate consistency is important to determine or assess your carbohydrate to insulin ratio.

Your dietitian can help you set carbohydrate goals.

Let's carb count! Sample carbohydrate counting

Food	Portion size	Grams of carbohydrate
Example – sandwich lunch		
Bread, whole wheat	2 slices	30 g
Chicken breast	2 oz	0 g
Margarine	1 tsp	0 g
Carrot sticks	½ cup	4.5 g
Green grapes	½ cup	15 g
Milk	1 cup	15 g
Tea/coffee	1 cup	0 g
Total		**64.5 g**

Sample day carbohydrate counting:

Food amount/type	Grams carbohydrate
Breakfast:	
1 ½ cups steel cut oats (cooked)	_____
2 tsp artificial sweetener	_____
2 TBSP slivered almonds	_____
½ cup milk 1%	_____
½ cup blueberries	_____
1 ½ cups coffee	_____
1 tsp cream	_____
Total =	_____
Lunch:	
1 ½ cups chicken noodle soup - Tim Hortons	_____
1 plain tea biscuit – Tim Hortons	_____
1 pat butter	_____
3 chocolate Timbits – Tim Hortons	_____
Bottle of water	_____
Total =	_____
Supper (circle your portion):	
1 cup OR 2 cups OR 3 cups cooked spaghetti	_____
½ OR 1 OR 1 ½ cups spaghetti sauce	_____
1 OR 2 TBSP parmesan cheese	_____
2 cups tossed salad (include 3 cucumber slices, 2 cherry tomatoes)	_____
2 TBSP oil/vinegar dressing	_____
2 small bagette slices	_____
1 glass (5 oz) red wine	
Total =	_____
Bedtime snack:	
13 Mary's original crackers	_____
5 baby carrots	_____
1 oz cheese	_____
½ cup guacamole	_____
Diet pop	_____
Total =	_____

How many carb choices do I include at each meal or snack?

These are general guidelines for healthy eating. Ask your dietitian about how many carb choices are right for you.

Small appetites:

- Include 2 to 3 carb choices (30 to 45 grams of carbohydrate) at each meal.
- Include 1 carb choice (15 grams of carbohydrate) at each snack (if needed).

Medium appetites:

- Include 3 to 4 carb choices (45 to 60 grams of carbohydrate) at each meal.
- Include 1 carb choice (15 grams of carbohydrate) at each snack (if needed).

Large appetites:

- Include 4 to 5 carb choices (60 to 75 grams of carbohydrate) at each meal.
- Include 1 to 2 carb choices (15 to 30 grams of carbohydrate) at each snack (if needed).

Smartphone applications for on-the-go diabetes management

Calorie Counters

MyFitnessPal

An app for calculating your daily physical activities as well as calories consumed. Creates a balance of calories in vs. calories out for each day, so you know whether you will be gaining or losing weight.

Use this app to:

- Add cardio or strength activities to find out calories burned, and track weekly activity.
- Add food to keep a food diary and track calories consumed.
- Tracks your progress against your goal.
- Imperial measures.
- Download into the Myfitnesspal website, and sign into your created account from anywhere.

Note: Available activities (other than walking) are fairly rigorous, such as sports and weight lifiting. App is for a reasonably active person.

Compatibility: Apple, Android, Microsoft.

Lose It! (free)

This app allows you to track your food and daily activity.

Use this app to:

- Track food intake easily with a food database that includes restaurants, grocery stores and brand name items.
- Track daily calories, protein, carbohydrates and fat.
- Set weight loss goals. View your progression on a graph.
- Use the barcode scanner on food products to help make tracking easy.

Compatibility: Apple, Android.

Carbohydrate Counting

Carb Counting With Lenny! (free)

This app will help you learn about foods with carbohydrate and carbohydrate counting.

Use this app to:

- Review carbohydrate amounts and serving sizes for commonly consumed foods with the quick reference guide.
- Play interactive games to help reinforce carbohydrate counting.

Compatibility: Apple, Android.

Daily Carb (free)
This app tracks carbohydrate intake. It can help you reach your daily carbohydrate targets.

Use this app to:

- Input the foods you eat at each meal to track your daily carbohydrate intake.
- Create your own custom foods and input recipes for easy tracking.
- Tracks water intake and body weight.
- Email your carbohydrate food logs.

Compatibility: Apple, Android.

Carb Master (free)
This app tracks carbohydrate intake. It can help you reach your daily carbohydrate targets.

Use this app to:

- Input the foods you eat at each meal to track your daily carbohydrate intake.
- Create your own custom foods for easy tracking.
- Calculate net carbohydrates
- Track your body weight.

Compatibility: Apple.

HelpDiabetes (free)
This app tracks your carbohydrate intake, exercise, blood glucose and medications.

Use this app to:

- Track the foods you eat by selecting items from a database with a wide variety of items.
- Input your blood glucose readings, activity and medications over time.

Note: This app allows you to search for specific foods and track what carbohydrates you ate, but will not produce any graph or reports.

Compatibility: Apple, Android.

Carb On (free)
An app that determines the total number of carbohydrates through your input of the foods and amount consumed.

Use this app to:

- Input the foods you eat at each meal, and the app will give you the total grams of carbohydrate eaten at the meal.
- Save your inputted maximum carbohydrate intake per day depending on your gender, age, and activity level.
- Export daily consumption date to your email address.

Compatibility: Microsoft.

Resources

Nutrient content

https://food-nutrition.canada.ca/cnf-fce/index-eng.jsp

https://ndb.nal.usda.gov/ndb/search/list

https://www.calorieking.com/foods/

https://www.eatracker.ca/

https://supertracker.usda/gov

https://www.myfitnesspal.com

Recipe analysis

https://www.eatracker.ca/recipe_analyser.aspx

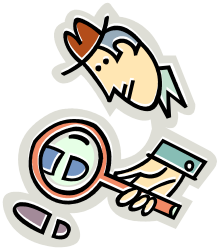
https://recipes.sparkpeople.com/recipe-calculator.asp

https://supertracker.usda.gov/myrecipe.aspx

https://www.calorieking.com/ (need to become a member to use recipe analyzer)

https://www.myfitnesspal.com/

Be a diabetes detective!



For 3 to 5 days (in a row), write down these in your “Food and Diabetes Log Book”.

1. **What you eat and drink and the time of day:**
    - Be sure to note the portion sizes. You may need to use measuring cups and food scales to be accurate.
    - Record the grams of carbohydrate in all your foods and drinks.

2. **Your insulin doses:**
    - Write down each time you take insulin (meal and correction) and include the dose.

3. **Your blood sugar levels:**
    - Test your blood sugar levels at least 4 times per day (before each meal and at bedtime).
    - If you are worried about low blood sugar levels at night, you may want to check your blood sugar at 3 am.

4. **Comments:**
    - Use this section to include details about your activity (what, when, how long), level of stress, illness or eating out.

Answers

Page 13
Which foods contain carbohydrates?

✓ corn	✓ potato
✓ sugar-free cookies	✓ honey
✓ skim milk	coffee (black or with artificial sweetener)
✓ green beans	fish
✓ apple juice (unsweetened)	✓ chick peas
✓ french fries	margarine
✓ rice	✓ crackers
✓ bread	diet soda
✓ jello	✓ ice cream
✓ cereal	✓ popcorn
✓ orange	✓ peach
✓ yogurt	✓ broccoli
cheese	✓ kidney beans
✓ chicken with breading	✓ gravy
✓ ketchup	✓ cashews

Practice time: label reading

Answer Sheet: Page 14

How to count grams of carbohydrate on a food label:

1. Read the **Nutrition Facts**.
2. Look for serving size at the top.
3. Look for the carbohydrate grams. Subtract the fibre grams from the carbohydrate grams. This equals the available carbohydrate in the serving size.

Old Mill

Nutrition Facts	
Per 1 bagel (85 g)	
Amount	% Daily Value
Calories 220	
Fat 1.5 g	2%
Saturated 0.3 g + Trans 0 g	2%
Cholesterol 0 mg	0%
Sodium 430 mg	18%
Carbohydrate 39 g	13%
Fibre 4 g	15%
Sugars 3 g	
Protein 9g	

1. Serving size: 1 bagel
2. Carbohydrate grams: 39 g
   Subtract Fibre grams: 4 g
   = 35 grams of available carbohydrate

Dempster's

Nutrition Facts	
Per 1 bagel (90 g)	
Amount	% Daily Value
Calories 240	
Fat 2 g	3%
Saturated 0.2 g + Trans 0 g	1%
Cholesterol 0 mg	0%
Sodium 410 mg	17%
Potassium 60 mg	2%
Carbohydrate 47 g	16%
Fibre 2 g	8%
Sugars 4 g	
Protein 8 g	

1. Serving size: 1 bagel
2. Carbohydrate grams: 47 g
   Subtract Fibre grams: 2 g
   = 45 grams of available carbohydrate

Country Harvest

Nutrition Facts	
Per 1/2 bagel (56 g)	
Amount	% Daily Value
Calories 150	
Fat 1 g	2%
Saturated 0.2 g + Trans 0 g	1%
Cholesterol 0 mg	
Sodium 340 mg	14%
Potassium 75 mg	2%
Carbohydrate 30 g	10%
Fibre 1g	5%
Sugars 3 g	
Protein 5 g	

1. Serving size: 1 bagel
2. Carbohydrate grams: 30 g
   Subtract Fibre grams: 1 g
   = 29 grams of available carbohydrate

If I eat a whole bagel
= 58 grams available carbohydrate

Page 15
Nutrition Labels

Example 1

Nutrition Facts
Ice Cream Bar
Per bar (80 g)
Amount
Calories 210
Carbohydrate 21 g
Fibre 2 g
Sugars 17 g

Carbohydrate: 21 **g**
Subtract Fibre: – 2 **g**
Available carbohydrate = 19 **g**

Example 2

Nutrition Facts
No Sugar Added Ice Cream Bar
Per 1 Bar (77 g)
Amount
Calories 210
Carbohydrate 20 g
Fibre 1 g
Sugars 8 g
Sugar Alcohol 6 g

Carbohydrate: 20 **g**
Subtract Fibre: – 1 **g**
= 19 **g**
Subtract Sugar Alcohol – 6 **g**
Available carbohydrate = 13 **g**

Page 16
Combination foods

How much carbohydrate (carbs)?

Minestrone soup (2 cups)

¼ cup kidney beans	7.50	g
¼ cup pasta	7.50	g
¾ cup vegetable stock	0	g
¼ cup stewed tomatoes	3.25	g
¼ cup carrots	2.25	g
¼ cup corn	7.50	g
Salt and pepper	0	g
Italian seasoning	0	g
1 tbsp onion	0	g
Total carbohydrate:	**= 28.0**	**g**

Page 17
1 small pizza slice

	Thin crust	Thick crust
Crust	15 g	30 g
Sauce	8 g	8 g
Cheese	0 g	0 g
Pepperoni	0 g	0 g
Mushrooms	0 g	0 g
Peppers	0 g	0 g
Total carbohydrate	**23 g**	**38 g**

Page 25
Holiday Time – Let's Count Carbs

Food	Carbohydrate
3 oz turkey	0 grams
2 tbsp gravy	3 grams
1 cup mashed potatoes	30 grams
1 tbsp cranberry sauce	8 grams
1 small dinner roll	15 grams
1 tsp margarine	0 grams
½ cup cooked asparagus	4 grams
½ cup peas and carrots	6 grams
½ cup stuffing	15 grams
5 oz glass of wine or 1 bottle of beer (341 ml)	0 grams
1 slice of pie	45 to 60 grams
Total Carbohydrate:	**126 to 141 grams**

Page 27
Sample day carbohydrate counting

Food amount/type	Grams carbohydrate
Breakfast:	
1 ½ cups steel cut oats (cooked)	30
2 tsp artificial sweetener	0
2 TBSP slivered almonds	2
½ cup milk 1%	8
½ cup blueberries	8
1 ½ cups coffee	0
1 tsp cream	0
Total =	**48**
Lunch:	
1 ½ cups chicken noodle soup - Tim Hortons	18
1 plain tea biscuit – Tim Hortons	34
1 pat butter	0
3 chocolate Timbits – Tim Hortons	30
Bottle of water	0
Total =	**82**
Supper (circle your portion):	
1 cup OR 2 cups OR 3 cups cooked spaghetti	30 or 60 or 90
½ OR 1 OR 1 ½ cups spaghetti sauce	15 or 30 or 45
1 OR 2 TBSP parmesan cheese	0
2 cups tossed salad (include 3 cucumber slices, 2 cherry tomatoes)	0 to 4
2 TBSP oil/vinegar dressing	0
2 small bagette slices	8
1 glass (5 oz) red wine	0
Total =	**depends on portions**
Bedtime snack:	
13 Mary's original crackers	18
5 baby carrots	5
1 oz cheese	0
½ cup guacamole	3
Diet pop	0
Total =	**26**

Your next appointment

Bring your “Food and Diabetes Log Book” to your next appointment with the dietitian:

Date and time: _____

Your dietitian will help you fine tune your baseline insulin doses and work with you to:

- set carbohydrate goals at your meals and snacks
- determine an insulin to carbohydrate ratio
- set blood sugar targets that work for you
- give you an insulin sensitivity factor
- evaluate your basal insulin dose

PD 8110 – 04/2019
dpc/pted/lrgbk/DiabetesBasalBolusInsulinCarbCount-trh.docx
dt/April 9, 2019