Hôpital de Montréal pour enfants
Centre universitaire de santé McGill

Montreal Children's Hospital
McGill University Health Centre

Carb Counting Quiz

Before you begin administering multiple daily injections of insulin (MDI) or using an insulin pump to manage diabetes, you will need to become comfortable with advanced carbohydrate counting. Your insulin doses will be based on *insulin-to- carbohydrate-ratios,* so it is important that you can accurately estimate the *available carbohydrate ratio* in the meal or snack that you will be eating. You will also need to have an idea of the *glycemic index, or* speed at which different carbohydrate-based foods make glucose in your body when mixed with protein, fat and fiber. The following 15 questions are meant to help you gain the understanding and skills you will need to successfully administer MDI, or to use insulin pump therapy.

To complete this quiz, you will need to be comfortable reading and interpreting the nutrition facts table found on a variety of food products. Health Canada provides a useful how-to guide on this topic, as well as an Interactive Nutrition Label Quiz. Health Canada also has an on-line database of foods called the Canadian Nutrient File or CNF that can be consulted to determine nutrient values of a variety of food products and a downloadable resource entitled *The Nutrient Value of Some Common Foods* that lists 19 nutrients for 1000 of the most commonly consumed foods in Canada. Lastly, the Montreal Children's Hospital's Insulin Pump Centre has created a number of tools that may also be of assistance, and are available on their webpage.

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1. **Of the following food options, which, if taken in, would quickly raise blood glucose levels if they were low?**
   a. **½ can (6 fl.oz, 180 ml) of diet pop**
   b. **3 - 4 Dex4® glucose tablets**
   c. **1 tube (31 g) of « Insta-Glucose®»**
   d. **A fun-sized mini bag (15 g, 15 pieces) of Skittles®**
   e. **½ c (4 oz, 120 ml) of orange or apple juice**

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2. Which of the following vegetables is *not considered « free »* if you eat less than ½ c (125 ml)?
   a. Carrots
   b. Celery
   c. Peas
   d. Broccoli
   e. Tomatoes

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3. Which of the following snacks *does not* require an injection or a bolus of insulin to regulate blood sugar levels?
   a. 1 cup (8 oz, 250 ml) of 1% milk
   b. 1 cup (8 oz, 250 ml) of chili
   c. 1 « tall » (12 oz, 385 ml) Starbucks® iced latte
   d. **1 serving (3 spears) of broccoli with lemon vinaigrette**
   e. **1 handful (1 cup) of grapes**

4. Which of the following snacks contains the greatest amount of carbohydrates per serving?
    a. 2 cups (500 ml) of strawberries
    b. 1 bottle (16 oz, 480 ml) of Nestea® **Iced Tea**
    c. **2 Oreo® cookies**
    d. ½ cup (3,3 oz, 100g) Dairy Queen® **Soft Serve Chocolate ice cream**
    e. **4 medium pieces of California roll sushi**

5. Jeremy wants to have a small bag of chips. At the store, he compares the labels for a bag of regular and a bag of baked chips. Based on a comparison of these labels, please indicate which statement is false:
    a. Both chips are high in salt.
    b. Regular chips are high in fat.
    c. Both chips are low in protein.
    d. Baked chips are lower in energy (calories)
    e. Regular chips require more insulin

REGULAR	
Nutrition Facts /Valeur nutritive Per 1 bag (43 g)Pour 1 sac (43 g)	
Amount **Teneur**	**% Daily Value** **% valeur quotidienne**
Calories /Calories 225	
Fat / Lipides 15 g	24%
Saturated / Saturés 1.5 g + Trans / trans 0 g	9 %
Cholesterol / Cholestérol 0 mg	
Sodium / Sodium 500 mg	20%
Carbohydrate / Glucides 22 g	8%
Fibre / Fibres 1 g	6%
Sugars / Sucres 0 g	
Protein / Protéines 3 g	
Vitamin A/Vitamine A 0%	Calcium/Calcium 0%
Vitamin C/Vitamine C 15%	Iron/Fer 3%

BAKED	
Nutrition Facts /Valeur nutritive Per 1 bag (43 g)Pour 1 sac (43 g)	
Amount **Teneur**	**% Daily Value** **% valeur quotidienne**
Calories /Calories 165	
Fat / Lipides 2.3 g	3%
Saturated / Saturés 0 g + Trans / trans 0 g	0%
Cholesterol / Cholestérol 5 mg	
Sodium / Sodium 500 mg	20%
Carbohydrate / Glucides 35 g	12%
Fibre / Fibres 3 g	9%
Sugars / Sucres 3 g	
Protein / Protéines 3 g	
Vitamin A/Vitamine A 0%	Calcium/Calcium 6%
Vitamin C/Vitamine C 3%	Iron/Fer 3%

6. Chantal is a member of a soccer team. Her nutritionist recommends that she take in 15 g of carbohydrates for every 30 minutes of exercise she performs. Which of the following food options *does not* contain this amount of carbohydrates?
    a. 1 cup (8 oz, 240 mL) of Gatorade®
    b. **½ cup (4 oz, 125 mL) of unsweetened apple juice**
    c. **1 medium orange**
    d. **1 small can (8½ oz, 250 mL) Red Bull®**
    e. **4 Dex 4® tablets**

7. Michael examines the food label below. He has just eaten 7 crackers. How many grams of carbohydrates are in these 7 crackers?

a. 10 g
b. 16 g
c. 18 g
d. 25 g
e. 40 g

Nutrition Facts /Valeur nutritive Per 4 crackers (14 g) Par 4 craquelins (14 g)	
Amount **Teneur**	**% Daily Value** **% valeur quotidienne**
Calories /Calories 56	
Fat / Lipides 1.0 g	2%
Saturated / Saturés 0 g + Trans / trans 0 g	0%
Cholesterol / Cholestérol 0 mg	
Sodium / Sodium 150 mg	4%
Carbohydrate / Glucides 10 g	4%
Fibre / Fibres 0 g	0%
Sugars / Sucres 1 g	
Protein / Protéines 1 g	
Vitamin A/Vitamine A 1%	Calcium/Calcium 0%
Vitamin C/Vitamine C 0%	Iron/Fer 0%

8. Sandra is cooking her supper and she wants to calculate the grams of carbohydrates found in the basmati rice she is preparing. After looking at the nutritional label, but she doesn't find it very helpful. Instead of weighing the raw rice, <u>she could find out the nutrient content of the rice in any of the following ways</u> ***<u>except</u>***:
   a. Remembering that 1/3 cup of cooked rice equals 1 *Starches and Grains Choice*, or about 15 g carbs.
   b. Using a label from a similar cooked product (e.g. short-grain rice)
   c. Using another reference which lists carbs for cooked rice by the cup.
   d. Using another reference which lists carbs for uncooked rice by the cup.
   e. Using another reference which lists carbs for 100 g of cooked rice

Nutrition Facts /Valeur nutritive Per 100 g uncooked Par 100 g cru	
Amount **Teneur**	**% Daily Value** **% valeur quotidienne**
Calories /Calories 349	
Fat / Lipides 0.8 g	0%
Saturated / Saturés 0 g + Trans / trans 0 g	0%
Cholesterol / Cholestérol 0 mg	
Sodium / Sodium 0 mg	0%
Carbohydrate / Glucides 78.5 g	24%
Fibre / Fibres 2.4 g	0%
Sugars / Sucres 0 g	
Protein / Protéines 7 g	
Vitamin A/Vitamine A 0%	Calcium/Calcium 0%
Vitamin C/Vitamine C 0%	Iron/Fer

9. Jonathan wants to eat a bowl of *Shreddies®*. **He looks at the label on the box and uses a measuring cup to serve himself 1½ cups of cereal. <u>How</u> many grams of carbohydrates in his portion will need insulin (excluding the milk)?**
   a. **35 g**
   b. **41 g**
   c. **47 g**
   d. **53 g**
   e. **62 g**

Nutrition Facts /Valeur nutritive
Per 1 cup (50 g)
Par 1 tasse (50 g)

Amount Teneur	**Cereal alone Céréale seule**	**with ½ cup skim milk avec ½ t lait écremé**
Calories /Calories	180	230
	% Daily Value % valeur quotidienne	
Fat / Lipides 1.0 g	2%	2%
Saturated / Saturés 0.2 g + Trans / trans 0 g	1%	2%
Cholesterol / Cholestérol 0 mg	0%	1%
Sodium / Sodium 310 mg	14%	15%
Carbohydrate / Glucides 41 g	14%	16%
Fibre / Fibres 6 g	24%	24%
Sugars / Sucres 8 g		
Protein / Protéines 5 g		
Vitamin A/Vitamine A	0%	8%
Calcium/Calcium	0%	15%
Vitamin C/Vitamine C	0%	0%
Iron/Fer	50%	50%

10. Nicholas uses an insulin pump and administers himself a ratio of 1 unit of insulin per 12 g of carbohydrates at his afternoon snack. How many units of insulin will he need to take in if he eats one *All-Bran®* ***Chocolate Cip Cereal Bar?***
   a. 1 unit
   b. 2 units
   c. 2.3 units
   d. 1.4 units
   e. No insulin

Julie is travelling with her hockey team, and the coach decides to stop at for supper at *Subway®*. **Julie doesn't usually eat at fast food restaurants, but she decides that she will give it a try. She buys a** 6 inch Turkey-Breast sub, a bowl of Minestrone soup (295 mL), a "Chocolate Chunk" cookie and a diet *Sprite®*. Her insulin-to-carb-ratio is 1 unit for 10g. How many units of rapid insulin will she need to administer for her meal?
   f. 7.5 units
   g. 8 units
   h. 8.5 units
   i. 9 units
   j. 9.5 units

11. Samuel loves his grandmother's lemon cake, and he wants to calculate the amount of carbohydrates it contains. The cake makes about 12 servings, and contains: 1 cup (250 mL) of sugar, 1½ cups (375 mL) of white flour, 2 eggs, ½ cup (125 ml) butter, juice of 1 lemon and 1 tsp baking powder. The cake weighs 600 g after it is baked.

I) How many grams of carbohydrates are there in 1 portion (1 /12th)?

a. 29 g
b. 32 g
c. 37 g
d. 42 g
e. 47 g

II) How many grams of carbohydrates are there in portion that weighs 75 g?

a. 62 g
b. 33 g
c. 44 g
d. 49 g
e. 37 g

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13. Samantha has an insulin-to-carb-ratio of 1 to 12 at breakfast. She calculates her carbohydrates well, but she notices that her blood glucoses are often high 2- 3 hours after breakfast (between 12 and 14 mmol/L). This happens even when her blood glucose is between 4 and 7 mmol/L before the meal. What should she do?
    a. Change her insulin-to-carb-ratio to 1 to 14
    b. Add 10 g of extra carbohydrates to her meal
    c. Decrease her insulin sensitivity factor
    d. Change her insulin-to-carb-ratio to 1 to 10
    e. Add ½ unit of insulin to her bolus
    f. Take her insulin 5-10 minutes before her breakfast

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14. Which of the following foods will raise an individual's blood glucose level the slowest, if eaten alone?
    a. White rice
    b. Regular Coke®
    c. **White spaghetti, cooked al dente**
    d. *Pom*® **white bread**
    e. **Whole wheat spaghetti, cooked al dente**

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15. Samuel eats a large supper consisting of a baked potato with sour cream, an 8 oz (240 g) BBQ'd steak, a green salad with a balsamic vinaigrette and a glass of red wine (don't worry, he is 18!). His blood glucose is 5,7 mmol/L before supper. At bedtime, his blood glucose is 6.8, He wakes up in the night because he is thirsty, and finds his blood glucose is 14.2 mmol/L. Which of the following reasons best explains his elevated blood glucose?
    a. There are uncounted carbs in the salad
    b. There are uncounted carbs in the sour cream
    c. The protein in the steak can be converted into glucose
    d. The fat in the sour cream can be converted into glucose
    e. The alcohol can be converted into glucose