


Supplemental Table S1: Relationship of participant demographics and clinical characteristics with hemoglobin A1c at initial nutrition assessment.

Supplemental Table	β	P-value
Age	0.008	0.899
Male	-0.468	0.214
<i>Race/Ethnicity</i>		
White	Reference	
Black	1.618	0.000
Hispanic	0.831	0.346
Other	-0.685	0.264
Age at DM Diagnosis	-0.068	0.132
Duration of DM	0.076	0.085
<i>Parental Education (n=106)</i>		
High School/GED	Reference	
Associate's Degree	-0.710	0.264
Undergraduate Degree	-0.930	0.068
Postgraduate Degree	-1.892	0.000
<i>Income (n=95)</i>		
less than \$25,000	Reference	
\$25,000-\$49,999	-0.280	0.753
\$50,000-\$74,999	-1.281	0.156
\$75,000-\$99,999	-3.033	0.002
\$100,000 or more	-2.612	0.001
DK/NA	-2.237	0.007
<i>Insulin Delivery</i>		
MDI	Reference	
Pump	-1.195	0.001
CGM Use	-0.736	0.063
Mean number of quizzes completed	0.162	0.382
Mean quiz score	-0.687	0.001

β regression coefficient. Income: DK/NA – don't know or no answer, some participants chose not to report this information

Carbohydrate Counting Knowledge Assessment



The image shows a box of Honey Nut Cheerios cereal and its corresponding Nutrition Facts label. The box features the brand name "Honey Nut Cheerios" in large, stylized letters, with a bee character and a bowl of cereal. A red heart graphic on the box says "Can Help Lower Cholesterol". The label provides detailed nutritional information for two serving sizes: Honey Nut Cheerios (3/4 cup) and with 1/2 cup skim milk.

Nutrition Facts

Serving Size: 3/4 cup

Amount Per Serving	Honey Nut Cheerios	with 1/2 cup skim milk
Calories	110	150
Calories from Fat	15	15
% Daily Value**		
Total Fat 1.5g*	2%	2%
Saturated Fat 0g	0%	0%
Trans Fat 0g		
Polyunsaturated Fat 0.5g		
Monounsaturated Fat 0.5g		
Cholesterol 0mg	0%	1%
Sodium 160mg	7%	9%
Potassium 115mg	3%	9%
Total Carbohydrate 22g	7%	9%
Dietary Fiber 2g	8%	8%
Soluble Fiber less than 1g		
Sugars 9g		
Other Carbohydrate 11g		
Protein 2g		

Example 1

1. What is the serving size?
2. How many carbohydrates are in 1 serving?
3. If you eat 1.5 cups, how many carbohydrates will you eat?
4. How will you measure the serving size?
5. How much insulin do you need if you eat 2 servings of cereal with 1 cup of milk?

Nutrition Facts			
Serving Size 1 oz (28g/About 21 pieces)			
Amount Per Serving			
Calories 160		Calories from Fat 90	
% Daily Value*			
Total Fat 10g		16%	
Saturated Fat 1.5g		8%	
Trans Fat 0g			
Cholesterol 0mg		0%	
Sodium 230mg		10%	
Total Carbohydrate 14g		5%	
Dietary Fiber less than 1g		2%	
Sugars less than 1g			
Protein 2g			
Vitamin A 0% • Vitamin C 0%			
Calcium 0% • Iron 2%			
Thiamin 6% • Niacin 4%			
* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:			
	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g
Calories per gram:			
Fat 9	•	Carbohydrate 4	• Protein 4



Example 2

1. What is the serving size?
2. How many carbohydrates are in 1 serving?
3. If you eat 0.5 ounces, how many carbohydrates will you eat?
4. If you eat 42 pieces, how many carbohydrates will you eat?
5. How can you measure the serving size?

Carbohydrate Counting Knowledge Assessment

Example 3

Nutrition Facts			
Serving Size		1/2 block of noodles with seasoning (43 g)	
Serving Per Container		2	
Amount Per Serving			
Calories	190	Calories from Fat	70
% Daily Value *			
Total Fat	7 g		11 %
Saturated Fat	3.5 g		18 %
Trans Fat	0 g		
Cholesterol	0 mg		0 %
Sodium	830 mg		35 %
Total Carbohydrate	26 g		9 %
Dietary Fiber	less than 1 g		3 %
Sugars	1 g		
Protein	4 g		
Vitamin A	**	• Vitamin C	0 %
Calcium	**	• Iron	10 %
** Contains less than 2% of the Daily Value of this nutrient.			
* Percent Daily Values are based on a 2,000 calorie diet.			
Your daily values may be higher or lower depending on your calorie needs			
	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate	Total Carbohydrate	300g	375g
Dietary Fiber	Dietary Fiber	25g	30g



1. What is the serving size?
2. How many carbohydrates are in 1 serving?
3. If you eat the entire package, how many carbohydrates will you count?
4. If your BG is 250mg/dl before the meal and you eat the entire package, how much insulin will you give yourself? (use your correction scale)
5. If you added ½ cup shredded chicken and ½ cup peas to the soup, would this increase the total carbohydrates? If so, what would be the total carbohydrate count?

Example 4: Carbohydrate Counting Knowledge Assessment



Serving size: 1 package

Calories	330
Calories From Fat	130
% Daily Value*	
Total Fat 14g	22%
Saturated Fat 0g	0%
Trans Fat 0g	0%
Cholesterol 30mg	10%
Sodium 0g	0%
Total Carbohydrates 39g	13%
Dietary Fibers 1g	4%
Sugars 25g	0%
Protein 0g	0%
Vitamin A	4%
Vitamin C	0%
Calcium	15%
Iron	0%

* Percent Daily Values are based on a 2,000 calorie diet.

1. How many carbohydrates in one serving?
2. Which foods/drink in the lunchable have carbohydrates?
3. How many carbohydrates would you eat if you ate the lunchmeat, Capri sun, and Reese cup but did not eat the crackers?
4. How many carbohydrates would you eat if you ate all of the lunchable except the Capri sun and ate a small bag of chips?
5. If your BG was 189mg/dl and you ate the crackers, meat, and reese cup (no juice pouch), how much insulin would you give?

Carbohydrate Counting Knowledge Assessment

Example 5:



1. How many carbs would you estimate are in the baked beans?
2. How many carbs would you estimate are in 1 ear of corn?
3. How much pasta salad do you think is in this picture? How many carbohydrates are in the pasta salad?
4. If you ate the entire plate except took off the top of the bun (and did not eat it) and your BG was 173mg/dl, how much insulin would you give? (Use your correction scale).
5. About 1 hour after eating this plate, you had 1 piece of brownie and 1 scoop ice cream, how much insulin would you give?

Carbohydrate Counting Knowledge Assessment

Example 6:



1. You are out to eat to celebrate your team at a pizza place. You check your BG and it is 141mg/dl. You are very hungry and eat the 3 slices of pizza in the picture and have a diet soda. How many carbs do you think you ate? And what would be your insulin dose?
2. After about an hour or so at the pizza place (once everyone is finished eating pizza), your coach surprises everyone with cake and ice- cream. You have in front of you the cake and ice cream in the picture. How many carbohydrates would you estimate are in the cake?
3. When you check your BG before eating, it reads 60mg/dl. You plan to eat 2 slices of pizza and have a diet soda. How would this BG change your eating and insulin dosing?
4. Do you need to check your BG again to figure into your insulin dose?
5. How much insulin would you give if you ate half of the cake and all of the ice cream?

Carbohydrate Counting Knowledge Assessment



The image shows a box of Honey Nut Cheerios cereal and its corresponding Nutrition Facts label. The box features the brand name "Honey Nut Cheerios" in large yellow letters, a "Whole Grain Guaranteed" logo, and a cartoon bee character. A red heart graphic on the box states "Can Help Lower Cholesterol". The Nutrition Facts label is positioned to the right of the box, showing the serving size as 3/4 cup and providing detailed nutritional information for both the cereal alone and when served with 1/2 cup of skim milk.

Nutrition Facts

Serving Size: 3/4 cup

Amount Per Serving	Honey Nut Cheerios	with 1/2 cup skim milk
Calories	110	150
Calories from Fat	15	15
	% Daily Value**	
Total Fat 1.5g*	2%	2%
Saturated Fat 0g	0%	0%
Trans Fat 0g		
Polyunsaturated Fat 0.5g		
Monounsaturated Fat 0.5g		
Cholesterol 0mg	0%	1%
Sodium 160mg	7%	9%
Potassium 115mg	3%	9%
Total Carbohydrate 22g	7%	9%
Dietary Fiber 2g	8%	8%
Soluble Fiber less than 1g		
Sugars 9g		
Other Carbohydrate 11g		
Protein 2g		

Example 1

1. What is the serving size? **3/4 cup**
2. How many carbohydrates are in 1 serving? **22 grams**
3. If you eat 1.5 cups, how many carbohydrates will you eat? **44 grams**
4. How will you measure the serving size? **With a measuring cup**
5. How much insulin do you need if you eat 2 servings of cereal with 1 cup of milk? **Answer will depend on patients insulin to carbohydrate ratio (total carbs will be 56 grams)**

Carbohydrate Counting Knowledge Assessment

Nutrition Facts	
Serving Size 1 oz (28g/About 21 pieces)	
Amount Per Serving	
Calories 160	Calories from Fat 90
% Daily Value*	
Total Fat 10g	16%
Saturated Fat 1.5g	8%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 230mg	10%
Total Carbohydrate 14g	5%
Dietary Fiber less than 1g	2%
Sugars less than 1g	
Protein 2g	
Vitamin A 0%	Vitamin C 0%
Calcium 0%	Iron 2%
Thiamin 6%	Niacin 4%
* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9	Carbohydrate 4 Protein 4



Example 2

1. What is the serving size? **28 g weight or 21 pieces**
2. How many carbohydrates are in 1 serving? **14 grams**
3. If you eat 0.5 ounces, how many carbohydrates will you eat? **7 grams**
4. If you eat 42 pieces, how many carbohydrates will you eat? **28 grams**
5. How can you measure the serving size? **Counting pieces or weighing on food scale**

Carbohydrate Counting Knowledge Assessment

Example 3

Nutrition Facts			
Serving Size		1/2 block of noodles with seasoning (43 g)	
Serving Per Container		2	
Amount Per Serving			
Calories	190	Calories from Fat	70
% Daily Value *			
Total Fat	7 g		11 %
Saturated Fat	3.5 g		18 %
Trans Fat	0 g		
Cholesterol	0 mg		0 %
Sodium	830 mg		35 %
Total Carbohydrate	26 g		9 %
Dietary Fiber	less than 1 g		3 %
Sugars	1 g		
Protein	4 g		
Vitamin A	**	• Vitamin C	0 %
Calcium	**	• Iron	10 %
** Contains less than 2% of the Daily Value of this nutrient.			
* Percent Daily Values are based on a 2,000 calorie diet.			
Your daily values may be higher or lower depending on your calorie needs			
	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate	Total Carbohydrate	300g	375g
Dietary Fiber	Dietary Fiber	25g	30g



grams

1. What is the serving size? $\frac{1}{2}$ block with seasoning or weight of 43g
2. How many carbohydrates are in 1 serving? 26 grams
3. If you eat the entire package, how many carbohydrates will you count? 52 grams
4. If your BG is 250mg/dl before the meal and you eat the entire package, how much insulin will you give yourself? (use your correction scale) This answer will depend on person's correction scale
5. If you added $\frac{1}{2}$ cup shredded chicken and $\frac{1}{2}$ cup peas to the soup, would this increase the total carbohydrates? If so, what would be the total carbohydrate count? Peas will add carbs (1/2 cup peas=11 grams). Total carbs=67 grams

Example 4: Carbohydrate Counting Knowledge Assessment



Serving size: 1 package

Calories	330
Calories From Fat	130
% Daily Value*	
Total Fat 14g	22%
Saturated Fat 0g	0%
Trans Fat 0g	0%
Cholesterol 30mg	10%
Sodium 0g	0%
Total Carbohydrates 39g	13%
Dietary Fibers 1g	4%
Sugars 25g	0%
Protein 0g	0%
Vitamin A	4%
Vitamin C	0%
Calcium	15%
Iron	0%

* Percent Daily Values are based on a 2,000 calorie diet.

1. How many carbohydrates in one serving? **39 grams**
2. Which foods/drink in the lunchable have carbohydrates? **Crackers, juice, reese**
3. How many carbohydrates would you eat if you ate the lunchmeat, Capri sun, and Reese cup but did not eat the crackers? **Estimate that there are 6 crackers in lunchable so subtract 12 grams from total carbs= 27 grama**
4. How many carbohydrates would you eat if you ate all of the lunchable except the Capri sun and ate a small bag of chips? **About 39 grams**
5. If your BG was 189mg/dl and you ate the crackers, meat, and reese cup (no juice pouch), how much insulin would you give? **Would depend on patient's correction scale. Carb amount would be about 24 grams)**

Carbohydrate Counting Knowledge Assessment

Example 5:



1. How many carbs would you estimate are in the baked beans? **25-35 grams**
2. How many carbs would you estimate are in 1 ear of corn? **15-25 grams**
3. How much pasta salad do you think is in this picture? How many carbohydrates are in the pasta salad? **$\frac{3}{4}$ -1cup= 20-30 grams**
4. If you ate the entire plate except took off the top of the bun (and did not eat it) and your BG was 173mg/dl, how much insulin would you give? (Use your correction scale). **80 grams (+/-)**
5. About 1 hour after eating this plate, you had 1 piece of brownie and 1 scoop ice cream, how much insulin would you give? **No correction calculated. Carb amount= 40-55 grams**

Carbohydrate Counting Knowledge Assessment

Example 6:



1. You are out to eat to celebrate your team at a pizza place. You check your BG and it is 141mg/dl. You are very hungry and eat the 3 slices of pizza in the picture and have a diet soda. How many carbs do you think you ate? And what would be your insulin dose? **75-90 grams**
2. After about an hour or so at the pizza place (once everyone is finished eating pizza), your coach surprises everyone with cake and ice-cream. You have in front of you the cake and ice cream in the picture. How many carbohydrates would you estimate are in the cake? **Cake=30-45 grams**
3. When you check your BG before eating, it reads 60mg/dl. You plan to eat 2 slices of pizza and have a diet soda. How would this BG change your eating and insulin dosing? **Would want to treat the low BG first (juice, etc). No correction will be needed**
4. Do you need to check your BG again to figure into your insulin dose? **Would want to make sure coming to 70mg/dl or above before starting to eat (mixing other foods in could delay rising bg). Would not need to use BG to give correction dose**
5. How much insulin would you give if you ate half of the cake and all of the ice cream? **Will depend on insulin dose (carb amount to dose= 45-55 grams)**

Quiz 1 (fundamental)	
Questions	Goal/Knowledge assessment
1. What is the serving size?	<ul style="list-style-type: none"> Understand how to read a food label.
2. How many carbohydrates are in 1 serving?	<ul style="list-style-type: none"> Understand how to read a food label. Recognizes a serving size.
3. If you eat 1.5 cups, how many carbohydrates will you eat?	<ul style="list-style-type: none"> Recognizes and understands how to measure variable servings,. Able to use arithmetic to figure out different serving size carbohydrate amount
4. How will you measure the serving size?	<ul style="list-style-type: none"> Can quantify measured food amount/ understands how to measure food
5. How much insulin do you need if you eat 2 servings of cereal with 1 cup of milk?	<ul style="list-style-type: none"> Recognizes and understands how to measure variable servings. Able to use arithmetic to figure out different serving size carbohydrate amount Demonstrates ability to calculate insulin dose based on grams of carbohydrates

Quiz 2 (fundamental)	
Questions	Goal/Knowledge assessment
1. What is the serving size?	<ul style="list-style-type: none"> Understand how to read a food label.
2. How many carbohydrates are in 1 serving?	<ul style="list-style-type: none"> Understand how to read a food label.
3. If you eat 0.5 ounces, how many carbohydrates will you eat?	<ul style="list-style-type: none"> Recognizes and understands how to measure variable servings. Able to use arithmetic to figure out different serving size carbohydrate amount
4. If you eat 42 pieces, how many carbohydrates will you eat?	<ul style="list-style-type: none"> Understand how to read a food label.
5. How can you measure the serving size?	<ul style="list-style-type: none"> Can quantify measured food amount/ understands how to measure food

Quiz 3 (intermediate)	
Questions	Goal/Knowledge assessment
1. What is the serving size?	<ul style="list-style-type: none"> Understand how to read a food label.
2. How many carbohydrates are in 1 serving?	<ul style="list-style-type: none"> Understand how to read a food label.
3. If you eat the entire package, how many carbohydrates will you count?	<ul style="list-style-type: none"> Understand how to read a food label. Recognizes and understands how to measure variable servings. Able to use arithmetic to figure out different serving size carbohydrate amount
4. If your BG is 250mg/dl before the meal and you eat the entire package, how much insulin will you give yourself? (use your correction scale)	<ul style="list-style-type: none"> Recognizes and understands how to measure variable servings. Able to use arithmetic to figure out different serving size carbohydrate amount Demonstrates ability to calculate insulin dose based on grams of carbohydrates and BG
5. If you added ½ cup shredded chicken and ½ cup peas to the soup, would this increase the total carbohydrates? If so, what would be the total carbohydrate count?	<ul style="list-style-type: none"> Able to identify carbohydrate sources Capable of estimating carbohydrates without label Demonstrates ability to calculate insulin dose based on grams of carbohydrates

Quiz 4 (intermediate)	
Questions	Goal/Knowledge assessment
1. How many carbohydrates in one serving?	<ul style="list-style-type: none"> Understand how to read a food label.
2. Which foods/drink in the lunchable have carbohydrates?	<ul style="list-style-type: none"> Able to identify carbohydrate sources
3. How many carbohydrates would you eat if you ate the lunchmeat, Capri sun, and Reese cup but did not eat the crackers?	<ul style="list-style-type: none"> Capable of estimating carbohydrates without label Demonstrates ability to calculate insulin dose based on grams of carbohydrates Able to use arithmetic to figure out different serving size carbohydrate amount
4. How many carbohydrates would you eat if you ate all of the lunchable except the Capri sun and ate a small bag of chips?	<ul style="list-style-type: none"> Capable of estimating carbohydrates without label Able to use arithmetic to figure out different serving size carbohydrate amount
5. If your BG was 189mg/dl and you ate the crackers, meat, and reese cup (no juice pouch), how much insulin would you give?	<ul style="list-style-type: none"> Capable of estimating carbohydrates without label Demonstrates ability to calculate insulin dose based on grams of carbohydrates Able to use arithmetic to figure out different serving size carbohydrate amount

Quiz 5 (advanced)	
Questions	Goal/Knowledge assessment
1. How many carbs would you estimate are in the baked beans?	<ul style="list-style-type: none"> Capable of estimating carbohydrates without label
2. How many carbs would you estimate are in 1 ear of corn?	<ul style="list-style-type: none"> Capable of estimating carbohydrates without label
3. How much pasta salad do you think is in this picture? How many carbohydrates are in the pasta salad?	<ul style="list-style-type: none"> Capable of estimating carbohydrates without label
4. If you ate the entire plate except took off the top of the bun (and did not eat it) and your BG was 173mg/dl, how much insulin would you give? (Use your correction scale).	<ul style="list-style-type: none"> Capable of estimating carbohydrates without label Demonstrates ability to calculate insulin dose based on grams of carbohydrates and bg Able to use arithmetic to figure out different serving size carbohydrate amount
5. About 1 hour after eating this plate, you had 1 piece of brownie and 1 scoop ice cream, how much insulin would you give?	<ul style="list-style-type: none"> Capable of estimating carbohydrates without label Demonstrates ability to calculate insulin dose based on grams of carbohydrates Able to use arithmetic to figure out different serving size carbohydrate amount Understand concept of insulin duration and dosing with BG and food verses food only

Quiz 6 (advanced)	
Questions	Goal/Knowledge assessment
1. You are out to eat to celebrate your team at a pizza place. You check your BG and it is 141mg/dl. You are very hungry and eat the 3 slices of pizza in the picture and have a diet soda. How many carbs do you think you ate? And what would be your insulin dose?	<ul style="list-style-type: none"> Capable of estimating carbohydrates without label Demonstrates ability to calculate insulin dose based on grams of carbohydrates Able to use arithmetic to figure out different serving size carbohydrate amount
1. After about an hour or so at the pizza place (once everyone is finished eating pizza), your coach surprises everyone with cake and ice-cream. You have in front of you the cake and ice cream in the picture. How many carbohydrates would you estimate are in the cake?	<ul style="list-style-type: none"> Capable of estimating carbohydrates without label
1. When you check your BG before eating, it reads 58mg/dl. You plan to eat 2 slices of pizza and have a diet soda. How would this BG change your eating and insulin dosing?	<ul style="list-style-type: none"> Capable of estimating carbohydrates without label Understand concept of insulin duration and dosing with BG and food Able to use arithmetic to figure out different serving size carbohydrate amount Comprehend how different carb sources impact BG rise
1. Do you need to check your BG again to figure into your insulin dose?	<ul style="list-style-type: none"> Understand concept of insulin duration and dosing with BG and food verses food only
1. How much insulin would you give if you ate half of the cake and all of the ice cream?	<ul style="list-style-type: none"> Capable of estimating carbohydrates without label Demonstrates ability to calculate insulin dose based on grams of carbohydrates Able to use arithmetic to figure out different serving size carbohydrate amount Understand concept of insulin duration and dosing with BG and food verses food only