



**Weill Cornell Medicine**  
Pediatric Endocrinology



**NewYork-Presbyterian**  
Phyllis and David Komansky  
Children's Hospital

# **Guidebook for Children and Adolescents with Diabetes**



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**Welcome to the Weill Cornell Medicine Pediatric Diabetes Program!**

This informational booklet will provide you and your family with diabetes education materials as well as introduce you to our practice.



Our Diabetes Team consists of five Medical Doctors, three Endocrine Fellows, one nurse practitioner/certified diabetes educator and one dietitian/certified diabetes educator. Additionally, we have a social worker and psychologist on staff to address mental health needs.

The Weill Cornell Medicine Diabetes Team:

Zoltan Antal, MD; Chief of Pediatric Endocrinology  
Alexis Feuer, MD; Co-Director, Pediatric Diabetes Program  
Marissa Censani, MD  
Oksana Lekarev, DO  
Tiffany Schumaker, DO

Emily Coppedge, CPNP, CDE  
Isabel Reckson, MPH, RD, CDE  
Doris Golub, RN  
Diane Hayles, RN

**Appointments**

Your child will be admitted to the hospital at diabetes diagnosis for blood glucose stabilization and education. Within one week of discharge, your child will follow up in our outpatient office. Between discharge and your doctor’s appointment, our medical team is available to assist with diabetes concerns and blood glucose management. Appointments will be a combination of in-person and video visits.

*Your appointment schedule will look like the following:*

First outpatient appointment after diagnosis with MD/Nurse Practitioner (NP)	Within 1-2 week of hospital discharge
Outpatient appointment with nutritionist and mental health care provider	Within 3 weeks of diagnosis

2 <sup>nd</sup> outpatient appointment with MD/NP	Within 6 weeks of diagnosis
All future appointments	At 3-month intervals

**Contacting Our Office:**

Please do not hesitate to call our office with any concerns or questions. Our main office number is **646-962-3442**. During office hours (9am-5pm), voicemails are checked hourly and will receive a timely response. If you are calling for an urgent blood glucose level, please state this when speaking to our patient coordinators.

After hours, you can reach the doctor on call at the same number (**646-962-3442**) by following appropriate prompts. If you have not received a call back in 20 minutes, please call again. If you have an urgent blood glucose matter, do not message your provider via Weill Cornell Connect. Instead, please call our office to reach the doctor on call.

**Prescriptions:**

To request prescription refills, contact our office or message us through Weill Cornell Connect. Please make sure your pharmacy information is up-to-date. Allow up to two business days to process all prescription refill requests.

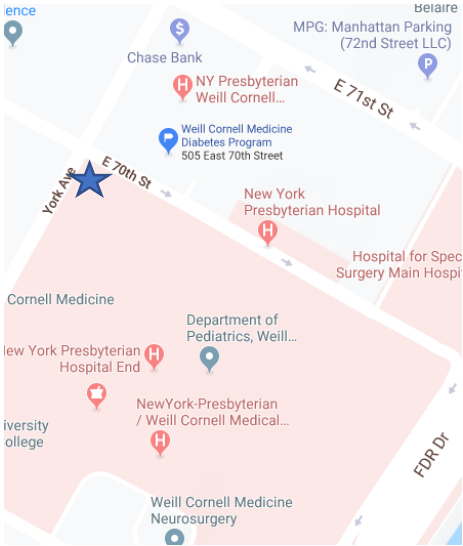
**Insurance coverage:**

We accept most major insurance plans. However, as plans can change, please provide us with your child’s most up-to-date insurance information. A referral may be required from your child’s pediatrician. Please make sure to contact their office prior to your appointment to ensure the referral has been submitted.

**Office Location:**

Helmsley Medical Tower  
 505 East 70<sup>th</sup> Street (between York Avenue and the East River)  
 New York, NY 10021

The offices are located on the 3<sup>rd</sup> and 5<sup>th</sup> floors.



We look forward to providing you and your family with the best and most compassionate care.

# What is Diabetes?

*Diabetes* is a lifelong disease that results from the pancreas not being able to produce insulin or make enough insulin. The pancreas is a gland organ by your stomach that makes enzymes necessary for digestion, as well as hormones that control blood sugars. There are two main types of diabetes, Type 1 and Type 2.

## **Type 1 Diabetes:**

What is it?	Who is affected?	Treatment
<ul style="list-style-type: none"> <li>An autoimmune disease that results from the destruction of the insulin producing cells, known as beta cells</li> </ul>	<ul style="list-style-type: none"> <li>Most common in children and teenagers</li> <li>Can also occur into adulthood</li> </ul>	<ul style="list-style-type: none"> <li>Lifelong insulin therapy</li> </ul>



**PANCREAS**

## **Type 2 Diabetes:**

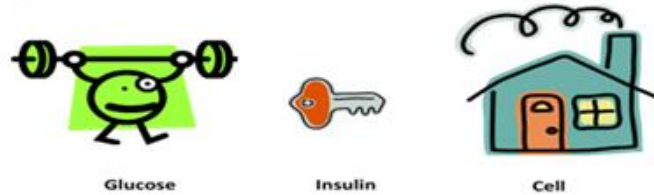
What is it?	Who is affected?	Treatment
<ul style="list-style-type: none"> <li>A condition in which the pancreas makes either too little insulin or the body loses the ability to use the insulin it produces</li> </ul>	<ul style="list-style-type: none"> <li>Most common in adults</li> <li>Can also occur in childhood</li> </ul>	<ul style="list-style-type: none"> <li>Lifestyle changes (healthy eating, physical activity)</li> <li>Oral medications</li> <li>Insulin or other injectable medications</li> </ul>



# Insulin

## **What is Insulin?**

Insulin is a hormone produced by the beta cells in the pancreas. By allowing sugar (glucose) to pass into our cells to be used as energy, insulin is considered the 'key' that unlocks the door to let glucose into the cells. In Type 1 Diabetes, the pancreas is no longer able to produce insulin, so it must receive insulin from the 'outside'. This is done with an insulin pen, syringe, or via an insulin pump.



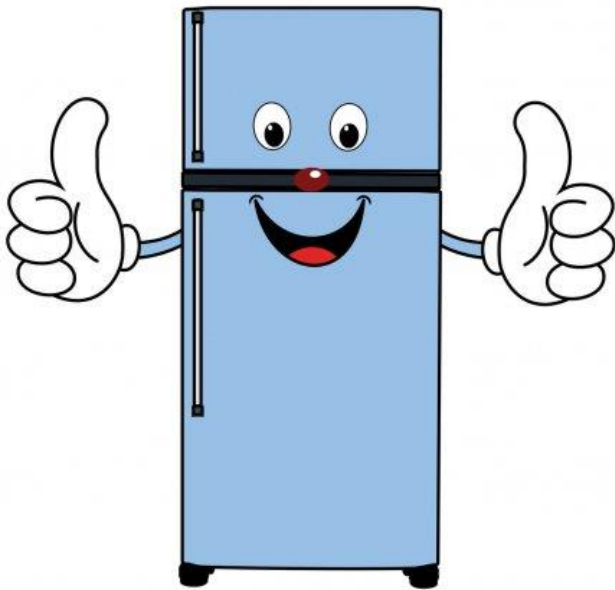
<b>Types of Insulin</b>	<b>Onset of Action</b>	<b>Use</b>
<b>Rapid Acting Insulin</b> <ul style="list-style-type: none"> <li>- Ademalog® (lispro)</li> <li>- Humalog® (lispro)</li> <li>- Novolog® (aspart)</li> <li>- Apidra® (glulisine)</li> </ul>	<ul style="list-style-type: none"> <li>- Begins working in 10-15 minutes</li> <li>- Lasts 3 to 4 hours</li> </ul>	Corrects high blood glucose levels and/or covers carbohydrate intake
<b>Ultra-Rapid Acting Insulin</b> <ul style="list-style-type: none"> <li>• Fiasp® (aspart)</li> </ul>	<ul style="list-style-type: none"> <li>- Begins working in 2.5 to 4 minutes</li> <li>- Lasts 3 to 4 hours</li> </ul>	Corrects high blood glucose levels and/or covers carbohydrate intake
<b>Long Acting Insulin</b> <ul style="list-style-type: none"> <li>- Basaglar® (glargine)</li> <li>- Lantus® (glargine)</li> <li>- Levemir® (determir)</li> </ul>	<ul style="list-style-type: none"> <li>- Lasts up to 24 hours</li> <li>- No Peak</li> <li>- Given at the same time daily</li> </ul>	Basal insulin (or background insulin) Not meant to cover food or correct high blood glucose levels
<b>Ultra-Long Acting Insulin</b> <ul style="list-style-type: none"> <li>• Tresiba® (degludec)</li> </ul>	<ul style="list-style-type: none"> <li>- Lasts up to 42 hours</li> <li>- No peak</li> </ul>	Basal insulin (or background insulin) Not meant to cover mealtimes or correct high blood glucose

*\*Rapid acting insulin should be administered BEFORE a meal. For children < 5 years old who are not able to consistently finish their meal, insulin can be administered after a meal.*



## ***How Do I Store Insulin?***

- Opened insulin can be safely kept at room temperature for up to 28 days
- Mark the expiration dates on the insulin or pen and discard after 28 days, even if insulin remains in the vial/pen
- UNOPENED insulin must be kept in the refrigerator. DO NOT FREEZE.
  - Unopened insulin in the refrigerator lasts until the expiration date on the box
- Do not expose the insulin to extreme temperatures (hot or cold)
- Needles are for one time use ONLY and should be disposed of in a sharps container
- Non-clear plastic containers that are punctured proof can be used for sharps
  - Glass containers are NOT allowed
- Check local regulations about disposal of sharps containers
  - <http://www1.nyc.gov/nyc-resources/service/2017/medical-waste-disposal>



# Blood Glucose Monitoring

Blood sugars are measured using a blood glucose meter. A fine, sharp pointed needle, called a lancet, is used to prick the skin to obtain a drop of blood to be placed on the testing strip.

Check blood glucose levels at the following times:

- Before all meals
- Before bedtime
- Overnight at 3 am if there is a change to the insulin regimen
- Before exercise
- With signs or symptoms of hypoglycemia or hyperglycemia
- Before driving



Reminders:

The lancet in the lancing device should be changed daily

Wash hands with soap and water prior to checking blood glucose levels

## Blood Glucose Goals:

*Blood glucose goals are individualized for every child. The below are guidelines:*

- Before meals: 90-130 mg/dl
- Bedtime: 90-150 mg/dl
- Overall goal of 70% of time between 70-180 mg/dl
- Hemoglobin A1c 7.0%
  - Hemoglobin A1c is a test that measures the average blood glucose level over the past 3 months.

Hemoglobin A1c Level	Corresponding average blood sugar level
6%	126mg/dL
7%	154mg/dL
8%	183mg/dL
9%	212 mg/dL
10%	240mg/dL
11%	269mg/dL
12%	298mg/dL
13%	326mg/dL
14%	355mg/dL

*Ask your doctor about your child's specific blood glucose goals*

## Hypoglycemia

Hypoglycemic is low blood sugar, when the blood glucose drops below 70 mg/dl (or below 80mg/dL in children under 5 years old).

### Signs and symptoms:



### Treatment of hypoglycemia:

- 15 grams of carbohydrate:

4 ounces of juice

OR

4 glucose tabs



- After treatment, recheck your child's blood sugar in 15 minutes
  - If blood glucose remains under 70mg/dL (or under 80mg/dL in children less than 5 years), repeat with 4 oz. juice or 4 glucose tabs

**IF UNABLE TO DRINK JUICE OR UNCONSCIOUS: ADMINISTER GLUCAGON INTRAMUSCULARLY AND CALL 911 (for glucagon administration see page 10)**

### **Glucagon Dosages:**

Intramuscular <ul style="list-style-type: none"> <li>• Glucagon®</li> </ul>	Children under 44 pounds: 0.5 mg
	Children over 44 pounds: 1 mg
Nasal <ul style="list-style-type: none"> <li>• Baqsimi®</li> </ul>	Children over 4 years old: 3 mg
Subcutaneous <ul style="list-style-type: none"> <li>• Gvoke®</li> </ul>	Children 2-11 years old: 0.5mg Children 12 years and older OR > 100 pounds: 1mg

## Glucagon Administration:

Glucagon is a hormone that increases blood sugars levels. Glucagon devices are needed in low blood sugar emergencies, such as if your child is unable to drink juice or is unconscious.

### ***Forms of glucagon:***

Intramuscular Injection: glucagon is injected directly into the muscle using a glucagon pen

Nasal Glucagon: a form of glucagon given as a nasal spray through the nose

Subcutaneous Auto Injection: glucagon injected directly into the fatty area (similar to injection sites-thigh, abdomen, upper arm) using a prefilled syringe

### Instructions to use Intramuscular Glucagon®:

1. Flip off the seal from the vial of Glucagon
2. Remove the needle cover from the syringe and insert needle into the rubber stopper on the vial
3. Inject the entire contents of the syringe into the vial of Glucagon
4. Remove the syringe from the vial and gently shake until the liquid is clear
5. Insert the same syringe into the vial and withdraw the following amount:
  - a. 0.5 mg if less than 44 pounds
  - b. 1.0 mg if greater than 44 pounds
6. Inject the glucagon into the top of the thigh



### Instructions to use Subcutaneous Auto Injector Gvoke®:

1. Pull red cap off
2. Push yellow end down on skin and hold for 5 seconds. The window will turn red confirming the dose was delivered

### Instructions to use Nasal Glucagon Baqsimi®:

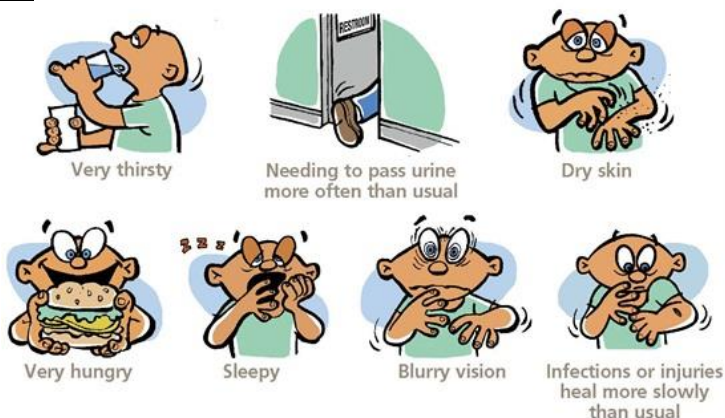
1. Hold the device between your fingers and thumb
  - a. Do NOT push plunger yet
2. Insert tip into nostril until finger(s) touch the outside of the nose
3. Push plunger firmly all the way in
4. Dose is complete when the Green Line disappears

**IF GLUCAGON IS NEEDED: CONTACT EMERGENCY SERVICES BY DIALING 9-1**

# Hyperglycemia

*Hyperglycemia is high blood sugar*

## Signs and symptoms:



**Ketones:** a waste product that accumulates when glucose is not available and instead, fat is used for energy

### ***When should my child check for ketones?***

- If blood sugar levels are over 250 mg/dl on two consecutive occasions
  - Example: breakfast and again at lunch
- If your child has any signs and symptoms of nausea/vomiting
- If my child is sick

### ***How can I check ketones?***

- Urinate on a urine test strip OR do a finger stick for a blood ketones result

**Treatment of hyperglycemia:** Novolog® /Humalog® insulin as per correction factor every 3 hours and WATER!

**Diabetic Ketoacidosis (DKA)** - DKA is an emergency condition in which extremely high blood glucose levels, along with a severe lack of insulin, result in the breakdown of body fat for energy and an accumulation of ketones in the blood and urine. Signs of DKA include high blood glucose levels, positive ketones, and nausea and/or vomiting

Blood Ketone Level	Urine Ketone comparison
Less than 0.6	Negative
0.6-1.0	Small to moderate
1.1-3.0	Moderate to Large



# Sick Day Management



If you are not feeling well:

- Continue to take your insulin
  - If your blood glucose is running lower, you will need less insulin, but do not stop your insulin
- Check your blood sugars every 2-3 hours
- If you wear an insulin pump, make sure you are not having pump site problems
- Check your ketones every 2-3 hours with urine ketone sticks or blood ketone meter
  - EVEN if your blood glucose levels are normal
- Hydrate with water
- If blood glucose levels are running low, drink regular Ginger Ale or eat regular Jello®
- Call the diabetes team if you have any of the following:
  - Moderate or large ketones
  - Vomiting
  - Consistently high blood glucose levels despite correcting with insulin

# Exercise and Diabetes

*Yes, you can still participate in physical activity if you have diabetes!  
Below are general recommendations for diabetes and exercise.*

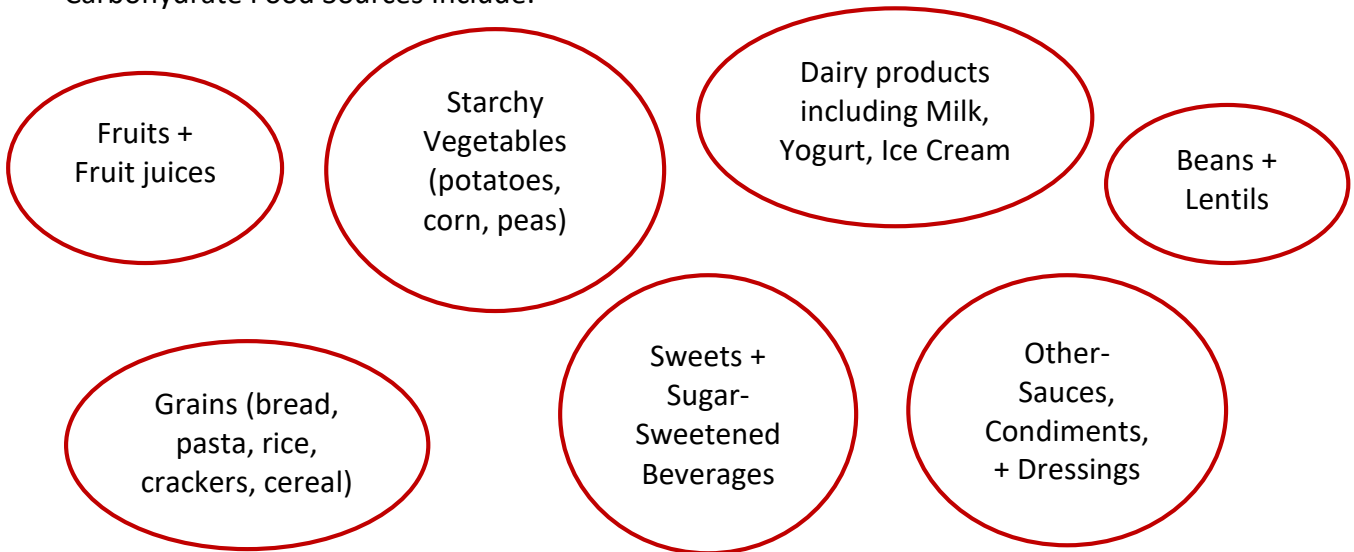
- If blood glucose levels are under 100mg/dl, consume 15 grams of carbohydrate prior to exercise (see page 15 for carbohydrate containing foods)
- If blood glucose levels are greater than 250mg/dl **AND** you have ketones prior to activity, please do not exercise until ketones are negative



## Nutrition and Diabetes

It is important for children to follow a balanced diet with protein, fat, and carbohydrates; including children with diabetes. Carbohydrates are essential for growth and development and serve as our number one energy source. As carbohydrates break down to sugar in the body, they are the main nutrient affecting blood glucose levels. Therefore, all carbohydrates eaten throughout the day (at meals AND snacks) need to be counted to appropriately dose insulin.

Carbohydrate Food Sources Include:



\*If you have questions about appropriate carbohydrate amounts and sources, ask your dietitian

## Carbohydrate Counting Food Guide:

*Below is a list of carbohydrate (CHO) amounts of common foods. Always check your labels.*

### **FRUIT:**

- 1 small apple = 15g CHO
- 1 large apple = 25g CHO
- 4 ounces of applesauce = 15g CHO
- 1 medium avocado = 15g CHO
- 1 large banana = 30g CHO
- 1 cup of berries (blackberries, blueberries, raspberries, strawberries) = 15g CHO
- 1 cup of cantaloupe = 15g CHO
- 1 clementine = 10g CHO
- 1 grape = 1g CHO
- 1 cup of mixed fruit salad = 30g CHO
- 1 cup of cherries = 20g CHO
- 1 whole grapefruit = 30g CHO
- 1 kiwi = 15g CHO
- 1 cup of mango = 30g CHO
- 1 medium orange = 15g CHO
- 1 cup of papaya = 15g CHO
- 1 small peach = 15g CHO
- 1 small pear = 15g CHO
- 1 cup of pineapple = 20g CHO
- 1 large plum = 15g CHO
- 2 tbsp. of dried fruit (raisins, cranberries) = 15g CHO

### **FRUIT JUICES:**

- 4 ounces of apple, orange, cranberry juice = 15g CHO

### **BREAD/GRAIN/STARCHES:**

- 8 animal crackers = 15g CHO
- Large bagel = 60g CHO
- 1 cup of beans = 30g CHO
- 1 cup of baked beans = 45g CHO
- 1 slice of white/wheat bread = 15g CHO
- 1 hot dog or hamburger bun = 30g CHO
- 8 baked chips (pita, potato) or 13 regular (tortilla) = 15g CHO
- 1 cup of chickpeas = 30g CHO
- 1 cup cereal (read labels!) = 30g CHO
- 1 cup of couscous = 45g CHO
- 1 cup of corn or 1 large ear = 30g CHO
- 1 piece of cornbread = 30g CHO
- 1 dinner roll = 15g CHO
- 1 donut (Dunkin Donuts) = 30g CHO
- 1 cup of cooked edamame = 15g CHO
- 1 English muffin = 30g CHO
- ¼ cup of granola = 15g CHO
- 1 large Kaiser roll = 60g CHO
- 3 graham cracker squares = 15g CHO
- 1 cup of grits = 30g CHO
- 2 tbsp. of hummus = 4g CHO
- 1 cup lentils = 30g CHO
- 1 muffin (bakery style) = 60 to 75g CHO
- 1 cup of cooked oatmeal = 30g CHO
- 1 large pancake = 15g CHO
  - 2 tbsp. of syrup = additional 25g CHO
- 1 cup cooked pasta = 45g CHO
- 1 cup of peas = 30g CHO
- 1 pita pocket = 30g CHO
- 1 plantain = 30g CHO
- 3 cups of popcorn = 15g CHO
- 1 small potato (3 oz.) = 15g CHO
- 1 cup of mashed potatoes = 30g CHO
- 20 mini pretzels = 25g CHO
- 1 cup of cooked quinoa = 15g CHO
- 1 cup of cooked rice = 45g CHO
- 1 rice cakes = 7g CHO
- 5 Ritz crackers = 10g CHO
- 5 Saltines = 15g CHO
- 1 cup sweet potato = 30g CHO
- 1 tortilla (6" diameter) = 15g CHO
- 1 EGGO waffle = 15g CHO
- 1 cup winter squash (acorn, butternut, pumpkin) = 15g CHO



**NUTS/SEEDS:**

- 24 almonds = 5g CHO
- ¼ cup of cashews = 8g CHO
- 2 tbsp. of peanuts = 5g CHO
- 1/4 cup pistachios = 8g CHO
- 7 walnuts = 4g CHO
- 2 tbsp. flax seeds = 4g CHO
- 1/4 cup of pumpkin seeds = 4g CHO
- 1/4 cup of sunflower seeds = 7g CHO

**DAIRY:**

- 1 cup of milk (includes cows, goat, soy) = 12 g CHO
- 1 cup of plain yogurt = 7g CHO
- 1 cup of ice cream = 30g CHO

**NONSTARCHY VEGETABLES:**

One non-starchy vegetable serving (1/2 cup cooked or 1 cup raw) has 5 grams of carbs or less:

- |                |                   |            |                             |
|----------------|-------------------|------------|-----------------------------|
| • Artichoke    | • Brussel sprouts | • Eggplant | • Spinach                   |
| • Asparagus    | • Cabbage         | • Greens   | • Squash (yellow, zucchini) |
| • Bean sprouts | • Carrots         | • Kale     | • Mushrooms                 |
| • Green beans  | • Cauliflower     | • Onions   | • Peas pods                 |
| • Beets        | • Celery          | • Peppers  | • Radishes                  |
| • Broccoli     | • Cucumber        |            | • Tomato                    |
|                |                   |            | • Water chestnuts           |

**COMBINATION FOODS:**

*(Foods with ingredients from one or more food group. Ex: CHO + fat or protein)*

- |   |  |
|---|--|
| • 1 ounce (1.25 inch square) of brownie = 15g CHO | • 2 small cookies=15g CHO                |
| • 1 burrito (15 ounces) = 45g CHO                 | • 1 small cupcake = 30g CHO              |
| • 1 cup of casserole = 30g CHO                    | • 1 French fries = 1 g CHO               |
| • 6 chicken nuggets = 15g CHO                     | • 1 cup of lasagna = 30g CHO             |
|   | • 1 cup of macaroni and cheese = 45g CHO |
|   | • 1 slice of Pizza (NY slice) = 60g CHO  |
|   | • 1 submarine sandwich =45g CHO          |
|   | • 1 taco= 15g CHO                        |

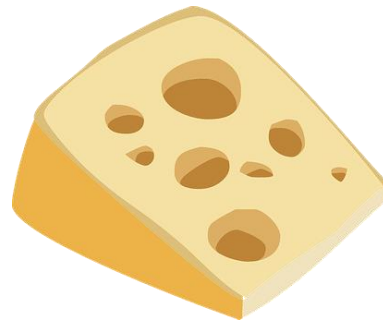
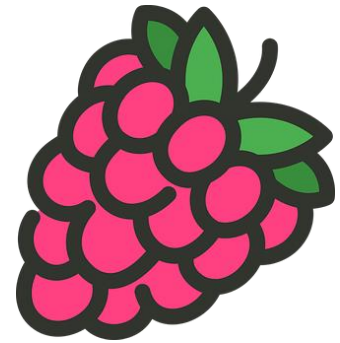
**FREE FOODS: *Food without (or with minimal) carbohydrates***

- |                                      |   |
|--------------------------------------|---|
| • Butter and margarine               | • Salad dressings (without added sugar) |
| • Cheese and cream cheese            | • Seasonings/herbs                      |
| • Cocoa powder (1 tbsp. unsweetened) | • Seltzer                               |
| • Eggs                               | • Sour cream                            |
| • Ketchup (1 tbsp. or less)          | • Tofu (1 cup or less)                  |
| • Meat, poultry, fish                | • Unsweetened tea Seasonings/herbs      |
| • Mayonnaise                         | • Seltzer                               |
| • Mustard (1 tbsp. or less)          | • Sour cream                            |
| • Oils                               | • Tofu (1 cup or less)                  |
| • Pickles                            | • Unsweetened tea                       |

# Very Low Carbohydrate Snacks

(Less than 5 grams of carbohydrate)

- NUTS: almonds/walnuts/ peanuts/pistachios (*1/4 cup*) or Nut Butter (*1 tbsp.*)
- Pumpkin or Sunflower SEEDS (*1/4 cup*)
- Edamame (*soybeans, 1/4 cup*)
- 1 hardboiled or deviled egg
- Baby carrots (*5 carrots*)+ ranch
- Cucumbers + hummus (*2 tbsp.*)
- Turkey roll up with Swiss cheese + lettuce
- Celery sticks with peanut butter (*1 tbsp.*) or cream cheese
- Zucchini chips (*1 cup sliced, baked with olive oil*)
- Kale chips (*1 cup baked + olive oil*)
- Pickles or olives
- Avocado slices (*1/3 of a whole*)
- Salad with greens, tomatoes, cucumbers (*1 cup*)+ oil/vinegar
- Blueberries, blackberries, raspberries (*1/4 cup*) or strawberries (*1/2 cup*)
- Caprese: Tomato (*1 medium*), mozzarella, and basil
- Tuna, egg, or chicken salad lettuce wraps
- Baked parmesan crisps
- Sugar snap peas (*2/3 cup*)
- Cottage cheese (*1/2 cup*) and raspberries (*6 total*)
- String cheese and strawberries (*5 total berries*)
- Plain Greek yogurt (*1/2 cup*)
- Almond milk (*1 cup*)
- Pepper slices (10 strips) dipped in salsa or guacamole (*1/4 cup*)
- Cauliflower (*10 small pieces*) “popcorn” cut up and baked with olive oil and parmesan
- Ricotta (*1/2 cup*) with cinnamon
- Beef Jerky or “Meat Sticks”
- Seaweed snacks (*around 10g, check labels*)



# A How-To Guide to Carbohydrate Counting

*It is time to eat! How can I include the carbohydrates I eat in my total insulin dosage?*

**Step 1:** Identify the carbohydrate foods in your snack or meal

*See page 13 for carbohydrate sources*

**Step 2:** Use your Insulin to carbohydrate ratio (given to you by your healthcare provider)

- I take **1** unit of insulin for every \_\_\_\_\_ grams of carbohydrates I eat

**Step 3:** Determine how many carbohydrates are in your meal or snack:

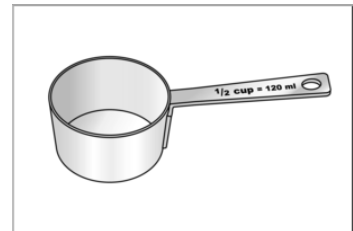
- Does my food have a nutrition facts label?
  - If **YES** proceed to A
  - If **NO** proceed to B

**A.**

**1** Find the serving size.

<b>Nutrition Facts</b>	
<b>Serving Size</b>	15 crackers (30g)
<b>Servings Per Container</b>	about 14
<b>Calories</b>	130
<b>Total Fat</b> 3g	5%
Saturated Fat 0g	
<b>Cholesterol</b> 0mg	0%
<b>Sodium</b> 160mg	7%
<b>Total Carbohydrate</b> 22g	7%
Dietary Fiber 2g	8%
Sugars 3g	
<b>Protein</b> 3g	–
Vitamin A	0%
Vitamin C	0%

**3** Compare the serving size listed to your actual portion.



**2** Locate the total carbohydrate in one serving. (Sugars are included in this number, so you do not need to count them separately.)

Use your measuring cups if applicable!

**B.** No food label? Do not worry! Try one of the following:

- Go to [calorieking.com](http://calorieking.com) and search for your food to find the carbohydrate amount
- Use Apps! “Calorie King”, “Pinto”, and “MyFitness Pal” have nutrient databases where you can look up your food to get a carb count estimation
- Try a food scale: this will tell you the weight of the food which you can then use to determine the carbohydrate amount
- Check-out a Food List such as the one provided (page 14-15)

## Rapid-Acting Insulin Dosing:

**Step 1:** Check your blood sugar & determine if a correction is required

**If yes, use your correction factor (also called your insulin sensitivity factor (ISF)), provided by your doctor):**

1 unit of insulin will lower my blood sugar \_\_\_\_\_ mg/dl to \_\_\_\_\_ (Target)

Example:  $\frac{\text{Blood Sugar} - \text{Target}}{\text{Correction Factor}} = \text{_____ units}$

Correction Factor  $\rightarrow$

**Step 2:** Determine total grams of carbohydrates to be eaten & calculate dose of insulin required (for how to carb count see page 18)

**Carbohydrate Coverage:** 1 unit of insulin for every \_\_\_\_\_ grams of carbohydrate eaten

Example:  $\frac{\text{Total carbs in meal/snack}}{\text{Insulin to carb ratio}} = \text{_____ units}$

Insulin to carb ratio  $\rightarrow$

### **Step 3**

Add the number of units from Step 1 **AND** Step 2 to determine total insulin dose

---

#### **\*\*Please note**

- For a meal or snack: if blood sugar is within target range, a correction dose is not required.
  - Skip Step 1 & only provide insulin for food coverage using Step 2.
- Do not give any CORRECTION *within 3 hours of a prior Novolog®/Admelog®/Humalog® insulin dose.*
- **ALWAYS COVER FOOD (CARBOHYDRATES)!**
- *Remember:* Long acting insulin, Lantus®/Levemir®/Basaglar®/Tresiba®, is given daily at the same time of the day

## Insulin Dosage Example:

**Step 1:** It is time for breakfast! How much insulin do I need to correct my blood sugar and cover my carbohydrates?

Current blood sugar = 220mg/dL

Target blood sugar = 120mg/dL (assigned by my doctor)

Correction factor (or ISF) = 50 (assigned by my doctor)

$$\frac{220 - 120}{50} = 2 \text{ units of insulin to correct my blood sugar}$$

**Step 2:** I am going to eat 1/2 cup of oatmeal, 1 cup of milk, 1 cup of raspberries and a hardboiled egg

Identify the carbohydrate foods: Oatmeal, milk, and raspberries

Insulin-to-carbohydrate ratio: 1 unit for every 14 grams of carbohydrate

Determine the carbohydrates in your meal:

**Oatmeal**

<b>Nutrition Facts</b>	
About 30 servings per container	
<b>Serving size 1/2 cup dry (40g)</b>	
<b>Amount per serving</b>	
<b>Calories 150</b>	
% Daily Value*	
<b>Total Fat</b> 3g	4%
Saturated Fat 0.5g	3%
Trans Fat 0g	
Polyunsaturated Fat 1g	
Monounsaturated Fat 1g	
<b>Cholesterol</b> 0mg	0%
<b>Sodium</b> 0mg	0%
<b>Total Carbohydrate</b> 27g	10%
Dietary Fiber 4g	13%
Soluble Fiber 2g	
Total Sugars 1g	
Includes 0g Added Sugars	0%
<b>Protein</b> 5g	

**Milk**

<b>Nutrition Facts</b>	
Serving Size 1 Cup (240mL)	
Amount per Serving	
<b>Calories</b> 110	Fat Cal 25
%Daily Value	
<b>Total Fat</b> 2.5g	4%
Saturated Fat 1.5g	8%
Trans Fat 0g	
<b>Cholesterol</b> 15mg	5%
<b>Sodium</b> 125mg	5%
<b>Potassium</b> 360mg	10%
<b>Total Carbohydrate</b> 12g	4%
Dietary Fiber 0g	0%
Sugars 12g	
<b>Protein</b> 8g	16%

**Raspberries**

<b>Nutrition Facts</b>	
Serving Size 1 cup (125g)	
Amount Per Serving	
<b>Calories</b> 50	Calories from Fat 0
% Daily Value*	
<b>Total Fat</b> 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	0%
<b>Cholesterol</b> 0mg	0%
<b>Sodium</b> 0mg	0%
<b>Total Carbohydrate</b> 17g	6%
Dietary Fiber 8g	32%
Sugars 12g	
<b>Protein</b> 1g	

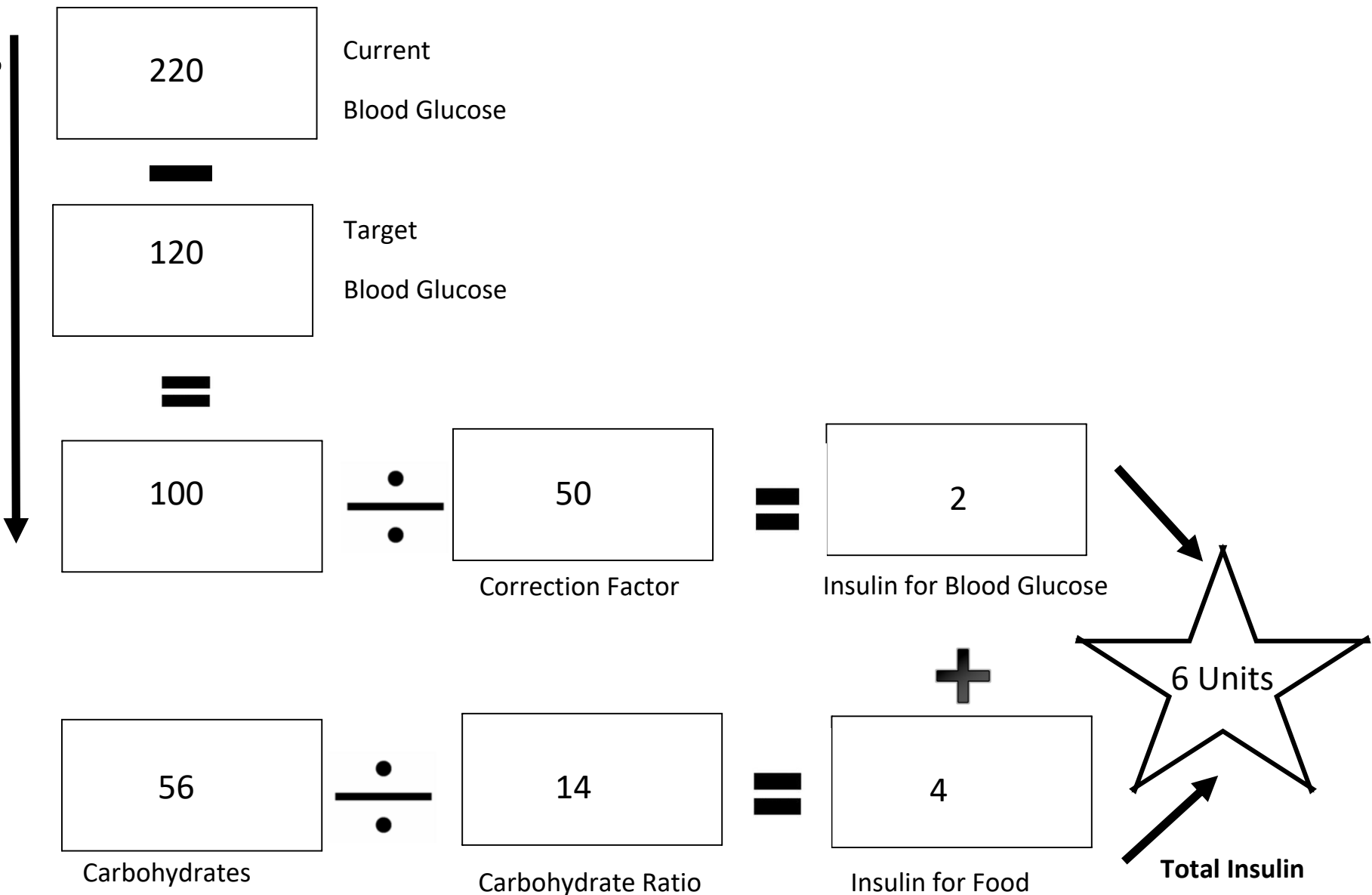
Oatmeal + Milk + Raspberries = 27 grams + 12 grams + 17 grams = 56 grams of carbohydrates

Determine your insulin for food:

$$\frac{56}{50} = 4 \text{ units of insulin for my breakfast}$$

**Step 3:** 2 units to correct + 4 units for carbohydrate coverage = 6 units total of insulin

**A.**



**B.**

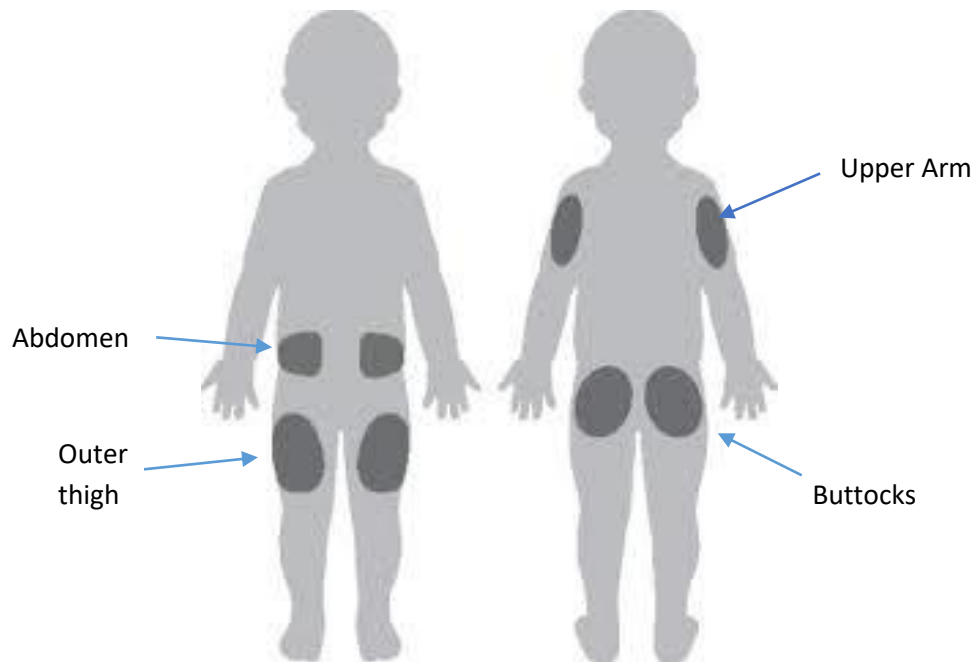


## Insulin Injections:

Insulin is administered using an insulin pen. A new pen needle should be used with every injection with an insulin pen.

Do not forget to rotate your insulin injection sites!

Recommended sites:



- If you notice a lump or bruising that does not go away at injection site or any signs of infection/inflammation (pus, swelling, persistent redness, pain that doesn't go away after injection, or skin that is hot to the touch) call your doctor

# Diabetes Programs at Weill Cornell Medicine

*Our diabetes team offers a variety of programs to teach coping skills and foster support within our community.*

Find the most up to date information about our programs on our webpage:

<https://weillcornell.org/pediatric-diabetes-program>

Ongoing Programs:

- Coffee Talks
  - Round table discussion with our Nurse Practitioner and Psychologist on diabetes topics to assist with coping and skill learning
- Diabetes Listserv
  - Our diabetes team shares updates in care, recipes, and other news via our listserv. If you would like to join, please email Isabel Reckson at [isr2007@med.cornell.edu](mailto:isr2007@med.cornell.edu)
- Camp Freedom
  - A one-week summer day camp for elementary age children (8-10 years old) with type 1 diabetes.
- Teen Program
  - A quarterly program for middle school children with type 1 diabetes that focuses on coping skills and diabetes management
- Transition Program
  - For our teenagers to young adults, to review diabetes education to promote independence and prepare them for success after high school. At the end of the program, these young adults become a part of transition clinic to formally transition care to adult providers

If your child is having trouble coping with their diabetes diagnosis, you can schedule an appointment with the staff social worker or psychologist by calling 646-962-3442.

## Resources for People with Diabetes:

1. Juvenile Diabetes Research Foundation (JDRF) [www.jdrf.org](http://www.jdrf.org)
2. Children with Diabetes Website [www.childrenwithdiabetes.com](http://www.childrenwithdiabetes.com)
3. American Diabetes Association [www.diabetes.org](http://www.diabetes.org)
4. American Dietetic Association [www.eatright.org](http://www.eatright.org)
5. Beyond Type 1 [www.beyondtype1.org](http://www.beyondtype1.org)
6. Calorie King [www.calorieking.com](http://www.calorieking.com)

## Resources for Medic Alert Bracelets

1. Medic Alert Foundation [www.medicalert.org](http://www.medicalert.org)
2. Laruen's Hope [www.laurenshope.com](http://www.laurenshope.com)
3. StickyJ Medical [www.stickyj.com](http://www.stickyj.com)





## My Diabetes Discharge Instructions:

Supplies to keep with me every day when I travel:

- Meter
- Lancets
- Ketone Test Strips
- Insulin pen needles
- Juice boxes or glucose tabs  
in case of hypoglycemia
- Log book
- Test strips
- Insulin
- Glucagon emergency kit



### Diabetes Regimen:

My long acting insulin: \_\_\_\_\_

My target blood sugar is: \_\_\_\_\_

My correction factor or insulin sensitivity factor: \_\_\_\_\_

My insulin to carbohydrate ratio: \_\_\_\_\_

My next diabetes appointment is: \_\_\_\_\_



Notes

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**Sample Blood Sugar Log**

Day/Time:		12am	3am	6am	9am	12pm	3pm	6pm	9pm
Day 1	BG								
	CHO								
	Insulin								
Day 2	BG								
	CHO								
	Insulin								
Day 3	BG								
	CHO								
	Insulin								
Day 4	BG								
	CHO								
	Insulin								

*BG=blood glucose; CHO= amount of carbohydrate eaten; Insulin=dosage given in units*

Day/Time:		12am	3am	6am	9am	12pm	3pm	6pm	9pm
Day 5	BG								
	CHO								
	Insulin								
Day 6	BG								
	CHO								
	Insulin								
Day 7	BG								
	CHO								
	Insulin								
Day 8	BG								
	CHO								
	Insulin								

*BG=blood glucose; CHO= amount of carbohydrate eaten; Insulin=dosage given in units*

