Managing your diabetes

PEDiatric DiABETEs

A PATIENT GUIDE

UCDAVIS
CHILDREN'S HOSPITAL
**DIABETES**

**Quick guide**

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**IMPORTANT PHONE NUMBERS**

**Pediatric Diabetes Nurse Educators**
Monday to Friday, 9 a.m. – 5 p.m. only
(916) 734-0494 (phone)
(916) 734-7070 (fax)
- Advice
- Medication refills

The nurse educators are your main contact for any questions/concerns.

**Pediatric Specialty Clinic**
(916) 734-3112
1-800-770-6850
- For clinic appointments/scheduling

**UC Davis Hospital Operator**
(916) 734-2011 or 1-800-641-6464
- Upon discharge, call M.D. every night with blood sugar values; as written on cover page
- After hours, weekends, holidays – **ONLY** for URGENT matters
- Ask for pediatric endocrinologist on call

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**ITEMS YOU WILL NEED TO MANAGE YOUR DIABETES**

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**PRESCRIPTION ITEMS**

You will receive prescriptions for the following items when you leave the hospital.

**Blood sugar testing:**
- Blood glucose meter (given to you in hospital)
- Test strips for meter
- Lancet device (for finger sticks, came with glucose meter)
- Lancets

**Insulin:**
- Lantus insulin
- Novolog/Humalog insulin
- Syringes (ultrafine, short needles)

**For treatment of low blood sugar:**
- Glucagon emergency kit

**For treatment of high blood sugar:**
- Ketostix (for testing urine for ketones when blood sugar is >350mg/dL)

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**NON-PRESCRIPTION ITEMS**

(must purchase at pharmacy)

- Batteries (for meter)
- Glucose tablets or gel or juice (for treatment of low blood sugar)
- 100% sterile cotton balls (to stop bleeding after finger sticks)
- Alcohol swabs (for injections)
DIABETES

Quick guide

TESTING BLOOD SUGAR
- Before meals and before bed.
- Anytime you have symptoms of high or low blood sugar.
- Record in logbook.
- Never test within 3 hours of eating unless you suspect hypoglycemia.

HYPERGLYCEMIA
(HIGH BLOOD SUGAR)
- See “hyperglycemia,” page 9 for signs and symptoms of high blood sugar.
- > 350mg/dL, test urine for ketones, record in logbook.
- Call Doctor if ketones are greater than “trace.”

EMERGENCIES REQUIRING A CALL TO A DOCTOR
- Severe hypoglycemia requiring use of glucagon.
- Positive urine ketones.

SICKNESS/VOMITING
- Test urine ketones.
- Give your child usual Lantus insulin, even if he/she is not eating.

FOOD
- Carbohydrate intake must be counted. Insulin will be based on carb intake.
- Blood sugar should be > 120 at bedtime. If not, eat 15 grams carbohydrates without Novolog/Humalog insulin. (Take Lantus as usual.)

HYPOGLYCEMIA
(LOW BLOOD SUGAR)
- See “hypoglycemia,” page 8 for signs, symptoms and treatment of low blood sugar.
- If your child experiences severe low blood sugar, requiring glucagon or emergency medical attention, call the Doctor that day for further instruction.
What is diabetes?
Testing blood sugar
Insulin dosing sheet
Insulin injections
Storing insulin
Hypoglycemia (low blood sugar)
Hyperglycemia (high blood sugar)
Glucagon fact sheet
Nutrition and type 1 diabetes
Counting carbohydrates
Measuring foods for diabetes
Sample meal
Exercise
TYPE 1 DIABETES

Type 1 diabetes is a disease in which the beta cells in the pancreas stop making insulin. The pancreas is an organ behind the stomach that produces substances needed to digest and absorb food. Insulin is one of the hormones it secretes. Insulin is needed for the body to use glucose. Glucose is a type of sugar. In your blood many foods turn to glucose. Glucose is the body’s main source of energy. Without insulin, glucose stays in the blood and is not made into energy. Type 1 diabetes is most common in children.

Insulin shots are the treatment for Type 1 diabetes.

TYPE 2 DIABETES

With Type 2 diabetes, the body still produces some insulin but it may not be enough or may not be used properly by the body. As with Type 1 diabetes, it is important that glucose not remain in the blood, but instead, be transferred to the cells for energy. Treatment of Type 2 diabetes requires lifestyle changes such as healthful eating and exercise. It may require either pills or insulin.

Diabetes is one of the most common chronic diseases among children in the United States.
The goal is to keep blood sugar as close to normal as possible. There will always be a rise in blood sugar after meals. It is important for the blood sugar to come back down to target range before the next meal.

**When to test?**
- Before meals and before bedtime (4 times per day).
- When there are symptoms of high or low blood sugar.

**Target blood sugars:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Target Blood Sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5 years</td>
<td>100 – 200 mg/dL</td>
</tr>
<tr>
<td>5 years – 12 years</td>
<td>80 – 180 mg/dL</td>
</tr>
<tr>
<td>12 years or older</td>
<td>70 – 150 mg/dL</td>
</tr>
<tr>
<td>Bedtime blood sugar</td>
<td>Should always be above 120 mg/dL</td>
</tr>
</tbody>
</table>

*target blood sugars may change as you learn more about managing diabetes

Write down blood sugar results in your diary and bring to all clinic appointments. Also, always bring your meter with you to appointments.

**HEMOGLOBIN A₁C**

Hemoglobin A₁C is a blood test that measures the amount of glucose attached to the red blood cell. The test measures the average blood sugar over the past 3 months. You will have your hemoglobin A₁C tested every 3-6 months at clinic visits.

It is measured as a percentage (e.g. 8%, 9%, etc.), which looks different from the numbers you will see on your meter.

The following compares Hemoglobin A₁C values to blood sugar values:

<table>
<thead>
<tr>
<th>Hemoglobin A₁C (%)</th>
<th>Blood sugar (mg/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>240</td>
</tr>
<tr>
<td>9</td>
<td>210</td>
</tr>
<tr>
<td>8</td>
<td>180</td>
</tr>
<tr>
<td>7</td>
<td>150</td>
</tr>
</tbody>
</table>
Step-by-Step

TESTING BLOOD SUGAR

1. Wash and dry hands.

2. Things you will need:
   - lancet
   - finger-stick device
   - test strip
   - blood glucose meter
   - cotton ball for blotting spot where you draw blood
   - logbook

3. Turn meter on.

4. Check date and time on meter are correct.*

5. Check that code on meter matches code on bottle of test strips. Change code on meter if these numbers do not match.*

6. Place strip in meter.

7. Attach lancet to finger-stick device and draw blood sample.

8. Bring blood sample to test strip, fill the whole yellow area on test strip. Blood sugar results can take from 5–30 seconds.

9. Stop bleeding with a cotton ball or tissue.

10. Record blood sugar results in logbook.

* Read instruction manual for meters as set-up may vary from one meter to the next.

Children will take their cues from you. When parents approach diabetes in a matter of fact way, children will follow.
Insulin Dosing Sheet

How Does It Work?

Lantus is a basal insulin, taken once a day. The basal insulin will keep your blood sugar in target range IF you don’t eat. Novolog or Humalog is rapid acting insulin taken every time you eat carbohydrate.

Approximately one in every 400 to 500 children and adolescents has type 1 diabetes.

Your amount of Lantus is ________. You need to take it at the same time every day. This Lantus dose will last about 24 hours. The time to take your Lantus is _____________.

Novolog or Humalog is a rapid acting insulin. You must take a shot of Novolog or Humalog every time you eat more than ____ grams of Carbohydrate. The exception is if you are treating a low blood sugar or covering exercise.

The amount of Novolog or Humalog you take depends on your blood sugar, and the amount of carbohydrate you will eat.

1) If your blood sugar is not within the target range you will need a “correction dose.”

2) Your “insulin to carbohydrate ratio” is the amount of Novolog or Humalog you need per carbohydrate you eat. Your ratio of Novolog or Humalog is 1 unit to ________ grams of carbohydrate.
To figure out how much Novolog/Humalog to take you must:

- First, check if your blood sugar is in the target range. If not, you need a “correction dose.” This will bring your blood sugar back into the target range. Your target blood sugar is _______.

- Second, count the grams of carbohydrate in your food. Divide the total carbohydrate grams by your ratio. Round off to the nearest number. This is the dose of Novolog/Humalog for your insulin to carb ratio.

- Now add the correction dose of Novolog/Humalog to the insulin to carb ratio dose. This is your total dose of Novolog/Humalog.

Important to Remember:

- When eating carbohydrate always take a Novolog/Humalog dose to cover the carbohydrate NO MATTER how soon it has been since your last shot of insulin. The exceptions are when treating low blood sugar or exercising.

- Use your insulin to carbohydrate ratio to determine the dose of Novolog/Humalog.

- Do not give a correction dose for a high blood sugar unless it has been at least 3 hours since your last carbohydrate containing meal or snack or dose of Novolog/Humalog.

- Only use Correction at Breakfast, Lunch, and Dinner and bedtime snack as above.

- Remember DO NOT MIX Lantus with any other insulin. Lantus is clear, so be careful to not confuse Lantus with Novolog/Humalog. After injection, count to 3 then remove syringe. Discard all vials 30 days after opening.
Insulin INJECTIONS

- Lantus insulin should be given at the same time every day (within 1 hour).
- Novolog/Humalog insulin should be given right before the meal.

INJECTION CHECKLIST:

- Change the spot where you give your insulin to prevent swelling, lumps and scar tissue
- Inject into fatty tissue
- Use the entire area, do not re-use the same spot

Abdomen: Stay 2 inches away from the belly button or scars. Insulin is absorbed the best from the abdomen.

Arms: Measure one hand width down from the shoulder and one hand width up from the elbow. Use the fleshy outer surface.

Legs: Measure one hand width down from the groin and one hand width up from the knee. Use the top and outer part of the leg staying away from the inner part of the thigh.

Buttocks: Use the upper outer area.

Allow your child to express feelings, both positive and negative. Don’t make light of negative feelings (”it’s not that bad”).
Insulin bottles have expiration dates on them. Discard insulin once it has passed the expiration date.

Keep unopened bottles of insulin in the refrigerator or in a cool place, less than 86°F. Keep away from direct sunlight.

Open bottles of insulin may be stored at room temperature, less than 86°F, and away from direct sunlight.

Write the date on bottle when it is opened. Insulin must be thrown away after being open for 1 month.

NEVER store insulin in the freezer.

* Injecting cold insulin may sting. If you store your insulin in the refrigerator, warm it to room temperature before injecting.

**DISPOSING OF NEEDLES:**

Insulin needles and lancets should be discarded in a container that cannot be punctured such as a metal coffee can. Call your local waste disposal company to find out if they have a policy for disposing of medical waste.

Agree with your child that diabetes is unfair or difficult, but reassure her or him that you are there to help through the hard times. JDRF.org
HYPOGLYCEMIA (low blood sugar)

Blood glucose of less than 80 mg/dL.

Causes:
- Too little carbohydrate
- Too much insulin
- Extra activity or exercise

Symptoms:
- Shaking
- Fast heartbeat
- Sweating
- Anxious
- Dizziness
- Hunger
- Impaired vision
- Headache
- Weakness/fatigue
- Irritable

Treatment:
1. Test Blood sugar and tell someone you feel low!
2. If below 80 mg/dL, treat by taking 15 grams of fast acting carbohydrate.
   
   For example: 3-4 small glucose tablets (check label for amount of carbohydrate)
   ½ cup juice or regular soda
   small juice box
   small tube cake icing
   
   If blood sugar below 50, take 30 grams of fast acting carbohydrate (double dose in examples above)
3. Wait 15 minutes then re-test blood sugar. Repeat treatment if blood sugar less than 80 mg/dL.

If child is unresponsive, use glucagon* and call 9-1-1.

* see page 10
**Hyperglycemia (High Blood Sugar)**

**Causes:**
- Too much carbohydrate
- Too little insulin
- Illness
- Stress
- Inactivity

**Symptoms:**
- Extreme thirst
- Hunger
- Dry skin
- Frequent urination
- Blurred vision
- Drowsiness
- Nausea

**Treatment:**
1. Test Blood sugar.
2. If blood sugar is over 350 mg/dL, test urine for ketones. Also test ketones if ill/vomiting.
3. If urine ketones greater than “trace”, call Doctor or Nurse Educator.

Diabetes does not define us, nor should it slow us down or stop us from doing the things we love to do.
Glucagon FACT SHEET

1. Remove the flip-off seal from the bottle of glucagon. Wipe rubber stopper on bottle with alcohol swab.

2. Remove the needle protector from the syringe, and inject the entire contents of the syringe into the bottle of glucagon. Remove syringe from the bottle.

3. Swirl bottle gently until glucagon dissolves completely. The solution should be clear water-like consistency.

4. The usual dose is 1 mg. For children weighing less than 44 lb give ½ mg (0.5 mg mark on syringe).

ACT IMMEDIATELY

- **Check blood sugar.** Unconsciousness may be caused by Hyperglycemia, in which case, Glucagon would be ineffective.

- **Glucagon may cause vomiting.** Turn patient on his side to prevent choking.

- The contents of the syringe are inactive. **Contents of the syringe must be mixed** with the glucagon in the bottle before giving injection.

- **DO NOT mix Glucagon for Injection until you are ready to use it.**

  *Never give food to a person with diabetes who is unconscious from hypoglycemia.*

INJECT GLUCAGON IMMEDIATELY AFTER MIXING

- There is **NO DANGER** of overdose

  *Use Same Technique as for Injecting Insulin*

- Feed the patient as soon as he awakens and is able to swallow. Give the patient a fast-acting source of sugar (such as a regular soft drink or fruit juice) and a long-acting source of sugar (such as crackers and cheese or a meat sandwich).

- If the patient does not awaken within 15 minutes, give another dose of glucagon and Call 9-1-1.

- Even if the glucagon revives the patient, the doctor should be promptly notified.
**Type 1 diabetes** is a disease in which your body no longer makes insulin. Insulin is a hormone that moves sugar (glucose) from your blood into your cells. Once in the cells, sugar is used as energy. Sugar is the primary fuel for your body, including the muscles and the brain.

Foods are made of carbohydrates, protein, fat or a mixture of these. Carbohydrates turn into sugar in your body. Therefore, when you eat carbohydrates you must take an insulin injection.

A proper balance between carbohydrates and insulin will lead to normal blood sugar levels. Your physician will tell you how much insulin you need to take for a specific amount of carbohydrates. Therefore, it is important to count the amount of carbohydrates you eat.

Too little carbohydrates with too much insulin will lead to low blood sugar levels.

Too much carbohydrates with too little insulin will lead to high blood sugar levels.

**Which foods have carbohydrates?**

Carbohydrates come from starch and sugar in food. Carbohydrates can be found in the following food groups:

- Starches
- Fruits
- Milk and yogurt
- Foods with added sugar

There are many ways to determine the carbohydrate content of the foods that you eat. You can read food labels, use published food lists, use the diabetes exchange lists, or a combination of all three.
Carbohydrates are listed in grams on the food label. The Total Carbohydrate listed on the label includes starch, sugars, and dietary fiber. Total Carbohydrate is the number that you will use when counting your carbohydrates. Do not count the sugars in food separately.

1) Check the **serving size**. If needed, use a measuring cup or a food scale to measure the serving size.

2) Check the **grams (g)** of **Total Carbohydrate**. This is the amount of carbohydrate per serving. If you have 2 servings, your Total Carbohydrate will be doubled (e.g. 44 grams).

3) Subtract **Dietary Fiber** from **Total Carbohydrates**.
   Fiber is counted in the Total Carbohydrate, but does not raise blood sugar. If a food contains fiber, subtract the grams of fiber from Total Carbohydrate.

In the example above, the **Total Carbohydrate** would be:

\[
\text{Total Carbohydrate (22 g) } - \text{ Dietary Fiber (9 g) } = \text{ 13 g carbohydrate}
\]
HOW DO I DETERMINE THE CARBOHYDRATE CONTENT OF FOODS WITH NO LABEL?

If a food does not have a label, you can find the carbohydrate content by using either nutrient information lists or exchange lists.

1. **Nutrient Information Lists:**

A variety of books and internet resources are available that contain carbohydrate information. Many grocery stores, bookstores, restaurants, and web sites have nutrient information lists. These lists may include other nutrition information such as fat, sodium, or calories. It is important that you count carbohydrate based upon the portion size that you eat.

<table>
<thead>
<tr>
<th>Food item</th>
<th>Calories</th>
<th>Total Fat (g)</th>
<th>Cholesterol (mg)</th>
<th>Sodium (mg)</th>
<th>Total Carbohydrate (g)</th>
<th>Dietary Fiber (g)</th>
<th>Sugars (g)</th>
<th>Protein (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheeseburger, 4 oz</td>
<td>300</td>
<td>13</td>
<td>50</td>
<td>725</td>
<td>30</td>
<td>1</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>French fries, small</td>
<td>220</td>
<td>10</td>
<td>0</td>
<td>180</td>
<td>27</td>
<td>2.5</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Side salad</td>
<td>25</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Cola, 12 oz</td>
<td>126</td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>32</td>
<td>0</td>
<td>30</td>
<td>0</td>
</tr>
</tbody>
</table>

Carbohydrates are a healthy and important part of a nutritious diet.
2. Exchange Lists:

Exchange lists group foods together that have similar amounts of carbohydrate. One carbohydrate exchange of starch, fruit, milk, or other carbohydrate food is equal to about 15 grams of carbohydrate.

**For example:**

- \( \frac{1}{3} \text{ cup rice} = 1 \text{ starch exchange} = 15 \text{ grams carbohydrate} \\
- 1 cup rice = 3 starch exchanges = 45 grams carbohydrate

### CARBOHYDRATE FOOD GROUPS

#### Starch List

<table>
<thead>
<tr>
<th>One exchange = 15 grams carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 slice bread</td>
</tr>
<tr>
<td>( \frac{1}{2} ) small bagel or ( \frac{1}{4} ) large bagel</td>
</tr>
<tr>
<td>( \frac{1}{2} ) hamburger or hot dog bun</td>
</tr>
<tr>
<td>1 (6-inch) tortilla</td>
</tr>
<tr>
<td>6 saltine crackers</td>
</tr>
<tr>
<td>( \frac{1}{2} ) cup cooked pasta</td>
</tr>
<tr>
<td>( \frac{1}{2} ) cup cooked cereal</td>
</tr>
<tr>
<td>( \frac{3}{4} ) cup unsweetened dry cereal</td>
</tr>
<tr>
<td>( \frac{1}{2} ) English muffin</td>
</tr>
<tr>
<td>1 (4 ( \frac{1}{2} ) inches) waffle</td>
</tr>
<tr>
<td>1 (4 inches across) pancake</td>
</tr>
<tr>
<td>15-20 tortilla chips</td>
</tr>
<tr>
<td>20 thin French fries</td>
</tr>
<tr>
<td>3 cups popcorn</td>
</tr>
<tr>
<td>( \frac{1}{2} ) cup cooked rice</td>
</tr>
<tr>
<td>( \frac{1}{2} ) cup cooked beans or lentils</td>
</tr>
</tbody>
</table>

**Starchy vegetables:**
- \( \frac{1}{2} \) cup corn or green peas
- 1 small potato
- \( \frac{1}{2} \) cup mashed potato, sweet potato, or yam
- 1 cup winter squash, (acorn, butternut, pumpkin)

#### Fruit List

<table>
<thead>
<tr>
<th>One exchange = 15 grams carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 small fresh fruit (e.g. apple, banana, orange, peach)</td>
</tr>
<tr>
<td>( \frac{1}{2} ) cup canned fruit, in juice</td>
</tr>
<tr>
<td>15 grapes</td>
</tr>
<tr>
<td>1 cup cubed melon</td>
</tr>
<tr>
<td>2 small tangerines</td>
</tr>
<tr>
<td>( \frac{3}{4} ) cup blueberries</td>
</tr>
<tr>
<td>2 Tbsp raisins</td>
</tr>
<tr>
<td>( \frac{1}{4} ) cup dried fruit</td>
</tr>
<tr>
<td>( \frac{1}{4} ) cup fresh pineapple</td>
</tr>
<tr>
<td>1 ( \frac{1}{4} ) cup strawberries</td>
</tr>
<tr>
<td>4 ounces fruit juice</td>
</tr>
</tbody>
</table>

#### Milk List

<table>
<thead>
<tr>
<th>One exchange = 12 grams carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 cup of milk</td>
</tr>
<tr>
<td>1 cup of soy milk</td>
</tr>
<tr>
<td>( \frac{3}{4} ) cup plain yogurt</td>
</tr>
<tr>
<td>1 cup light (sugar-free) yogurt</td>
</tr>
</tbody>
</table>

#### Other Carbohydrate List

<table>
<thead>
<tr>
<th>One exchange = 15 grams carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \frac{1}{2} ) cup ice cream</td>
</tr>
<tr>
<td>1 (2 inch) brownie, unfrosted</td>
</tr>
<tr>
<td>1 (2 inch) piece cake, unfrosted</td>
</tr>
<tr>
<td>5 vanilla wafers</td>
</tr>
<tr>
<td>( \frac{1}{2} ) cup sugar-free pudding</td>
</tr>
<tr>
<td>8 ounces sports drink</td>
</tr>
<tr>
<td>1 (3 oz) fruit juice bar</td>
</tr>
<tr>
<td>3 small sugar-free cookies</td>
</tr>
<tr>
<td>1 Tbsp sugar</td>
</tr>
<tr>
<td>1 Tbsp honey</td>
</tr>
<tr>
<td>1 Tbsp syrup</td>
</tr>
<tr>
<td>1 Tbsp molasses</td>
</tr>
</tbody>
</table>

Sweets can fit into a balanced, healthful diet when eaten in moderation.
LOW CARBOHYDRATE FOOD GROUPS

These foods contain less than 5 grams carbohydrate per normal serving and will have little effect on your blood sugar in normal portions.

Non-Starchy Vegetables
Include vegetables in your diet every day. Remember to count starchy vegetables (such as potatoes, corn, and peas) as carbohydrate. A serving of these vegetables is ½ cup cooked or 1 cup raw.

- Artichokes
- Asparagus
- Beets
- Broccoli
- Carrots
- Cauliflower
- Cucumber
- Eggplant
- Green beans
- Lettuce, greens
- Mushrooms
- Onions
- Peppers
- Radishes
- Spinach
- Summer squash (e.g., zucchini, crookneck)
- Tomato
- Water chestnuts

Meats and Other Proteins
Choose lean protein sources more often. Try to eat protein foods with your meals.

- Lean beef, poultry, and pork
- Beef jerky
- Fish
- Eggs
- Cottage Cheese
- Cheese
- Peanut butter
- Tofu

Free Foods
Limit to 3 servings per day.

- ¼ cup salsa
- 1 Tbsp low-fat sour cream
- 2 Tbsp whipped topping
- 1 sugar-free hard candy
- 2 tsp light jam or jelly
- Sugar-free gelatin
- 2 Tbsp sugar-free syrup
- 1 Tbsp mustard or ketchup
- Diet soda, diet beverage
- Vinegar
- 1 ½ large dill pickle
- 1 Tbsp fat-free cream cheese

Carbohydrates affect your child’s blood sugar more than any other kind of nutrient.
It is very important to measure portion sizes of food when you are counting carbohydrate. There are several ways to measure foods depending upon the type of food you are measuring.

**MEASURING CUPS AND SPOONS:**

Measuring cups, tablespoons, and teaspoons are important to use. These are not the same as the cups and spoons you use to eat. You can purchase measuring cups and spoons at many stores. When you measure with these utensils, the food should be LEVEL with the top of the measure. These utensils are used to measure the VOLUME of foods.

*Here is a reminder of the common volume measures:*

- 1 Tablespoon (Tbsp) = 3 teaspoons (tsp)
- $\frac{1}{4}$ cup = 4 Tbsp
- $\frac{1}{2}$ cup = 4 fluid ounces (oz)
- 1 cup = 8 fluid oz or 16 fluid Tbsp
- 1 oz = 30 milliliters (ml)
- 8 fluid oz = 240 ml
- 1 pint (pt) = 2 cups
- 1 quart (qt) = 2 pts
- 4 cups = 1 qt
- 1 gallon (gal) = 4 qts

**SCALES:**

Many people find that using a scale to weigh food is helpful. Food labels often list serving sizes in ounces and grams by weight. An ounce by weight must be measured on a scale. There are scales available that have nutrition information programs to help you calculate carbohydrates in the food you weigh.

*Here is a reminder of common weight measurements:*

- 16 oz = 1 pound (lb)
- 1 ounce = 28 grams (gm)
- 1 lb = 454 gms

**NOTE:**

A fluid ounce is a volume measure and is **NOT** the same as an ounce by weight.
### Ants on a Log
*(makes one serving)*

**Ingredients:**
- 1 stalk celery
- 1 tablespoon peanut butter
- 2 ½ teaspoons raisins

**Directions:**
Cut the celery stalks in half. Spread with peanut butter. Sprinkle with raisins.

**Nutrition information (per serving):**
- Calories: 184 (59% from fat)
- Protein: 7.1 g
- Fat: 13.3 g (sat 2.7 g)
- Carbohydrate: 13 g
- Fiber: 2.5 g
- Cholesterol: 0 mg
- Iron: < 1 mg
- Sodium: 156 mg
- Calcium: 30 mg

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Your recommended daily carbohydrate intake goal is ________ to ________ grams per day.

**Remember:**
1. Carbohydrate intake can vary from meal to meal and snack to snack but you must adjust the insulin to your carbohydrate intake using your insulin to carbohydrate ratio.
2. Test your blood sugar before each meal and before bedtime.
3. Blood tests should be at least 3 hours after your last carbohydrate-containing meal or snack. Testing sooner than 3 hours after eating carbohydrate may reveal a high blood sugar level. If you must check your blood sugar before 3 hours after a carbohydrate meal, do not give extra insulin to correct an elevated blood sugar.
4. Not eating enough carbohydrate for your insulin dose will cause hypoglycemia (low blood sugar).
Exercise is important for the heart and lungs. It helps build muscle, reduces stress, and build self-confidence.

Exercise helps lower blood sugar by moving sugar from the blood into muscle tissue. In some cases, there may be a slight increase in blood sugar following the start of exercise but lower blood sugar later. Exercise can lower blood sugar for up to 24 hours.

Checklist for maintaining blood sugar control during and after exercise:

- If you are planning on exercising for 60 minutes or more, test your blood sugar before, during, and after exercise.
- DO NOT exercise if your blood sugar is greater than 350 mg/dL, anytime ketones are positive, or if your blood sugar is less than 80 mg/dL.
- Consume extra carbohydrate before exercising to prevent hypoglycemia.
- Eat 15 grams of carbohydrate for every ½ hour of strenuous exercise. You should not give insulin for this carbohydrate as the exercise will lower the blood sugar.
- Always have a fast-acting sugar source available to treat hypoglycemia.

If exercise is longer or more strenuous than normal (for example, a track meet, ski trip, swim competition), please call the Pediatric Diabetes Nurse Educator at (916) 734-0494 for advice on adjusting insulin doses.
HELPING Children MANAGE Diabetes

- Follow a healthy meal plan
- Get regular physical activity
- Check blood glucose levels regularly
- Take all diabetes medication as prescribed
Helping children manage diabetes

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