PEDIATRIC DIABETES

A PATIENT GUIDE TO MANAGING A NEW DIAGNOSIS OF DIABETES
What is Diabetes?

Many people live with diabetes or know someone who is living with diabetes. Treatment looks different for each type of diabetes. With careful attention to a personalized medical plan – as well as maintaining a healthy diet and lifestyle – people with diabetes can live long, active, and healthy lives.

**Type 1 Diabetes**

Type 1 diabetes is an autoimmune disease. In type 1 diabetes, the body does not make an important hormone called insulin. The body breaks down carbohydrates from foods into glucose (sugar), which is needed for energy. Insulin is needed to move the glucose from the blood into the cells of the body. People with type 1 diabetes need to take insulin to keep blood sugar in a normal range.

**Type 2 Diabetes**

In type 2 diabetes, the body may make insulin, but does not make enough or does not use it correctly. This is called insulin resistance. Glucose builds up in the blood and causes high blood sugar. Type 2 diabetes is often treated with diet and lifestyle changes. Some people may also take oral medications and/or insulin.

The information in this booklet will help patients and their families learn about diabetes and diabetes management.
Patient Testimonials

“Breathe. Relax. This is the hardest it’ll ever be.”
– Malika

“Never be afraid to share your thoughts. Inflict others with your own knowledge and never give up. You are not alone.”
– Jordan

“Diabetes is only a little part of you; don’t let it take over you. I can still do anything I want, and so can you!”
– Isabella

“Don’t give up, your health and safety are worth a bit of trouble.”
– Garrett

“Diabetes isn’t something you need to hide. Talk about it with family and friends.”
– Emily

“I believe…
Courage is found in you and me
Guidance is found along our path
Trust is found where you may seek
Dreams and wonders oh so deep
If you have faith you will see
The road is paved with opportunity”
– Ava

“You aren’t different. You are just like everyone else and can do everything they can. Don’t let other people put you down for having diabetes.”
– Cooper

“Diabetes helps us develop good skills, like being brave and being patient.”
– Ainsley
## Quick Guide

### Important Phone Numbers

<table>
<thead>
<tr>
<th>Service</th>
<th>Contact Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pediatric Diabetes Nurse Educators</strong></td>
<td><em>The nurse educators are your main contact for any questions or concerns</em></td>
</tr>
<tr>
<td></td>
<td>Monday to Friday, 9 am to 5 pm</td>
</tr>
<tr>
<td></td>
<td>916-734-0494</td>
</tr>
<tr>
<td><strong>Pediatric Specialty Clinic</strong></td>
<td><em>For clinic appointments and other scheduling needs</em></td>
</tr>
<tr>
<td></td>
<td>916-734-3112</td>
</tr>
<tr>
<td></td>
<td>1-800-770-6850</td>
</tr>
<tr>
<td><strong>UC Davis Hospital Operator</strong></td>
<td><em>Ask for the “pediatric endocrinologist on-call”. Use this number ONLY for urgent matters after hours (5 pm to 9 am), on weekends and university holidays.</em></td>
</tr>
<tr>
<td></td>
<td>916-734-2011</td>
</tr>
<tr>
<td></td>
<td>1-800-641-6464</td>
</tr>
</tbody>
</table>

**Urgent issues include:**

- Hypoglycemia (low blood sugar) requiring use of Glucagon
- Positive urine ketones
- Sick/vomiting and unable to eat or drink
**Items You Will Need to Manage Your Diabetes**

<table>
<thead>
<tr>
<th>Blood sugar testing:</th>
<th>Insulin:</th>
<th>Other:</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Blood glucose meter (glucometer)</td>
<td>▪ Basal/24-hour long-acting insulin</td>
<td>▪ Glucagon emergency kit</td>
</tr>
<tr>
<td>▪ Test strips for meter</td>
<td>▪ Rapid-acting insulin/“day time” insulin</td>
<td>▪ Ketostix</td>
</tr>
<tr>
<td>▪ Lancet device (for finger sticks – comes with glucose meter)</td>
<td>▪ Syringes/pens</td>
<td>▪ Batteries (for meter)</td>
</tr>
<tr>
<td>▪ Lancets</td>
<td></td>
<td>▪ Glucose tablets or gel or juice</td>
</tr>
</tbody>
</table>

*Write down blood sugar results in your diary and bring to clinic. Bring your meter with you to all appointments. Your team cannot make changes to your insulin without the knowing information from your meter.*

**After Hospital Discharge**

After discharge, insulin doses will likely need to be adjusted every few days. Please call the Pediatric Diabetes Nurse Educators during the weekdays (8 am – 12 pm) at 916-734-0494 to report blood sugar values. A nurse will return your call to discuss insulin dose changes. If you do not hear back from a clinic nurse by 5 pm and you think an insulin dose change is needed, please call the UC Davis Hospital Operator to get into contact with the pediatric endocrinologist on-call.
Blood Sugar Testing and Goals

Hemoglobin A1c (also called “A1c”)

Hemoglobin A1c is a blood test that measures the average blood sugar over the past 3 months. It is measured as a percentage. A higher A1c means blood sugar has been consistently higher over those three months.

A1c is a useful tool for monitoring risk for complications related to diabetes. Long-term high blood sugars are related to negative effects on brain function, brain structure, and brain development in children and teens with diabetes.

Your A1c will be tested with a finger stick at each clinic visit.

Your A1c goal is less than 7.5%.

When do you test blood sugar?

You will test your blood sugar at home using a blood glucose meter (glucometer). You should test your blood sugar:

- before meals and before bedtime (4 times per day), and
- when there are symptoms of high or low blood sugar.

What are your blood sugar goals?

Here are starting blood sugar goals:

<table>
<thead>
<tr>
<th>Age Category</th>
<th>Blood Sugar Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5 years old</td>
<td>70-180 mg/dL</td>
</tr>
<tr>
<td>5 years and older</td>
<td>70-150 mg/dL</td>
</tr>
<tr>
<td>At bedtime</td>
<td>120-200 mg/dL</td>
</tr>
</tbody>
</table>

The goal is to keep blood sugar in the target range most of the time. Target blood sugars will change as you learn more about diabetes. Some things to keep in mind:

- Targets may be different based on age, size, activity level, pancreas function, etc.
- There will always be a rise in blood sugar after meals. The goal is for the blood sugar to come back down to target range before the next meal.
- You will learn to treat blood sugar less than 80 mg/dL with fast-acting carbohydrate (see page on “Hypoglycemia”). Blood sugars in the 70-80 mg/dL range are safe, but if blood sugars are dropping, we want you to treat them with carbohydrate before they reach lower levels.
- If blood sugars are frequently outside your goal range then insulin dose adjustments may be needed.
Things You Will Need to Test Your Blood Sugar:

- Lancet
- Finger stick device
- Test strip
- Blood glucose meter
- Cotton ball for blotting
- Blood sugar diary

How to Test Blood Sugar:

1. Wash and dry your hands.
   - Food or drink left on a finger before testing can cause a falsely high glucose reading.
   - A slightly wet finger can cause a falsely low sugar reading. You should completely clean and dry a finger before testing.
2. Turn meter on.
   - Check that the date and time on meter are correct. Read instruction manual. Set-up may change from one meter to the next.
3. Place strip in meter.
4. Perform finger stick.
5. Bring finger to test strip. Fill test strip with blood. Wait for result.
6. Wipe finger with a cotton ball or tissue.
7. Record blood sugar results in blood sugar diary.
Insulin

**Basal insulin** is your 24-hour, long-acting insulin and is usually taken once per day. Take it at the same time every day. It will keep your blood sugar in range if you don’t eat.

**Rapid-acting insulin** is taken every time you eat carbohydrates and/or when blood sugar is above goal. Rapid-acting insulin should be given before the meal or carbohydrate-containing snack.

- The amount of rapid-acting insulin you take depends on your blood sugar and the amount of carbohydrate you eat.
- If your blood sugar is above the target goal, you will need a “correction dose” of rapid-acting insulin.
- Your “insulin to carbohydrate ratio” is the number of units of rapid-acting insulin you need per gram of carbohydrate.

To decide how much rapid-acting insulin to take:

1. Check your blood sugar. Compare to your correction scale.
2. Count the grams of carbohydrate in your food. Divide the total carbohydrate grams by your insulin to carbohydrate ratio.
3. Add the correction dose to the insulin to carbohydrate dose. This is your total dose of rapid-acting insulin.

The “three-hour rule” for rapid-acting insulin:

*Do not give a correction dose for high blood sugar within 3 hours of your last dose of rapid-acting insulin.*

- When eating carbohydrate, always take rapid-acting insulin to cover the carbohydrate you are eating, no matter how recently you last took insulin. Use only your insulin to carbohydrate ratio to determine how much insulin to take.

For example: Jeremy took his insulin with lunch at a birthday party. One hour later, he wants to eat a slice of cake. He should count the carbohydrates in his cake slice and take insulin only based on his insulin to carbohydrate ratio.
Step-by-Step Guide to Using an Insulin Syringe
Source: Diabetes Forecast® (American Diabetes Association)

If You Use Vials and Syringes

Step 1
Clean the top of the vial with an alcohol pad, then remove the cap from the syringe needle.

Step 2
Draw air into your syringe—an amount equal to the units of insulin you’ll be injecting. To do so, pull back the syringe’s plunger until its black stopper reaches your insulin dose amount on the syringe barrel. So if you will be taking 6 units of insulin, pull back the plunger until the stopper hits the 6 etched onto the barrel.

Step 3
Put the vial on a flat surface and hold it. Insert the syringe into the vial, and press down on the plunger to inject the air from Step 2 back into the vial.

Step 4
With the syringe still in the bottle, turn the vial and syringe upside down. The tip of the needle should be fully covered by insulin.

Step 5
Make air bubbles less likely by slowly pulling down on the plunger. Draw insulin past your dose. Tap the syringe a few times so any bubbles rise to the top.

Step 6
Without removing the syringe from the vial, slowly push the plunger until the edge of its black stopper reaches the number of units in your dose, as marked on the syringe. If you see any bubbles, push all that insulin back into the vial and repeat these steps until no bubbles are present.

Step 7
Identify an injection site. Pinch up a bit of skin (if necessary). Insert the needle at a 90-degree angle. Hold the needle in the skin for 5 seconds to ensure there is no leakage.

Step 8
Dispose of your syringe and needle in a sharps container.
Step-by-Step Guide to Using an Insulin Pen

1. Wash and dry your hands.
2. Arrange your supplies: sharps container, alcohol wipes, insulin pen and needle.
3. Remove the pen cap and wipe the stopper using an alcohol wipe.
4. Remove the seal and push the new needle straight onto the pen.
5. Screw needle on tight.
6. Remove the outer shield (a), and then remove the inner shield (b).
7. Check the flow of the medication by dialing two units. With the needle facing up, press the thumb button until you see a drop of medication. If necessary, repeat until you see a drop of medication.
8. Dial your medication dose.
10. Press the thumb button down. Post injection, count for ten (10) seconds before removing the needle from your skin.
11. Throw the needle away after one use. Use a safe sharps container.
Insulin Injections

- Do not mix basal/24-hour insulin with any other insulin.
- Rotate the spot where you give your insulin to prevent swelling, lumps, and scar tissue.
- Inject insulin into fatty tissue.
- After injection, wait 5-10 seconds before removing the syringe from your body.

Injection Sites

- **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.

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

Insulin Storage

- Keep **unopened** bottles/pens of insulin in the refrigerator or in a cool place (less than 86 degrees Fahrenheit).
- **Open** bottles/pens of insulin may be stored at room temperature (less than 86 degrees Fahrenheit) and away from direct sunlight.
- NEVER store insulin in the freezer.
- Write the date on the bottle/pen when it is opened. Expiration dates of insulin will vary. Check the product insert or ask the pharmacist for information about insulin expiration.

Disposal of Needles and Syringes

It is illegal to dispose sharps waste in the trash or recycling containers. All sharps waste must be transported to a collection center in an approved sharps container.

For information about sharps disposal locations and take-back programs, visit www.safeneedledisposal.org or call (800) 643-1643.
# Hypoglycemia (Low Blood Sugar)

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

## If your blood sugar is low, you may feel:
- Shaking
- Fast heartbeat
- Sweating
- Anxious
- Dizziness
- Hunger
- Impaired vision
- Weakness/fatigue
- Headache
- Irritability

## Treating Low Blood Sugar

You should treat blood sugar less than 80 mg/dL. Here’s how:

1. Tell someone you feel low and test blood sugar.
2. If blood sugar is less than 80 mg/dL, treat by eating or drinking 15 grams of fast-acting carbohydrate. (If blood sugar is below 50 mg/dL, take 30 grams of fast acting carbohydrate = double dose of examples below.)

### Examples of 15 grams fast acting carbohydrates:
- 3-4 small glucose tablets (check label for amount of carbohydrate)
- ½ cup juice or regular soda
- Small juice box
- Small tube of cake icing

3. Wait 15 minutes then re-test blood sugar. Repeat step 2 if blood sugar is less than 80 mg/dL.

Never give food to a person who is unconscious from hypoglycemia. **If the person is unresponsive, give Glucagon and call 9-1-1.**
Glucagon

Glucagon is used when someone’s blood sugar is low AND the person is unresponsive and unable to take carbohydrate by mouth. **You should always have Glucagon with you.**

Directions for use:

1. Remove the flip-off seal from the bottle of Glucagon. Wipe rubber stopper on the bottle with an alcohol swab.
2. Remove the needle protector from the syringe and inject the entire contents of the syringe into the bottle of Glucagon. Remove the syringe from the bottle.
3. Swirl bottle gently until Glucagon dissolves completely. The solution should be clear and water-like in consistency.
4. The usual dose is 1 mg. For children weighing less than 44 lbs., give ½ mg (0.5 mg mark on syringe). There is no danger of overdose with Glucagon.
5. Inject immediately into muscle: buttock, thigh, or arm.
6. Glucagon may cause vomiting. Turn patient on his or her side to prevent choking.
7. Call 9-1-1 immediately after giving Glucagon.

Download this helpful smartphone app: Glucagon – Information you need to feel prepared to use Glucagon
Hyperglycemia (High Blood Sugar)

Common Causes:
- Too much carbohydrate
- Too little insulin
- Illness/stress

If your blood sugar is high, you may feel:
- Extreme thirst
- Hunger
- Dry skin
- Frequent urination
- Blurred vision
- Drowsiness
- Nausea

Treating High Blood Sugar

1. Test blood sugar.
2. If blood sugar is over 350 mg/dL or the person is ill or vomiting, test urine for ketones.
3. If urine ketones are greater than "trace", call the endocrinologist on call.
Nutrition and Type I Diabetes

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

**Which foods have carbohydrate?**

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

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

To find the amount of carbohydrates in the food you eat:

- read nutrition labels,
- use online resources, and/or
- use smartphone applications.

Measuring cups or food scales will help you be most accurate in measuring the amount of carbohydrate-containing foods you eat at meals and snacks.
Food Labels

If a food has a label, use these steps to count how many carbohydrates you are eating:

1. Check the serving size.
   - Use a measuring cup or food scale to measure your food portion accurately.

2. Check the “Total Carbohydrate”.
   - This is the amount (in grams) of carbohydrate per 1 serving. This number includes starch, sugars, and fiber*.
     Do not count grams of “Sugars” (listed under “Total Carbohydrate”) separately.

3. Adjust your carbohydrate count if you are eating more or less than 1 serving.
   - Examples:
     - If you eat ½ cup of the food in the sample label, your carb intake would be 11 grams.
     - If you eat 2 cups of the food in the sample label (1 full container), your carb intake would be 44 grams.

*A note on fiber:

Foods that are higher in fiber include whole grain products, fruits, vegetables, and legumes. These are healthy foods that should be a part of a healthy diet.

Fiber is counted in “Total Carbohydrate” but it does not raise blood sugar. Some people may see better blood sugar control if they adjust their insulin dose (give less insulin) for foods that are higher in dietary fiber. Ask your diabetes team if this is something you should do.
Resources

Book:

“The Calorie King Calorie, Fat & Carbohydrate Counter” by Allan Borushek

- There is a section within the book dedicated to fiber. The carbohydrate counts do not include fiber, so it is important to check this section separately if you are going to make an adjustment to your insulin dose.

Websites:

- Calorie King: [www.calorieking.com](http://www.calorieking.com)
- Diabetes Food Hub: [www.diabetesfoodhub.org](http://www.diabetesfoodhub.org)
- SparkRecipes: [https://recipes.sparkpeople.com/](https://recipes.sparkpeople.com/)

Smartphone apps:

- Calorie King
- Figwee Visual Food Diary
- Lose It!
- My Fitness Pal

Nutrient Information Lists

Nutrient information lists like the sample below are available online and at grocery stores and restaurants. Remember to look for “Dietary Fiber” if you are adjusting your carbohydrate count for fiber.

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Calories</th>
<th>Total Fat (g)</th>
<th>Cholesterol (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>Chicken Burrito (Chipotle)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12” flour tortilla</td>
<td>320</td>
<td>9</td>
<td>0</td>
<td>50</td>
<td>3</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>4 oz chicken</td>
<td>180</td>
<td>7</td>
<td>125</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>4 oz white rice</td>
<td>210</td>
<td>4</td>
<td>0</td>
<td>40</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>4 oz pinto beans</td>
<td>130</td>
<td>1.5</td>
<td>0</td>
<td>21</td>
<td>8</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>2.5 oz fajita vegetables</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3.5 oz tomato salsa</td>
<td>25</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
Diabetes Food Lists

It is important to measure each food to determine how many carbohydrate “choices” you are eating. Remember that each choice is only an estimate of carbohydrate content.

### High-Carbohydrate Food Groups

#### Starches (15 grams carbohydrate each choice)

<table>
<thead>
<tr>
<th>Food</th>
<th>Carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>½ small bagel or ¼ large bagel (1 oz)</td>
<td>15 grams</td>
</tr>
<tr>
<td>1 slice bread (1 oz)</td>
<td>15 grams</td>
</tr>
<tr>
<td>½ cup cooked beans or lentils</td>
<td>15 grams</td>
</tr>
<tr>
<td>½ cup cooked cereal</td>
<td>15 grams</td>
</tr>
<tr>
<td>¼ cup dry cereal, unsweetened</td>
<td>15 grams</td>
</tr>
<tr>
<td>½ English muffin</td>
<td>15 grams</td>
</tr>
<tr>
<td>20 thin French fries</td>
<td>15 grams</td>
</tr>
<tr>
<td>½ hamburger or hot dog bun</td>
<td>15 grams</td>
</tr>
<tr>
<td>1 pancake (4 inches across)</td>
<td>15 grams</td>
</tr>
<tr>
<td>¼ cup cooked pasta</td>
<td>15 grams</td>
</tr>
<tr>
<td>3 cups popcorn</td>
<td>15 grams</td>
</tr>
<tr>
<td>½ cup cooked rice or quinoa</td>
<td>15 grams</td>
</tr>
<tr>
<td>6 saltine crackers</td>
<td>15 grams</td>
</tr>
<tr>
<td>1 (6-inch) tortilla</td>
<td>15 grams</td>
</tr>
<tr>
<td>13 tortilla chips (1 oz)</td>
<td>15 grams</td>
</tr>
<tr>
<td>1 waffle (4 ½ inches)</td>
<td>15 grams</td>
</tr>
<tr>
<td>Starchy Vegetables:</td>
<td></td>
</tr>
<tr>
<td>½ cup corn or green peas</td>
<td></td>
</tr>
<tr>
<td>1 small potato</td>
<td></td>
</tr>
<tr>
<td>½ cup mashed potato, sweet potato, or yam</td>
<td></td>
</tr>
<tr>
<td>1 cup winter squash</td>
<td></td>
</tr>
<tr>
<td>(acorn, butternut, pumpkin)</td>
<td></td>
</tr>
</tbody>
</table>

#### Fruits (15 grams carbohydrate each choice)

<table>
<thead>
<tr>
<th>Food</th>
<th>Carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 small (4 oz) apple</td>
<td>15 grams</td>
</tr>
<tr>
<td>8 dried apricot halves</td>
<td>15 grams</td>
</tr>
<tr>
<td>1 (4-inch) banana</td>
<td>15 grams</td>
</tr>
<tr>
<td>¼ cup blueberries</td>
<td>15 grams</td>
</tr>
<tr>
<td>½ cup canned fruit, in juice</td>
<td></td>
</tr>
<tr>
<td>2 Tbsp dried fruit</td>
<td></td>
</tr>
<tr>
<td>17 small grapes</td>
<td></td>
</tr>
<tr>
<td>½ cup juice (apple, orange, pomegranate)</td>
<td></td>
</tr>
<tr>
<td>½ cup kiwi, sliced</td>
<td></td>
</tr>
<tr>
<td>1 cup cubed melon (cantaloupe or honeydew)</td>
<td></td>
</tr>
<tr>
<td>1 medium (5 ½ - 6 ½ oz) nectarine, peach, or orange</td>
<td></td>
</tr>
<tr>
<td>¾ cup fresh pineapple</td>
<td></td>
</tr>
<tr>
<td>1¼ cup strawberries</td>
<td></td>
</tr>
<tr>
<td>1¼ cup watermelon</td>
<td></td>
</tr>
</tbody>
</table>

#### Milk and Yogurt (12 grams carbohydrate each choice)

<table>
<thead>
<tr>
<th>Food</th>
<th>Carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 cup milk</td>
<td>12 grams</td>
</tr>
<tr>
<td>1 cup sweetened soy milk</td>
<td>12 grams</td>
</tr>
<tr>
<td>1 cup plain nonfat or low-fat yogurt</td>
<td>12 grams</td>
</tr>
</tbody>
</table>

#### Sweets, or “Other Carbohydrates” (15 grams carbohydrate each choice)

<table>
<thead>
<tr>
<th>Food</th>
<th>Carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 small (1¼- inch square) brownie, unfrosted</td>
<td>15 grams</td>
</tr>
<tr>
<td>1 (2-inch square) piece cake, unfrosted</td>
<td>15 grams</td>
</tr>
<tr>
<td>½ cup ice cream, sorbet, or sherbet</td>
<td>15 grams</td>
</tr>
<tr>
<td>1 (3 oz) fruit juice bar</td>
<td>15 grams</td>
</tr>
<tr>
<td>3 small sugar-free cookies</td>
<td>15 grams</td>
</tr>
<tr>
<td>½ cup sugar-free pudding</td>
<td>15 grams</td>
</tr>
<tr>
<td>5 vanilla wafers</td>
<td>15 grams</td>
</tr>
</tbody>
</table>
Low-Carbohydrate Food Groups

Non-Starchy Vegetables

Include vegetables in your diet every day. Remember to count starchy vegetables (such as potatoes, corn, and peas) as carbohydrate.

<table>
<thead>
<tr>
<th>Artichokes</th>
<th>Cucumber</th>
<th>Peppers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asparagus</td>
<td>Eggplant</td>
<td>Radishes</td>
</tr>
<tr>
<td>Beets</td>
<td>Green beans</td>
<td>Spinach</td>
</tr>
<tr>
<td>Broccoli</td>
<td>Lettuce, greens</td>
<td>Tomato</td>
</tr>
<tr>
<td>Carrots</td>
<td>Mushrooms</td>
<td>Water chestnuts</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>Onions</td>
<td>Zucchini</td>
</tr>
</tbody>
</table>

Meats and Other Proteins

Choose lean protein sources more often. Try to eat protein foods with your meals.

<table>
<thead>
<tr>
<th>Chicken or turkey</th>
<th>Fish</th>
<th>Meatless breakfast “sausage&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheese</td>
<td>Jerky</td>
<td>patties</td>
</tr>
<tr>
<td>Cottage cheese</td>
<td>Lean beef, lamb, or pork</td>
<td>Peanut butter</td>
</tr>
<tr>
<td>Eggs</td>
<td>Peanut/nut butter</td>
<td>Tofu or tempeh</td>
</tr>
</tbody>
</table>

Fat

Eat more fat as unsaturated fat, which comes from non-animal sources like avocado, olives, nuts and seeds.

<table>
<thead>
<tr>
<th>Avocado</th>
<th>Cream cheese</th>
<th>Olives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacon</td>
<td>Margarine</td>
<td>Peanut/nut butter</td>
</tr>
<tr>
<td>Butter</td>
<td>Mayonnaise</td>
<td>Salad dressing</td>
</tr>
<tr>
<td>Coconut milk</td>
<td>Nuts</td>
<td>Seeds</td>
</tr>
<tr>
<td></td>
<td>Oil</td>
<td></td>
</tr>
</tbody>
</table>

“Free Foods"

These foods contain less than 5 grams carbohydrate per serving. Limit “free foods” 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
- 1 Tbsp honey mustard or ketchup
- Vinegar or lemon juice
- 1 large dill pickle
- 1 Tbsp fat-free cream cheese
- Diet soda, diet beverage
- 4 tsp sugar-free coffee creamer
Exercise and Type I Diabetes

Exercise is important for the heart and lungs. It helps build muscle, reduces stress, and builds 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:

- 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.
- If you are planning on exercising for 60 minutes or more, test your blood sugar before, during, and after exercise.
- Eat or drink 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.
- Always have a fast-acting sugar source available to treat hypoglycemia.
More Resources

Education and Entertainment

Smart-phone apps

- Carb Counting with LennySM – Diabetes learning games
- Glucagon – Information you need to feel prepared to use Glucagon
- MySugr – Includes blood sugar tracker, carb logger, bolus calculator, and estimated A1c
- One Drop – Track and analyze blood sugar, medications, food, and activity

Books and E-Books

- A Type 1 Diabetes Guide to the Universe – With videos and chapters, this eBook helps you navigate diabetes
- Medikidz Explain Type I Diabetes – Join this comic book superhero to learn about type I diabetes

Social

Smart-phone app

- Beyond Type 1 – Industry news, inspirational stories and practical help

Website

- MyGlu.org – Accelerating research by seeking answers, sharing wisdom, and offering support

General Information

American Diabetes Association®  http://www.diabetes.org
Children with Diabetes®  http://www.childrenwithdiabetes.com/
DYF (Diabetes Youth Families)  https://dyf.org/