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I. Communicating with Dayton Children’s Diabetes Team
communicating with Dayton Children’s diabetes team
Diabetes Manual · Dayton Children’s endocrinology clinic

illness
If your child is ill, has moderate or large ketones, or has an emergency, please call 937-641-3487. Press option 3 to speak to a nurse, then 1 for diabetes, then 1 again for sick calls.

When you call please have the following information:
- Blood sugars and ketone results
- Insulin doses

blood sugars
You can submit blood sugar records for review by phone, fax, or email.
- Call directly to the blood sugar line: 937-641-3474
- Fax: 937-641-5878
- Email: diabetesnurse@childrensdayton.org

The dosing changes will be returned to you by phone or email.

Please include the following information:
1. Your child’s name and date of birth. Please spell your child’s name if calling.
2. Your child’s current doses.
3. The date, time, and actual blood sugar numbers.

Please do not leave a message requesting the nurse to call you back for the blood sugars. This will only delay the physician reviewing the blood sugars and adjusting doses.

prescriptions
Please leave your request on the prescription phone line with the following information.
1. Your child’s name and date of birth. Please spell your child’s name.
2. The refill needed.
   Example: Test strips – be sure to leave the type of strips so the correct refill will be provided (ex. Aviva Plus, Contour, Freestyle Lite, Smart View, True-Test, Ultra, Verio, etc.)
3. 30-day or 90-day supply (this is dependent upon your insurance)
4. The pharmacy name and phone number
   a. Requests are faxed to the pharmacy you specify unless you request the prescription to be mailed or picked up.
   b. If you are requesting a 90-day supply, please also provide the pharmacy city and state.

non-emergency requests
Examples: forms for school, work, or driving, general questions, etc.
- For any form to be completed and sent by the diabetes team, a release of information form must be signed by the parent or child if 18 years of age or older.
- A release of information is good for one year.
diabetes clinic guidelines

how often does my child need to be seen?
An appointment will need to be scheduled for follow-up one to two weeks after they are discharged and then in one month. After initial follow-up, routine appointments will be scheduled every 2–3 months.

In order for the diabetes clinic appointments to go as smoothly as possible, we need your help. Please follow the guidelines listed below to help maintain the flow of the diabetes clinic:

• When coming to clinic, please allow up to two to four hours to meet with team members. You will be seen by the physician but you may also be seen by the nurse, dietitian, social worker, and/or psychologist.

• Please come prepared with your written records for the last two weeks, all home meters, list of prescriptions, and any questions or concerns you have.

• Fasting lab work: Fasting labs are done on a yearly basis. You must arrive in the lab one hour before your appointment. This will allow enough time for blood work to be drawn, insulin given, and breakfast eaten. When finished, go immediately to the diabetes clinic and sign in.

• Routine clinic: At routine visits, a hemoglobin A1c lab is drawn. This can be drawn in the clinic. If you choose to go to lab to have this drawn, then you must arrive in the lab 30–60 minutes before your scheduled appointment. After blood is drawn, go immediately to the diabetes clinic and sign in.

• If the meter and blood sugars are not brought, your appointment may need to be rescheduled. This information is needed for accurate assessment and appropriate recommendations.

• Remember your child's snack or meal if the visit is scheduled close to meal or snack time. If you are late for your appointment, it may be necessary to reschedule you at a later date.

• Schedule follow-up appointments before leaving our department.

• When needing school or driving forms, please complete the parent section, provide a self-addressed stamped envelope and allow approximately one to two week for forms to be completed. Forms will be mailed unless a fax number is provided.
  * If the form is to be faxed, a release of information (ROI) form must be completed and signed prior to the form being faxed. The ROI form is valid for a year.

• All school, work, and sports physicals need to be done by your primary physician.
II. What is diabetes?
what is diabetes?

Diabetes is a serious, lifelong illness that affects how the body uses food. The food we eat is broken down into glucose (sugar), which is our body’s main source of energy. Our body uses sugar in the following ways:

- The food we eat is turned into sugar through digestion.
- The sugar moves into the bloodstream.
- When our body senses an increase in the blood sugar, it sends a signal to your pancreas. The pancreas is an organ that lies behind the stomach.
- The pancreas makes insulin and sends it into the bloodstream.
- Insulin acts as a door key which allows the sugar to move from the bloodstream into the cells. The cells can then use the sugar as energy.

Just as a car will not run without gasoline, our bodies will not “run” without sugar for fuel. Think of this being similar to a car with plenty of gas (or fuel) but there is not a key to start it. The sugar (the fuel) in our body will not do us any good unless we have insulin (the key) to allow it to go into the cells.

In people with diabetes, this system doesn’t work. This is because a person with diabetes has either lost the ability to produce insulin or the person does not respond to the insulin normally.

1. Due to a lack of insulin, sugar builds up in the bloodstream instead of going into the cells of the body.

2. The increased blood sugar causes water and electrolytes to begin to leave cells and enter the bloodstream. This leads to increased urinating, dehydration and thirst.

3. Although the sugar is elevated, the body cannot use the sugar due to the lack of insulin. Even with very high blood sugar, the inability to use the sugar misleads the body into believing it is starving.

4. Because the body believes it is starving, it begins to use a back up fuel source: fat cells. As the body breaks down fat cells for fuel, a substance called ketones are produced. As ketones accumulate in the body, water in the body and electrolytes get out of balance. This can eventually make the child very ill due to being in diabetic keto-acidosis (DKA).

signs of diabetes and high blood sugar

- Increased thirst
- Increased urinating
- Increased hunger
- Decreased energy level
- Recent weight loss
types of diabetes

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Type 1: Insulin Dependent</th>
<th>Type 2: Non-Insulin Dependent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin production</td>
<td>Absent</td>
<td>Normal or abnormal</td>
</tr>
<tr>
<td>Age at onset</td>
<td>Usually before 40</td>
<td>Usually after 40</td>
</tr>
<tr>
<td></td>
<td>Usually in children</td>
<td>but is increasing in children</td>
</tr>
<tr>
<td>Appearance</td>
<td>Often thin</td>
<td>Often overweight</td>
</tr>
<tr>
<td>Symptoms</td>
<td>Sudden onset of symptoms. Includes greater thirst, urination, hunger, weight loss, decreased energy, have ketones</td>
<td>Gradual, subtle onset of symptoms, or may not have symptoms</td>
</tr>
<tr>
<td>Treatment</td>
<td>Insulin, meal plan and exercise</td>
<td>Meal plan, exercise, oral agents and/or insulin</td>
</tr>
</tbody>
</table>

what caused my child’s diabetes?

Heredity may play a part in who develops diabetes. Even though having diabetes in the family does not mean that it will automatically be “passed on,” it does tend to run in families.

- Type 2 diabetes tends to run in families more than Type 1.
- Many diagnosed with Type 1 have no history of diabetes in their family.

In Type 1 diabetes, the exact cause is not known but there is one main theory.

- The body forms antibodies against the cells in the pancreas that make insulin (beta cells). This means the body begins to destroy its own insulin-producing beta cells. This is called an “autoimmune response.”
- Research has shown that some viruses may trigger the production of antibodies against the beta cells of the pancreas. This destruction is not reversible! All beta cells will eventually be destroyed.
**how to manage diabetes**

Diabetes is a chronic condition that cannot be cured, but it can be managed. A treatment plan that includes insulin, food and exercise can help manage diabetes.

**goals for diabetes management**

1. Blood sugar levels as normal as possible
2. Normal physical growth and development
3. Normal social development
4. The ability to care for oneself according to age
5. Freedom from acute and long-term complications

**honeymoon period**

- This is a period of time shortly after diagnosis where the pancreas has a “last hurrah.”

- When your child is started on insulin, this allows the remaining beta cells to “rest”. The remaining beta cells may be able to temporarily increase their insulin production, which may cause your child to have lower blood sugars. When this occurs, the insulin doses may need to be decreased.

- Some individuals may actually not need any insulin for a short period of time or some may only require smaller and/or fewer doses during the day.

- Remember, this is temporary and it is NOT a cure!

- When your child is having lower blood sugars, it is very important to report the blood sugars to the diabetes team so that the insulin doses can be adjusted.

---

**You will learn how to balance your child’s blood sugar by remembering:**

- **food** raises blood sugar
- **insulin** lowers blood sugar
- **exercise** lowers blood sugar
III. Blood sugar testing, ketone testing, and insulin injections
blood sugar testing, ketone testing, and insulin injections

Diabetes Manual • Dayton Children’s endocrinology clinic

blood sugar (glucose) testing

blood sugar testing at home
The most accurate way to monitor a child’s diabetes control is by checking the child’s blood sugar (also called blood glucose). This can be done easily at home by using a glucose meter. The diabetes nurse educator will provide a glucose meter for your child and instruct you on how to use your meter.

Regardless of which meter you use, keep the following points in mind:

• You should only use a meter that has date, time and memory.

• Make sure the correct date and time are programmed in the meter. This is especially important to be able to review the blood sugars in the meter.

• Each meter also has a 1-800 number on the back for assistance. You can call that number 24 hours a day, seven days a week. The meter manual is also helpful if you have problems or forget information.

• It is important to use the proper strip for your glucose meter. Each meter has strips specifically made for that meter. Check the expiration date on each new bottle of strips.

• Your meter will alert you to when the batteries need to be replaced. The batteries can be purchased at local pharmacies.

• Do not expose the meter to extreme heat or cold, such as leaving it in the car in the winter or summer.

blood sugar testing at home

• For your child’s safety and best interest, it is necessary to check the blood sugar at least four times a day (before breakfast, lunch, dinner and before bedtime snack).

• Check if your child complains of feeling ill or has symptoms of low blood sugar.

• You will need to check more frequently when your child starts a sport or their activity increases as this will affect their blood sugar.

• For your child’s safety when insulin changes are made, you will need to occasionally check the blood sugar at midnight and/or 3:00 am. Follow your nurse or doctor’s instructions.
what to do with blood sugar results

1. **Initially, keep a written record of your results.** These records will help you learn about pattern management and understand dose adjustments. The diabetes team can provide you with blood sugar records that you can use.

   **Example of a glucose record:** You will need to write the following information in the hour closest to the time the event occurs.

<table>
<thead>
<tr>
<th>Date:</th>
<th>12am</th>
<th>3am</th>
<th>6am</th>
<th>7am</th>
<th>8am</th>
<th>9am</th>
<th>10am</th>
<th>11am</th>
<th>12pm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood sugar</td>
<td>BG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of carbs eaten</td>
<td>Carbs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units of insulin given</td>
<td>Insulin dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gym class, etc.</td>
<td>Exercise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ketone level</td>
<td>Ketones</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. **After being discharged from the hospital, you will need to call in blood sugars daily to the diabetes team.** You will receive discharge instructions with your doses, basic daily instructions, and the phone numbers needed to contact the diabetes team. These numbers are in the beginning of this manual.

   - There is software available for each glucose meter which allows you to download the blood sugars from the meter to a computer. The software is often available to download from the website for the meter.

3. **After the diabetes physician (called an endocrinologist) sees you for your follow-up appointment, you should call as your physician directs and when you suspect a need for insulin adjustments.**

   - Blood sugars will increase when your child has growth spurts, has an illness or is stressed (example: school tests).
   - Even though the child is doing nothing wrong, sometimes they will feel that they will get in trouble due to their blood sugars being high. It is important not to label blood sugars as good or bad; the numbers are just measurements.

**caution**
Always confirm written records with the meter’s memory. If incorrect blood sugars are presented to the team, harmful dose adjustments could result.
ketone testing

when to test for ketones

• Urine must always be checked for ketones if blood sugar is above 300 mg/dl.
• Urine must always be checked anytime the child feels sick or nauseated, even if the blood sugar is under 300 (especially if she/he vomits, even once).
• For the first week after diagnosis, you should also check the urine for ketones every morning.

how to check for ketones

• Completely cover the colored square on the end of the strip by dipping into fresh urine.
  • You can hold the strip directly in the urine stream or the urine can be collected in a cup.
  • If the child is in diapers, cotton balls can be placed in the diaper and the strip can then be pressed on the wet cotton ball.
• Compare the test area closely with the color chart. Hold the strip close to the color block and match the colors carefully. The timing is very important.
  • Ketostix: Read the ketones at exactly 15 seconds after dipping the strip.
  • Clinistix: Read the ketones at 2 minutes after dipping the strip.

what to do if ketones are positive

1. Notify the diabetes nurses or physician if ketones are moderate to large. Additional insulin may be needed due to the illness and ketones.
2. Have your child rest or play quietly. Physical activity should be avoided until ketones are gone. Activity can worsen the ketones.
3. Encourage fluid intake, especially water.
4. Recheck urine until ketones are negative.
5. Give insulin as ordered by physician or by your ketone correction scale.
6. Record the result of the ketones in your blood sugar record. You can use the following letters or numbers to record the result:

<table>
<thead>
<tr>
<th>Ketone Result</th>
<th>What to Write in Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>N or 0</td>
</tr>
<tr>
<td>Trace</td>
<td>T or 5</td>
</tr>
<tr>
<td>Small</td>
<td>S or 15</td>
</tr>
<tr>
<td>Moderate</td>
<td>M or 40</td>
</tr>
<tr>
<td>Large</td>
<td>L or 80</td>
</tr>
<tr>
<td>Large-Large</td>
<td>LL or 160</td>
</tr>
</tbody>
</table>
insulin and injections

Insulin is a hormone made by the beta cells in the pancreas. Insulin allows sugar to go from the bloodstream into the body’s cells and be used for energy. Insulin lowers blood sugar.

insulin facts

• A person cannot survive without insulin. Insulin is needed in the body 24 hours a day even if you are not eating.
• People with Type 1 diabetes make little or no insulin so they need multiple daily insulin injections. This is due to the fact that there is not a single insulin which can completely control the blood sugars throughout the day. Therefore, an injection will be needed with each meal and at bedtime.
• People with Type 2 diabetes may still produce insulin, but are unable to use it well. Some may need insulin to help control blood sugar levels.
• At this time, insulin does not come in a pill but this is being researched as a possibility.

storage of insulin

• Refrigerate but make sure it does not freeze! Once opened, a vial may be left at room temperature.
• New vials need to be opened every 28–30 days. This is because insulin weakens 28–30 days after the vial has been punctured with a needle.
• Write the date on the vial or change vials on the same day each month.
• Insulin may lose its strength if exposed to very high or very low temperatures.
  • If the outside temperature is very warm (above 86˚F or 30˚C), the insulin must be kept in a cooler. Frio coolers are an example of coolers available for insulin storage. These can be purchased online.
  • If the temperature is at freezing or below (less than 32˚F or 0˚C), the insulin must be protected from freezing.

what you need to know about your insulin

In the United States, insulin is synthetically made in a laboratory and is most like human insulin.

Information that you need to know about insulin:
1. Name of each insulin,
2. Types of your insulin(s),
3. Doses—Insulin is measured in units.
4. Always have an extra supply of each insulin available.

<table>
<thead>
<tr>
<th>Name</th>
<th>Onset of Action</th>
<th>Peak Action</th>
<th>Working Time</th>
<th>Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid Acting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apidra</td>
<td>10–15 minutes</td>
<td>1 hour</td>
<td>2–4 hours</td>
<td>Clear</td>
</tr>
<tr>
<td>Humalog</td>
<td>10–15 minutes</td>
<td>1–2 hours</td>
<td>3–5 hours</td>
<td>Clear</td>
</tr>
<tr>
<td>Novolog</td>
<td>10–15 minutes</td>
<td>1–2 hours</td>
<td>3–5 hours</td>
<td>Clear</td>
</tr>
<tr>
<td>Long Acting*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basaglar/Lantus</td>
<td>1–2 hours</td>
<td>None</td>
<td>Up to 24 hours</td>
<td>Clear</td>
</tr>
<tr>
<td>Levemir</td>
<td>1–2 hours</td>
<td>None</td>
<td>Up to 24 hours</td>
<td>Clear</td>
</tr>
</tbody>
</table>

*Long acting insulins are also known as basal insulins.
Basaglar or Lantus insulins
These are basal or “background” insulins. As basal insulins, these insulins control the blood sugar in a fasting or non-eating state.

- Basal insulins need to be given daily. For kids school age or older, this will be at bedtime. For younger kids, this may be in the morning.
- Basal insulins are to be given consistently at the same time each day.
- This dose will be determined by your physician and will increase as your child grows. Example: A 2-year-old will have a much smaller dose than a 16-year-old.
- When food is eaten, it will cause the blood sugar to rise. Basal insulins are not able to keep the blood sugar at the ideal level due to the sugar from the food. This requires the use of a second insulin, Novolog or Humalog.

Novolog or Humalog insulins
These are rapid acting insulins used at mealtimes and at times when the blood sugar is too high.

- Novolog and Humalog insulins are essentially the same type insulin but made by different companies. Your insurance will determine which insulin is prescribed for your child.
  - As Novolog is utilized by Dayton Children’s Hospital, Novolog will be used in the following instructions.
- Each Novolog meal dose will be based upon the following:
  - Blood sugar just before the meal
  - Amount of carbohydrates (carbs) eaten at the meal (called carb dose)
  - Once given, Novolog starts lowering the blood sugar in 15 minutes. Novolog works strongest or peaks 1–2 hours after being given. This is the time at which Novolog lowers the blood sugar the most. Due to this peak, Novolog should not be given sooner than 2 hours from the last Novolog dose as this would put your child at risk for low blood sugar.
- The dose for a high blood sugar is known as just the correction dose.
  - You will be given a target range for your child’s blood sugars (example: 80–150).
  - When a blood sugar is above the target range, extra Novolog insulin will need to be given to correct the blood sugar down to the target range.

Example target range and correction dose for child who is school age or older

<table>
<thead>
<tr>
<th>Joe's target blood sugar range is 80-150</th>
<th>Correction Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Sugar</td>
<td>Units of Novolog</td>
</tr>
<tr>
<td>150–200</td>
<td>1</td>
</tr>
<tr>
<td>201–250</td>
<td>2</td>
</tr>
<tr>
<td>251–300</td>
<td>3</td>
</tr>
<tr>
<td>301–350</td>
<td>4</td>
</tr>
<tr>
<td>351–400</td>
<td>5</td>
</tr>
<tr>
<td>Above 400</td>
<td>6</td>
</tr>
</tbody>
</table>

For a younger child, the correction scale will be weaker, meaning less insulin will be needed to correct the blood sugar to the target range.

answer
Joe’s blood sugar before lunch was 230. Joe will need to take 2 units of Novolog to correct the blood sugar down from 230 to the target range of 80–150.
carb dose

The Novolog dose for carbs is determined by the carb-to-insulin ratio. The ratio(s) will be determined by your doctor.

The following are examples of different ratios that may be prescribed.

- **Example A:** Your child has a carb-to-insulin ratio of 10 grams of carbs to one unit of Novolog. This means that your child will take 1 unit of Novolog insulin for every 10 grams of carbs eaten.
  - Your child eats 30 grams of carbs. \(30 \div 10 = 3 \text{ units}\)
  - This means that your child needs 3 units of Novolog for eating 30 grams of carbs.

- **Example B:** The carb to insulin ratio is 15 grams of carbs to one unit of Novolog.
  - Your child eats 46 grams of carbs. \(46 \div 15 = 3.067\)
  - Round to the nearest ½ unit. The dose would be 3 units.

- **Example C:** The carb to insulin ratio is 20 grams of carbs to one unit of Novolog.
  - Your child eats 68 grams of carbs. \(68 \div 20 = 3.4\)
  - Round to the nearest ½ unit. The dose would be 3.5 units.

---

**formula to determine the total meal dose**

\[
\text{Correction dose} + \text{Carb Dose} = \text{Total # of units of Novolog}
\]

**example:**

First, determine the correction dose.

The pre-lunch blood sugar was 244 and 71 grams of carbs were eaten. The ratio for this meal is 10 grams: 1 unit Novolog.

<table>
<thead>
<tr>
<th>Blood Sugar</th>
<th>Units of Novolog</th>
</tr>
</thead>
<tbody>
<tr>
<td>150–200</td>
<td>1</td>
</tr>
<tr>
<td>201–250</td>
<td>2</td>
</tr>
<tr>
<td>251–300</td>
<td>3</td>
</tr>
<tr>
<td>301–350</td>
<td>4</td>
</tr>
<tr>
<td>351–400</td>
<td>5</td>
</tr>
<tr>
<td>Above 400</td>
<td>6</td>
</tr>
</tbody>
</table>

Correction dose = 2 units of Novolog

Next, determine the carb dose.

71 grams of carb eaten \(\div 10 \text{ (ratio)} = 7.1 \text{ (round to nearest ½ unit)} = 7 \text{ unit carb dose}\)

Finally, determine the total # of units of Novolog needed for lunch.

2 units (correction dose) + 7 units (carb dose) = 9 units (total units of Novolog needed for lunch)

**other examples**

Pre-lunch blood sugar is 287 and 59 grams of carbs were eaten.

Correction dose: 287 blood sugar range = 3 units (on correction scale)

Carb dose: \(59 \div 10 = 5.9\) (round to nearest ½) 6 units

Total units of Novolog: 3 units + 6 units = 9 units

Pre-dinner blood sugar is 144 and 85 carbs were eaten.

Correction dose: 144 blood sugar range = 0 units (on correction scale)

Carb dose: \(85 \div 10 = 8.5\) (round to nearest ½) 8.5 units

Total units of Novolog: 0 units + 8.5 units = 8.5 units

---
other factors to consider for determining the Novolog dose

<table>
<thead>
<tr>
<th>Activity level</th>
<th>Example of activity</th>
<th>Round up or down?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inactive</td>
<td>Being in school</td>
<td>Round the dose up</td>
</tr>
<tr>
<td>Active</td>
<td>Playing outside</td>
<td>Round down, or even pre-treat for activity</td>
</tr>
</tbody>
</table>

schedule for meal times

Novolog meal doses can be given either right before or after the meal. While in the hospital, children will be receiving their Novolog after meals. Physicians will be determining their doses.

- **Older children:** School age or older will need to give the Novolog just prior to the meal.
  - By giving the Novolog just prior to the meal, the blood sugars will not go as high after eating. This results in better blood sugar control.

- **Younger children:** For younger children, Novolog needs to be given within 30–40 minutes from the time your child starts eating.
  - Younger children are given their insulin right after eating due to the child not being able to tell what they are going to eat specifically. If the Novolog was given before and the child does not eat the full carb amount, this will put them at risk of low blood sugars.
  - Once younger children are able to tell what they are going to eat at meals, the Novolog dose should be given before the meals.

**Check blood sugar**

**Count carbs**

**Determine total Novolog dose**

**Correction dose + Carb dose = Total Novolog dose**

insulin syringes or shots

**using syringes**

Insulin must be given with insulin syringes as these syringes are made specifically for giving insulin. Using other types of syringes may result in the wrong amount of insulin being given.

- There are three (3) sizes of insulin syringes. The smaller syringes are marked in either one unit or ½ unit amounts.
  - **Note:** The needle size and length for all the syringes is the same. They just differ in the amount of insulin they hold.
  - 3/10 cc syringe – can hold up to 30 units
  - ½ cc syringe – can hold up to 50 units
  - 1 cc syringe – can hold up to 100 units

- Insulin syringes that are prescribed have either short or mini needle length. Make sure that the pharmacy provides insulin syringes with the correct needle length.

rotation of insulin injections

- Insulin is injected into the fatty areas just under the skin in the arms, abdomen, thighs, and buttocks. Injections for these areas of the body are known as “subcutaneous” injections.
- Rotating sites means following a pattern as you move your injections around from site to site. Every person’s pattern may be different.
- **Insulin enters the blood:**
  - Fastest from the abdomen
  - A little slower from the arms
  - Even more slowly from the legs
  - Most slowly from the hip/buttocks
  - **Note:** You may want to use an area at a certain time because of its absorption rate.

- Do not give your injection in the same spot everyday! This can cause lumps and hard places under the skin (hypertrophy). Hypertrophy or scar tissue causes insulin not to be absorbed correctly.

- It is recommended to use all sites in one location, keeping injections approximately ½ inch apart. Jumping from site to site makes it difficult to remember where the last injection was given. You may choose to have all your morning injections in the belly, all afternoon in the arm and all bedtime injections in the hip or leg.

- Don’t inject too closely to scars, bruises, belly buttons or moles. Stay away from the inner thighs – rubbing between the legs can make the injection site sore.

- Use the entire site area for injections, such as the top and outer aspect of the leg.
7 easy steps to drawing up a single type of insulin

1. Wash your hands with soap and water, then gather supplies: syringe, alcohol, swab, insulin and doses.

   caution
   Make sure of which insulin you are preparing. Giving the wrong insulin can greatly affect blood sugars. Call the diabetes team immediately if the wrong type of insulin is given.

2. Wipe off the top of the insulin bottle with an alcohol swab.

3. Pull the plunger down to pull air into the syringe. You will need the same number of units of air as the number of units of insulin that you are going to withdraw. This is important because if you skip this step, the air pressure in the bottle will change enough that it will make it hard to draw insulin out of the bottle.

4. Push the needle into the bottle.

5. Push the plunger so that the air goes into the bottle.

6. Turn the insulin bottle over with the needle still inside it (so the syringe is under the bottle).

7. Pull plunger down to the number of units needed at that time.

steps for insulin injection

1. Gather needed supplies: syringe filled with correct amount of insulin and alcohol swab.

2. Choose an injection site. Remember, insulin is absorbed best from (in order):
   - Abdomen
   - Arm
   - Thigh
   - Hip

3. Clean skin at site with an alcohol swab. Let alcohol dry.

4. Bunch up a large area of skin with one hand.

5. Hold your syringe like a dart or pencil with the opposite hand.

6. Push the needle all the way into the skin, going straight in at a 90 degree angle. Be sure the needle is all the way in.

7. Use a finger to push the plunger all the way down. This will push the insulin into the body. Leave the needle under the skin for three seconds.

8. Pull the needle straight out of your skin. Do not rub the place where the injection was given. Check the area for any redness, bleeding or bruising.

9. Safely dispose of used needles and syringes. See the next section for instructions on how to do this.

10. Some restaurants and airports now have “sharp containers” in their bathrooms for your use.
disposing of sharps at home

Like anything else we throw out, lancets, syringes, and pen needles need to be disposed of properly. Otherwise, they can end up in places they don’t belong, like beaches. Because they are sharp, someone could accidentally get hurt, like the person who collects your garbage, someone in your family, or even you!

steps for disposal

1. After you’ve checked your blood sugar or given an insulin shot, put your lancet, syringe, or pen needle directly into a strong plastic or metal container with a tight cap or lid. **Do not bend, break or put the cap back on your needle… you might hurt yourself!**

2. When the container is full, tightly secure the lid and reinforce it with heavy-duty tape before throwing it in the trash. Mark it “Sharps.” Be sure not to put it in the recycling bin!

container do’s

The best containers to use are those that:

- Are made of strong plastic or metal, so needles can’t poke through.
- Examples: Bleach bottles, liquid detergent bottles, coffee cans

container don’ts

- Don’t use glass containers or lightweight plastic containers.
- Don’t use any container that will be returned to a store.
- If you use a recyclable container, be sure it doesn’t end up in the recycling bin by mistake.
IV. high and low blood sugars
high and low blood sugars
Diabetes Manual • Dayton Children’s endocrinology clinic

high blood sugar

hyperglycemia/diabetic ketoacidosis
Complications of high blood sugar occur more slowly than those of low blood sugar.

causes of high blood sugar
• Too much food
• Missed insulin injection or not enough insulin
• Being sick with an infection or increased stress
• Being inactive
• Growth

early symptoms
• A blood sugar above the target range
• Increased thirst
• Increased urination
• Hunger
• Decreased energy
• Blurred vision
• Headache
• Stomachache

An occasional high blood sugar is treatable with the appropriate insulin dose. However, if the high blood sugar is not treated and these symptoms are ignored, the high blood sugar and the symptoms can worsen. Having higher blood sugar increases the risk of developing ketones. This can make a child feel very sick, and can put them at risk for developing diabetic ketoacidosis (DKA). DKA results when high blood sugars and ketones have accumulated, resulting in an imbalance of body water and electrolytes. DKA is a medical emergency and needs to be treated by your physician. DKA can result in coma or even death.

symptoms of ketoacidosis include
• Moderate to large ketones
• Dehydration
• “Fruity” odor to breath
• Deep, rapid respirations (labored breathing)
• Lethargy/fatigue
• Vomiting
**what to do when your child has symptoms of high blood sugar**

1. First check the blood sugar.

2. If the blood sugar is above 300, check for ketones. If the ketones are moderate or large, call the diabetes nurses or physician or give blood sugar and ketone correction if you already have a ketone scale. **When in doubt, call.**

   - If Monday through Friday, 8:00 am–5:00 pm, call 937-641-3487
   - If after 5:00 pm or on a weekend or holiday, call 937-641-3000 to have the physician paged.
   - The office is closed after hours and on the weekend. **Note: Do not leave a message on the office voicemail.**

3. If the ketones are negative, then Novolog insulin can be given to correct for high blood sugar. Novolog insulin can be given every 2–3 hours, using your blood sugar correction scale to determine the dose.

   - Example: If the lunch insulin was given at 12:00 pm, you could give Novolog at 2:00 to 3:00 pm to correct for the high blood sugar.

4. Before correcting for a high blood sugar, consider your child's activity level after the insulin will be given.

   - If active, a reduced dose may be more appropriate—remember insulin and activity both lower blood sugar.
   - If your child is ill and inactive due to the illness, remember that illness and inactivity both can cause higher blood sugars. You should give the correction at this time.

   **Note:** Your physician may change these guidelines as you become more experienced with your child's care.

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**low blood sugar or hypoglycemia**

If your child’s blood sugar drops below the target range, he/she may have the symptoms of low blood sugar or hypoglycemia. The body and brain do not work well without the needed sugar.

For children, a blood sugar less than 80 any time during the day is considered a low blood sugar.

**causes of low blood sugar**

- The honeymoon period (referenced in the “What is diabetes?” section of this manual)
- Too much insulin
- Exercise/increase in activity
- Vomiting/diarrhea
- Drinking alcohol

When sugar levels drop, signals are sent out that more sugar is needed.

**early symptoms include:**

- Paleness
- Shakiness
- Sweating
- Irritability
- Headache
- Hunger
- Nightmares

**later, more serious symptoms are:**

- Confusion
- Unconsciousness
- Seizure
treatment of low blood sugar

1. If your child is having symptoms of low blood sugar, check the blood immediately. Do not leave a child with a low blood sugar alone!

   - If a monitor is not available, treat the symptoms and recheck the blood sugar as soon as possible. This is not ideal as a glucose meter should be readily available at all times.

2. Treat with 15 grams of a quick acting carb. In younger children, it may be recommended that 8–10 grams of carbs be used for treatment.

3. Sources of quick acting carbs include (15 grams of carbs):
   - ½ cup fruit juice
   - Small pack of fruit snacks (check label for carbs)
   - 3–4 glucose tabs
   - A fun size pack of Skittles (23 Skittles)
   - 8 lifesavers
   - ½ cup regular soft drink
   - 1 tablespoon honey or Karo syrup

4. Recheck the blood sugar 15 minutes after treatment is given. This is known as the 15–15 rule: 15 grams treatment with recheck in 15 minutes. If it is still less than 80, treat again.

5. If the low occurs at a scheduled mealtime, give the quick acting carbs and then allow your child to eat their meal. Do not add the treatment carbs to the total carbs eaten for the meal.

   - Example: Blood sugar before lunch = 64
     4 oz juice (15 grams of carbs for treatment of low)
     Carbs from rest of lunch = 50 grams

   - Dose of insulin is only given for 50 grams. The 15 grams of carbs from the juice is strictly to treat the low blood sugar. If you gave insulin for the total amount of carbs (65 instead of 50 grams), this would cause the blood sugar to drop too low again.

6. If the low blood sugar occurred at a mealtime, you do not need to recheck the blood sugar unless your child is still symptomatic for low blood sugar.

treatment of low blood sugar at bedtime

1. If the blood sugar at bedtime is less than 100 (between 80–99), add an extra 15 grams of carbs, such as juice, to the snack.

2. If the blood sugar at the bedtime check is less than 80, add an extra 30 grams of carbs.

3. Recheck blood sugar in 30 minutes, and again in two hours to ensure that the blood sugar is over 100 before leaving the child alone for the night.

If you have to treat low blood sugar frequently, call in the blood sugars for review and possible insulin dose adjustment.
severe low blood sugar

Late signs of low blood sugar are decreased coordination and eventually, a loss of consciousness. Treatment is needed immediately.

glucose gel

Glucose gel should be given if your child is awake but "spacey" or uncoordinated, and you are not certain they could safely drink juice.

- Twist the cap off and squirt a small amount of gel inside the jaw.
- Keep giving small amounts of gel until your child has improved coordination and/or is able to speak.

glucagon

If you should find your child asleep and are unable to wake him, his blood sugar may be severely low. Treatment should begin immediately!

What is glucagon?

Glucagon is a hormone that causes the liver to release a quick burst of sugar. Glucagon is given by injection to the unconscious person with low blood sugar as an “extra boost” to help raise the blood sugar.

Caution

Remember, never put food or juice into an unconscious person’s mouth. They can choke. In this case, an injection of glucagon will be needed to raise the blood sugar.

Instructions for glucagon emergency kit

1. Flip the plastic cap off the vial in the kit. Wipe off the bottle top with an alcohol pad.
2. Inject all the liquid in the syringe into the vial and tilt the vial back and forth until the glucagon is dissolved. Swirl the vial in a circle.
   - Note: Do not shake!
3. Withdraw all the solution from the vial into the syringe.
4. Using an alcohol pad, wipe off the skin where the injection is to be given. The arms or legs are the easiest sites.
5. For children weighing 44 pounds or more, give all the Glucagon. For children less than 44 pounds, give ½ the solution.
6. Stick the needle straight in all the way.
7. As soon as you give the child the injection, place them on their side and call 911! When an unconscious person awakens, he/she may vomit. Turning the child on their side will prevent them from choking.
8. As soon as the child is awake, they should start drinking some liquids that contain sugar.
V. sick days and surgery health care tips
sick days and surgery
health care tips

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sick days

how can being sick affect my diabetes?
Illness makes blood sugar control more difficult and increases insulin needs. The physical stress of being “sick” or having surgery causes the blood sugar to go higher.

Illness includes colds, flu, diarrhea, ear infections, fever, poison ivy, viruses, or even sunburns. Basically, any condition in which the body is physically stressed.

what to do when your child is ill

1. When ill, check blood sugar and ketones and call the diabetes team or the physician if after office hours. Check the ketones even if the blood sugar is less than 300 or even low. Ketones can develop as a result of the illness.

- Monday–Friday, 8:00 am–5:00 pm: 937-641-3487, press option 3 to speak to a nurse, then 1 for diabetes, then 1 again for sick calls.

- After office hours, on weekends or holidays: 937-641-3000. This is the Dayton Children’s operator phone number. The operator will talk to you first and then page the endocrinologist on-call.

2. You need to contact the diabetes team/endocrinologist for sick day care instruction as well as insulin dosing instruction. It is often necessary for insulin doses to be adjusted during illness.

3. If insulin is not taken, especially with illness, high blood sugar and ketones more than likely will occur and can make your child severely ill. If not treated appropriately, this can quickly progress to DKA (diabetic ketoacidosis). This requires hospitalization and close monitoring in the Intensive Care Unit.

4. You can still use over-the-counter medications such as Tylenol or cough medicine.

- Note: There is not a significant amount of sugar in these medicines even though they taste sweet.

5. If your child is ever prescribed an oral steroid, this will make the blood sugar go up drastically. Please call the office or doctor on call to report the blood sugars so that the insulin doses may be adjusted.
what should my child eat when sick?

Your child will still need to take in some carbohydrates during illness. If your child does not take in any carbs, starvation ketones may develop. These ketones are due to the body needing sugar for fuel. If no carbs are eaten, the body resorts to breaking down fat cells as a back-up source of fuel.

• If your child is unable to or refuses to eat regular foods, liquids with carbs such as regular 7Up, Sprite, or Gatorade may be substituted.

• Fluids are also important to avoid becoming dehydrated.

• Offer at least an ounce (2 tablespoons) of fluid every 20–30 minutes to help prevent dehydration.

carbohydrate alternatives
Remember, during illness there is no need to eat meat, protein or fat. There are minimal carbs, if any, in these foods and they may upset the stomach. Milk products and higher fat foods should also be avoided during vomiting and diarrhea.

Foods with approximately 15 g carbohydrates:

• ½ cup apple juice or other 100% fruit juice
• ½ cup 7Up, ginger ale
• 1 tablespoon honey or corn syrup
• 1 tablespoon jelly
• 8 Lifesavers
• 1 tablespoon sugar
• 1 cup Gatorade
• 1 juice bar (60 calories)
• 1 slice toast

• ½ cup cooked cereal
• 6 saltines
• ½ cup sweetened Jell-O
• ½ cup ice cream
• ¼ cup sherbet
• ¼ cup sweetened pudding
• 1 sugar-free pudding pop
• 1 ¼ cup chicken noodle soup
• 1/3 cup frozen yogurt
• 1 cup cream soup
• 1 cup vegetable soup
• 8 animal crackers
general health care tips

Good hygiene is important for everyone. People with diabetes need to be aware that diabetes control may be affected if good health habits are not maintained.

- **Watch cuts closely.** Tell your doctor about any cut that is healing too slowly or not at all.
- **Don’t get sunburned.** Sunburns are damage to the skin and can cause higher blood sugars and potentially, even ketones.
- **Dress warmly for cold weather.** Frostbite could be very damaging.
- **Get plenty of sleep.** Fatigue affects everyone’s performance.

- **See the following doctors regularly:**
  - The doctor who cares for your diabetes.
  - Your pediatrician or family doctor for annual check-ups, including immunizations and acute illness. This doctor will also provide sports physicals.
  - Dentist
  - Ophthalmologist (eye doctor)
long-term complications

what causes complications?
The most important factor is prolonged high blood sugar. Over a long period of time, high blood sugar may cause damage to the small and large blood vessels. The blood vessels in the eyes and kidneys are the most frequently damaged. Complications can occur after the person has had diabetes for at least 10 years. You can delay or lessen the severity of complications by helping to keep your child’s diabetes in good control.

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<tr>
<th>Affected body part/system</th>
<th>Complications</th>
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| Eyes                      | • Blurred vision/double vision – these are temporary states due to high blood sugars.  
• Retinopathy – damage to the small vessels in the eye that can lead to blindness. |
| Kidneys                   | • Diabetic nephropathy – this can be caused by high blood sugars and/or high blood pressure. Protein leaks out of the kidney. Damaged kidneys cannot remove wastes from the bloodstream. |
| Heart                     | • People with diabetes are more likely to have fat build-up in their arteries. This may cause heart disease, stroke and high blood pressure. |
| Nervous system            | • Neuropathy – prolonged high blood sugar can damage nerve endings, especially in the feet. This is why foot care is important. |
| Complications due to infection | • Uncontrolled blood sugars can lead to yeast infections.  
• Uncontrolled blood sugars can slow healing, leading to infection. |

foot care

Because diabetes may affect the blood circulation in our legs and feet, people with diabetes must take especially good care of their feet. Diabetic children usually have good circulation. However, as your child grows into adulthood, this circulation may decrease and good foot care will become more important.

For foot care to become routine, children need to be taught how to take care of their feet early. Taking a few extra minutes everyday to do foot care may prevent serious complications later.

1. **Inspect (look over carefully) your feet every day.** Watch for cracks, blisters, cuts, sores and any signs of infection (redness, discoloration, swelling, pus). Call your pediatrician or family doctor if you notice any signs of infection.

2. **Avoid injuries to your feet.** For a person with uncontrolled diabetes, the chances of a blister or cut becoming infected are greater.

3. **Keep your feet covered.** Wear shoes or slippers everywhere, even around the house or at the pool or beach.

4. **Wear clean cotton socks, which help absorb moisture.**
   - Diabetic socks are not necessary.
   - Avoid wearing anything tight on the feet or ankles that would slow the blood flow to the feet.

5. **Wash your feet everyday in warm (not hot) soapy water and rinse them well.** Dry your feet by patting with the towel until dry instead of rubbing. At this time, apply lotion to any rough spots so that the skin will not crack.

6. **Keep toenails trimmed straight across.** File down any sharp edges.

7. **Avoid shoes that rub or do not fit well.** These could cause blisters.

8. **Rub corns daily with a pumice stone.**Trimming them or applying commercial corn remedies may cause harm to your feet.

9. **Keep feet warm by wearing socks.** Do not use hot water bottles or heating pads on your feet. Avoid sun burning your feet.
medic alerts

Carrying medical identification is a must for a person with diabetes. This could be lifesaving! All children with diabetes need to wear a bracelet, necklace or anklet stating that they have Type 1 Diabetes.

Medic alert jewelry will protect your child’s health or even their life should they need medical aid due to complications related to their diabetes or being involved in an accident. It is very important that the medical people taking care of your child know that they have diabetes!

You can obtain medic alert jewelry from a variety of sources:

• The Medic Alert Foundation – 1-800-432-5378. They provide neck chains and wrist bracelets containing medical information tied to a 24-hour emergency response service.

• Lauren’s Hope for a Cure Bracelets – 1-800-360-8680. Bracelets made of beads and crystals.

• Fifty 50 Pharmacy – 1-800-746-7505. Neoprene ID bracelets and bags to carry diabetes supplies.


• Also available at most pharmacies and jewelry stores.

Contact your diabetes nurse educator if you have any questions or concerns about medic alert identification necklaces or bracelets.

exercise and its benefits

Exercise helps control diabetes! Eating right, taking your medications and exercising are the three main things you need to do for good diabetes control.

• Exercise can make your blood sugar go down. The drop in blood sugar can occur hours after the activity.

• Exercise helps burn fat.

• Exercise will help keep your blood pressure and cholesterol down.

• Exercise can help you cope with the stress of daily life.

exercise and insulin

• Test your blood sugar before you exercise. Treat if low before starting.

• Pre-treat for exercise. Follow the exercise and food chart in this manual.

• Carry quick energy foods with you when you exercise. Examples: fruit juice, fruit snacks, runners’ gels, or glucose tabs.

• If you will be exercising one part of your body very hard, try not to inject your insulin in that part of your body that day.

• Ask your doctor if you need to change your insulin doses!

getting started

• Choose an exercise that keeps you going at a steady pace, like walking, jogging, biking, swimming, dancing or stair climbing.

• Exercise safety

  • Always warm up before you exercise.
  • Always cool down after you exercise.
  • Don’t overdo it.
  • You need to be able to exercise 30 minutes each time you exercise. Work up to it.
  • Remember to drink plenty of water.
  • Contact your diabetes team about any exercise questions.
how to coordinate with your child’s school

- **School nurse.** Before your child returns to school after diagnosis, set up a meeting with the school nurse to talk to them about your child’s diabetes.
  - Each school has a plan for students with diabetes. Meeting with the school nurse will allow you to learn about your child’s school plan and ask questions before your child returns to school.

- **School forms.** The diabetes team will provide your child’s school with forms specific to your child’s diabetes care needs.

- **Sports.** Your child can participate in any sport.
  - A statement regarding diabetes care may be requested by the coaches or trainers and can be provided by the diabetes team.
  - Sports physical forms will need to be completed by your primary care physician.

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special occasions

It is possible to take care of your diabetes and still go to birthday parties, sleepovers or slumber parties at your friends’ homes, trick-or-treating on Halloween, and enjoy parties at school!

school parties

Have the teacher let you know when there is going to be a party. Then you can find out what foods or treats are planned for the party. If you need help with the carb content of the foods or treats, contact your dietitian or diabetes team member.

slumber parties

Your child does not have to miss the fun of a slumber party at the home of a friend. Talk with the friend’s parents about what foods will be served, and about the best time foods will be available during the slumber party. Remember that your child will probably be up later than usual and may be more active. The blood sugar may need to be checked more often on these nights.

travel tips

Having diabetes should not interfere with vacation or travel plans. It is very important, though, that you plan ahead. By planning ahead for diabetes care, you will minimize or prevent any diabetes-related problems. Also, you should discuss your travel plans with your child’s diabetes doctor in advance.

what should you do on vacation?

- Always carry food for meals and snacks with you.
- Always carry a quick sugar source available to treat low blood sugars or to pre-treat for activity. Plan on extra snacks any time he/she is to be especially active.
- Have the child carry identification and wear their medic-alert necklace, bracelet, or anklet at all times.
- Keep doing blood and ketone testing like you do at home. You will need to do more frequent checking when traveling and when being more active than usual.
- Always carry your child’s insulin with you. Do not place it in the trunk, glove compartment, or dashboard of the car. Always keep it with you in your carry-on luggage.
- Be prepared with extra diabetic supplies. This includes syringes, insulin and testing supplies. Carry a prescription from your doctor for extra insulin and syringes in case you lose your supply.

air travel, cruises and international travel

- If traveling by plane or going on a cruise, you may need a travel letter specific to diabetes care and supplies. Please give your travel dates as early as possible to the diabetes care coordinators. Check with the airline to see what they require. At times, airlines have required that specific amounts of supplies be listed on the travel letter.
- If traveling in different time zones, insulin adjustments for the different time zones may be necessary. Please request assistance with this as soon as possible.
- If you travel to other countries, you need to remember that in the US, insulins are 100-unit strength (U–100), meaning there are 100 units of insulin per milliliter (ml) of liquid. A 10 ml bottle of U–100 strength insulin contains 1,000 units of insulin. Other countries may have different strengths insulins which will affect your blood sugars.
- Know where to go in an emergency situation. You may either call the local diabetes association or go to the local hospital emergency room. To find either one of these things search the city name and “diabetes association” online, or look in the phonebook under “diabetes.”
community resources

There are many organizations that work with diabetes. Some organizations are on the local, state or national level. Some of these organizations provide information, support groups and education. Other organizations aid in funding research for a cure.

The following organizations or groups are available to support you! For more information and to find the most up-to-date contact information, check their websites or childrensdayton.org.

- **Diabetes Dayton (DD)** – A group of health professionals who offer telephone counseling, support, literature, and information expos. [www.diabetesdayton.org or 937-220-6611](http://www.diabetesdayton.org or 937-220-6611)
  - **Camp Ko-Man-She** – This is a summer camp for children and teens with diabetes solely sponsored by DD.
  - **Camp Tiponi** – This is a summer camp for children and teens with type 2 Diabetes, pre-diabetes, or Syndrome X. This camp is also sponsored by DD.

- **Juvenile Diabetes Research Foundation (JDRF)** – This is a not-for-profit voluntary health agency, whose primary objective is to support and fund research to find the cause, cure, treatment and prevention of diabetes and its complications. They have an annual walk for the cure that families can participate in, and there are many opportunities for people interested in volunteering their time. [www.jdrf.com or 937-439-2873](http://www.jdrf.com or 937-439-2873)

- **American Diabetes Association** – This is a national organization for health professionals and people with diabetes that is also active on the local and state level. They publish the “Forecast” magazine. [www.diabetes.org or 937-297-0002](http://www.diabetes.org or 937-297-0002)

- **Dayton Children’s Hospital** – At Dayton Children’s, the diabetes team is available to every family of a child with diabetes. The team is made up of pediatric endocrinologists, diabetes nurse educators, dietitians, a medical social worker and a psychologist. [www.daytonchildrens.org](http://www.daytonchildrens.org)
  - Individual counseling is available through a referral by your primary pediatrician or family doctor.
  - **Family Support Group Meetings** – Available at Dayton Children’s. Please call for dates, times and place: 937-641-3487 or 937-641-5300

online resources and useful apps

Please be aware that the information found on the internet is not always accurate. The information may also be sponsored by pharmaceutical companies. The people who you encounter online may have a different level of education and may not have good diabetes control. Please discuss any questions you have with your child’s diabetes team.

**additional online resources**

To look up food to get nutritional information (carbohydrate content, calories, fat, etc.), both [www.nutritiondata.com](http://www.nutritiondata.com) and [www.calorieking.com](http://www.calorieking.com) are helpful.

Check out childrensdayton.org for more resources too, including Pinterest boards with snack and meal ideas.

**smartphone apps**

Don’t have an iPhone? Go to your app store on your smartphone and search “diabetes.” For Apple products, visit the app store to check out the following apps and more. Some are free, some cost up to $5.00.

- Carb counting with Lenny the Lion (free app from Medtronic) shows children how many carbs are in various foods by showing serving sizes and pictures. It also offers games on carbs.
- Glucose Buddy is a simple free log book app that can be emailed to yourself, your family members, or the diabetes doctor.
- Go Meals (free), Carb Master (costs $0.99), and Fast Food Calories (costs $0.99 for Pro version, non-pro version is free) help you to count carbs in meals.
Different levels of exercise can affect blood sugar levels. The chart below will help you know what kinds of foods (if any) you should give your child to help regulate their blood sugar after exercise.

<table>
<thead>
<tr>
<th>Blood sugar level</th>
<th>Mild intensity exercise</th>
<th>Moderate intensity exercise</th>
<th>Hard intensity exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 80</td>
<td>Fairly easy exercise and less than 30 minutes in duration. Examples are walking, easy biking, baseball, hide and seek, hop scotch, and jumping rope.</td>
<td>Somewhat hard exercise for 1 hour. Examples are swimming, easy biking, roller skating, skate boarding, aerobics.</td>
<td>Examples are fast biking, basketball, hiking, football, soccer and team sports.</td>
</tr>
<tr>
<td>80–120</td>
<td>1 bread/starch or 1 fruit = 15 g carbohydrate</td>
<td>1 bread/starch + 1 meat = 15 g carbohydrate + 1 oz meat</td>
<td>2 bread/starch + 2 meat = 30 g carbohydrate + 2 oz meat</td>
</tr>
<tr>
<td>120–180</td>
<td>Do not need extra snack</td>
<td>1 bread/starch or 1 fruit = 15 g carbohydrate</td>
<td>1 bread/starch + 1 meat = 15 g carbohydrate + 1 oz meat</td>
</tr>
<tr>
<td>180–240</td>
<td>Do not need extra snack</td>
<td>May not need extra snack</td>
<td>1 bread/starch or 1 fruit = 15 g carbohydrate</td>
</tr>
<tr>
<td>240 or above</td>
<td>Do not need extra snack</td>
<td>Do not need extra snack</td>
<td>May not need extra snack</td>
</tr>
</tbody>
</table>
counting carbohydrates: the basics

what is a carbohydrate?

Food provides important nutrients for our bodies, including protein, fats and carbohydrates. Carbohydrates are important for your child’s growth and development and their developing brain.

All carbohydrates eventually turn into blood sugar (also known as blood glucose) after digestion. Carbohydrate is the part of food that is called starch, sugar and fiber.

counting carbohydrates

Counting carbohydrates (or counting carbs) is a method of controlling the amount of carbohydrates you eat. We use grams (g) to measure the amount of carbohydrates in all foods.

To count the number of carbohydrates in a food you will need the nutrition label. Or, you can use online information sources. You will also need measuring cups and a food scale to measure the serving size.

foods that contain carbohydrates

- **Starches**: cereal, grains, breads, crackers, beans, lentils, potatoes, corn, peas
- **Fruit**: fruit, fruit juice, dried fruit, canned fruit
- **Milk**: any variety of milk or yogurt
- **Vegetables**: green beans, broccoli, tomatoes, cucumbers
- **Combination foods**: casseroles, pizza, stews, soups, chili, snack items
- **Others**: sweets, desserts, syrup, jelly, honey, donuts, sugar, corn syrup
**Nutrition Facts**

Cereal O’s (no milk)

**Serving Size 1 cup (28g)**

Servings per container about 12

<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>% Daily Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories 100</td>
<td>Calories from Fat 15</td>
</tr>
<tr>
<td>Total Fat 2g</td>
<td>3%</td>
</tr>
<tr>
<td>Saturated Fat 0.5g</td>
<td>3%</td>
</tr>
<tr>
<td>Trans Fat 0g</td>
<td></td>
</tr>
<tr>
<td>Polyunsaturated Fat 0.5g</td>
<td></td>
</tr>
<tr>
<td>Monounsaturated Fat 0.5g</td>
<td></td>
</tr>
<tr>
<td>Cholesterol 0mg</td>
<td>0%</td>
</tr>
<tr>
<td>Sodium 140mg</td>
<td>6%</td>
</tr>
<tr>
<td>Potassium 180mg</td>
<td>5%</td>
</tr>
<tr>
<td>Total Carb 20g</td>
<td>7%</td>
</tr>
<tr>
<td>Dietary Fiber 3g</td>
<td>11%</td>
</tr>
<tr>
<td>Soluble Fiber 1g</td>
<td></td>
</tr>
<tr>
<td>Sugars 1g</td>
<td></td>
</tr>
<tr>
<td>Other Carbohydrate 16g</td>
<td></td>
</tr>
<tr>
<td>Protein 3g</td>
<td></td>
</tr>
</tbody>
</table>

Vitamin A 0%

Calcium 4%

Iron 10%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

<table>
<thead>
<tr>
<th>Calories</th>
<th>Calories from Fat</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,000</td>
<td>2,500</td>
</tr>
<tr>
<td>Total Fat Less Than</td>
<td>65g</td>
</tr>
<tr>
<td>Saturated Fat Less Than</td>
<td>20g</td>
</tr>
<tr>
<td>Cholesterol Less Than</td>
<td>300mg</td>
</tr>
<tr>
<td>Sodium Less Than</td>
<td>2,400mg</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>300g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>25g</td>
</tr>
</tbody>
</table>

**Calories per gram:**

| Fat 9 | Carbohydrate 4 | Protein 4 |

---

**serving size**

The serving size is a very important piece of information on the food label. It is the portion that all of the nutrition facts are based on. For example, if you ate ½ cup of this food instead of the suggested 1 cup serving size, you would need to divide all of the nutrients listed on the label in half.

**total carbohydrate**

The total carbohydrate is measured in grams (g). This is the number that you will need, along with the serving size, to count the grams of carbs for your meal plan.

**counting carbs**

The product shown in the nutrition label to the left has 20g of carbohydrates per 1 cup. If you ate 2 cups, you would have 40g of carbohydrates total.

<table>
<thead>
<tr>
<th>Example Meal</th>
<th>Grams of carbohydrates (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 slices whole grain bread</td>
<td>30</td>
</tr>
<tr>
<td>2 oz turkey</td>
<td>0</td>
</tr>
<tr>
<td>1 oz low-fat cheese</td>
<td>1</td>
</tr>
<tr>
<td>1 tbsp light mayonnaise</td>
<td>0</td>
</tr>
<tr>
<td>1 small apple (3 oz)</td>
<td>15</td>
</tr>
<tr>
<td>1 oz baked chips</td>
<td>15</td>
</tr>
<tr>
<td>8 oz low-fat milk</td>
<td>12</td>
</tr>
<tr>
<td>total grams of carbohydrates</td>
<td>72 g of carbohydrates</td>
</tr>
</tbody>
</table>
Fiber may decrease the risk of heart disease and colon cancer. This is a list of the fiber content in some common foods. To determine your child’s goal for daily fiber intake, take your child’s age and add 10. That’s the number of grams of fiber they should eat per day. Adults should get 25-35 grams/day.

<table>
<thead>
<tr>
<th>food/amount</th>
<th>fiber (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>fruits</strong></td>
<td></td>
</tr>
<tr>
<td>Apple w/ skin, 5.5 oz</td>
<td>3</td>
</tr>
<tr>
<td>Applesauce, ½ cup</td>
<td>2</td>
</tr>
<tr>
<td>Banana, 6 oz w/skin</td>
<td>2</td>
</tr>
<tr>
<td>Blueberries, ½ cup</td>
<td>2</td>
</tr>
<tr>
<td>Figs, dried, 3 1.5 oz</td>
<td>5</td>
</tr>
<tr>
<td>Orange w/ skin 7-8 oz</td>
<td>3</td>
</tr>
<tr>
<td>Pear w/ skin, 6 oz</td>
<td>4</td>
</tr>
<tr>
<td>Prunes, dried, 4 1 oz</td>
<td>2</td>
</tr>
<tr>
<td>Raisins, 2 tbsp</td>
<td>2</td>
</tr>
<tr>
<td>Strawberries, 1 cup</td>
<td>4</td>
</tr>
<tr>
<td><strong>vegetables, cooked</strong></td>
<td></td>
</tr>
<tr>
<td>Broccoli, ¼ cup</td>
<td>2</td>
</tr>
<tr>
<td>Brussel sprouts, ¼ cup</td>
<td>3</td>
</tr>
<tr>
<td>Peas, ½ cup</td>
<td>2</td>
</tr>
<tr>
<td>Potato w/ skin, baked, 5 oz</td>
<td>4</td>
</tr>
<tr>
<td>Potato, mashed, ½ cup</td>
<td>1</td>
</tr>
<tr>
<td>Spinach, ¼ cup</td>
<td>2</td>
</tr>
<tr>
<td>Sweet potato w/ skin, baked, 2 oz</td>
<td>2</td>
</tr>
<tr>
<td><strong>vegetables, raw</strong></td>
<td></td>
</tr>
<tr>
<td>Carrots, 3 oz</td>
<td>2</td>
</tr>
<tr>
<td>Lettuce, romaine, 1 cup</td>
<td>1</td>
</tr>
<tr>
<td>Spinach, 1 cup</td>
<td>1</td>
</tr>
<tr>
<td>Tomato, 4.5 oz</td>
<td>2</td>
</tr>
<tr>
<td><strong>beans, cooked</strong></td>
<td></td>
</tr>
<tr>
<td>Baked beans, ½ cup</td>
<td>3</td>
</tr>
<tr>
<td>Kidney beans, ½ cup</td>
<td>3</td>
</tr>
<tr>
<td>Lentils, ½ cup</td>
<td>4</td>
</tr>
<tr>
<td><strong>breads, grains and pasta</strong></td>
<td></td>
</tr>
<tr>
<td>Bagel, 2 oz</td>
<td>1</td>
</tr>
<tr>
<td>Breadstick, 2 oz</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Noodles, ½ cup</td>
<td>1</td>
</tr>
<tr>
<td>Brown rice, cooked, ½ cup</td>
<td>2</td>
</tr>
<tr>
<td>French bread, 1 slice, 1 oz</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Pumpernickel bread, 1 slice, 1 oz</td>
<td>3</td>
</tr>
<tr>
<td>Spaghetti, cooked, ½ cup</td>
<td>1</td>
</tr>
<tr>
<td>Wheat bran, 1 tbsp</td>
<td>2</td>
</tr>
<tr>
<td>Wheat germ, 1 tbsp</td>
<td>1</td>
</tr>
<tr>
<td>White bread, 1 slice, 1 oz</td>
<td>&lt;1</td>
</tr>
<tr>
<td>White rice, cooked, ½ cup</td>
<td>1</td>
</tr>
<tr>
<td>Whole-wheat bread, 1 slice, 1 oz</td>
<td>2</td>
</tr>
<tr>
<td>Sara Lee whole-wheat white, 1 oz</td>
<td>3</td>
</tr>
<tr>
<td><strong>snack foods</strong></td>
<td></td>
</tr>
<tr>
<td>Hummus dip, 2 tbsp</td>
<td>2</td>
</tr>
<tr>
<td>Peanuts, dry-roasted, ¼ cup</td>
<td>3</td>
</tr>
<tr>
<td>Popcorn, air-popped, 1 cup</td>
<td>1</td>
</tr>
<tr>
<td>Sunflower seeds, ¼ cup</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>food/amount</th>
<th>fiber (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>breakfast cereals</strong></td>
<td></td>
</tr>
<tr>
<td>100% bran, ½ cup</td>
<td>8</td>
</tr>
<tr>
<td>Bran flakes, ¼ cup</td>
<td>5</td>
</tr>
<tr>
<td>Corn flakes, ¼ cup</td>
<td>1</td>
</tr>
<tr>
<td>Granola w/ raisins, ¼ cup</td>
<td>2</td>
</tr>
<tr>
<td>Oatmeal, cooked, ¼ cup</td>
<td>3</td>
</tr>
<tr>
<td>Raisin Bran, ½ cup</td>
<td>5</td>
</tr>
<tr>
<td>Shredded wheat, 1 cup</td>
<td>6</td>
</tr>
</tbody>
</table>

*All values are rounded. Due to the different methods used to determine fiber in foods and to “round” values, the grams of fiber listed on Nutrition Facts panels and in other sources may differ slightly from those listed above.

Sources: Bowes and Church’s Food Values of Portions Commonly Used. 16th Ed, 1994; Plant Fiber in Foods. 2nd Ed, 1990; and manufacturer data adapted from The American Dietetic Association’s Complete Food and Nutrition Guide, 1998; The Calorie King. 22nd Ed, 2010.
## Exchanges of Commonly Used Ingredients

<table>
<thead>
<tr>
<th>Starches</th>
<th>Amount</th>
<th>Carbs (g)</th>
<th>Protein (g)</th>
<th>Fat (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biscuit mix</td>
<td>½ cup</td>
<td>37</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Bread crumbs, dry</td>
<td>1 cup</td>
<td>65</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Cornmeal, uncooked</td>
<td>1 cup</td>
<td>117</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Cornstarch</td>
<td>2 tbsp</td>
<td>14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cream soup, undiluted</td>
<td>10 ¾ oz can</td>
<td>22</td>
<td>5</td>
<td>19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flour</th>
<th>Amount</th>
<th>Carbs (g)</th>
<th>Protein (g)</th>
<th>Fat (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All purpose</td>
<td>1 cup</td>
<td>87</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Cake (sifted)</td>
<td>1 cup</td>
<td>79</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Rye</td>
<td>1 cup</td>
<td>66</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Whole wheat</td>
<td>1 cup</td>
<td>80</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Graham cracker crumbs</td>
<td>1 cup</td>
<td>90</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>Macaroni, cooked (3.5 oz uncooked)</td>
<td>1 cup</td>
<td>41</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Noodles, egg, cooked (2.5 oz uncooked)</td>
<td>1 cup</td>
<td>40</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Oatmeal, uncooked</td>
<td>1 cup</td>
<td>54</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Rice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• white and brown, cooked</td>
<td>1 cup</td>
<td>36</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>• Wild, uncooked</td>
<td>¼ cup</td>
<td>21</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Spaghetti, cooked (3.5 oz uncooked)</td>
<td>1 cup</td>
<td>41</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Wheat germ (1 oz)</td>
<td>¼ cup</td>
<td>13</td>
<td>9</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fruits and Vegetables</th>
<th>Amount</th>
<th>Carbs (g)</th>
<th>Protein (g)</th>
<th>Fat (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barbecue sauce</td>
<td>3 tbsp</td>
<td>15</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Ketchup</td>
<td>½ cup</td>
<td>30</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Dates</td>
<td>1 cup</td>
<td>130</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Raisins</td>
<td>½ cup</td>
<td>55</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Tomatoes or tomato juice</td>
<td>1 cup</td>
<td>9</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Tomato sauce or puree</td>
<td>1 cup</td>
<td>20</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sugars and Syrups</th>
<th>Amount</th>
<th>Carbs (g)</th>
<th>Protein (g)</th>
<th>Fat (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn syrup</td>
<td>1 cup</td>
<td>242</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Gelatin, powdered regular</td>
<td>3 oz. box</td>
<td>74</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Molasses, dark</td>
<td>1 cup</td>
<td>180</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sugar</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Brown, packed</td>
<td>1 cup</td>
<td>212</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>• Powdered, unsifted</td>
<td>1 cup</td>
<td>119</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>• White</td>
<td>1 cup</td>
<td>199</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nuts</th>
<th>Amount</th>
<th>Carbs (g)</th>
<th>Protein (g)</th>
<th>Fat (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almonds</td>
<td>½ cup</td>
<td>15</td>
<td>14</td>
<td>41</td>
</tr>
<tr>
<td>Cashews</td>
<td>1 cup</td>
<td>29</td>
<td>17</td>
<td>46</td>
</tr>
<tr>
<td>Coconut, shredded</td>
<td>1 cup</td>
<td>33</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td>Peanuts</td>
<td>½ cup</td>
<td>5</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Peanut butter</td>
<td>1 cup</td>
<td>34</td>
<td>76</td>
<td>137</td>
</tr>
<tr>
<td>Pecans</td>
<td>1 cup</td>
<td>13</td>
<td>9</td>
<td>73</td>
</tr>
<tr>
<td>Walnuts</td>
<td>1 cup</td>
<td>16</td>
<td>15</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>amount</td>
<td>carbs (g)</td>
<td>protein (g)</td>
<td>fat (g)</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------</td>
<td>-----------</td>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>meats</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beef, lean, ground, raw</td>
<td>1 pound</td>
<td>0</td>
<td>79</td>
<td>66</td>
</tr>
<tr>
<td>Chicken, canned</td>
<td>5.5 oz</td>
<td>0</td>
<td>34</td>
<td>18</td>
</tr>
<tr>
<td>Salmon, pink, canned</td>
<td>16 oz</td>
<td>0</td>
<td>93</td>
<td>27</td>
</tr>
<tr>
<td>Tuna, canned</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Water-packed</td>
<td>6 ½ oz</td>
<td>0</td>
<td>44</td>
<td>3</td>
</tr>
<tr>
<td>• Oil-packed</td>
<td>6 ½ oz</td>
<td>0</td>
<td>45</td>
<td>30</td>
</tr>
<tr>
<td><strong>dairy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butter or margarine</td>
<td>¼ cup</td>
<td>0</td>
<td>0</td>
<td>49</td>
</tr>
<tr>
<td><strong>Cheese</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cheddar, shredded</td>
<td>1 cup</td>
<td>2</td>
<td>29</td>
<td>37</td>
</tr>
<tr>
<td>• Cream</td>
<td>4 oz</td>
<td>3</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>• Mozzarella part-skim, shredded</td>
<td>1 cup</td>
<td>3</td>
<td>28</td>
<td>18</td>
</tr>
<tr>
<td>• Parmesan, grated</td>
<td>¼ cup</td>
<td>1</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td><strong>Cream</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Half and half</td>
<td>½ cup</td>
<td>5</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>• Heavy, unwhipped</td>
<td>¼ cup</td>
<td>2</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>• Sour</td>
<td>½ cup</td>
<td>4</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Egg, whole</td>
<td>1</td>
<td>-</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Egg yolk</td>
<td>1</td>
<td>-</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

**Milk**

- Evaporated, skim
- Nonfat dry, instant
- Yogurt, plain nonfat

**Fats, oils, chocolate, cocoa**

- Chocolate, bitter
- Chocolate chips
- Chocolate-flavored syrup
- Cocoa powder
- Mayonnaise
- Shortening
- Vegetable oil
carbohydrate free snack ideas

These food items have about 5 grams of carbohydrates or less per serving. They can be eaten up to 3 different times throughout the day.

Remember, all foods have calories that can contribute to unhealthy weight gain if eaten in excess. Also, many carb-free foods are high in fat. When eaten in excess, high-fat foods can be bad for your heart health, even if you are at an appropriate weight for your height.

5 gram or less per serving carbohydrate snack

- ¼ cup low-fat cottage cheese
- ¼ cup almonds, peanuts, pistachio or macadamia nuts
- 1 slice of turkey rolled up with 1 slice part-skim cheese with mustard
- 5 small celery sticks spread with peanut butter
- 5–7 cocktail shrimp (not breaded or fried)
- Scrambled eggs (use 1 whole egg and 1 egg white)
- 1 part-skim mozzarella cheese stick
- 1 oz tuna mixed with 1 tbsp light mayo, spread on 4 wheat thin crackers
- 1 cup raw broccoli, cauliflower, peppers and cucumbers dipped in 2 tbsp light ranch dressing (optional)
- 1 cup sugar-free Jell-O with 1 tbsp sugar-free Cool Whip
- Cucumber salad prepared with thinly sliced cucumbers, sour cream, dill and vinegar (½ cup serving)
- 2 slices dill pickles
- 2 oz grilled chicken breast (chopped), mixed with light mayo, mustard or Italian dressing. Wrap in lettuce leaf or eat plain.
- 1 sugar-free popsicle
- 1 cup popcorn with 1 tbsp peanut butter melted on it. Or, sprinkle with parmesan cheese.
- Omelet: 1 egg, ¼ cup green pepper, ¼ cup shredded cheese, 1 slice bacon (chopped)
15 gram per serving carbohydrate snack

- ½ cup canned fruit (lite, or in own juice)
- 1 small piece of fresh fruit
- 3 cups light popcorn, sprinkled with parmesan cheese
- 24 Cheez-Its
- 1 tbsp raisins mixed with 1 oz peanuts
- 10 Triscuits with 1 string cheese
- Salad: 1 cup spinach/lettuce, ½ cup cucumber, ½ cup tomatoes, ½ cup carrots with 2 tbsp dressing
- 1 slice low-carb bread with 1 tbsp peanut butter and 1 tsp low sugar spread
- 3 oz baby carrots, 2 tbsp ranch dressing and 1 string cheese
- ½ fresh apple with 2 tbsp peanut butter
- 3 graham crackers and 1 tbsp peanut butter
- ½ cup sweetened Jell-O
- 6 oz yogurt (plain or flavored – “light”)
- ½ cup fresh diced pineapple with ½ cup cottage cheese
- ½ cup cooked cereal
- 1 sugar-free pudding pop
- 4 animal crackers with 4 oz skim milk
- ¾ oz pretzels
- ¾ cup cream soup
- 1 cup vegetable soup
- 1 ¼ cup chicken noodle soup
- ½ cup frozen yogurt
- ½ small bagel with low-fat cream cheese
- ½ cup sugar-free pudding
- 1 slice turkey breast, lettuce and tomato wrapped in 6 in. tortilla
- ½ cup ice cream
- ½ roast beef sandwich on whole wheat
nutrition
USDA – www.choosemyplate.gov
Vegetables and fruits – www.fruitsandveggiesmorematters.org
Academy of Nutrition and Dietetics – www.eatright.org
Calorie King Online – www.calorieking.com/
MyPlate Calorie Tracker – www.livestrong.com/myplate
Carb Counter – www.carb-counter.net
Calorie Count – www.caloriecount.com

diabetes support
Children with Diabetes – www.childrenwithdiabetes.com
Juvenile Diabetes Research Foundation – www.jdrf.org
Dayton Area Diabetes Association – www.diabetesdayton.org
dLife – www.dlife.com
Diabetic Living Magazine – www.diabeticlivingonline.com

recipe analyzer
Use “create a dish,” add each food/ingredient to dish, then how many servings the recipe makes to get total carbohydrates per serving or for total recipe.

smartphone apps
Calorie King Food Search
MyPlate Calorie Tracker
MyFitness Pal
GoMeals