Diabetes Education
Talk to your doctor or health care team if you have any questions about your care.

For more health information, contact the Library for Health Information at 614-293-3707 or e-mail health-info@osu.edu.
Diabetes classes are available at various locations across The Ohio State University Wexner Medical Center. For more information about class times and locations or to register, please call 614-688-6251.
Understanding Diabetes

Whether you have had diabetes for many years or have just been told you have diabetes, you are not alone. More than 30 million people in the United States (9.4%) have diabetes. The information in this book will help you understand more about diabetes and how to live successfully with it.

About diabetes
Diabetes is a disease in which your blood glucose, or blood sugar, levels can get too high. Glucose comes from the foods you eat. Insulin is a hormone, produced by the pancreas, that helps the glucose get into your cells to give them energy.

- With **type 1 diabetes**, your body does not make insulin.
- With **type 2 diabetes**, the more common type, your body does not make enough insulin or your body is not able to use the insulin it makes. Without enough insulin, the glucose stays in your blood.
- With **prediabetes**, your blood sugar is higher than normal, but not high enough to be called diabetes. Having prediabetes puts you at a higher risk of getting type 2 diabetes.

Over time, having too much glucose in your blood can cause serious problems. It can damage your eyes, kidneys, and nerves. Diabetes can also cause heart disease, stroke, and even the need to remove a limb. Women can also get diabetes during pregnancy, called **gestational diabetes**.

Warning signs of diabetes
Everyone responds differently to diabetes. Some of the common warning signs are:
- Having to go to the bathroom often to pass urine.
- Feeling thirsty, even though you are drinking fluids.
- Losing weight.
- Blurry vision.
- Healing is slow for cuts or scrapes on your skin.
- Feeling tired.
- Feeling hungry.
- Being irritable or grumpy.

Often people may not notice any signs of diabetes. One in four people with diabetes doesn’t know he or she has it.

Diagnosing diabetes
Your doctor will do a physical exam and ask you about your signs. Blood tests will be done to check for diabetes:
- An **A1C test**, also called the hemoglobin A1C, HbA1c, or glycohemoglobin test, measures blood sugar over the last 2 to 3 months. An A1C of 6.5% or higher indicates diabetes.
• A **fasting plasma glucose (FPG)** test, also called fasting blood glucose, measures blood sugar. You will need to fast, so you are not able to eat or drink anything except for water for at least 8 hours before the test. A FPG of 126 mg/dl or above on two testing occasions indicates diabetes.

• A **glucose tolerance test (GTT)** measures blood sugar. You will need to fast for at least 8 hours before the test and for 2 or 3 hours after drinking a sweet tasting orange drink. A blood sugar level of 200 mg/dl or higher indicates diabetes.

**Prediabetes**

If you have blood sugar levels that are higher than normal, but not high enough to be diabetes, you have prediabetes. 84.1 million adults in the U.S. have prediabetes. Without treatment, prediabetes often leads to type 2 diabetes within five years.

**To prevent or delay type 2 diabetes:**

• Lose weight. Losing just 5 to 10 percent of your body weight can reduce your diabetes risk.

• Eat a healthy diet that is low in fat and calories.

• Increase your physical activity. Exercise most days of the week, such as walking briskly for 30 minutes, 5 days a week.

• See your doctor regularly for wellness check-ups.

**Treating diabetes**

If your blood sugar level indicates diabetes, your doctor, nurse, and dietitian will work with you to control your diabetes. The goal of treatment is to keep your blood sugar level as near to normal as possible (80 to 130 mg/dl fasting). To do this, a balance of food, medicine, and exercise is needed.

**How to control your diabetes:**

• Follow your meal plan.

• Take your insulin or other diabetes medicines as ordered.

• Exercise most days of the week, such as walking briskly for 30 minutes, 5 days a week.

• Maintain a healthy weight.

• Learn how to check and record your blood sugar levels.

• Learn how to recognize when your blood sugar level is too high or too low.

• Keep all of your appointments with your doctors, nurses, and dietitians.

• Attend diabetes education classes.

Learn as much as you can about diabetes. The more you know about your diabetes, the better you will be able to control it.
How to Check Your Blood Sugar

A blood glucose monitoring device, also called a blood sugar meter, allows you to measure the amount of sugar, called glucose, in your blood. The device uses a test strip that has chemicals on it. A small drop of your blood, often from the side of your finger, is placed on a test strip. The blood drop mixes with the chemicals on the strip, and in less than 30 seconds, you know your blood sugar or glucose result.

Your doctor wants you to check your blood sugar to learn more about your diabetes. By knowing your blood sugar levels, both you and your doctor can make changes in your current medicine, diet, and exercise plan to better control your diabetes. Checking your blood sugar can help you to treat high or low blood sugar before it becomes a problem or an emergency.

Ask your diabetes educator, pharmacist, nurse, or doctor to show you how to use your blood sugar meter if you have any problems.

Blood sugar target range

Keeping your blood sugar under control can help protect against diabetes complications that affect the eyes, kidneys, heart, blood vessels, and nerves. Talk with your doctor and nurse about what target range is best for you based on your age, type of diabetes, and other health conditions that you have. You may be told to:

• Keep before meal blood sugar in a target range of 80 to 130 mg/dl, and after meals no higher than 180 mg/dl.
• Keep before meal blood sugar in a narrow range of 60 to 99 mg/dl, and after meals no higher than 128 mg/dl if you are pregnant.

If your diabetes is out of control, do not expect to get it under control overnight. Start slowly and work with your doctors, nurses, and dietitians to get your blood sugar in the target range and learn to live well with diabetes.

High and Low Ranges

Blood sugar above your target range, called high blood sugar, may lead to diabetes complications. High blood sugar can result from eating too much, not exercising enough, stress, illness, or not enough medicine.
Blood sugar below your target range, called low blood sugar, may lead to seizures, coma, and even death. Low blood sugar can result from not eating enough food, too much insulin or diabetes medicine, or too much or unplanned exercise.

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<thead>
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<th>400</th>
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| Less than 70 | Low Blood Sugar

### When to check your blood sugar

Your nurse or doctor will tell you how often to check your blood sugar. The checks are often done before mealtimes and before bedtime.

You will need to check your blood sugar more often during times of stress, illness, infection, menstrual cycles, or surgery. This may be as often as every 1, 2, or 4 hours.

If you are pregnant, you may need to check your blood sugar up to 8 times a day: before and after meals, at bedtime, and at 3:00 in the morning.

### Supplies

A variety of blood sugar meters, glucose strips, lancets, and lancing devices are available. Check with your insurance company to see if they cover the cost for certain brands of meters. Meters are often on sale or rebates may be available. The cost of the test strips will be the larger expense, so it may be best to know what your insurance will cover.

Your diabetes educator, doctor, nurse, or pharmacist can help you choose the best meter and supplies for you. You will need the following supplies:

- Blood sugar meter
- Glucose test strips that match your meter
- Lancing device
- Lancets
- Alcohol swab
- 1 to 2 cotton balls (optional)
- Blood Sugar Record (a record is included at the back of this book)
- Sharps disposal container
In addition, you will need to:

- Check the expiration date on your test strip bottle. Never use the strips if the date has expired. Date the bottle when you open it. **Throw away any strips have not been used by 3 months** after the bottle has been opened.
- Make sure the cap fits snugly on the test strip bottle. If you use foil wrap strips, check to make sure the foil wrap has not been opened or damaged. Sunlight and moisture can damage the strips.
- Use each lancet only one time. Talk to your doctor or nurse to find out if it is safe for you to re-use the lancets.
- Code the meter with each new bottle or box of strips if needed.
- Use the control solutions for your meter when you open a new bottle or box of strips to make sure the strips are good, so your result will be correct.

**What sites to use for checking your blood sugar**

You can get a drop of blood from:

- The sides of your fingers and thumbs.
- Forearms or top of legs if an alternate site meter is used.

Most people use their fingers. Use a different finger each time you do a blood sugar check to avoid infection, soreness, and calluses. Avoid using the tip of your finger as this is the most sensitive area of the finger, and you may feel more pain here. **Never use your feet or toes.**

**Wash your hands with warm water and soap before you do a check.**

**What to do if problems occur**

Most people have no problems. Checking blood sugar is an easy and almost painless task. The chart below has some helpful hints to help you avoid problems.

<table>
<thead>
<tr>
<th>Problem</th>
<th>What to do</th>
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</thead>
<tbody>
<tr>
<td>Sore fingers</td>
<td>• Use only the sides of your fingers and thumbs.</td>
</tr>
<tr>
<td></td>
<td>• Always use a lancing device.</td>
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<tr>
<td></td>
<td>• Use a different finger or thumb for each blood sugar check.</td>
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<tr>
<td></td>
<td>• Use a micro fine lancet (30 to 33 gauge).</td>
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<tr>
<td></td>
<td>• Lightly place the lancing device against the side of your finger.</td>
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<tr>
<td></td>
<td>• Consider alternate site checks.</td>
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<tr>
<td></td>
<td>• Use a lancing device with an adjustable cap or depth.</td>
</tr>
<tr>
<td>Problem</td>
<td>What to do</td>
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<tr>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Blood drop is too small</td>
<td>• Shake your hand and lower it below heart level before lancing your finger.</td>
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<tr>
<td></td>
<td>• Do NOT use lancets without a lancing device.</td>
</tr>
<tr>
<td></td>
<td>• If using a micro fine lancet, try using a smaller gauge lancet.</td>
</tr>
<tr>
<td></td>
<td>• Wash your hands with warm, soapy water before lancing.</td>
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<tr>
<td></td>
<td>• Squeeze your finger until it turns pink before using the lancing device.</td>
</tr>
<tr>
<td></td>
<td>• Squeeze your finger after using the lancing device to get a bigger drop of blood.</td>
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</table>

**Record your blood sugar readings**

Keep a record of your blood sugar readings, so you and your doctor can see patterns of low and high blood sugar. Make copies of the record sheet included in the back of this book or create your own record. Add comments to further personalize your record. It may be helpful to develop codes for diet, activity, illness, weight (weekly), and anything else that would serve as a cue to you as you review your blood sugar levels. Bring your record sheet with you to all appointments.

Some blood sugar meters have special features that allow the downloading of your results into a computer for reports. Check the manufacturer’s instructions that came with your meter to see if it has these functions.

**Safely throw away lancets and needles in a sharps container**

*To protect yourself and others, never throw lancets or needles into the trash.*

**Buy a sharps or needle disposal container** at the drug store or use an empty, heavy plastic bleach or detergent bottle with a lid.

Keep the container out of the reach of children or pets.

Ask your pharmacist or nurse how you should throw away your container of used needles. You can also check with your garbage collector.
A1C test

An A1C test, also called the hemoglobin A1C, HbA1c, or glycohemoglobin test, measures blood sugar over the last 2 to 3 months. An A1C of 7% or less indicates that your diabetes is well controlled.

The A1C test is a partner to daily blood sugar checks. A1C cannot identify glucose patterns. Using a blood sugar meter daily to check your blood sugar lets you see patterns of high and low blood sugar. You, your doctor, and your diabetes team will look at both your A1C and daily blood sugar check results to determine what changes are needed to your medicines, diet, or exercise to keep your diabetes under control.

**A1C levels should be checked every 3 to 6 months.** Keeping your blood sugar under control, between 6% to 7%, is important to prevent complications of diabetes.
Taking Medicine for Diabetes

Based on the type of diabetes you have, you may be able to take diabetes medicine by mouth. You will also need to follow diet and exercise guidelines to keep your diabetes under control. Your doctor will determine the best medicine for your type of diabetes. **Ask your nurse, doctor, or pharmacist to give you information about the medicine that has been prescribed for you.**

There may be times when you need more than one type of diabetes medicine. You may need to take insulin in addition to diabetes pills during times when your blood sugar is hard to control. Testing your blood sugar regularly and reporting how you are feeling will help your doctor determine the best medicine for you.

Before taking any medicine, tell your doctor:

- If you have ever had an allergic or unusual reaction to any medicine, food, or other substance. Ask your doctor or pharmacist if you have questions.
- If you are pregnant or if you plan to become pregnant. The use of any medicine during pregnancy must be carefully considered. Your obstetrician or pharmacist will be able to tell you about the safety of any medicines you take during pregnancy.
- If you are breastfeeding. Some medicines pass into breast milk and can cause side effects to your baby.
- If you are taking any prescription or over the counter medicines, including vitamins or herbal supplements. Certain medicines can change how your diabetes medicine works.

What you should know about your medicine

- Please ask questions about the medicines you are taking. Write down your questions and take them with you to your doctor’s visit. Your pharmacist can also answer questions about the medicine when the prescription is filled.
- Learn the medicine’s generic and brand names.
- Take your prescribed medicine at the same time every day according to the directions given to you by your doctor.
- **Do not skip meals when you are taking diabetes medicine.** This can cause a low blood sugar reaction, which can be very dangerous.
- Ask for a refill of your medicine several days before your supply is gone.
- Talk with your pharmacist before taking any over the counter medicine. Some medicines can interfere with the way your diabetes medicine works.
• Avoid alcohol while taking diabetes medicine. Alcohol can cause some very serious side effects. **Talk to your doctor about alcohol use.**

• If you miss a dose of your medicine, take the missed dose as soon as possible. Skip the missed dose if it is almost time for the next dose. Do not take two doses at the same time.

• Always read the label before taking any medicine. Check the date on the bottle and throw out those medicines that have expired.

• Keep your medicines tightly capped in their original bottles. Never put different medicines in one bottle to store for a long time.

• Store your medicines away from heat and direct sunlight. Do not put medicines in a bathroom cabinet because heat and moisture from showers may cause them to change.

• When you travel, keep your medicines with you. Do not check them with your luggage. If your luggage is lost or delayed, you will have your medicines with you.

**Precautions**

• Some medicines used for diabetes can cause low blood sugar, especially if you miss a meal, exercise for a long time, or drink alcohol. You need to know the symptoms of low blood sugar and how to treat it right away.

• Keep a record of your blood sugar results and take them to each doctor’s appointment.

• Ask your doctor or pharmacist about side effects that should be reported.

• Do not share your prescription medicine with others. This can be very dangerous, and it is against the law. The medicine is for your medical problem, and may not be the right treatment for another person.

• Keep a list of all of the medicines you are taking in your wallet. Your doctor will want to see this list whenever you have an appointment.

• Before you have tests, surgery, or emergency treatment, tell your doctor or dentist about all of the medicines you are taking.

  › **Follow your healthcare provider’s instructions for how to adjust your diabetes medicines before tests or surgery.**

• If you take more than is prescribed, call your doctor, pharmacist, or Poison Control Centers’ Poison Help Line at 1-800-222-1222 right away. The Poison Help Line offers free, confidential medical advice 24 hours a day, seven days a week.
Oral Diabetes Medicines

Many people with type 2 diabetes take oral diabetes medicines. These are pills that are used along with meal planning and exercise to control blood sugar. The pills are not insulin and cannot be used to treat type 1 diabetes. There are several groups of oral medicines for treating diabetes.

**Biguanides**
This medicine helps your cells be more sensitive to insulin, so your body is able to use your own insulin better to lower your blood sugar.

- **Metformin**, also known by the brand name **Glucophage** (most often taken two times each day) and **Glucophage XR** (most often taken one time each day)

Metformin also keeps your liver from releasing too much glucose into your system. The medicine is taken every day whether you eat or not. Weight gain or loss is not expected as a direct effect of this medicine. People taking metformin may have diarrhea, nausea, vomiting, or gas as their body adjusts to these medicines, but these effects often go away within the first week of treatment. Your doctor will order blood tests to check your kidney function. People with kidney problems may need a lower dose.

**Sodium Glucose Cotransport 2 (SGLT-2) Inhibitors**
These medicines help your body get rid of more glucose during urination.
The medicines in this group include:

- **Canagliflozin**, also known by the brand name **Invokana**
- **Dapagliflozin**, also known by the brand name **Farxiga**
- **Empagliflozin**, also known by the brand name **Jardiance**
- **Ertugliflozin**, also known by the brand name **Steglatro**

All of these medicines should be taken one time each day by mouth with or without food. They have also been linked with some weight loss and improvement in blood pressure. The major side effect seen with this is an increase in yeast infections. As a result, these medicines are not recommended in patients with a history of frequent yeast infections. The SGLT2 inhibitors may slightly increase your bad cholesterol, called LDL, but have been proven safe in heart studies. **Empagliflozin (Jardiance)** also reduces the risk of cardiovascular death in patients with type 2 diabetes and cardiovascular disease.
Dipeptidyl Peptidase-4 (DPP-4) Inhibitors

These medicines increase insulin release from the pancreas and decrease glucagon production in the liver.

The medicines in this group include:
- **Saxagliptin**, also known by the brand name Onglyza
- **Linagliptin**, also known by the brand name Tradjenta
- **Alogliptin**, also known by the brand name Nesina

These medicines lower blood sugar, especially after meals. These medicines work only when blood sugar is high, not when blood sugar is low, meaning it is less likely to cause low blood sugar. Your doctor will order blood tests to check your kidney function if you take Januvia, Onglyza, or Nesina, but not Tradjenta. People with kidney problems will need blood tests and a lower dose. All of these medicines should be taken one time each day by mouth with or without food. These medicines are often well tolerated, but some people have reported headaches or upper respiratory infections. Weight gain or loss is not expected as a direct effect of this medicine.

TZD decreases the release of glucose from your liver and increase insulin action in your muscles. Blood tests will be done to check liver enzymes before starting these medicines and at regular times after you start the medicine. Most often, these medicines are taken one time each day at breakfast. Although very effective, some serious side effects have been linked to these medicines. People taking Avandia or Actos may have weight gain, fluid retention, headaches, and be at an increased risk of heart failure and broken bones (most often in the upper arm, hand, or foot). Avandia may increase LDL (bad) cholesterol.

Sulfonylureas (SU)

These medicines lower blood sugar mainly by causing the pancreas to produce more insulin. The pills in this group are taken 1 or 2 times each day, often before breakfast and dinner.

Some of the most often used drugs in this group include:
- **Glipizide**, also known by the brand names Glucotrol, Glucotrol XL, and Glucotrol XR
- **Glyburide**, also known by the brand names of Micronase, Glynase, or DiaBeta
- **Glimeperide**, also known by the brand name Amaryl

These medicines lower blood sugar, also called hypoglycemia, can be a side effect of these medicines. Eat within 30 minutes of taking medicines in this group to reduce the chance of low blood sugar. If you take the medicine and skip meals or drink alcohol, you may have more problems with low blood sugar. Some signs of low blood sugar are feeling weak or shaky, confused, or hungry. These medicines also may cause some weight gain, so healthy eating habits are important. People with sulfa allergies may not be able to use this group of medicines.

Thiazolidinediones (TZD)

These medicines improve your cells' response to your own insulin.

The medicines in this group include:
- **Pioglitazone**, also known by the brand name Actos
- **Rosiglitazone**, also known by the brand name Avandia

Low blood sugar, also called hypoglycemia, can be a side effect of these medicines. Eat within 30 minutes of taking medicines in this group to reduce the chance of low blood sugar. If you take the medicine and skip meals or drink alcohol, you may have more problems with low blood sugar. Some signs of low blood sugar are feeling weak or shaky, confused, or hungry. These medicines also may cause some weight gain, so healthy eating habits are important. People with sulfa allergies may not be able to use this group of medicines.
Meglitinides
These medicines cause your pancreas to produce insulin faster.
The medicines in this group include:

• **Repaglinide**, also known by the brand name **Prandin**
• **Nateglinide**, also known by the brand name **Starlix**

These are taken up to 30 minutes before each meal. It keeps blood sugar levels from rising so high after you eat. If you need to skip a meal for any reason, do not take the **Starlix or Prandin**. Low blood sugar could occur if you take either without eating.

People taking either of these medicines may have bloating, abdominal cramps, diarrhea, or gas. Weight gain may occur with these medicines.

Alpha-Glucosidase Inhibitors
These medicines slow the breakdown of starchy foods, so your blood sugar does not rise as quickly after you eat.
The medicines in this group include:

• **Acarbose**, also known by the brand name **Precose**
• **Miglitol**, also known by the brand name **Glyset**

These medicines are taken with the first bite of each meal up to three times each day. People taking **acarbose or miglitol** may have diarrhea, stomach bloating, or gas as their body adjusts to these medicines. Weight gain or weight loss is not expected as a direct effect of these medicines. If low blood sugar occurs while taking these medicines, a simple sugar, such as glucose tablets, is needed to treat it. Complex sugars will not be able to help.

Bile Acid Sequestrant
These medicines reduce cholesterol levels. Only one medicine in this group is used for diabetes:

• **Colesevelam**, also known by the brand name **Welchol**

It may help patients with diabetes by reducing insulin resistance and glucagon production in the liver. It may also reduce the absorption of glucose in the intestines. This medicine requires you to take 6 tablets one time each day or 3 tablets with breakfast and dinner. Patients taking **Welchol** may have nausea, bloating, constipation, or indigestion. Although it may improve your cholesterol levels, it can increase your triglyceride levels.

Combination Medicines
With these medicines, you have the benefit of only taking one pill to get the effects of two medicines. Refer to the individual medicine information to learn more.

Combination medicines include the following groups of medicines:

• **Metformin** plus SGLT-2 inhibitor:
  - **Cangliflozin/Metformin**, brand name **Invokamet**
  - **Dapagliflozin/Metformin**, brand name **Xiduo XR**
  - **Empagliflozin/Metformin**, brand name **Synjardy**
  - **Ertugliflozin/Metformin**, brand name **Segluromet**

• **Metformin** plus DPP-IV inhibitors
  - **Linagliptin/Metformin**, brand name **Jentadueto**
  - **Sitagliptin/Metformin**, brand name **Janumet**
  - **Saxagliptin/Metformin**, brand name **Kombiglyze**
  - **Alogliptin/Metformin**, brand name **Kazano**
• **Metformin** plus TZD
  ․ Pioglitazone/Metformin, brand name Actoplus Met
  ․ Rosiglitazone/Metformin, brand name Avandamet

• **Metformin** plus SU
  ․ Glipizide/Metformin, brand name Metaglip
  ․ Glyburide/Metformin, brand name Glucovance

• **Metformin** plus Meglitinide
  ․ Repaglinide/Metformin, brand name PrandiMet

• **DPP-IV inhibitor** plus SGLT2 inhibitor
  ․ Empagliflozin/Linagliptin, brand name Glyxambi
  ․ Dapagliflozin/Saxagliptin, brand name Qtern
  ․ Ertugliflozin/Sitagliptin, brand name Steglujan

• **DPP-IV inhibitor** plus TZD
  ․ Alogliptin/Pioglitazone, brand name Oseni

• **TZD** plus SU
  ․ Pioglitazone/Glimepiride, brand name Duetact
  ․ Rosiglitazone/Glimepiride, brand name Avanaryl

Talk with your doctor about which medicine or medicines are best for you to take to help control your diabetes.

Tell your doctor and pharmacist if you are taking any other medicines before starting any diabetes pills. This includes prescription and over the counter medicines and any vitamin or herbal supplements you may be taking.
Injectable Diabetes Medicines (Non-Insulin)

Besides insulin, there are two medicines given by shot or injection to treat diabetes. Each of these medicines is a man-made form of hormones that is also made in your body. If you are to take any of these medicines, you will be taught how to do the injections.

Glucagon-Like Peptide 1 (GLP-1) Receptor Agonists

These medicines are used for patients with type 2 diabetes and may be used by themselves or with other medicines for diabetes.

The medicines in this group include:

- **Exenatide**, also known by the brand name **Byetta** (2 times each day) or **Bydureon** (1 time each week)
- **Liraglutide**, also known by the brand name **Victoza** (1 time each day)
- **Lixisenatide**, also known by the brand name **Adlyxin** (1 time each day)
- **Dulaglutide**, also known by the brand name **Trulicity** (1 time each week)
- **Semaglutide**, also known by the brand name **Ozempic** (1 time each week)

These medicines are used to help:

- Increase insulin secretion
- Decrease glucagon production from the liver
- Slow how quickly your stomach empties
- Trigger the sense of fullness

These medicines may cause some weight loss. The most common side effects are nausea, diarrhea, and upset stomach.

These side effects often get better after the first few days. **Liraglutide (Victoza)** reduces the risk of cardiovascular events in adults with type 2 diabetes and cardiovascular disease.

Amylinomimetic

The medicine in this group is used for patients with type 1 or type 2 diabetes who are on insulin but have not achieved their desired goals.

The medicine in this group includes:

- **Pramlintide**, also known by the brand name **Symlin**

This medicine is used to help:

- Trigger the sense of fullness
- Lower the amount of glucagon secreted
- Slow down how quickly food leaves the stomach

This medicine may cause some weight loss. The most common side effects are nausea, vomiting, headaches, dizziness, and lack or loss of appetite. The use of **Symlin** can also greatly increase risk of low blood sugar, so the dose of insulin is often reduced when starting this medicine.
Insulin

Insulin is a hormone made by the pancreas. The pancreas is a small organ that lies behind and below the stomach. Insulin allows the glucose from food you eat to go into the body’s cells for energy. A person cannot live without insulin.

Your doctor may prescribe insulin to treat your diabetes because your body:

• Does not make insulin (type 1 diabetes).
• Does not make enough insulin (type 2 diabetes).
• Is not able to use the insulin it makes (type 2 diabetes).

Insulin is most often taken as a shot using an injector pen, syringe, V-Go device, or insulin pump. There is a new inhaled form of insulin available as well.

Taking insulin for diabetes

• In the United States, insulin is human insulin. It is made from harmless bacteria through DNA engineering.
• Some people with diabetes only need to take insulin for a short time. It may be needed due to stress, pregnancy, illness, infection, surgery, or when taking certain medicines, such as steroids.
• With type 2 diabetes, you may or may not need insulin to control your blood sugar. This is because your body still makes some insulin. You may or may not take oral medicine to work with the insulin.
• With type 1 diabetes, you will need insulin for the rest of your life. This is because your body does not make any insulin. You will probably need two or more shots of insulin each day. Your doctor will decide how many shots and how much insulin you will need to take.

Supplies

You will need these supplies to take your insulin. Keep at least a week’s supply on hand at all times.

Injector pen:

• Insulin pen or cartridges
• Pen needles
• Alcohol swabs

NEVER reuse pen needles and NEVER leave pen needles attached to the pen. This can result in an increased risk of infection and irritation at the site of injection.
Syringe:
• Insulin vial
• Syringes with needles
• Alcohol swabs

V-Go insulin delivery device:
• Insulin vial
• V-Go device
• V-Go insulin loading device
• Alcohol swabs

This device provides a small, continuous dose of insulin throughout the day with the ability to give added insulin at mealtimes. It is not an insulin pump, but acts in a similar way.

Insulin pump:
Supplies needed to keep on hand for an insulin pump will be discussed with you.

Things to know about your insulin
1. Your doctor will choose the kind and amount of insulin you need. Check the label(s) on your insulin bottle(s) to be sure you have the right kind.

2. Learn the following information about your insulin:
   • Name: such as **NPH**, **Regular**, **70/30**, **75/25**, **Humalog**, **Lantus**, or **Novolog**
   • Strength: U-100 (most common), U-200, U-300, and U-500
   • Brand: such as Novo-Nordisk, Eli-Lilly, or Sanofi
   • Expiration date: do not use expired insulin

Do not change the name, strength, or brand of your insulin. Only your doctor should make these changes.

3. Travel:
   • When traveling, keep your insulin and supplies with you in case your luggage gets lost.
   • NEVER leave your supplies in a vehicle. You want to avoid temperature extremes.
   • Insulin needs to be refrigerated. All unopened bottles should always be stored in the refrigerator. Avoid exposing your insulin to extreme temperatures and direct sunlight.

4. After opened, insulin can be kept at room temperature safely for:
   • 14 days for **NPH**
   • 28 days for **Regular**, **Humalog**, **Novolog**, **Apidra**, **Basaglar**, **Fiasp**, **Levemir**, and **Lantus**
   • 10 days for mixed insulin, such as **75/25**, **50/50**, and **70/30**
   • 42 days for **Toujeo**
   • 56 days for **Tresiba**
5. There are four types of injectable insulin:

- **Rapid acting (meal time):** Apidra, Fiasp, Humalog, and Novolog
- **Short acting:** Regular (Humulin R, Novolin R)
- **Intermediate acting:** NPH (Humulin N, Novolin N)
- **Long acting (basal):** Basaglar, Lantus, Levemir, Toujeo, and Tresiba
  - Long acting insulin cannot be mixed in a syringe with other insulins

**Insulin is also available in premixed combinations:**

- Premixed:
  - Novolin 70/30 or Humulin 70/30 = 70% NPH and 30% Regular
  - Humalog Mix 75/25 = 75% NPH and 25% Humalog
  - Humalog Mix 50/50 = 50% NPH and 25% Humalog
  - Novolog Mix 70/30 = 70% NPH and 30% Novolog
  - Ryzodeg 70/30 = 70% Tresiba and 30% Novolog

<table>
<thead>
<tr>
<th>Type</th>
<th>Concentration</th>
<th>Starts</th>
<th>Works hardest / peaks</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rapid acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apidra (Glulisine)</td>
<td>U-100</td>
<td>12 to 30 minutes</td>
<td>1.6 to 2.8 hours</td>
<td>3 to 4 hours</td>
</tr>
<tr>
<td>Fiasp (Aspart)</td>
<td>U-100</td>
<td>12 to 30 minutes</td>
<td>1.5 to 2.2 hours</td>
<td>5 to 7 hours</td>
</tr>
<tr>
<td>Humalog (Lispro)</td>
<td>U-100, U-200</td>
<td>15 to 30 minutes</td>
<td>0.5 to 2.5 hours</td>
<td>Less than 5 hours</td>
</tr>
<tr>
<td>Novolog (Aspart)</td>
<td>U-100</td>
<td>12 to 18 minutes</td>
<td>1 to 3 hours</td>
<td>3 to 5 hours</td>
</tr>
<tr>
<td><strong>Short acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>U-100</td>
<td>30 minutes</td>
<td>2.5 to 5 hours</td>
<td>4 to 12 hours</td>
</tr>
<tr>
<td></td>
<td>U-500</td>
<td>30 minutes</td>
<td>2.5 to 5 hours</td>
<td>Up to 24 hours</td>
</tr>
<tr>
<td><strong>Intermediate acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humulin/Novolin NPH</td>
<td>U-100</td>
<td>1 to 2 hours</td>
<td>4 to 12 hours</td>
<td>14 to 24 hours</td>
</tr>
<tr>
<td><strong>Long acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basaglar (Glargine)</td>
<td>U-100</td>
<td>6 hours</td>
<td>Nearly peakless</td>
<td>About 24 hours</td>
</tr>
<tr>
<td>Lantus (Glargine)</td>
<td>U-100</td>
<td>3 to 4 hours</td>
<td>Nearly peakless</td>
<td>About 24 hours</td>
</tr>
<tr>
<td>Levemir (Detemir)</td>
<td>U-100</td>
<td>3 to 4 hours</td>
<td>Nearly peakless</td>
<td>About 24 hours</td>
</tr>
<tr>
<td>Toujeo (Glargine)</td>
<td>U-300</td>
<td>6 hours</td>
<td>Peakless</td>
<td>Greater than 24 hours</td>
</tr>
<tr>
<td>Tresiba (Degludec)</td>
<td>U-100, U-200</td>
<td>1 hour</td>
<td>Peakless</td>
<td>Greater than 24 hours</td>
</tr>
<tr>
<td><strong>Premixed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humulin/Novolin 70/30</td>
<td>U-100</td>
<td>30 minutes</td>
<td>2 to 12 hours</td>
<td>18 to 24 hours</td>
</tr>
<tr>
<td>Humalog 50/50</td>
<td>U-100</td>
<td>15 to 30 minutes</td>
<td>0.8 to 4.8 hours</td>
<td>14 to 24 hours</td>
</tr>
<tr>
<td>Humalog 75/25</td>
<td>U-100</td>
<td>15 to 30 minutes</td>
<td>1 to 6.5 hours</td>
<td>14 to 24 hours</td>
</tr>
<tr>
<td>Novolog 70/30</td>
<td>U-100</td>
<td>10 to 20 minutes</td>
<td>1 to 4 hours</td>
<td>18 to 24 hours</td>
</tr>
<tr>
<td>Ryzodeg 70/30</td>
<td>U-100</td>
<td>14 minutes</td>
<td>72 minutes</td>
<td>Greater than 24 hours</td>
</tr>
</tbody>
</table>
One form of insulin is available for inhalation:

- **Afrezza** is a powder insulin that is inhaled. It is used as a meal-time insulin. The cartridges contain 4, 8 or 12 units. You may need more than 1 inhalation, based on your dose.

**Combination Insulin/Glucagon-Like Peptide 1 (GLP-1) Receptor Agonists**

The medicines in this group combine a long-acting (basal) insulin with a GLP-1 receptor agonist. You receive the benefits of both medicines with a single injection. The doses for each drug in this medicine are fixed, so it does not work for all people. The medicine is given one time each day. The medicines in this group include:

- Insulin Glargine/Lixisenatide, brand name Soliqua
- Insulin Degludec/Liraglutide, brand name Xultophy

**Take your insulin at the same time(s) each day**

- Do not vary the time of your injection by more than one hour.
- If you are taking short acting insulin, such as Regular, take your insulin 30 to 45 minutes before eating.
- If you take rapid acting insulin, such as Humalog or Novolog, take your insulin within 5 to 10 minutes of eating.
- Apidra and Fiasp may be taken up to 20 minutes after eating.
- Timing does NOT matter with Tresiba, but this is the only exception.

**Talk with your nurse or doctor if you have any of these problems**

Most people have no trouble giving their insulin injections. Talk with your nurse or doctor if you notice:

- Bruising
- Dimpled areas
- Redness
- Hard, lumpy areas
- Itching
How to Take Your Insulin

Getting ready

1. Select an area of the body for your shot.
   Give your insulin in the same area for 7 to 10 days before changing to a new place. Insulin is absorbed differently throughout your body. Fastest absorption is in your abdomen followed by arms, thighs, and buttocks.

2. Gather your supplies:
   - Insulin either by vial, pen, or cartridge.
   - Syringe or pen needle.
   - Alcohol pad.
   - Sharps disposal container

3. Wash your hands well with soap and water.

Drawing up one insulin

Follow these steps if you need to fill a syringe with insulin.

1. Check the label on the insulin bottle to make sure you are using the correct insulin.

2. Check the expiration date on your insulin bottle. Do not use expired insulin.

3. Gently roll the bottle of insulin between your hands until it is mixed. Do not shake the insulin bottle because this can cause air bubbles.

4. Wipe off the top of the insulin bottle with an alcohol pad, and then do not touch the top of the bottle.
5. Take the syringe out of its package or remove the plastic cap.

6. Take off the needle cap and place it on the table.

7. Pull the plunger of the syringe down to the number of units of insulin you need. The syringe will fill with air. The syringe has small lines and numbers. The space between each line on the syringe is one unit. If you are using a 100-unit syringe, the space between each line is 2 units. Move the plunger, so the dark end closest to the needle matches the number of units you need.

8. Carefully put the needle through the rubber stopper of the insulin bottle. Push the air into the bottle by pushing the plunger all the way down. Putting air in the bottle makes it easier to get the insulin out of the bottle.
9. Turn the insulin bottle upside down with the syringe still in place. Support the needle in the bottle, so it does not bend. Pull the plunger down to the number of units of insulin you need.

10. Check for air bubbles in the syringe. Air bubbles will not hurt you, but will take the place of insulin. This could cause you to get less insulin than you need because there is no insulin in the air bubble. If you see air bubbles:
   - Tap the syringe firmly with your fingertip to move the bubbles to the top of the syringe.
   - Push the plunger up a few units until the air bubbles go back into the insulin bottle.
   - Pull down on the plunger and fill the syringe with the correct amount of insulin.
   - Check again for air bubbles.

11. Take the needle out of the insulin bottle and set the syringe down. Follow the steps for Giving insulin with a syringe.

**Giving insulin with a syringe**

Follow these steps to give yourself insulin with a syringe.

1. Clean the area with an alcohol pad using a circular motion. Let the alcohol air dry. If you have just showered or bathed, you do not need to clean the area again.
2. Pinch up and hold the skin of the area with one hand if you are using a 12 mm needle. If you are using the shorter 8 mm syringe needle, you do not need to pinch the skin unless you are very lean.

3. Put the needle straight into the skin at a 90-degree angle in a quick motion. Push the needle all of the way into the skin.

4. Using your index finger, push the plunger all the way down to inject the insulin. Hold the needle in place for a count of 10 before removing.

5. Pull out the needle.

6. Check the area for any redness, bleeding, or bruising.

7. Throw the needle and syringe into a sharps disposal container.

**Giving insulin with an insulin pen**

Follow these steps to give yourself insulin with an insulin pen.

1. Clean the area with an alcohol pad using a circular motion. Let the alcohol air dry. If you have just showered or bathed, you do not need to clean the area again.

2. Remove the cover from the pen. You will be able to see the insulin in the pen.

3. If you are using a cloudy insulin (NPH, 75/25, or 70/30), gently roll the pen between your hands or turn it up and down to mix the insulin.
4. Clean the end of the pen with alcohol where the needle twists on.

5. Attach a new needle by peeling back the paper cover and screwing it onto the pen. It should be snug but not too tight.

6. Clear the air out of the pen or prime the pen.
   - Remove the outer cover from the needle. Also remove the needle cover, so you can see the needle. Ask your pharmacist, nurse, or diabetes educator if you have questions, and check the manufacturer's instructions for more information.
   - Turn the knob dose dial to 2 units. Holding the pen so the needle is up in the air, push the dial knob in. Watch the tip of the needle for a drop of insulin. You may need to repeat the dialing to 2 units and push a few times until you see the drop on the needle. Dial in your insulin dose by turning the knob clockwise until you see the right number for your dose.

7. Put the needle straight into the skin at a 90-degree angle in a quick motion. Push the needle all of the way into the skin.

8. Using your thumb, push the knob down slowly to inject the insulin. Hold the needle in place for a count of 10 before removing. Check that the pen is back to zero. Pull out the needle.

9. Check the area for any redness, bleeding, or bruising.

10. Remove the needle from the pen. Throw it into your needle disposal container.

11. Put the cover back on your insulin pen.
Carbohydrate Counting

Carbohydrate counting, also called carb counting, is a meal planning tool for people with type 1 or type 2 diabetes. Carb counting involves using food labels and estimating portion sizes of foods to keep track of the amount of carbohydrates you eat each day.

Carbohydrates are one of the main nutrients found in food and drinks. Protein and fat are the other main nutrients. **Carbohydrates include starches, sugars, and fiber.** Carb counting can help to control your blood sugar levels because carbohydrates affect your blood sugar more than other nutrients.

The amount of carbohydrate you need in your diet

The amount of carbohydrate you need is based on your height, weight, activity level, and blood sugar control. Most people do well in the following ranges:

- **Women need 30 to 45 grams per meal** (2 or 3 servings of carbohydrate per meal).
- **Men need 45 to 60 grams per meal** (3 or 4 servings of carbohydrate per meal).
- Snacks may be needed to satisfy hunger and carbohydrate needs. Your dietitian can provide you with recommendations for your needs.

**15 grams of carbohydrate = 1 carb choice or serving.**

How to count carbohydrates

When reading food labels, use these 4 tips to help you count carbohydrates:

1. **Check the serving size.** All nutritional information on the label is based on one serving. Be sure to look at the common measure, such as cups or tablespoons. The grams (g) listed here are the weight of the serving.

   The serving size for this product is ⅔ cup.

2. **Look for total carbohydrates in grams.** This includes the fiber, sugars, and other carbohydrates in the food. Use this number when counting carbohydrates. **Do not look at sugars alone. You need to consider total carbohydrates in a product.**

   There are 37 grams of carbohydrate in this product per serving. If you ate 2 servings of this food, you would be getting 74 grams of carbohydrate.
3. **Understand the sugar alcohol rule.** Sugar alcohols, like fiber, are another form of carbohydrate on product labels. Sugar alcohol is not an alcoholic drink. It refers to a specific group of sugars that come from plants and have names, such as xylitol, mannitol, or sorbitol. They are in food and drinks because they have fewer calories, and do not cause spikes in blood sugar.

The sugar alcohol rule: if eating a food with sugar alcohols, you can subtract half of the total grams of sugar alcohols listed (regardless of the total grams of sugar alcohol) from the total grams of carbohydrates.

This product has no sugar alcohols in it.

4. **Compare labels.** Start by comparing the serving sizes of products you eat, and then compare the grams of total carbohydrate. Look at the fiber and sugar content. For some products, like cookies or candy, you will find that sugar-free does not mean carbohydrate-free.

### Carbohydrate serving sizes

If you have a food exchange book or list, you can use it to look up carbohydrate grams for foods. Otherwise, read the product's food label. If no food label is available, use the estimates on the next pages to calculate the carbohydrate grams for a food. Be aware that carbohydrate amounts can vary greatly between different types of the same food. For example, some breads are 15 grams a slice while others are closer to 25 grams.

**Starch Group – 1 serving equals 15 grams of carbohydrate or 1 carb choice**

Choose whole grains over refined grains.

1 serving =

- 1 (1 ounce) slice of bread
- 1 (1 ounce) small roll
- ¼ (1 ounce) bagel
- ½ hamburger bun or English muffin
- 1, 6-inch tortilla
- ½ cup cooked rice, pasta, barley, or couscous
- ½ cup cooked bulgur wheat, lentils, or legumes (dried beans or peas)
- ½ cup corn, sweet potato, or green peas
- 3 ounce baked sweet or white potato
- ½ cup cooked cereal
- ¾ cup unsweetened dry cereal
- ¾ ounce pretzels
- 3 cups hot air popped or microwave popcorn with no more than 3 grams of fat per serving

**Fruit Group – 1 serving equals 15 grams of carbohydrate or 1 carb choice**

1 serving =

- 1 small apple, orange, or nectarine
- 1 medium peach
• ½ banana, grapefruit, or mango
• 1 kiwi
• 1 cup fresh berries
• 1 cup fresh melon cubes
• ½ cup fruit juice
• 2 tablespoons (Tbsp) dried fruit

Milk Group – 1 serving equals 15 grams of carbohydrate or 1 carb choice
1 serving =
• 1 cup (8 ounces) fat-free or low-fat milk
• 1 cup (8 ounces) plain yogurt
• 6 ounces light yogurt

Sweets
Limit the amount of sweets you eat. They are high in carbohydrates and often high in calories and fat. This includes limiting the amount of cake, ice cream, pie, syrup, cookies, candies, and doughnuts you eat. Do not add table sugar, honey, or other sweeteners to your foods or beverages. Limiting sweets will help to keep your blood sugar under control.

Fiber
A high fiber diet can help you control your blood sugar. Choose whole grains that are high in fiber as well as fruits, vegetables, beans, and lentils. Talk with your dietitian about how to increase fiber in your diet.

Foods that have little effect on blood sugar
Non-Starchy Vegetable Group - 1 serving equals 5 grams of carbohydrate
Examples include:

• Artichoke
• Asparagus
• Bean sprouts
• Beets
• Bok choy
• Broccoli
• Brussels sprouts
• Cabbage
• Carrots
• Cauliflower
• Celery
• Cucumber
• Green or yellow beans
• Salad greens
• Mushrooms
• Onions
• Peppers
• Radish
• Snow peas
• Sugar snap peas
• Tomatoes
• Turnips
• Yellow squash
• Zucchini

You may eat an unlimited amount of foods from this group unless your doctor has instructed you to limit potassium in your diet. Talk with a dietitian for specific diet instructions.
1 serving =
• 1 cup raw vegetables or salad greens
• ½ cup cooked vegetables
• ½ cup vegetable juice
Meat and Meat Substitutes Group
Avoid meats that are high in saturated fat, such as bacon and sausage.

1 serving =
- 1 egg, 2 egg whites, or ¼ cup egg substitute
- 1 ounce turkey breast or chicken breast, skin removed
- 1 ounce fish fillet
- 1 ounce canned tuna in water
- 1 ounce shellfish
- 1 ounce lean beef, lamb, or pork (limit to 1 to 2 times per week)
- 1 ounce of cheese (limit cheese to 1 to 2 ounces per day)
- ¼ cup nonfat or low-fat cottage cheese
- 1 ounce lean lunch meat (with 3 grams or less of fat per ounce)
- ½ cup cooked beans (black beans, kidney, chickpeas or lentils): count as 1 serving of starch and 1 serving of meat
- 4 ounces tofu
- 2 tablespoons peanut butter
- 2 tablespoons seeds
- 1 ounce nuts

Fats
Limit the amount of fats you eat. Fats have a lot of calories and some contain saturated fats, trans fats, and cholesterol that increase your risk for heart disease.

1 serving (5 grams of fat) =
- 1 teaspoon oil (vegetable, corn, canola, olive, etc.)
- 1 teaspoon butter or margarine
- 1 teaspoon mayonnaise
- 1 tablespoon salad dressing
- 1 tablespoon cream cheese
- 2 tablespoons avocado
- 8 to 10 large olives
- 1 slice bacon
## Sample menu for 45 grams of carbohydrates per meal

### Breakfast

<table>
<thead>
<tr>
<th>Item</th>
<th>Alternative</th>
<th>Carbohydrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 whole wheat waffle</td>
<td>1 slice of toast</td>
<td>15 grams</td>
</tr>
<tr>
<td>1 cup low-fat milk</td>
<td>1 tablespoon jelly</td>
<td>15 grams</td>
</tr>
<tr>
<td>½ large banana</td>
<td>1 small orange</td>
<td>15 grams</td>
</tr>
<tr>
<td>2 tablespoons natural peanut butter</td>
<td>1 hard boiled egg</td>
<td>0</td>
</tr>
</tbody>
</table>

### Lunch

<table>
<thead>
<tr>
<th>Item</th>
<th>Alternative</th>
<th>Carbohydrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 ounces tuna fish</td>
<td>2 tablespoon natural peanut butter</td>
<td>0</td>
</tr>
<tr>
<td>½ bagel (2 ounces)</td>
<td>2 slices of bread</td>
<td>30 grams</td>
</tr>
<tr>
<td>1 tablespoon light mayonnaise</td>
<td>2 tablespoons hummus</td>
<td>0</td>
</tr>
<tr>
<td>½ cup cooked broccoli</td>
<td>1 cup celery sticks</td>
<td>0</td>
</tr>
<tr>
<td>½ cup fruit cocktail</td>
<td>3/4 cup blueberries</td>
<td>15 grams</td>
</tr>
</tbody>
</table>

### Snack

<table>
<thead>
<tr>
<th>Item</th>
<th>Alternative</th>
<th>Carbohydrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>½ cup vegetable juice</td>
<td>1 cup raw carrots</td>
<td>0</td>
</tr>
<tr>
<td>2 tablespoons sunflower seeds</td>
<td>1 tablespoon salad dressing</td>
<td>0</td>
</tr>
</tbody>
</table>

### Dinner

<table>
<thead>
<tr>
<th>Item</th>
<th>Alternative</th>
<th>Carbohydrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 medium baked potato (6 ounces)</td>
<td>2 small dinner rolls</td>
<td>30 grams</td>
</tr>
<tr>
<td>3 ounces grilled chicken</td>
<td>3 ounces steak</td>
<td>0</td>
</tr>
<tr>
<td>1 tablespoon fat-free sour cream</td>
<td>1 tablespoon salad dressing</td>
<td>0</td>
</tr>
<tr>
<td>1 cup California mixed vegetables (broccoli and carrots)</td>
<td>1 cup salad</td>
<td>0</td>
</tr>
<tr>
<td>1 cup strawberries</td>
<td>1 cup low-fat milk</td>
<td>15 grams</td>
</tr>
</tbody>
</table>

### Snack

<table>
<thead>
<tr>
<th>Item</th>
<th>Alternative</th>
<th>Carbohydrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar-free gelatin</td>
<td>Sugar-free popsicle</td>
<td>0</td>
</tr>
</tbody>
</table>

**Total grams of carbohydrate for day** = **135 grams**
### Sample menu for 60 grams of carbohydrates per meal

#### Breakfast

<table>
<thead>
<tr>
<th>Item</th>
<th>Equivalent</th>
<th>Carbohydrates (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 English muffin or 1 cup unsweetened cooked cereal, such as oatmeal</td>
<td>=</td>
<td>30 grams</td>
</tr>
<tr>
<td>1 teaspoon margarine or 4 English walnut halves</td>
<td>=</td>
<td>0</td>
</tr>
<tr>
<td>1 cup artificially sweetened yogurt or 1 cup fat-free milk</td>
<td>=</td>
<td>15 grams</td>
</tr>
<tr>
<td>1 cup strawberries or 1 small apple</td>
<td>=</td>
<td>15 grams</td>
</tr>
<tr>
<td>1 hard boiled egg or 1 ounce turkey sausage</td>
<td>=</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Lunch

<table>
<thead>
<tr>
<th>Item</th>
<th>Equivalent</th>
<th>Carbohydrates (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 ounce low-sodium turkey lunch meat or 3 ounce lean ground beef or other meat</td>
<td>=</td>
<td>0</td>
</tr>
<tr>
<td>2 slices of bread or 2/3 cup rice</td>
<td>=</td>
<td>30 grams</td>
</tr>
<tr>
<td>1 cup low-fat milk or ½ cup black beans</td>
<td>=</td>
<td>15 grams</td>
</tr>
<tr>
<td>1 cup salad greens or Cooked peppers, onions, tomatoes (no limit)</td>
<td>=</td>
<td>0</td>
</tr>
<tr>
<td>1 tablespoon salad dressing or 1 tablespoon fat-free sour cream</td>
<td>=</td>
<td>0</td>
</tr>
<tr>
<td>1/2 banana or 1, 6-inch tortilla</td>
<td>=</td>
<td>15 grams</td>
</tr>
</tbody>
</table>

#### Snack

<table>
<thead>
<tr>
<th>Item</th>
<th>Equivalent</th>
<th>Carbohydrates (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 cup sliced cucumbers or 1 cup celery sticks</td>
<td>=</td>
<td>0</td>
</tr>
<tr>
<td>1 tablespoon salad dressing or 2 tablespoons natural peanut butter</td>
<td>=</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Dinner

<table>
<thead>
<tr>
<th>Item</th>
<th>Equivalent</th>
<th>Carbohydrates (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>½ cup mashed potatoes or 1, 6-inch tortilla</td>
<td>=</td>
<td>15 grams</td>
</tr>
<tr>
<td>3 ounces roasted, baked or broiled meat, fish, or chicken or 2 ounces lean ground beef or chicken</td>
<td>=</td>
<td>0</td>
</tr>
<tr>
<td>2 teaspoons margarine or 1 ounce jack cheese</td>
<td>=</td>
<td>0</td>
</tr>
<tr>
<td>Salad with non-starchy vegetables and 1 tablespoon salad dressing or ¼ cup salsa</td>
<td>=</td>
<td>0</td>
</tr>
<tr>
<td>1 slice bread or ½ cup refried beans</td>
<td>=</td>
<td>15 grams</td>
</tr>
<tr>
<td>½ cup corn or 1 cup vegetable soup</td>
<td>=</td>
<td>15 grams</td>
</tr>
<tr>
<td>½ cup unsweetened canned fruit or ½ small fresh mango</td>
<td>=</td>
<td>15 grams</td>
</tr>
</tbody>
</table>

#### Snack

<table>
<thead>
<tr>
<th>Item</th>
<th>Equivalent</th>
<th>Carbohydrates (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ounce cheese or Sugar-free popsicle</td>
<td>=</td>
<td>0</td>
</tr>
</tbody>
</table>

**Total grams of carbohydrate for day** = 180 grams
Healthy Meals for Blood Sugar Control

The **Plate Method** is a simple way to keep carbohydrates to a moderate amount to improve blood sugar control.

Calories come from carbohydrate, protein, or fat. Carbohydrates have the largest and quickest effect on blood sugar. High carbohydrate foods groups include:

- Whole grains and starchy vegetables
- Fruit
- Milk and yogurt

Sugar is a concentrated form of carbohydrate. Limit foods high in sugar in your diet.
Follow these 5 steps to eat meals with the Plate Method

1. Divide a 9-inch plate in half and fill half of the plate with non-starchy vegetables.

These include:

- Artichoke
- Asparagus
- Bean sprouts
- Beets
- Bok choy
- Broccoli
- Brussels sprouts
- Cabbage

Choose fresh or frozen vegetables that have no added salt, sugar, or fat in a variety of colors to get a variety of vitamins and minerals.

Non-starchy vegetables:

- Provide your body some carbohydrates, but much less than the high carbohydrate food groups.
- Help fill you up without having a large effect on your blood sugar.
- Provide the fiber, vitamins, and minerals your body needs to function well.

2. Divide the other half of the plate in half again.

- Fill one section with whole grains or starchy vegetables:

  Whole grain options include:
  - Barley
  - Brown rice
  - Bulgur
  - Oats, oatmeal
  - Polenta
  - Quinoa
  - Whole grain breads
  - Whole grain cereals
  - Whole wheat couscous
  - Whole wheat pasta
  - Wild rice

  Starchy vegetable options include:
  - Beans, such as black, great northern, kidney, navy, and pinto beans
  - Black-eyed peas
  - Corn
  - Lentils
  - Peas
  - Potatoes with skin
  - Sweet potatoes with skin

- Fill the other section with protein foods.

These include:

- Beef, round and loin cuts, fat trimmed
- Cheese
- Chicken, no skin
- Cottage cheese, low-fat
- Eggs
- Fish (eat fish at least 2 times per week)
- Pork, loin cuts, fat trimmed
- Turkey, no skin
3. Add a serving of fruit, milk, or yogurt to your meals or eat a serving for a snack.
   Aim for 2 to 4 servings of fruit and 2 to 3 servings of milk or yogurt each day.

   **1 serving of fruit includes:**
   - 1 cup fresh melon, raspberries, or strawberries
   - ¾ cup fresh pineapple, blueberries, or blackberries
   - ½ cup fresh grapes
   - 1 small fresh fruit, such as an apple the size of a baseball
   - ½ of a large piece of fresh fruit, such as ½ of a large banana or ½ of a large pear
   - ½ cup canned fruit in juice or light syrup
   - 2 tablespoons of dried fruit
   - 4 ounces of fruit juice with no sugar added

   **1 serving of milk or yogurt includes:**
   - 8 ounces fat free milk
   - 6 ounces light or plain yogurt
   - 6 ounces light or plain Greek yogurt

4. Keep added fats to small amounts.
   Fats improve the taste of many foods, help us feel full longer, and provide essential nutrients. All fats are high in calories, so keep portions small:
   - 1 to 2 teaspoons of oil, margarine, butter, or mayonnaise
   - 1 tablespoon of salad dressing
   - 1 to 2 tablespoons of avocado
   - ¼ cup of nuts or seeds

5. Drink mostly water with meals and snacks.
   Aim for at least 8, 8-ounce, glasses of water each day.
   Water:
   - Is calorie-free and has no carbohydrates.
   - Is essential for your body’s cells, tissues, and organs.
   Plain coffee and tea are also calorie-free and will not raise your blood sugar.

**General tips**
- Cook at home as much as possible, using low fat cooking methods, such as bake, broil, microwave, roast, steam, sauté, or grill. Restaurant foods and processed foods often have added sugar and more sodium.
- Choose fresh fruit or yogurt for dessert, or try a low carbohydrate dessert recipe.
- Eat breakfast daily and space meals about 4 to 5 hours apart. Eat snacks if meals are more than 4 to 5 hours apart. Do not skip meals.
- Read food labels and ingredient lists on packaged foods. Avoid foods that have trans fats and partially hydrogenated oils.
Healthy Snacks for Blood Sugar Control

Snacking can be a part of a healthy diet, ensuring your body gets the energy it needs every 3 to 5 hours. This helps to control appetite. It also helps to control blood sugars, which is important if you have diabetes. A snack, as opposed to a treat, is a “mini meal” meant to provide nutrients your body needs. Snacks that combine carbohydrates with fiber and protein and that are low in sugar are better at controlling blood sugar and appetite. These snacks can be healthy choices for everyone regardless if they have blood sugar problems.

Snacks with about 15 grams of carbohydrate (1 carb serving)

- 3 (2.5 inch) graham crackers topped with 1 tablespoon natural peanut butter
- ½ cup tuna, chicken, or egg salad made with light mayonnaise in one half of a whole wheat pita
- One small apple or ½ large banana with a hard-boiled egg
- ½ cup cooked oatmeal with ¼ cup chopped nuts
- 5 to 6 whole wheat crackers with 1 ounce cheese
- 1 cup non-starchy vegetables (carrots, cucumber, sugar snap peas, bell pepper strips) and ½ cup hummus
- 2 tablespoons raisins and ¼ cup roasted unsalted almonds
- ½ cup low fat cottage cheese and ½ cup fruit, such as pineapple or peaches
- ¾ cup blueberries and ¼ cup walnuts
- Celery topped with 1 tablespoon natural peanut butter and 2 tablespoons raisins
- 1 slice whole wheat toast with one scrambled egg and ½ teaspoon butter
- ½ cup grapes and 1 ounce cheese
- ½ whole wheat toasted English muffin, topped with 1 tablespoon cashew butter
- 3 cups popcorn with less than 3 grams of fat per serving and 1 ounce cheese
Other 1 carb serving snacks

Here are some less healthy 1 carb serving snacks that can fit into a healthy eating plan when eaten in moderation:

- 1 frozen fruit bar
- 3 ginger snaps
- 5 vanilla wafers
- 2 small cookies
- 8 animal crackers
- 12 reduced fat Wheat Thins
- 15 mini twist pretzels
- 10 to 12 baked Tostitos tortilla chips
- 1 ounce (about 15) potato chips
- ½ cup sugar free pudding
- ½ cup frozen yogurt
- ½ cup ice cream

Snacks with 30 grams of carbohydrate (2 carb servings)

- One half a large banana and 1 tablespoon natural peanut butter placed and rolled in 6” whole wheat tortilla
- 1 ¼ cup whole strawberries dipped in ½ cup sugar free chocolate pudding
- 1 cup fat-free or 1% low-fat milk with ¾ cup unsweetened cereal (such as Cheerios or Bran Flakes)
- 1 cup homemade trail mix (2 tablespoons dried cranberries or raisins, ¼ cup almonds, and 1 cup puffed cereal, such as Rice Krispies or Kix)
- ½ cup fruit blended with 6 ounces plain or light yogurt and 2 tablespoons flaxseed meal
- Mini pizzas made from 1 split whole wheat English muffin, topped with tomato sauce and 1 ounce mozzarella cheese and then baked
- One, 6-inch whole wheat tortilla filled with ½ cup low-fat refried beans, 1 ounce cheese, and salsa, and heated in the microwave
- 1 to 2 rice cakes topped with 1 tablespoon natural peanut butter and 2 tablespoons dried fruit
- 1 cup cantaloupe cubed and 1 cup unsweetened or light vanilla soy milk
- ½ cup oatmeal with 2 tablespoons dried fruit and ¼ cup pistachios
Standard portions

When you are away from home and do not have measuring cups and spoons handy, it helps to know what a standard portion looks like. The table below gives examples of common serving sizes and everyday items they are equal to.

<table>
<thead>
<tr>
<th>Serving Size</th>
<th>Similar Sized Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 teaspoon</td>
<td>Small marble or tip of thumb</td>
</tr>
<tr>
<td>1 tablespoon</td>
<td>Large marble, poker chip, or thumb to first knuckle</td>
</tr>
<tr>
<td>2 tablespoons</td>
<td>2 large marbles, 1 ping pong ball, or whole thumb</td>
</tr>
<tr>
<td>¼ cup</td>
<td>Golf ball or cupped handful</td>
</tr>
<tr>
<td>½ cup</td>
<td>Tennis ball, hockey puck, deck of cards, bar of soap, checkbook, computer mouse, or palm of hand</td>
</tr>
<tr>
<td>1 cup</td>
<td>Wiffle ball, baseball, or a woman’s fist</td>
</tr>
<tr>
<td>1 ounce</td>
<td>4 dice or 2 dominoes</td>
</tr>
</tbody>
</table>
Alcohol and Diabetes

People with diabetes must be extra cautious as they consider whether to drink alcohol. Alcohol may have negative effects on your blood sugar and overall health. The American Diabetes Association suggests that you ask yourself these basic questions before drinking:

- Is my diabetes under control?
- Does my healthcare provider agree that I am free from health problems that alcohol could make worse?
- Do I know how alcohol can affect me and my diabetes?

If you answer “yes” to all three questions, it is okay to have a drink now and then. **You should not have more than two drinks a day if you are a man and one drink a day if you are a woman.**

Your body and alcohol

After you drink, alcohol goes from your stomach straight into your bloodstream. It then goes to your liver where it is slowly broken down. It takes about 2 hours for a 150 pound person to break down 1 drink. Two drinks would take twice as long. If you drink alcohol faster than your body breaks it down, the alcohol affects your brain and you may feel or act drunk. If you drink 3 or more drinks each day, you may develop liver disease and other health problems.

Effects of alcohol on blood sugar

Drinking alcohol can raise your blood sugar if you have drinks mixed with sweet mixers or fruit juices. Examples of drinks that will raise your blood sugar include daiquiris, grenadine, fruit juices, margaritas, ice cream drinks, and wine coolers. Liqueurs and port wines are also high in sugar. It is wise to avoid these types of drinks.

Alcohol can also have the opposite effect and cause low blood sugar. If you have diabetes and take insulin or diabetes pills, you risk low blood sugar when you drink alcohol. Normally, when no alcohol is in the blood, your liver helps to keep blood sugar from going too low by slowly releasing glucose into your bloodstream. Alcohol prevents this release of glucose because the liver is too busy breaking down the alcohol. **To protect yourself, never drink on an empty stomach.** Drinking after exercise may further increase your risk of having low blood sugar because exercise helps to lower your blood sugar.

Heavy drinking over time can hurt your liver, so it is not able to make glucose as well. When this happens, your diabetes is harder to control.

Glucagon shots do not help low blood sugar caused by drinking. Glucagon works by getting your liver to release more glucose into your bloodstream, but alcohol stops this process. You will need to treat your low blood sugar with simple carbohydrates, such as glucose tablets or gels. If you pass out, you will need medical help.
Alcohol and weight management

Alcohol is very high in calories, so it is not a good choice if you are trying to control your weight. Alcohol has almost twice as many calories as carbohydrates and protein.

If you are following a carb counting or low calorie diet, but desire an alcoholic drink once in a while, the following list will help you figure out the carbohydrates and calories in your diet.

<table>
<thead>
<tr>
<th>Alcoholic Beverage</th>
<th>Serving Size</th>
<th>Count As</th>
</tr>
</thead>
</table>
| Beer: various light, draft, and craft brewed | 12 fluid ounces | 1 alcohol equivalent + at least ½ carbohydrate  
Grams of carbohydrate for 12 ounce serving can range from 3 to 20. Be sure to check the label to count carbohydrates. |
| Distilled spirits: vodka, rum, gin, whiskey (80 or 86 proof) | 1 ½ fluid ounces | 1 alcohol equivalent |
| Liqueur, coffee (53 proof) | 1 fluid ounce | 1 alcohol equivalent + 1 carbohydrate |
| Sake | 1 fluid ounce | ½ alcohol equivalent |
| Wine:  
• Dessert (sherry)  
• Dry, red or white (10%) | 3 ½ fluid ounces  
5 fluid ounces | 1 alcohol equivalent + 1 carbohydrate  
1 alcohol equivalent |

Note: In general, 1 alcohol equivalent has about 100 calories.

Better choices

Some drinks are better choices for people with diabetes. Select drinks that are lower in alcohol and sugar, such as:

• Distilled liquors, like gin, vodka, or whiskey with sugar-free mixers (club soda, seltzer, diet tonic, diet soda, or water).
• Light beer.
• Dry wines or wine spritzers (2 ounces of wine mixed with sparkling water, club soda, or diet soda).
Alcohol is not for everyone

Some people with diabetes should not drink alcohol.

- **If you have nerve damage from diabetes**, drinking can make it worse. Drinking can increase the pain, burning, tingling, numbness, and other symptoms found with nerve damage.
- **If you have diabetic eye disease**, heavy drinking (3 or more drinks per day) may worsen the disease.
- **If you have high levels of fat, called triglycerides, in the blood**, drinking can make it worse. Alcohol affects how the liver clears fat from the blood and causes the liver to produce more triglycerides.

Tips for safe alcohol use

- **Check with your doctor or pharmacist to see if alcohol is allowed with your prescribed medicine.**
- Drink only when your diabetes is under control.
- Limit alcoholic drinks to 2 per day for men and 1 per day for women.
- Sip slowly to make the drink last.
- Never drink on an empty stomach, especially if you take insulin or pills to control your diabetes.
- Choose distilled liquors with sugar-free mixers, light beer, dry white wine, or wine spritzers. Avoid sweetened drinks.
- Check your blood sugar after you drink to see how alcohol affects you. Remember, this may be as much as 6 to 12 hours later.
- Wear medical identification. If you have low blood sugar, you want others to know that you have diabetes and are not drunk.
- Do not drink and drive.
Benefits of exercise

Some of the benefits of exercise are to:
• Improve your blood sugar control.
• Help with weight control.
• Improve your body’s ability to use its own insulin.
• Help you feel better and have more energy.
• Lessen your risk of diabetes complications.
• May help lower your lipid levels (cholesterol and triglycerides).

All of these are good reasons to begin and stick with a regular exercise program.

Getting started

If you have not been exercising, talk with your healthcare team before you start to ensure you need no special precautions or limitations. For your safety, follow any limits your doctor sets.

Testing your blood sugar

Blood sugar testing with record keeping should be done before and after exercise, especially when you first start exercising. This will let you see the affects of exercise on your blood sugar. For some people with diabetes, especially those taking insulin, there may be a risk of hypoglycemia or low blood sugar with exercise. The amount or type of insulin may need to be adjusted or a carbohydrate snack may be used to increase blood sugar.

Your exercise plan

• Begin slowly and increase the time and intensity of your exercise over time.
• The type of exercise you choose depends on what you like and what is comfortable for you.
• You do not need to spend a lot of money on exercise equipment.
• Walking, swimming, biking, running, and jogging are all good choices.
• Check with your local recreation center or YMCA to see what exercise classes are offered if you think that you would do better with a group.
• Wear socks and shoes that fit well and are supportive to provide some cushioning for your feet.
• Dress in layers so as you warm up, you can remove a layer to keep from getting too warm.

To get the best results:

• Get 150 minutes of moderate intensity, cardiovascular exercise each week. You can break up this time into whatever increments work best for you, such as exercising for 30 minutes, 5 days a week.
• If you are new to exercising, start with 5 or 10 minutes of walking, 3 or 4 days a week. Then the second week increase to 10 minutes of walking, twice a day, 3 days a week.

Exercise is the key to good diabetes control.
• Include a warm up and a cool down period with your exercise. This helps prevent injury and allows your body to adjust to your activity. It is also a good idea to stretch your muscles after you cool down. This helps with flexibility and helps to reduce injury.

• Add strength training exercises to your exercise program 2 to 3 days a week for more weight loss and improved insulin sensitivity.

• Work up to a level of exercise that is comfortable for you. If you can exercise every day, you will see better balance in your blood sugars.

**Exercise at the right pace**

Do not push yourself too hard. If you are walking, you should be able to say hello to your neighbor or a person passing you on the sidewalk without feeling short of breath. Exercise at a pace that makes your body work, but does not cause you pain or exhaustion.

**Stop exercising right away if you feel:**

• Pain or pressure in your chest, neck, or jaw
• Tired even though you have been sleeping well
• Dizzy or light-headed
• Irregular heartbeats

*If any of these signs persist after stopping exercise, call your doctor or seek medical help right away.*

**Part of your routine**

You may see some weight loss when you first begin to exercise, but then it seems to stop. Do not be discouraged. Fat takes up more space than muscle. As you exercise and build up muscle, you will become more fit. This helps your body use insulin better. You may not see many pounds come off, but you may notice that your clothes fit better and your blood sugar is better controlled.

Finding time to work exercise into your daily routine can be hard. Stick with it and you will see your effort rewarded. Choose something you feel good about doing. Find a friend who is willing to be your exercise buddy, so you can keep each other on track and motivated. The benefits of exercise are worth the effort. Your blood sugar and total body health will be better for it.
High Blood Sugar

High blood sugar, also called hyperglycemia or uncontrolled diabetes, happens when there is too much blood sugar, called glucose, in the body. People with diabetes can get hyperglycemia from not eating the right foods or not taking medicines correctly. Other problems that can raise blood sugar include infections, certain medicines, hormone imbalances, or severe illnesses. High blood sugar can damage your nerves, blood vessels, and organs. Talk with your doctor or nurse if your blood sugar is not managed with your current medicine, diet, and exercise plan.

Use this table to review general blood sugar levels. **Anytime your blood sugar before meals is above 140, it is too high.** You may have different treatment goals or tighter glucose control. Follow the goals set for you by your doctor or nurse.

<table>
<thead>
<tr>
<th>Checking Blood Sugar</th>
<th>Normal</th>
<th>Goal</th>
<th>Additional Actions Need to Be Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting</td>
<td>Less than 100</td>
<td>80 - 130</td>
<td>Less than 70 Greater than 140</td>
</tr>
<tr>
<td>Before meal</td>
<td>Less than 110</td>
<td>80 - 130</td>
<td>Less than 70 Greater than 140</td>
</tr>
<tr>
<td>2 hours after meals</td>
<td>Less than 140</td>
<td>Less than 180</td>
<td>Less than 80 Greater than 180</td>
</tr>
<tr>
<td>Bedtime</td>
<td>Less than 120</td>
<td>100 - 140</td>
<td>Less than 100 Greater than 180</td>
</tr>
<tr>
<td>A1C test</td>
<td>Less than 5.6%</td>
<td>Less than 7%</td>
<td>Greater than 7%</td>
</tr>
</tbody>
</table>

**High blood sugar risk**

High blood sugar is more likely to occur when you:

- Are first diagnosed with diabetes.
- Do not take enough medicine.
- Miss, skip, or delay medicines.
- Take steroid medicines.
- Eat more food than your meal plan allows.
- Eat foods high in sugar or carbohydrates.
- Get too little exercise.
- Have infection or illness.
- Have stress.
- Have heredity or genetic factors.
- Are pregnant.
Signs of high blood sugar

High blood sugar affects each person differently. Think about how you feel when blood sugar is high. Record these signs and notice if they return.

Warning signs may appear any time blood sugar is not well managed. Blood sugar can slowly rise over hours, days, and even weeks. It is important to check blood sugar often to stay within the normal range.

Signs may be noticed by others before you notice them. Talk to family and friends about your signs of high blood sugar, which may include:

- Extreme thirst
- Frequent urination
- Increased appetite
- Impotence
- Blurred vision
- Weight changes, loss, or gain
- Skin itching
- Skin infections, such as boils
- Feeling tired or sleepy
- Feeling moody or grumpy
- Delayed healing of wounds, cuts, or blisters
- Numbness in feet or hands
- Vaginal itching or frequent vaginal infections

Treatment for high blood sugar

Short term actions to take:

- Drink plenty of water, at least eight, 8-ounce glasses a day.
- Exercise if your blood sugar level is less than 250.
- Recheck your blood sugar level in 2 hours.
- Reduce your carbohydrate intake at your next meal if your blood sugar is still high.
- Contact your doctor or nurse for advice.

Long term actions to take:

- **Follow your treatment plan.** Review your Blood Sugar Record, diabetes medicines, meal plans, and activity of the last few days. Look for any changes that might explain high blood sugar.
  - Check your blood sugar level 4 times a day and record the results in your Blood Sugar Record.
  - Take your insulin and oral diabetes medicines as directed. Do not skip doses or take more medicine than needed unless directed to do so by your doctor.
  - Follow your meal plan. Eat a variety of whole grain foods, fruits, and vegetables each day. Limit foods that are high in sugar and carbohydrates. Eat less fat. Eat smaller portions spread throughout the day. Use less salt. Limit alcohol.
  - Exercise for at least 150 minutes each week. This is about 30 minutes of moderate exercise, 5 days a week.

Contact your doctor or nurse if your blood sugar is not being managed with your current treatment plan.
• **Contact your doctor if you have illness, infection, or other health changes** that can increase blood sugar. If you have Type 1 diabetes and your blood sugar is 240 or higher, your doctor may have you check for ketones in your urine.

• **Follow your sick day diabetes care plan as needed.** Separate sick day plans are used for general illness and for illness during pregnancy.

### Treatment problems

**Do not ignore high blood sugar.** If not treated, high blood sugar can lead to:

- Damage to major organs and nerves, including kidneys, heart, and eyes. Nerve damage can affect the feet and the ability to walk and have balance.
- Wounds that do not heal well.
- A coma. This is also called diabetic ketoacidosis (DKA) or hyperglycemic hyperosmolar state (HHS).
- Death.

*If you have any questions or concerns, talk with your doctor, nurse, dietitian, or diabetes educator to help you with the management of your high blood sugar.*

### Family and friends

Your spouse, family members, roommates, friends, and co-workers should know that you have diabetes. It is up to you to decide who you tell and how much you tell them about diabetes. They should know that you can have high blood sugar and what they can do when it happens.
Low Blood Sugar

Low blood sugar is also called hypoglycemia, insulin shock, and insulin reaction. It means that there is not enough blood sugar, called glucose, in the body. Glucose is the major fuel needed to feed the body’s cells. A normal blood sugar level is most often between 70 and 99. **Low blood sugar for people with diabetes means that glucose is below 70.**

**Low blood sugar risk**

Low blood sugar is more likely to occur when you:

- Take too much insulin or oral diabetes medicine.
- Skip, miss, or delay meals.
- Do too much exercise or unplanned exercise.

There may also be times when you do not know why your blood sugar is low.

**Signs of low blood sugar**

Low blood sugar affects each person differently. Some people have warning signs while other people have none. It is more common in people who have had diabetes for many years to not have warning signs. **Learn how you feel when your blood sugar is too low.**

Sometimes low blood sugar develops slowly while other times it happens within minutes. **Signs may be noticed by others before you notice them.** Talk to your family and friends about your signs of low blood sugar, which may include:

- Feeling shaky
- Feeling dizzy or light-headed
- A fast heartbeat
- Feeling moody or grumpy
- Feeling weak or tired
- Numbness around the mouth or lips
- Being unable to speak
- Feeling hungry
- Feeling nervous
- A headache
- Blurred vision
- Not thinking clearly
- Sweating
Treatment for low blood sugar

Short term actions to take:

• Eat or drink some food with sugar, such as:
  ‣ Chew 3 glucose tablets or 1 package of oral glucose gel
  ‣ 1 small piece of fruit
  ‣ 1 cup of milk
  ‣ 1 tablespoon of sugar
  ‣ ½ cup of juice or soda
  ‣ 3 squares of graham crackers
  ‣ 2 teaspoons of honey or syrup
  ‣ 5 to 6 mini jelly beans
  ‣ 2 to 3 gumdrop candies or regular size jelly beans

• Wait 15 minutes and check your blood sugar.
  ‣ If your blood sugar is still less than 100, or if you are not feeling better, eat or drink another serving of food or drink from the list.

• Wait another 15 minutes and recheck your blood sugar.
  ‣ If your blood sugar is 100 or more, you will be fine. You may feel tired for awhile. If it is time for your next meal soon, go ahead and sit down and eat. If your next meal time is more than an hour away, eat a snack of ½ sandwich and 1 cup of milk.
  ‣ If you check your blood sugar and it is 100 or more and you are still not feeling better, call 911. It may not be a problem with your blood sugar, and you may need more help.

• Be careful not to over treat. If you panic and start to eat or drink until you feel better, your blood sugar may go too high.

• Call your doctor or nurse if you have low blood sugar more than 2 times in a week.

Long term actions to take:

• Follow your treatment plan. Review your Blood Sugar Record, diabetes medicines, meal plans, and activity of the last few days. Look for any changes that may explain low blood sugar.
  ‣ Check your blood sugar level 4 times a day and record the results in your Blood Sugar Record.
  ‣ Take your insulin and oral diabetes medicines as directed. Do not take extra medicine unless directed to do so by your doctor.
  ‣ Follow your meal plan. Eat meals and snacks at the same time each day. Do not miss, skip, or delay meals.
  ‣ Exercise for at least 150 minutes each week. This is about 30 minutes of moderate exercise, 5 days a week.

• Keep food like crackers, glucose tablets, glucose gels, or juice with you at all times at work, in your car, and when you exercise.

• Talk with your doctor and dietitian before starting a weight loss diet.

• Call your doctor or nurse if you have low blood sugar more than 2 times in a week or wide swings from high to low blood sugar.
Family and friends

Your spouse, family members, roommates, friends, and co-workers should know that you have diabetes. It is up to you to decide who you tell and how much you tell them about diabetes. They should know that you can have low blood sugar and what they can do when it happens.

Glucagon injection

If you take insulin, a family member, roommate, or coworker should learn how to give a shot of glucagon. Glucagon is a hormone that raises your blood sugar. It is used as a medicine for severe low blood sugar when you might be found unconscious. Liquids and food should never be given to someone who is not alert or awake. A nurse will teach your spouse, family member, or friend how to give glucagon. You need a prescription for glucagon.

Be ready:

Glucagon comes as liquid in a syringe and powder in a vial. It is mixed together and injected with a small needle. It has to be given immediately after being mixed. People you have asked to help you need to learn about it ahead of time.

- Get a prescription from your doctor for glucagon. Keep a kit with you. Ask about getting more kits to keep one at home, at work or school, and in the car.
- Pick family, friends, and coworkers who could give you this emergency medicine.

Show these helpers where you keep the medicine and have them learn how to use it. They should practice by giving you an insulin shot, so they are able to take action in an emergency.

These are general instructions for giving a glucagon injection. Check your own kit’s instructions and ask your pharmacist or nurse if you have any questions.

How to give a glucagon injection:

1. Remove the cap from the vial with the glucagon powder.
2. Remove the cap from the needle on the syringe.
3. Inject all liquid in the syringe into the vial with the powder.

Continue to next page for steps 4 through 8.
4. Remove the syringe or keep it in the vial, according to your kit’s instructions. Swirl the vial gently until the solution is clear. If you keep the needle in the vial while mixing, be careful not to bend it.

5. Slowly withdraw all the liquid into the syringe. (This is for an adult. Children may get a different amount of medicine).

6. Stick the needle straight into the upper arm, upper leg, or buttocks. Push the plunger down to give the medicine, and then remove the needle.

7. Turn the person on their side. Throwing up (vomiting) may happen after glucagon is given. Call 911.

8. Throw away the needle in a needle disposal box. Do not throw it away in the trash.
Dealing with Sick Days

Although no one plans it, everyone gets sick from time to time. The fall and winter months are the most common times of the year for illness. The person with diabetes, like everyone else, will have minor illnesses such as:

- Colds
- Viruses
- Diarrhea
- Flu
- Sore throats
- Infections
- Menstrual cycles
- Sun burns

Even a cold can make your diabetes harder to control. To understand how this happens, think of a minor illness as a stress. Stress usually raises blood sugar. The person with diabetes works hard to balance medicine (insulin or pills), diet, and exercise. The added stress of a cold or other illness upsets this balance. Your usual medicine, diet, and exercise are then less effective in controlling your blood sugar levels. Think about prevention, planning ahead, and being prepared for sick days. This will make them easier to manage.

Prevention

Use these guidelines to help you create a plan to prevent illness:

1. **Get a flu (influenza) vaccine each year.** These shots are available each fall and help to protect you from certain types of flu.
   
   Talk with your doctor to find out if one or both pneumococcal vaccines (PCV13, PPSV23) are recommended for you. These vaccines protect you from certain types of pneumonia.

2. **Keep blood sugar levels in your “target range” (80 to 130 mg/dl fasting).** Watch for patterns of high or low blood sugar. Work with your doctor to change your diabetes medicines (insulin, oral), diet, and exercise to keep your diabetes in good control. Many people find that they are more likely to get ill when their diabetes is out of control.

3. **Drink at least eight, 8-ounce glasses of liquid each day.**

4. **Take all of your medicines as prescribed.** Do not skip or double up on any medicine unless you are advised to do so by your doctor.

5. **Treat any illness in its early stages to prevent it from getting worse.** Report signs of illness or infection early to your doctor. These include:
   
   - A fever of more than 100.5 degrees F or 38 degrees C for more than 24 hours
   - Nausea
   - Vomiting
   - Diarrhea
6. **Always wear some form of medical identification.** A bracelet is the best choice since it can be easily seen. Another good idea is to carry a wallet card that lists your:
- Name
- Address and phone number
- Doctor’s name and phone number
- All of the medicines you are taking
- A family member’s name and phone number
Place this card next to your driver’s license. **Medical identification speaks for you when you are not able to.**

### Preparing for sick days

1. **Keep at least a week’s worth of diabetes supplies on hand.** This includes:
   - Glucose test strips
   - Lancets
   - Alcohol swabs
   - Cotton balls
   - Diabetes medicines (insulin, oral)
   - Syringes or pen needles
   - Extra batteries for glucose meter or insulin pump
   - Ketostix (Type 1 diabetes)
   - Glucagon IM (intramuscular) injection emergency kit (Type 1 diabetes)
   - Insulin pump supplies (for pump users)

2. **If you do not already have a sick day meal plan, make an appointment with your dietitian to make an individualized plan.**

   Stock your kitchen with soft and liquid foods that can be used in your sick day meal plan. Some good choices include:
   - Bouillon cubes and broth soups
   - Gelatin and pudding (sugar-free and regular)
   - Hot cereals like Cream of Wheat
   - Hot chocolate (sugar-free and regular)
   - Instant custard mix
   - Instant mashed potatoes
   - Popsicles (sugar-free and regular)
   - Saltine and graham crackers
   - Diet soft drinks like Diet 7UP, Diet Pepsi
   - Regular soft drinks like Coke, Sprite, Ginger Ale
   - Tea bags
   - Unsweetened fruit juices

3. **Check the supplies in your medicine cabinet.** Keep the following on hand:
   - Thermometer
   - Antacid
   - Aspirin
   - Tylenol
   - Blistex / Vaseline
• Kaopectate anti-diarrheal medicine
• Vaporizer / humidifier
• Sugar free cough syrup or lozenges
• Rectal suppositories (for nausea)
• Glucagon (for severe low sugar - insulin users)

Talk with your doctor, diabetes nurse, or pharmacist for help in choosing over the counter products. Remember, many of these products have sugar, alcohol, and other drugs in them. These can raise both your blood sugar and blood pressure.

4. **Make a list of the following phone numbers.** Keep this list by the phone for quick and easy use. Include:
   • Doctor’s office number
   • Pharmacy or pharmacist
   • Local family member
   • Friend or neighbor
   • Local hospital emergency room
   • Diabetes nurse

**Sick day plan**

Now that you have reviewed how to prevent and plan ahead for sick days, it is time to review what to do when you become ill. At the first sign of illness, begin using your sick day plan. Remember, even a minor illness or stress can lead to a diabetes emergency that may require hospitalization.

You may also want to put your sick day plan into use for:

• Dental work
• Tooth removal
• Oral surgery
• Tests / procedures
• X-rays of stomach or bowel area
• Same day or outpatient surgery

**Your prompt action can and will make a difference. These sick day guidelines will help you:**

1. **Check your blood sugar more often - at least every 4 hours.** Aim to keep your blood sugar under 200 mg/dl. There may be times when you will need to check your blood sugar hourly. Record all blood sugar levels. Keep this record by the phone, so you are ready to share it with your doctor.

2. **If you have Type 1 diabetes, check your urine ketones.** Use a foil wrapped strip, such as Ketostix, to check every time you urinate. Record these results in your *Blood Sugar Record*. Talk with your nurse or doctor if you do not know how to check your ketones.
3. **NEVER stop taking your diabetes medicine (insulin, oral).** Take your usual dose(s) unless your doctor has told you differently. When ill, you may need more diabetes medicine to keep your blood sugar under control. Some people wrongly believe that because they are ill and eating less, they need little or no medicine. High blood sugar can lead to a diabetes emergency. You may need more insulin or extra shots when ill. Your body sees the illness as a stress and usually more medicine (insulin, oral) is needed to control diabetes.

4. **Follow your sick day meal plan:**
   - **Eat frequent small meals (every 2 to 3 hours).** You need to eat the same amount of carbohydrate that you normally do. Soft and liquid foods may be more easily tolerated by your stomach.
   - **Drink more liquids when ill.** Try to drink twelve, 8-ounce glasses of liquid each day. Take small sips of liquids or suck on ice chips if you are nauseated.
   A loss of body fluid (dehydration) and sodium and potassium (electrolytes) can cause serious problems when you have a fever, diarrhea, or vomiting. Weigh yourself everyday when ill to see if you are losing weight, and **drink liquids that contain sodium and potassium** to replace these minerals in your body. **Liquids high in sodium** include sports drinks like Gatorade and Powerade, club soda, tomato juice, broth, or bouillon. **Liquids high in potassium** include sports drinks, grapefruit juice, orange juice, or tomato juice.
   - **Drink 4 to 6 ounces (½ to ¾ cup) of sugar-free liquids every hour if your blood sugar is 240 mg/dl or higher.** Liquids include water, ice chips, club soda, sports drinks, coffee, tea, and broth.
   - **Drink 4 to 6 ounces (½ to ¾ cup) of liquids with sugar every hour if you cannot eat your usual diet or soft foods, and your blood sugar is below 240 mg/dl.** Liquids with sugar include 7UP, Sprite, tea with honey, and Kool-Aid for example. This will help you get some calories with your fluids.
   - Write down your fluids and amounts you are drinking in your *Sick Day Record*.
   - **If you are vomiting:**
     - **Stop drinking liquids for 1 hour.** This will let your stomach rest.
     - Take a suppository for nausea. If nausea happens often, talk with your doctor about getting a prescription for use at home.
     - Rest in a reclining chair. Do not lie flat.
     - **After one hour,** try small sips of lemon-lime soda, such as 7UP or Sprite, over ice chips every 10 to 15 minutes.
     - **If vomiting continues for 4 or more hours,** call your doctor or go to the Emergency Room.
5. **Keep a list of how you are feeling.** Write down your signs and symptoms in your *Sick Day Record*. Be ready to share this information with your doctor.

- **Temperature**: Current temperature? If fever is present? How long? How high? Have you taken aspirin or Tylenol?
- **Vomiting**: How many times? How long since you last vomited? Have you been able to eat or drink anything? Have you taken any medicine for nausea or vomiting?
- **Cough**: Are you coughing up yellow or green mucous? Have you taken cough syrup or lozenges?
- **Diarrhea**: How many times? How long since last episode? Have you taken anti-diarrheal medicine?
- **Ketones**: Do you have a moderate or large level of ketones in your urine?

6. **Call your doctor early in the illness.** Together you can work to relieve symptoms and control your blood sugar. If you are unable to reach your doctor by phone, call or go to the nearest emergency room. This is very important if you have been vomiting or have had diarrhea for 4 or more hours.

**Call your doctor if you are unsure of what to do or have:**

- Blood sugar greater than 240 mg/dl for more than 1 day
- Moderate or large ketones
- Vomiting or diarrhea for 4 or more hours
- Severe pain of any kind
- Fever of more than 100.5 degrees F or 38 degrees C

7. If you live alone, call a family member or close friend. Let them know you are at home and sick. **Set up a calling system, so you are in touch by phone every 2 to 4 hours.** Sometimes you may not realize how ill you are. You may need someone to come and stay with you.

8. **Stay at home and get plenty of rest.** Do not risk your health or the health of others by going to work ill. One or two days of rest at the start of an illness may prevent the loss of several days work later on.

9. **Do not exercise when you are ill.** Postpone exercise until you are well.

Although sick days do not happen often, the person with diabetes can learn how to manage them. Take time now to review your personal sick day plan. Being prepared to handle ill days and putting into action your own sick day plan is a good way to begin.

By following these sick day tips you may be able to avoid going to the hospital. You can make a difference. Your doctor, nurse, and dietitian can help you get started.
Sick Day Meal Plan

When you are sick, look for ways to balance carbohydrates and protein to get the nutrition that your body needs.

- Eat the same amount of carbohydrates as you do on days that you are well. Women need about 30 to 45 grams per meal. Men need about 45 to 60 grams per meal.
- Try to drink twelve, 8-ounce glasses of liquid each day.
- Eat small meals of carbohydrates if you have nausea or a poor appetite.
- **Follow a carbohydrate replacement plan.** To use, replace the carbohydrate servings from your usual meal plan with any of the carbohydrate foods listed below. These carbs are easier on your stomach when you are sick.

### Carbohydrate

15 gram servings:

#### Starch replacement

- ½ cup regular sweetened Jell-O or other brand gelatin (not diet or sugar free)
- ½ cup or 4 ounces of regular soft drink (not diet)
- 1 slice toast
- 2 slices light bread, toasted
- 3 graham cracker squares
- 5 vanilla wafers
- 6 saltine crackers
- ¾ cup dry unsweetened cereal
- 1 cup broth soup
- ¾ cup cream soup
- ½ cup mashed potatoes
- ½ cup plain rice
- ½ cup cooked cereal

#### Fruit replacement

- ½ cup unsweetened applesauce
- 1 regular popsicle (half of 2-stick popsicle)
- 1 frozen fruit juice bar
- ½ cup cranberry, grape, or prune juice
- ½ cup apple, grapefruit, orange, or pineapple juice
- 2 teaspoons honey or sugar

#### Milk replacement

- ½ cup baked custard
- ½ cup vanilla ice cream
- ¼ cup regular pudding
- ½ cup sugar free pudding
- ½ cup eggnog
- 1 cup sugar free fruited yogurt

### Protein

If your stomach can tolerate it, include foods from the Meat / Meat Substitutes Group, such as eggs, cottage cheese, baked chicken, turkey, or ground beef.
Testing Urine for Ketones

With Type 1 diabetes, it is important to check your urine for ketones. In addition to learning what ketones are, you will also need to know when, why, and how to check for them. Your nurse will teach you how to check for ketones.

About ketones

Ketones are a warning sign that the body is using fat for energy. Normally, ketones are not found in the bloodstream or urine. When ketones are found in people with diabetes, it is a sign that there is not enough insulin and blood sugar levels are too high.

Your body is made up of many different kinds of cells. These cells need energy to grow and live. The energy comes from the foods you eat. Most of the food you eat is broken down into a form of energy called glucose. For glucose to get into your body’s cells, insulin is needed. When there is not enough insulin, your body uses other energy sources, such as fat.

Fat is the most available source of energy for your body to use. Ketones are the substances that are made when fat is broken down by the body. Since the body has no use for ketones, it filters them from the bloodstream through the kidneys and into your urine.

When there are too many ketones in the blood, dehydration or loss of body fluids occurs. The kidneys cannot handle the large amount of ketones and they build-up in the blood. This can lead to a diabetes emergency, called Diabetic Ketoacidosis (DKA), that needs treatment right away.

When to check for ketones

Follow the instructions from your doctor or nurse as to how often to check your urine for ketones.

- **If you have Type 1 diabetes**, check your urine for ketones:
  - Anytime your blood sugar is greater than 300 mg/dl or more than 200 mg/dl during pregnancy.
  - If you are sick with nausea, vomiting, diarrhea, or other illnesses that cause fluid loss.
  - Every morning if you are pregnant.

Remember, ketones in your urine are a warning sign. Ketones in small amounts are usually not harmful. However, they may be the first sign of Diabetic Ketoacidosis (DKA).

- **If you have Type 2 Diabetes**, you probably will not need to check for ketones. Your doctor or nurse will go over this with you if it is needed.

- **If you are pregnant**, ketones may be a warning sign that you are not eating enough. This may mean that you need to eat more for your bedtime snack. Review your meal plan with your dietitian.
Ketone testing products

Ketone tests can be purchased at your local pharmacy. There are several products available. We recommend that you select foil-wrapped strips, such as Ketostix, as foil-wrapped strips store longer. If you use another product, carefully read the product’s directions for use. Replace if the expiration date has passed, which is often 6 months after opening the container.

How to check for ketones

1. Wash your hands with soap and water.
2. Gather your supplies: timer or clock with second hand, test strip, and urine sample. Check the expiration date of the test strip. Do not use if expired.
3. Remove the test strip from the foil package. Be careful not to touch the test pad area.
4. Collect a sample of your urine in a clean container.
5. Dip the strip’s test pad into the urine and remove it quickly. You may also pass the test pad through your urine stream.
6. Tap the test strip to remove extra urine.
7. Wait 15 seconds or as directed by package instructions for the test pad to change color.
8. Compare the test pad to the color chart on the test strip bottle. This gives you a range of the amount of ketones in your urine. Ignore any color changes that happen after 15 seconds.
9. Discard the used test strip.
10. Record your results.

Test results

Ketones in small or trace amounts may mean that ketone buildup is starting. Retest your urine for ketones in a few hours.

**Call your doctor right away if your result is moderate to large.** Moderate to large results are a danger sign that your diabetes is out of control. You may need more insulin and liquids, especially water. Never exercise when your ketones are moderate to large and your blood sugar is high. Recheck your blood sugar level until it is 200 or less.
Stress and Diabetes

Stress is any feeling that bothers you or puts a strain on your body or mind. Some people describe stress as an uncomfortable feeling of tension. Others describe it as a feeling of excitement and challenge. Stress is a part of everyday life and everyone has it. Life is not perfect and many of its challenges can be stressful.

Stress can be both good and bad:

• Examples of “good” stress include getting married, the birth of a grandchild, or a promotion. These types of stress can add interest and excitement to your life.

• Examples of “bad” stress include traffic tickets, doing poorly on a test in school, going through a divorce, or the death of a loved one. These types of stress can be upsetting and hard to deal with.

The body’s response to stress

When the body is under stress, it releases hormones made by the endocrine glands. The body also has a rise in heartbeat, blood pressure, and blood sugar. You may have heard this reaction called the “fight or flight” response. Release of these hormones gives a quick source of energy for coping with stress.

These body changes can be harmful for anyone, but high blood sugar can be especially dangerous for people with diabetes. Stress can easily upset the balance of medicine, diet, and exercise you use to control your diabetes. Un controlled diabetes may lead to diabetes emergencies and complications over time.

Signs of stress

High blood sugar caused by stress often causes warning signs. Learn to identify how your body shows signs of stress. Recognizing stress is the first step in dealing with it.

Do any of these signs of stress sound familiar?

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You may have only a few or several signs of stress. Knowing how you feel when you are under stress is an important step towards learning to deal with it. Take time to answer the following questions for yourself:

- Can you tell when you are under stress?
- What causes stress for you?
- What situations are stressful for you?
- What are two or three personal signs of stress for you?
- How do you usually deal with stress?
- Do you feel overwhelmed or like you are running on empty? How do you handle these feelings?

**Diabetes and stress**

It is common to feel overwhelmed about managing diabetes with everything else that is going on in your life. You may feel your body is no longer under your control. It is natural to sometimes feel angry, guilty, depressed, frustrated, and helpless about having diabetes and managing it day by day.

Your thoughts, feelings, and attitudes about diabetes and taking care of yourself have a powerful effect on your body. A good place to start is to accept diabetes as a challenge. Next, make a plan for how to live well with diabetes and manage stress. Your plan should include:

- Good nutrition
- Exercise
- A way to improve your attitude
- Training on relaxation techniques and stress management
- A commitment to lifelong learning

You may want some help to learn how to deal with stress. Challenge yourself to learn how to relax. Use stress management techniques and exercises, such as meditation or guided imagery. Many communities offer courses on a variety of stress or behavior modification techniques.

**Coping with stress**

The best way to live with stress is to prevent it. When that is not possible, learn to reduce it as well as control how you respond to it. Listed below are ten ideas that may be helpful in coping with stress:

1. **Prevent or avoid stress.** Do not put yourself in situations or with people who you know cause stress. Try to catch yourself before you overreact or get angry. Anger can change energy from positive to negative. Although you cannot always change what happens to you, you can control how you react or respond to what happens.

2. **Think positively.** Negative thoughts often end up in negative results. Try to find at least one positive thing, even in the most challenging situations. Practice saying “I can”, “I will” and “I’ll give it a try”. Positive thoughts often lead to positive results.
3. **Find someone you can talk to.** Talk openly to someone you trust when something is bothering you. Suffering in silence causes stress to build up inside. Do not be afraid to ask for what you want. Sometimes finding a good listener lets you “think aloud”. This can be very helpful and lets you look at a problem differently. After thinking out loud, learn to listen to suggestions and advice. Your good listener may be your spouse, friend, co-worker, clergyman, or a healthcare professional.

4. **Make time for yourself.** Plan some time every day just for you. If you are not used to doing this, start with 15 minutes a day. Take time to read that book you have had for six months, treat yourself to a movie, or indulge in a leisurely bubble bath. Be adventurous! Try a new hobby or get involved with a club you want to join. Find time to enjoy life’s simple pleasures and learn how to be kind to yourself.

5. **Set realistic goals.** Do not set yourself up for failure by setting unrealistic goals. Begin with daily goals then move to weekly or monthly goals. Start with small goals and celebrate your successes. Keep your goals simple, practical, and just for you. Soon they will become part of your daily routine. Part of goal setting is being able to identify what is most important. Do you often feel that the clock or other people set your agenda? Take time to concentrate on what is really important to you. You will probably find several things that you do out of habit, which are not necessary and a waste of time and energy. Focus on what is really important to you. Finally, recognize that you are human. If you do not reach your goal, reevaluate and start again. Remember, each day is a new beginning.

6. **Exercise.** An exercise program is a great way to relieve stress. Exercise also helps control weight and glucose levels, both important in managing diabetes. Exercise also gives you an opportunity for time to yourself. If you have not been exercising, check with your doctor first. Choose an activity you enjoy doing. Be sure to include a warm-up and cool down period. Slowly work up to exercising at least 30 minutes, 5 days a week. Be sure to protect your feet and wear comfortable clothes. There also are some simple exercises you can use when you feel stressed. These include muscle relaxation, deep breathing, yoga, and meditation. Consider a YMCA, community center, or local school for group sports.

7. **Get support.** Join a diabetes support group in your community. Many communities also have support groups for families of people with diabetes. Many support groups are directed by local or national diabetes organizations. Diabetes support groups allow you to meet other people who face some of the same challenges you do living with diabetes. Community and spiritual groups can also provide an opportunity to meet people, make new friends, and take a few minutes to do something just for you.

8. **Follow a healthy diet.** What we eat affects our health. People with diabetes see this everyday as they check their blood sugar levels. Part of having a healthy mind is a healthy body. Diet is the cornerstone of diabetes management. It is also an area of challenge. It is important to follow your diabetes meal plan. If you are having problems or have questions, make an appointment with a dietitian (preferably a Certified Diabetes Educator or CDE). Together, you will review and change your meal plan as needed. A dietitian can make suggestions for changes and give you new ideas to make your meal plan more realistic to follow.

9. **Embrace humor.** Everyday we have opportunities to laugh at ourselves. Laughter helps reduce stress and tension. It is important to find humor in life’s everyday challenges. Make sure you know the difference between laughing at or with someone. Humor begins with you. Can you laugh at yourself? Can you share laughter?
10. Commit to lifelong learning. New information, research, and technologies are being discovered everyday about diabetes. To learn more about diabetes:

- Keep doctor appointments. Most people see their diabetes doctor every 3 to 4 months. This is a good time to ask questions and learn more about your diabetes.
- Make an appointment with a diabetes educator to review your diabetes plan, learn a new skill, or just talk about your diabetes. You may be pleasantly surprised to learn about new foods and products (sugar substitutes), new glucose meters that are quicker and easier to use and that have memories, and better ways to take your medicines (insulin by pumps, timing, etc.). If you are lucky enough to have an interested spouse, family member, or friend, bring them along and make it a family affair.
- Attend diabetes meetings and classes.
- Become a volunteer at a local diabetes agency.
- Subscribe to diabetes magazines, such as *Diabetes Forecast* or *Diabetes Self-Management*.

In summary

Nothing stays the same for very long and change is a part of life. Change is closely linked with stress. Although we cannot always control the changes and stresses in our lives, we can choose how to respond to them. Imagine how boring our lives would be if we never had change!

Your emotional health is closely linked with your physical health. Health in both areas requires learning how to recognize and manage stress. Since stress is a natural part of everyone’s life, it is important for you to think about what causes you stress, whether it is diabetes or another part of your life. Learning how to recognize your own personal stress symptoms is the first step. Begin to take an active role in decreasing the effects of stress on your body and in your life. Try some of the suggestions mentioned earlier.

Although we cannot control all the stress in our lives, we can learn to control our reactions to it. Controlling stress will also have a positive effect on your diabetes. Good luck!
Daily Foot Care and Foot Safety

Your feet are very important. Having healthy feet takes work, but it is well worth the time and effort. The healthy habits you begin today can help protect your feet for years to come. To take good care of your feet, have a plan for daily care, nail care, and first aid, choose good footwear, and have your doctor check your feet at each visit.

Daily care

Every day:

1. **Look at your feet** and pay special attention to the:
   - Tops and bottoms
   - Sides and heels
   - Toes and toenails
   - Between each toe

   You may need to use a mirror or a magnifier to help you see parts of your feet and toes.

   Watch for these changes:
   - Redness
   - Infection, sores
   - Ingrown toenails
   - Dryness, cracks in the skin
   - Blisters

   **If you notice any of these changes, contact your doctor.**

   If you cannot reach or see your feet, ask a family member, friend, or nurse to check your feet.

2. **Wash all parts of your feet** with a mild super-fatted soap, such as Dove or Basis, a clean wash cloth, and warm water. Be sure to rinse off all the soap because it can build up and dry out your skin.

3. **Dry your feet well** using a clean towel. Gently pat dry all areas of the foot and **carefully dry between your toes.**

4. **Apply lotion on your feet.** Do not put lotion on between your toes. Choose a lotion that has lanolin and is alcohol-free. If sweaty feet are a problem, lightly sprinkle on cornstarch or talcum powder after drying.
Nail care

Trimming your toenails can be hard to do if they are thick or brittle. If you have poor vision or cannot reach your feet, it may also be difficult to trim your own nails. If you have any of these problems, a family member or foot doctor (podiatrist) will need to help you with your toenail care.

If you are able to trim your own nails, follow these guidelines:

- File your toenails straight across using an emery board. File your nail to the shape of your toe.
- Avoid filing your toenails too short as this can lead to ingrown nails.
- If your toenails are thick and hard, cut the nails after a bath or shower when the nails are softer.
- Never use sharp or pointed objects to cut your toenails. Even a metal file can be dangerous.
- Use good light when trimming or filing your nails.
- Be careful and cut your toenails and not your toes or feet.

First aid for feet

Accidents and injuries can happen to anyone. Early recognition and treatment of a foot sore or injury is very important.

If you injure your foot or notice a sore, use the following guidelines:

1. Clean the area with mild soap and warm water.
2. Pat the area dry with a clean towel.
3. **Do not** use antibiotic ointments, such as Neosporin or Bacitracin, unless ordered by your doctor.
4. Cover the area with a plain gauze pad.
5. Wrap gauze around your foot and secure the gauze with tape.
6. **Do not** put tape on your skin.
7. Stay off of your feet.

Contact your doctor if:

- You see signs of infection, such as redness, foul smell, or pus.
- Your sore or injury is not better in 24 hours.
Protect your feet

Feet are prone to injury, and it is very important to protect them.

- **Do not** go barefoot.
- **Do not** use heating pads, space heaters, or hot water bottles on or near your feet.
- **Do not** use harsh chemicals, such as iodine, corn removers, betadine, alcohol, or peroxide. These can burn your healthy skin.
- See your podiatrist, or foot doctor, regularly.
- Gently file calluses with a pumice stone, file, or emery board.
- Carefully file your toenails straight across using an emery board.
- **Do not** wear tight fitting clothes, such as girdles, garters, slacks, hose, or socks. These can decrease circulation to your feet.
- **Never** soak your feet. This dries out the skin.
- **Do not** cut your calluses or corns.
- **Do not** expose your feet to very hot or cold temperatures.

Choose good footwear

**Socks**

- Wear socks that are made up of 70 to 90 percent natural fibers, such as cotton, silk, or wool. They allow your feet to breathe. Synthetic fibers trap moisture against your feet.
- Wear white socks, so you can easily see drainage or blood.
- Wear clean socks every day.
- **Do not** wear socks that have been darned, have holes, or have thick seams. These areas can cause pressure and could lead to a foot sore.
- **Do not** wear tight socks or hose.
- Wear socks that match the shape of your foot.
- Always wear socks with shoes.

**Shoes**

Every day:

- Check the inside of each shoe for stones and other objects before putting them on.
- Check your feet after taking off your shoes for red areas. Red areas could mean the shoes are too tight.
- Avoid heels over one inch high.
- Never go barefoot indoors or outdoors.
- If possible, do not wear the same shoes every day.
- Change your shoes and socks if you are on your feet for more than 4 hours at a time.
When buying new shoes:

• Always have both feet measured.
• Choose an oxford style or tie shoe.
• Check the toe box area to be sure it is wide enough.
• Choose soft leather or canvas, which let your feet breathe.
• Choose a shoe that matches the shape of your feet.
• Choose a crepe or rubber sole. This helps absorb the shock or pressure of the hard ground.
• Choose a low heel of one inch or less.
• Never wear new shoes for more than 1 to 2 hours a day until they are “broken in”.
• If you have foot problems, such as hammer toes or bunions, you may need special shoes.
• If you have decreased feeling or numbness in your feet, tell the sales person.
• If you are not sure, bring your shoes in for your doctor or nurse to see if they fit properly.
• Ask your podiatrist or diabetes educator about shoe stores and brands of shoes that may best meet your foot needs.

**Doctor appointments**

Caring for your feet is a team effort. Work with your healthcare team to take care of your feet and prevent problems. At visits, you can expect your doctor or nurse to:

• Check your feet.
• Check if your shoes fit properly.
• Check for both nerve damage and poor circulation.
• Recommend you see a podiatrist if needed.
• Recommend special tests to check the nerves and circulation in your feet.
• Recommend special shoes if you need them.

Use your doctor’s appointment to learn more about your feet. You should:

• Always take your shoes and socks off at each visit.
• Discuss any foot problems you have had since your last appointment.
• Ask questions about what you can do to protect your feet.
Your Checklist for Living Well

Below are things you should do to stay healthy if you have diabetes. Talk with your doctor or diabetes educator about your goals for managing your diabetes and other health problems.

Things to do throughout your life

- Do not smoke or use tobacco.
- **Call your doctor when:**
  - You are sick.
  - Your blood sugar is very high or very low.
  - You have a sore or wound that does not heal or is infected.
  - You have frequent low blood sugar reactions or you pass out.
- If you have type 1 diabetes, test your urine for ketones when your blood sugar is over 300 mg/dl. Test more often when you are sick.

Things to do every day

- Check and record blood sugar levels as often as directed.
- Take your diabetes medicines as directed.
- Follow your diabetes meal plan. Talk to your doctor or a dietitian if you are not sure what to eat.
- Exercise for at least 30 minutes.
- Take care of your feet. Wash them, trim toenails, and check for signs of injury or infection. Use a mirror to see the bottom of your feet and between your toes. Ask for help if you are unable to trim your toenails.
- Brush and floss your teeth.

Things to do every 3 to 6 months

- Visit your doctor.
  - Have your blood pressure checked at every visit. Follow your doctor’s advice for keeping your blood pressure in the goal range.
  - Have your feet checked for sores at every visit. Take off your shoes and socks at the beginning of every visit as a reminder. Have your doctor do a thorough foot exam at least once a year.
  - Have your hemoglobin A1C checked at least twice a year to determine what your average blood sugar level was for the past 2 to 3 months.
Things to do every year

- Visit an eye doctor to have a dilated eye exam to look for signs of eye disease from diabetes.
- Visit your doctor.
  - Have your urine albumin, or protein, measured to detect signs of kidney disease from diabetes.
  - Have your cholesterol, HDL, LDL, and triglyceride levels checked.
  - Get a flu shot each year. Get a pneumonia shot, if you have not had one, or if you are older than 65, you may need a second pneumonia shot.
  - Review your goals with your doctor.
  - Ask what else can be done to lower your risk of developing complications from diabetes.

Things to do if you plan to become pregnant

Women with diabetes who are planning to become pregnant need to get their blood sugar under control first and keep their blood sugar in control during pregnancy. Babies who are born to women whose diabetes is under poor control are at greater risk for birth defects. There are risks for the mother as well, including worsening of diabetes complications like infections and eye and kidney problems.

Talk to your healthcare team about your desire to become pregnant. A physical exam will be done. The exam may include:

- An A1C test.
- Checking for high blood pressure, heart disease, and kidney, nerve, and eye damage. If you have type 1 diabetes, your doctor may also check your thyroid function.
- Reviewing the prescription and over the counter medicines and vitamin and herbal supplements you take to ensure that they are safe to take during pregnancy. Some medicines may need to be changed.

It is recommended that blood sugar be under control for 3 to 6 months and healthy living habits be in place before becoming pregnant. You should also take a folic acid supplement every day to boost your preconception health. Talk to your doctor for more information.
Diabetes and Metabolism Research Center

Ohio State’s Diabetes and Metabolism Research Center (DMRC) is dedicated to advancing diabetes research, education, and patient care. The goal of the center’s research is to prevent and cure type 1 and type 2 diabetes.

Participate in research

When you participate in a research study, you become a vital part of a team working to change the future of healthcare and improve people’s lives.

Research study volunteers help doctors find ways to improve care. The research studies that are carefully done are the fastest and safest way to find treatments that work. The research often tries a new treatment alongside the best methods now known. With diabetes research studies, people get at least the standard treatment. Some also receive a new treatment. This is how breakthroughs in treatment for better care are discovered. Research studies help us find ways to prevent, screen, or treat diabetes. They may also help us find ways to help people feel better during treatment and have better health. A research study may give you the chance to:

- Receive a new treatment before it is available to the public.
- Have access to a new drug or device.
- Have your diabetes closely monitored.
- Receive supplies, testing, exams, and more personalized attention from the study team.
- Have satisfaction from doing something to help others.

Access other services

The DMRC also provides:

- Diabetes education through group classes and individual counseling
- Nutritional counseling
- Insulin pump training

Contact us

If you have diabetes and are interested in taking part in a research study or accessing the DMRC’s other services, please call 614-685-3333 or visit https://wexnermedical.osu.edu/departments/internal-medicine/dmrc for more information.

The center is located at:
CarePoint East
543 Taylor Avenue
Columbus, OH 43203
Blood Sugar Record

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<th>Date</th>
<th>Fasting AM/ Breakfast</th>
<th>Lunch</th>
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<th>Correction Factor</th>
<th>Insulin to Carbohydrate Ratio</th>
<th>Basal Rates</th>
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<td>1 unit for every _____ mg/dl for blood sugar &gt; _____ mg/dl</td>
<td>AM 1 unit per _____ grams</td>
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<td>Noon 1 unit per _____ grams</td>
<td>____ to _____ ____ units/hour</td>
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<td>_____ to _____ mg/dl</td>
<td>PM 1 unit per _____ grams</td>
<td>____ to _____ ____ units/hour</td>
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<td>Insulin on Board</td>
<td>Bedtime 1 unit per _____ grams</td>
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<td>Basal Rate Total ______ units</td>
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**Correction Factor**: 1 unit for every _____ mg/dl for blood sugar > _____ mg/dl

**Target Blood Sugar**: _____ to _____ mg/dl

**Insulin on Board**: ________ hours

**Insulin to Carbohydrate Ratio**

- AM 1 unit per _____ grams
- Noon 1 unit per _____ grams
- PM 1 unit per _____ grams
- Bedtime 1 unit per _____ grams

**Basal Rates**

- Time: ____ to _____ _____ units/hour
- Rate: _____ to _____ _____ units/hour
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# Sick Day Record

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<th>Blood Sugar (check at least every 4 hours)</th>
<th>Urine Ketones (for persons with Type 1 diabetes only)</th>
<th>Fluids Taken (kind and how much)</th>
<th>Symptoms (fever, nausea, vomiting, diarrhea, etc.)</th>
<th>Actions (what you did, such as called doctor, used over the counter medicines, etc.)</th>
<th>Medicine / Insulin Adjustment (name and dose)</th>
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Diabetes Information Resources

Diabetes information resources are listed in alphabetical order to help in your information search. Most cover topics to help patients or their family members with all types of diabetes.

**American Diabetes Association**
Toll Free: 1-800-DIABETES (1-800-342-2383)
Email: askada@diabetes.org
Website: [www.diabetes.org](http://www.diabetes.org)
Find information about managing signs, advice on a healthy diet and exercise, as well as diabetes care at school and work.

**Academy of Nutrition and Dietetics**
Toll Free: 1-800-877-1600
Website: [www.eatright.org](http://www.eatright.org)
Find information about making food choices, and developing positive eating and physical activity behaviors.

**American Heart Association: Diabetes**
Toll Free: 1-800-AHA-USA1 (1-800-242-8721) 1-888-474-8483
Website: [www.heart.org/diabetes](http://www.heart.org/diabetes)
The diabetes section of this site focuses on the ways diabetes can affect heart and blood vessel disease.

**Centers for Disease Control and Prevention (CDC)**
Toll Free: 1-800-CDC-INFO (1-800-232-4636) 1-888-232-6348
Website: [www.cdc.gov/diabetes](http://www.cdc.gov/diabetes)
Find information on the effects of diabetes as well as advice on healthy eating and more. This site has a glucose tracking log and quiz to help determine your risk of developing heart problems.

**Central Ohio Diabetes Association**
Phone: 614-884-4400
Toll Free in Ohio: 1-800-422-7946
Email: coda@diabetesohio.org
Website: [http://diabetesohio.org](http://diabetesohio.org)
This association covers Franklin County (Columbus) and the 10 counties forming central Ohio. Diabetes education classes, case management, and nutrition support are offered.

**MedlinePlus: Diabetes**
Find information about diabetes, living with diabetes, and ways to reduce a person’s risk for the disease. It features tutorials, available in both English and Spanish.

**National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)**
Toll Free: 1-800-860-8747
TTY: 1-866-569-1162
Email: ndic@info.niddk.nih.gov
Website: [https://www.niddk.nih.gov/health-information/diabetes](https://www.niddk.nih.gov/health-information/diabetes)
The website has booklets and brochures on diagnosis, treatment, and managing diabetes. Fact sheets, research, referrals to health professionals, and other resources are in English and Spanish.