Patient Education

Diabetes Care Handbook

DukeHealth

Your Diabetes Care Handbook

Whether you are newly diagnosed or have had diabetes for many years, this handbook is designed to help you learn about diabetes self-care. Taking care of your diabetes will help you stay as healthy as possible.

Your healthcare team can help you learn new information or skills and answer questions you have about your care.

Who do I call if I have questions?

If you have any questions or concerns, call your provider, nurse, or diabetes educator.

_____

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Understanding Diabetes

What is diabetes?

Blood sugar (also called glucose) is your body's main source of energy. Sugar comes from the foods you eat. Insulin, a hormone made by the pancreas, helps sugar get into your cells to be used for energy. When your pancreas is not able to make enough insulin, or your body does not use insulin well, too much sugar stays in your blood. Diabetes is a disease that happens when your blood sugar is too high.

There are several types of diabetes.

Type 1 diabetes:

- Your body no longer makes insulin.
- You need to take insulin every day to live.

Type 2 diabetes (the most common type):

- Your body does not make enough insulin or does not use insulin well.
- You may need diabetes medicines (pills or insulin) in combination with a healthy lifestyle.

Drug induced diabetes or high blood sugar:

- Some medicines can cause high blood sugar or diabetes.
- The most common medicines to do this are steroids.

Diabetes caused by damage to or removal of the pancreas:

- Pancreatitis, pancreatic cancer, surgery, or trauma may make the pancreas less able to make insulin, causing diabetes.
- If the pancreas is removed, diabetes will occur.

What are the symptoms of diabetes?

- Frequent urination (urinating more)
- Increased thirst
- Feeling tired
- Increased hunger
- Blurred vision
- Numbness or tingling in feet or hands
- Unexplained weight loss
- Sores that heal slowly

Why is it important to take care of diabetes?

- When your blood sugar is in a healthy range, you are likely to:
  - have more energy
  - be less tired and thirsty
  - need to pass urine less often
  - heal better
  - have fewer skin or bladder infections
- Over time, high blood sugar can cause health problems such as:
  - heart attack or stroke
  - trouble seeing or blindness
  - nerve damage causing pain, tingling, or numbness in your hands and feet
  - kidney problems
- Taking care of yourself and your diabetes can help you feel good today and prevent problems in the future.

How can I take care of my diabetes?

- Check your blood sugar levels.
- Try to keep your blood sugar levels in target range.
- Take your diabetes medicine(s).
- Eat healthy foods.
- Be physically active.
- Lose weight if you are overweight.
- See your health care provider.
- Stop smoking.
- Manage your blood pressure and cholesterol.
  - High blood pressure and cholesterol increase your risk for heart attack and stroke.
  - You may need medicine to help manage your blood pressure and cholesterol.

Use the camera on your iPhone or QR Code reader on your Android phone to access a short video about diabetes and your heart.

Checking Blood Sugar

You can check your blood sugar with a blood sugar meter (also called glucometer). Knowing your blood sugar numbers can help you make decisions about food, physical activity, and medicines. Use the record on page 20 to log your blood sugar self-checks. Take your blood sugar meter and records with you when you visit your health care team.

How do I get a blood sugar meter?

- You can get a blood sugar meter and supplies at any pharmacy or large discount store.
- If you have insurance, you will need a prescription from your provider for the meter and supplies. Your pharmacist can help you get the brand and model of meter covered by your insurance.
- If you do not have insurance, you can buy a meter without a prescription. Meter prices start at around $10.

How do I learn to use my blood sugar meter?

A home meter follows the same general steps as a hospital meter.

- Wash your hands in warm, soapy water and dry them well. You may use alcohol if you prefer.
- Put a test strip into the meter.
- Prick the side of your fingertip with a lancing device.
- Touch your blood drop to the edge of the test strip.
- The meter will show you how much sugar is in your blood at the moment.

For further help learning to use your home meter, ask the pharmacist where you buy your meter. If you have a problem with your meter, call the toll-free number on the back of the meter.

When should I check my blood sugar?

The number of times that you check your blood sugar will depend on the type of diabetes that you have and the type of medicine you take to treat your diabetes. Talk with your health care team about how often to check your blood sugar.

What are the target ranges?

The American Diabetes Association suggests the following targets for most adults:

Before a meal: **80 – 130**

2 hours after the start of meal: **less than 180**

- Your targets may be different depending on how long you have had diabetes, how old you are, what other medical conditions you have, and other reasons.
- If you are pregnant, ask your provider for your targets.
- Be sure to tell your health care professional if your sugar levels often go above or below your target range.

What is an A1c Test?

- A1c is another tool to help you know if your blood sugars are staying in a safe range.
- A1c is a blood test done at your routine health care provider visit or in the lab.
- It reflects your average blood sugar level over the past 3 months.
- The chart below shows how A1c results relate to average blood sugar.

A1c	Average Blood Sugar
6%	126
7%	154
8%	183
9%	212
10%	240
11%	269
12%	298
13%	326
14%	355
15%	384
16%	412

The American Diabetes Association (ADA) recommends an A1c goal for most adults to be 7% or below.

My recent A1c result:

_____%

Date: _____

Use the camera on your iPhone or QR Code reader on your Android phone to access short videos on testing your blood sugar and on the A1c test.

Diabetes Medicine

Along with healthy food choices and physical activity, medicine can help you manage diabetes. There are many diabetes medicines available. Some are pills, and some are injections.

Metformin is a common medicine for people with type 2 diabetes. Metformin is a pill that helps lower your blood sugar and may help you lose a small amount of weight. There are other diabetes medicines that act in different ways to lower blood sugar levels. Over time, you may need more than one diabetes medicine.

Even if you do not usually take insulin, you may need it at special times, such as if you are in the hospital or during pregnancy.

What is insulin?

Insulin is a hormone made in the pancreas. Insulin helps keep blood sugar levels in target range. It moves sugar from the blood into your body's cells. Usually, the body makes the right amount of insulin on its own. When you have diabetes, your body may not make enough insulin. Some medicines, surgery, or stress can cause you to need more insulin than your body makes.

What are the different types of insulin?

Several different types of insulin are available. Each type starts to work at a different speed and its effects last a different length of time. Your health care provider will prescribe the types and amounts that you need to take.

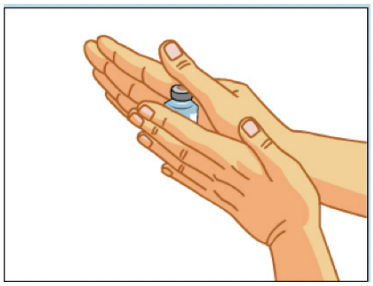
Types of Insulin	Brand Name (generic name)	Guidelines for Taking
Rapid Acting	▪ Humalog (lispro) ▪ Novolog (aspart) _____	Take just before eating meal _____ _____
Short Acting	▪ Humulin R (regular) ▪ Novolin R (regular) ▪ ReliOn R (regular)	Take about 30 minutes before eating _____ _____
Intermediate Acting	▪ Humulin N (regular) ▪ Novolin N (regular) ▪ ReliOn N (regular)	Varies – check with your doctor _____ _____
Long Acting	▪ Lantus (glargine) ▪ Basaglar (glargine) ▪ Levemir (detemir) _____	Usually once per day at the same time every day _____ _____

Types of Insulin	Brand Name (generic name)	Guidelines for Taking
Premixed Insulin	▪ Humulin 70/30 (70% N and 30% R) ▪ Novolin 70/30 (70% N and 30% R) ▪ Humalog 75/25 (75% insulin lispro protamine and 25% lispro) ▪ Novolog 70/30 (70% insulin aspart protamine and 30% aspart)	Varies – usually before breakfast and your evening meal _____ _____

What are the possible side effects of insulin?
Low blood sugar can happen. Learn more about recognizing, treating, and preventing low blood sugar on page 14.

Use the camera on your iPhone or QR Code reader on your Android phone to access short videos on how to prepare an insulin dose and how to give an injection.

How to Inject Insulin With a Syringe



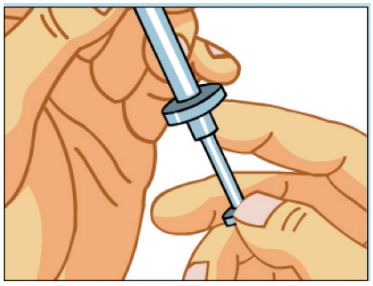
1. Wash your hands.

Check the insulin for lumps, crystals, or discoloring.

Gently roll cloudy insulin between your hands until it is uniformly cloudy.

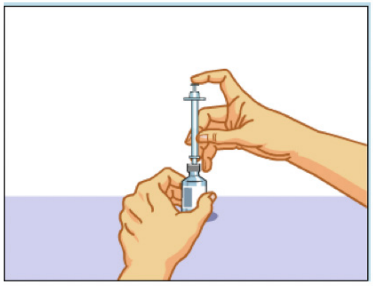
Never shake insulin.

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



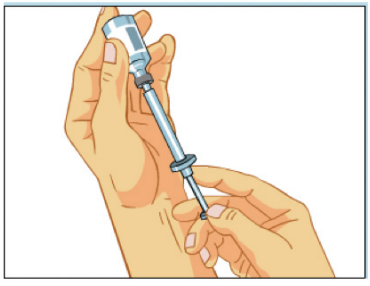
3. Pull the plunger down to let air into the syringe.

The units of air should equal the units of insulin that you plan to inject.



4. Push the air into the insulin bottle.

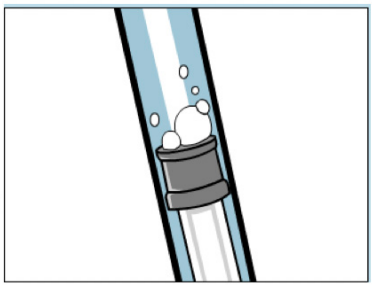
Leave the needle in the bottle.



5. Turn the insulin bottle and syringe upside down.

Be sure the needle is in the insulin, not in the airspace inside the bottle.

Pull the plunger down to get your dose of insulin into the syringe.

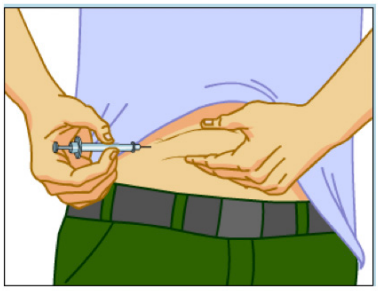


6. Look for air bubbles in the syringe. If there are air bubbles, push the insulin back into the bottle and start again from step 5.

When you have the right insulin units with no air bubbles, pull the syringe out of the bottle.

7. Clean a small area of skin with an alcohol swab, using a circular motion.

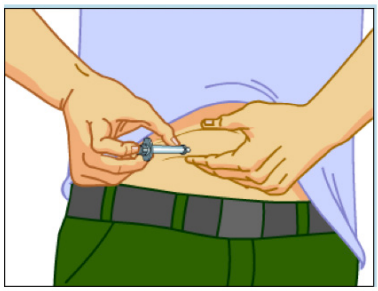
Let the alcohol dry completely before you inject.



8. Pinch up the area of skin that you wiped with alcohol.

Hold the syringe like a pencil.

Be sure the needle does not touch anything.



9. Push the needle into the pinched skin at a 90 degree angle.

Push the plunger to inject the insulin.

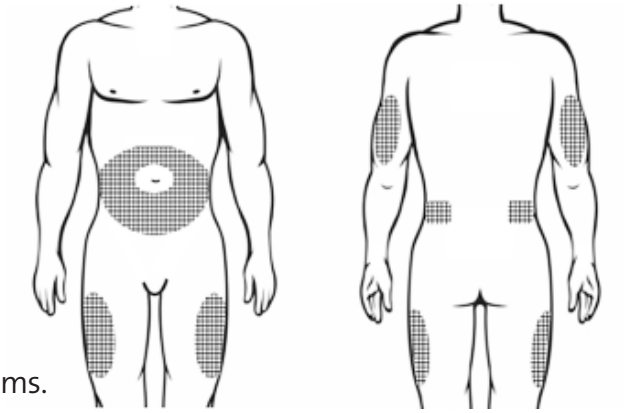
Release the pinch, then pull the syringe needle out of your skin.

If you notice a drop of blood, press a finger on the injection spot for a few seconds.

10. Place the used syringe into a sharps container.

Do not reuse the syringe.

Where should I give my insulin?



- Insulin is injected into the fat layer just under the skin in these areas:
  - Abdomen (belly)
  - Back of the upper arms
  - Top and outer part of the upper legs (thighs)
- It is important to rotate injection sites to prevent problems.
- Do not inject within 2 inches of the navel (belly button), scars, or moles.

What do I do with used syringes and lancets?

- To protect trash collectors from being stuck by needles, never throw loose syringes, needles, or lancets directly in the garbage.
- Put the sharps in a strong container with a tight lid.
  - Laundry detergent, bleach bottles, and peanut butter jars are strong containers.
  - Do not use thin plastic, cardboard, or glass.
- Before the container is full, put the lid on tightly.
  - Needles may more easily poke through the container if it is full.
- Throw the sealed container in your trash at home.
- Do not place into the recycle bin.

How do I store my insulin?

- Always check the expiration date before using. Do not use expired insulin.
- Store unopened insulin in the refrigerator until you are ready to use it for the first time.
- Once insulin is open (rubber top is punctured for the first time), it may be kept at room temperature.
- Do not store your insulin near extreme heat or extreme cold such as the freezer, direct sunlight, or in a car.
- Most types of insulin may be used for about a month after opening.
  - Some types may last for a longer or a shorter time.
  - Read the instructions that come with your insulin carefully.
  - Write the opened date on the bottle, or put a reminder of the expiration date on your calendar.

Healthy Eating

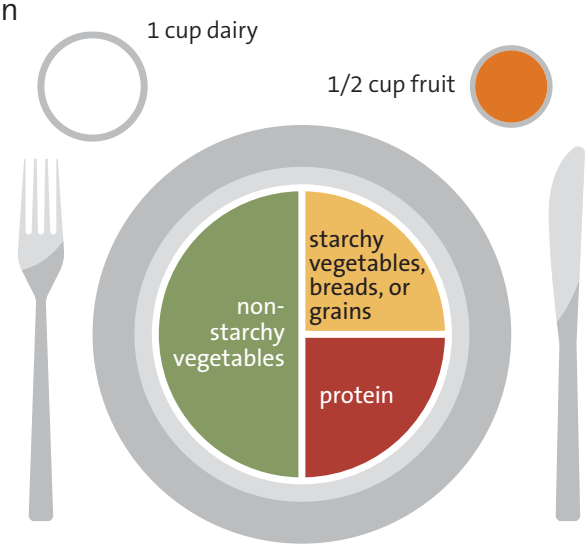
What can I eat?

You may worry that having diabetes means going without foods you enjoy. The good news is that you can still eat your favorite foods, but you might need to eat smaller portions or enjoy them less often. You can follow one of the methods below to help you choose healthy foods.

The Plate Method

The Plate Method is one way to choose healthy foods in the right size portions.

- Fill HALF of your plate with non-starchy vegetables: spinach, carrots, lettuce, greens, cabbage, broccoli, cauliflower, green beans, tomatoes, salsa, onion, cucumber, beets, okra, mushrooms, peppers, turnips, zucchini, eggplant, okra, asparagus, and celery.
- In one small section, add meat or meat substitute: chicken or turkey without the skin, lean beef or pork, fish or other seafood, eggs, tofu, reduced fat cheese.
- In one small section, add a starch such as a grain: bread, pasta, cereal, rice, tortillas, crackers, snack chips, pretzels, or starchy vegetable: corn, peas, beans, or potatoes.
- Add a small piece or serving of fruit.
- Add a small glass of milk. If you don't drink milk, you can add another piece of fruit, yogurt, or small starch serving.



Avoid beverages with added sugars such as sweet tea, regular soda, regular sports or energy drinks, and juice. Drink water or artificially sweetened drinks instead of sugar-sweetened beverages. Consider using a sugar substitute in your coffee or tea.

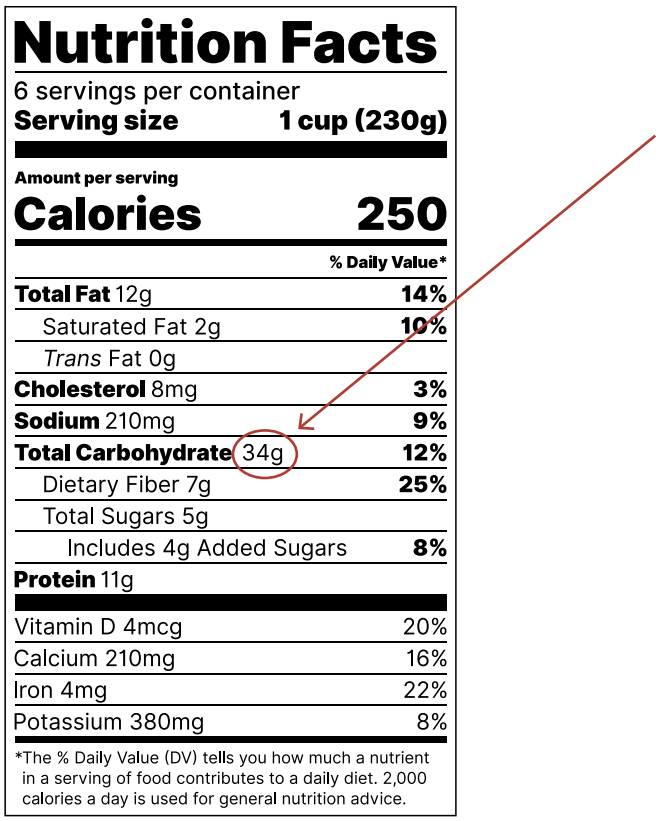
Use the camera on your iPhone or QR Code reader on your Android phone to access a short video on how to build your plate.

Carbohydrate Counting

Carbohydrate counting is another way to help you choose the right foods and portion size.

Foods are made up of fat, protein, and carbohydrate. Most carbohydrates come from starches, fruits, milk, and sweets. Because carbohydrates turn into sugar in your body, they affect your blood sugar more than other foods do. However, this does not mean that you must avoid carbohydrates altogether. Choose healthy carbohydrates from whole grains, beans, fruit, vegetables, and low-fat or nonfat milk or yogurt.

The amount of carbohydrates in foods is measured in grams. Most hospitalized adults with diabetes are allowed about 60 grams of carbohydrates per meal, so that is a good starting point for home meal planning. If you snack, limit your snacks to 15 to 30 grams once or twice a day.



Nutrition Facts

6 servings per container

Serving size **1 cup (230g)**

Amount per serving

Calories **250**

	% Daily Value*
Total Fat 12g	**14%**
Saturated Fat 2g	**10%**
Trans Fat 0g	
Cholesterol 8mg	**3%**
Sodium 210mg	**9%**
Total Carbohydrate 34g	**12%**
Dietary Fiber 7g	**25%**
Total Sugars 5g	
Includes 4g Added Sugars	**8%**
Protein 11g	
Vitamin D 4mcg	20%
Calcium 210mg	16%
Iron 4mg	22%
Potassium 380mg	8%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

To count carbohydrate grams:

- Read the Nutrition Facts Label to find the **Total Carbohydrates** in one serving.
- Use smart phone apps, internet, or calorie counting books to find carbohydrate amounts in foods that you eat.
- Add the grams of carbohydrate from each food you eat to get your total for each meal or snack.

Talk to your provider, dietitian, or diabetes educator for more information. Ask your primary care provider to refer you to a registered dietitian for additional learning.

Physical Activity

Does physical activity help my diabetes?

Physical activity is an important part of managing your blood sugar level and staying healthy. Exercise can improve how your body uses insulin, lower your blood sugar levels, help you lose weight, increase your energy, decrease stress, and improve your cholesterol and blood pressure.

Ask your health care team what physical activities are safe for you.

> Examples: walking, hiking, swimming, water aerobics, dancing, biking, exercise class, playing basketball, tennis, or other sport

Aim for 30 minutes of activity, 5 days a week. If you are trying a new activity, start slowly, with 5 to 10 minutes a day. Then add a little more time each week.

Caution: Exercise can lower your blood sugar. Read more about low blood sugar on page 14.

- Keep low blood sugar treatments with you in case your blood sugar gets low.
- Talk to your health care provider about your exercise plan, including whether you should check your blood sugar or eat a small snack before exercising.

> **Special Situation Type 1 diabetes:**
>
> If you have type 1 diabetes and your blood sugar is high, test for ketones before exercising. **Do not** exercise when you have ketones in your blood or urine. Read more about ketones on page 16.

Use the camera on your iPhone or QR Code reader on your Android phone to access a short video on diabetes and exercise.

What is Low Blood Sugar (Hypoglycemia)?

Low blood sugar is also called **hypoglycemia**. A blood sugar level below 70 is considered to be too low. Low blood sugar is dangerous and needs to be treated right away. Low blood sugar is a possible side effect of insulin and some pills for diabetes treatment.

If your blood sugar gets too low, you may have one or more of the mild-to-moderate symptoms listed below. However, sometimes people don't feel any symptoms.

- Shaky and weak
- Sweaty and clammy
- Nervous and upset
- Fast heartbeat
- Blurry vision
- Hungry
- Headache
- Light-headed or confused

If you begin to feel low blood sugar symptoms:

- Check your blood sugar to find out if it is lower than 70.
- Eat or drink 15 grams of carbohydrates right away.
- Wait 15 minutes and check your blood sugar again.
- If your sugar level is still low, eat or drink another 15 grams of carbohydrates.
- Wait 15 minutes and check your blood sugar again.
- Repeat these steps until your glucose level is 70 or above.

Examples of 15 grams of carbohydrates:

- 4 glucose tablets or 1 tube of glucose gel
- 1/2 cup (4 ounces) of fruit juice—not low-calorie or reduced sugar
- 1/2 can (4 to 6 ounces) of soda—not diet, low-calorie or reduced sugar
- 1 tablespoon of sugar, honey, or corn syrup
- Handful of raisins or candies that you can chew quickly (like jelly beans, gummies, fruit chews)
- Caution: Avoid hard candies which could cause you to choke. Avoid chocolate, cake, cookies, peanut butter, or ice cream to treat low blood sugar. These do not raise glucose fast enough.

After your blood sugar gets back up to 70 or more, if your next meal is 1 hour or more away, eat a small snack. A small snack could be milk and crackers, or a sandwich with lean meat or peanut butter.

Severe hypoglycemia is when your blood sugar level becomes so low that you are unable to treat it yourself. You may be confused, pass out, or have a seizure. You need immediate help from another person. This condition is more common in people with type 1 diabetes.

Someone will need to give you a glucagon injection or glucagon nasal powder if it is available or call 911. Talk with your health care provider about whether you need a glucagon kit and when and how to use it.

How do I prevent low blood sugar?

- Check your blood sugar regularly.
- Eat meals and snacks with the right amount of carbohydrates.
- Do not skip meals.
- Work with your health care provider to learn to adjust diabetes medicine or food to allow for extra physical activity.
- Talk to your health care provider about how to drink alcohol safely. If you drink alcohol, it is best to eat some food at the same time.
- Tell your health care provider if you have had low blood sugar. Your health care team may help you adjust your diabetes medicines, diet, or exercise.

Use the camera on your iPhone or QR Code reader on your Android phone to access a short video on how to give a glucagon shot.

What is High Blood Sugar (Hyperglycemia)?

High blood sugar is also called **hyperglycemia**. It means that your blood sugar level is higher than your target level. Having high blood sugar levels over time can lead to long-term, serious health problems.

Symptoms that your blood sugar levels may be too high:

- Thirsty all the time
- Need to urinate often
- Weak or tired
- Nausea or vomiting
- Fruity smelling breath

How do I treat high blood sugar?

- Drink plenty of water.
- Take a walk.
- Recheck your blood sugar again after an hour to see if it is coming down.
- Call your provider if you have blood sugar above your target on a regular basis. Your diabetes medicine prescription may need to be changed.

How do I prevent high blood sugar?

- Check your blood sugar regularly.
- Take your diabetes medicines.
- Follow your meal and exercise plans.
- Treat infections and illnesses quickly. (Learn more about sick day care on page 17).
- Try stress management strategies such as faith-based activities, meditating, physical activity, support groups, or talking with someone you trust.

Special Situation type 1 diabetes:

- If you have Type 1 diabetes and your blood sugar is over 240, test for **ketones**. **Ketones** are acids your body might make when your blood sugar level is too high and your insulin level is too low. Too many ketones can lead to a serious condition called diabetic ketoacidosis (DKA). You can buy urine ketones test strips over the counter at any pharmacy. Ketones and DKA are less common in people with type 2 diabetes.
- If you have positive ketones, heavy labored breathing, fruity smell on breath, stomach pain, nausea, or vomiting, contact your health care provider right away or go to the nearest emergency department. You may have diabetic ketoacidosis (DKA).

How Do I Take Care of My Diabetes When I am Sick?

Having a cold, the flu, or other infection can raise your blood sugar levels. Your body releases hormones to fight the illness. Higher hormone levels can also cause high blood sugar levels. You should have a plan for taking care of your diabetes when you are sick.

Drink fluids

It is important to get enough water to avoid dehydration. Drink at least 1 cup, or 8 ounces, of water or other calorie-free liquid **every hour** while you are awake to prevent dehydration.

Check blood sugar

Check your blood sugar often, about every 2 to 4 hours, when you are sick. Keep a log of all your results so you can report the results to your health care team.

Check ketones

If you have Type 1 diabetes, check for ketones. If your ketones are positive or if you are vomiting or have nausea or abdominal pain, you may have diabetic ketoacidosis (DKA). Seek emergency care right away.

What should I do about my diabetes medicines when I am sick?

Your body still needs insulin when you are sick. Do not skip insulin doses. Contact your provider if you are eating less than usual or are concerned about taking the full dose.

Some diabetes pills, including metformin, should not be taken when you are sick. Talk to your health care provider **in advance** about how to adjust your diabetes medicines if you are sick. Do not skip medicines without talking to your health care provider.

What should I do if I cannot eat my regular meals?

Try to eat or drink one choice from this list every hour. This can help avoid low blood sugar.

- ½ cup regular soft drink
- ½ cup fruit juice
- 1 cup sports drink
- 6 crackers (saltine)
- 1 slice bread or toast
- ½ cup applesauce
- 1 cup soup
- ½ cup regular ice cream
- ½ cup regular gelatin

When should I call my health care provider or seek emergency care?

- If you vomit more than once
- Have diarrhea for longer than 6 hours
- Blood sugars stay above 200 for 2 days or reach 350
- Blood sugars stay around 70 or below
- Moderate to large ketones in urine (even if your blood sugar is not high)

How Do I Take Care of My Feet?

Over time, high blood sugar may cause nerve damage that can make you lose feeling in your feet. You can hurt your feet without knowing it. Cuts and sores can become infected. If you have poor blood flow to your legs and feet, it can make it hard for a sore or an infection to heal.

To prevent this from happening:

- Keep your blood sugar on target.
- Do not smoke or use any type of tobacco product.
- Check your feet and toes every day for cuts, sores, blisters, calluses, bruises, ingrown toenails, and signs of infection such as redness, swelling, or pus.
  - If you cannot see the bottom of your feet, use a mirror or ask someone else to look.
  - If you find anything, call your doctor no matter how small the problem.
  - Checking your feet daily will help you catch problems early before they get worse.
- Wash your feet every day with warm water and mild soap.
  - Use your hand to test the temperature of the water.
  - Dry your feet well, including in between your toes.
- Put lotion on the tops and bottoms of your feet, but not between your toes.
- Ask your doctor if a medical professional should cut your toenails.
  - If you cut your nails yourself, cut them straight across.
  - Smooth sharp edges with an nail file.
- Wear shoes at all times, including at the pool or beach.
- Check the inside of your shoes before putting them on to make sure the lining is smooth and free of pebbles or other objects.

Use the camera on your iPhone or QR Code reader on your Android phone to access a short video on daily foot care.

When Should I Follow Up With My Provider?

Taking care of your diabetes will help you stay healthy and avoid future problems. See your health care team at least **twice a year** to find and treat any problems early.

At each visit	▪ blood pressure check ▪ foot check ▪ weight check ▪ review of your self-care plan
Two times a year	▪ A1c test (may check more often if it is over 7%) ▪ dental exam to check teeth and gums
Once each year	▪ cholesterol test ▪ complete foot exam ▪ dilated eye exam to check for eye problems ▪ urine and a blood test to check for kidney problems ▪ flu vaccine and discuss other vaccines needed

How can I find support and learn more about diabetes?

Coping with a new diagnosis and making lifestyle changes can be overwhelming. Ask your primary care provider to refer you to an outpatient diabetes education and support program. Duke has outpatient diabetes education programs in the Durham and Raleigh area. To find a class in your area, check with your local health care team, hospital, or area health clinic. You can also search online through the American Diabetes Association or Association of Diabetes Care and Education Specialists. Read more about diabetes online. These are good websites for more information:

American Diabetes Association	**Diabetes.org**
Juvenile Diabetes Research Foundation	**JDRF.org**
National Diabetes Information Clearinghouse	**Diabetes.Niddk.Nih.gov**
Association of Diabetes Care and Education Specialists	**DiabetesEducator.org**
Calorie King (Food Database)	**CalorieKing.com**
Duke MyChart Health Reference Library	**Healthwise.net/DukeHealth**

Blood Sugar Record

The American Diabetes Association suggests the following targets for most adults:

- Before a meal: 80 – 130
- 2 hours after the start of meal: less than 180

Talk to your health care provider about whether these targets are right for you.

	Breakfast		Lunch		Dinner		Bedtime	
Date	Blood Sugar Before	Insulin Dose	Blood Sugar Before	Insulin Dose	Blood Sugar Before	Insulin Dose	Blood Sugar Before	Insulin Dose
__/__/__								
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DUHS Patient Education Governance Council approved October 2020
Diabetes Care Booklet
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Endocrinology