

Diabetes Management

Your guide to understanding diabetes.



Kimberly Cerra, BSN, RN, CDCES

TABLE OF CONTENTS

Topic	Page(s)
Overview of diabetes	3-4
Monitoring blood sugar	5-8
Continuous glucose monitor	9-11
Low blood sugar	12-14
High blood sugar	15-16
Exercise	17-18
Sick day guidelines	19
Foot care	20-21
Healthy meal planning	22-24
Medications	25-26
Insulin	27-28
Injecting with insulin pen	29
Injecting with insulin vial and syringe	30
Sharps	31
Health tips/online resources	32
Financial resources	33-34
References	35

WHAT IS DIABETES?

Diabetes, also called diabetes mellitus, is a disease that causes blood sugar to rise. When you have diabetes, the food you eat cannot be used for energy because your body is not making enough insulin OR the insulin you have is not working the way it should.

Your body changes much of the food you eat into a sugar called glucose. Your blood then carries the glucose to all the cells in your body where it is either used for energy or stored to use later when you need extra energy. The cells use the glucose for energy with the help of a hormone called insulin. Insulin is made by an organ in your body called the pancreas.

What does that mean?

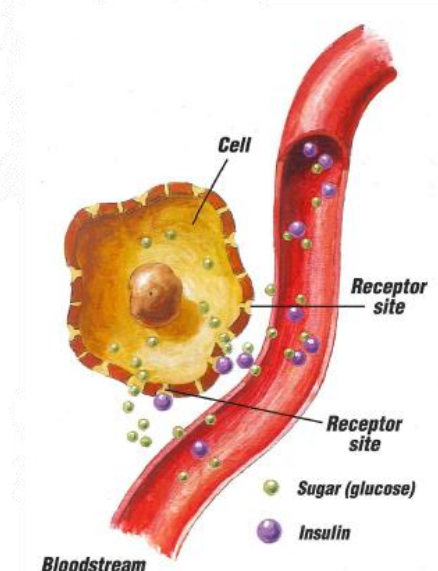
Use your imagination-Let's say you are sitting in your car and need to go to the grocery store, but the car does not move! What does the car need to move? GAS. Ok, say I put gas in the car, and I sit in the car, but the car still does not move...what else do I need? A KEY.

This car is a lot like your body. Just like the car needs gas to move, you also need fuel (food) to move and live. Without gas, the car will not move, likewise, without food you will not have energy. Just like you need a KEY to start your car, your body needs INSULIN to help you use the food you eat for energy. No key and the car will not start, no insulin and your body will starve.

Classification of diabetes

Type 1 diabetes: Idiopathic or autoimmune B-cell destruction, the body makes little or no insulin on its own. People with Type 1 diabetes need insulin via injections or pump.

Type 2 diabetes: The body produces insulin but there is not enough, or it is not very good at changing the blood sugar into energy.



Criteria for the diagnosis of diabetes in non-pregnant individuals

Blood test	Normal Range	Pre-diabetes	Diabetes
Fasting plasma glucose	<100 mg/dL	100-125 mg/dL	≥ 126
A1C test	<5.7%	5.7-6.4%	≥ 6.5%
2-hour glucose value during a 75-g oral glucose tolerance test (OGTT)	<140 mg/dL a	140-199 mg/dL	≥200 mg/dL

What is Hemoglobin A1C (HbA1C)?

A laboratory blood test that measures your average estimated blood glucose over the past 3 months.

It measures the amount of sugar that sticks to hemoglobin, the part of the red blood cell that carries oxygen.

As the hemoglobin travels through the bloodstream, it picks up sugar that is in the blood; the more sugar in your blood, the more sugar sticks to the hemoglobin.

Since red blood cells have about a two-to-three-month life span in the body, we can measure the “sugar coating” of a sample of hemoglobin.

A1C %	Estimated Average Glucose (eAG)
6%	126
7%	154
8%	183
9%	212
10%	240
11%	269
12%	298
13%	326
14%	355

Target A1c for many adults is 7%.

Discuss your goals with your healthcare provider.

BLOOD SUGAR GOALS

American Diabetes Association recommendations for many adults with diabetes:

Blood sugar before meals	80-130 mg/dL
Blood sugar 1-2 hours after beginning of meal	<180 mg/dL

- It is important to note, a healthy blood sugar range may be different for people with serious medical problems, elderly people or very young people, and women who are pregnant.

MONITORING YOUR BLOOD SUGAR

- It is important to check your blood sugar (fingerstick) so that you know whether your diabetes treatment plan is working.
- To check your blood sugar at home you will need a glucose meter, test strips and lancets.
- Recommendations/frequency of monitoring blood sugar at home depends on what medications you are taking for diabetes. It is important to note, you should always follow your provider order regarding frequency.
- Patients managed with lifestyle modifications (diet/exercise) and have a healthy A1c (<7%): Do **not** need to monitor glucose levels on a regular basis. However, as a diabetic, you should always have access to a glucometer and know how to use it. Testing should be done as needed for signs and symptoms of hypoglycemia (low blood sugar) or hyperglycemia (high blood sugar).
- Patients managed with pills or once-weekly Injectables: Check blood sugar at least once per day.
- Patients managed with Insulin(s): Check blood sugar prior to administering any insulin injection(s); 1-4x daily depending on Insulin regimen.

GLUCOSE MONITORING/FINGER STICK TESTING



1. Wash hands/use alcohol pad. Dry hands well.
2. Load lancet (needle) into lancing device (adjust number on lancing device to control depth of finger stick)
3. Place test strip into glucose meter (this will turn machine on).
4. Poke finger with lancing device. Massage your finger in an upward stroke to bring a drop of blood to the surface.
5. Obtain blood sample. Touch a drop of blood onto proper place on test strip- hold finger to edge of strip until blood is absorbed.
6. Obtain blood glucose reading.
7. Remove test strip from meter and discard.
8. Remove lancet from lancing device, place into sharps container.



TIPS FOR TESTING BLOOD SUGAR

- Best time to check is before meals.
- If new to testing, check at various times over the span of 2-4 weeks.
- Example: Monday-before breakfast, Tuesday-before dinner, Wednesday-before bed.
- If not new to testing (and) only testing once per day, check in the morning when you wake up (fasting glucose).
- There may be times that you need to check more often than usual (illness, new medications, having high or low readings).
- Pick a different finger each time.
- Be sure to properly dispose of sharps (needles/lancets) see page 31

KEEPING BLOOD SUGAR RECORDS

- It is important to keep track of your blood sugar levels.
- keeping a written record of your blood sugar will help you and your provider to determine if you are on the best regimen.
- Changes in food, work, exercise, illness, or stress can cause fluctuations in your blood sugar levels.
- Changes in your daily routines can also affect your glucose levels.
- This can be an individualized based on your DM management. Some patients may only need to record glucose levels once per day whereas individuals on multiple daily insulin injections may need to record additional data.

BLOOD SUGAR LOG EXAMPLES

Diabetes record (patients taking insulin)

BG=Blood glucose

Dose= Amount of insulin administered if applicable

	Breakfast		Lunch		Dinner		Bedtime		Comments
	BG	Dose	BG	Dose	BG	Dose	BG	Dose	
Sunday									
Monday									
Tuesday									
Wednesday									
Thursday									
Friday									
Saturday									

Diabetes record (patients not on insulin)

*Option to record blood glucose before meals and 1-2 hours after meal

*This does not mean that you must check 6-8x per day

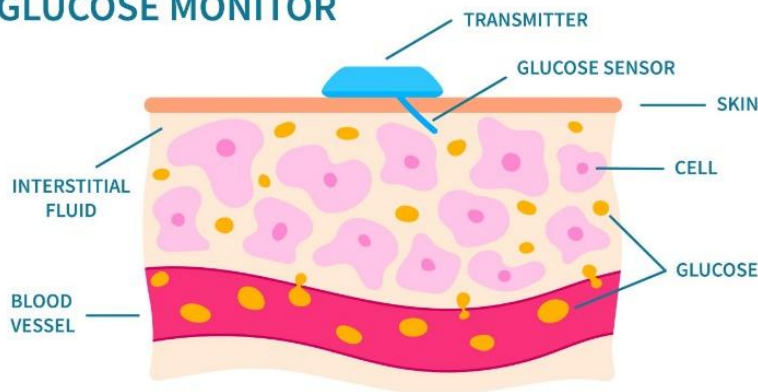
*Can be utilized to check different trends, sometimes check before and after breakfast, sometimes check before and after lunch, etc.

	Breakfast		Lunch		Dinner		Bedtime	Comments
	Before	After	Before	After	Before	After		
Sunday								
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								

CONTINUOUS GLUCOSE MONITOR

- A continuous glucose monitor, also called CGM, measures blood sugar levels within the fluid that surrounds the cells below the skin (interstitial fluid).
- Glucose hits your bloodstream first and then leaks into your interstitial fluid. So, there is a lag between your blood glucose level and interstitial glucose levels. This means there may be a few minutes delay in your CGM sensor glucose readings compared with fingerstick blood glucose readings (up to 20 minutes delayed).
- A CGM is made up of a sensor, transmitter, and a monitor (receiver). The sensor is the part of the device that senses blood sugar levels within the fluid. The sensor sends the blood sugar reading to the transmitter. The transmitter then sends the information to a monitor/receiver. Blood sugar reading shows up on a display screen on the monitor/receiver. This may be a separate handheld device (receiver). Many CGM devices allow you to use your smartphone as the receiver if the specific CGM device app is compatible with cellphone.

CONTINUOUS GLUCOSE MONITOR



Who might qualify for a CGM?

Most insurance companies will cover a CGM if patient is on insulin.

Contact your insurance company to find out specifics on coverage/cost.

Benefits of CGM use:

- Helps identify trends that can assist with modifying dietary patterns or insulin doses.
- Reduce risk of hypoglycemia and hyperglycemia
- provide real-time and retrospective information about glucose levels which can help individuals and their healthcare providers understand how factors like food, activity, stress, and illness impact glucose levels.
- CGM data can be downloaded and reviewed with your healthcare provider.
- Review blood sugar levels over night.
- Most CGM systems have alarms that allow you to set a range you feel comfortable with. If your blood sugar goes below or above this range, the CGM will send signal/alerts so that you can make appropriate and timely changes.



Considerations with CGM use:

- CGMs must be removed prior to any MRI or CT scan.
- It is important to always have a glucometer with adequate testing supplies as back-up.
- CGM systems are less accurate on the first day of use, use caution with readings and compare CGM readings with a blood glucose meter if you are unsure of the accuracy.

Example: CGM monitor is alarming that blood sugar is low at 65. Individual feels fine and does not have any s/s hypoglycemia. Check fingerstick with glucometer to compare.

- Skin irritation: the adhesive patches used to attach the sensor can cause skin irritation.
- Medications: Some medications can cause false readings including Acetaminophen, Hydroxyurea, and Vitamin C. You do not need to remove device if taking any of these medications. However, it is important to be cautious of readings and obtain fingerstick with glucometer for any discrepancies in glucose readings and symptoms.
- Alarm fatigue: depending on your settings, you may get several alarms from your CGM. This can become distressing and lead to burnout, and/or disrupt your sleep. Before removing the device, consider adjusting your alarm settings to better fit your schedule and routine. You can also turn off alarms if needed. This would still allow you to check the monitor/receiver/phone for glucose readings without receiving alarms that have become distressing.

Hypoglycemia= Low blood sugar (<70 mg/dL)



Signs and symptoms:

- Headache
- Hunger
- Confusion
- Nervousness or irritability
- Sweaty or clammy
- Pale skin color
- Dizziness or shakiness
- Faster than normal heartbeat
- Numbness or tingling around the mouth.
- Sudden moodiness or behavior changes

How to treat low blood sugar:

Check your blood sugar (if possible)

Treat with 15 grams of glucose (rule of 15)

Examples of 15 grams of glucose include:

- 3-4 glucose tablets
- 4 Ounces (1/2 cup) of juice or regular soda (not diet)
- 3-4 pieces of small hard candy (starbursts, life savers)
- 1 tablespoon of sugar, honey, or syrup
- 8 ounces of milk



Once you have treated with 15 grams of glucose, wait 15 minutes, and recheck your blood sugar.

If blood sugar is still less than 70 mg/dL, treat again with additional 15 grams of glucose.

****If the person is unconscious, give glucagon according to package directions and call 911****

****If you are prescribed any Insulin (long-acting and/or rapid-acting), you should have a prescription for glucagon for emergencies****



Causes of low blood sugar:

- Taking too much Insulin
- Not eating enough food, or delayed meal/snack
- More active than normal
- Recent weight loss
- Certain diabetes medications
- Acute illness/sick

Consumption of alcohol: The liver is busy breaking down alcohol instead of releasing glucose into the bloodstream. It takes the liver about 1-1.5 hours to process each alcoholic drink. The risk of low blood sugar increases with each drink. Your liver regains the ability to release sugar after the alcohol has been removed from your body, which usually takes about 12 hours. If drinking alcoholic beverages, be mindful of the carbohydrates/sugars in each drink, monitor glucose more frequently, and try to consume a snack with carbohydrates and protein to maintain glucose levels and prevent hypoglycemic episode.

Hyperglycemia= High blood sugar

It is important to note that high blood sugar is any number above YOUR target range. Not every individual will have signs/symptoms of high blood sugar based on a set glucose value.



Signs and symptoms:

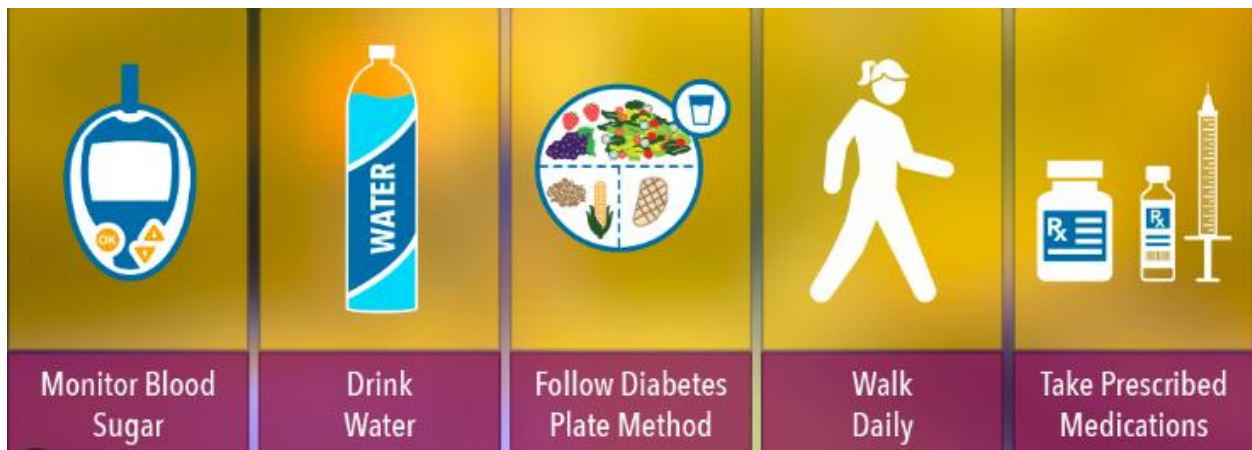
- Thirsty
- Hungry
- Sleepy, fatigued, weak, decreased energy.
- Increased urination
- Blurry vision or problems seeing
- Infections/injuries that are slower to heal than usual.
- Fast breathing
- Nausea or decreased appetite

How to treat high blood sugar:

- Test blood sugar every couple of hours.
- Notify physician for consistent high blood sugars (BG >250 x 3)
- Adjustment in medication (s) if indicated by doctor.
- Follow meal plan; decrease intake of sweetened foods/beverages.
- Increase consumption of fluids; drink at least 8 ounces of water every hour
- Participate in a healthy activity if able, such as going for a walk.
- Check for ketones if indicated by your provider.

Ketones

You may be told to check your urine for ketones when your blood sugar level is >250 and you are not feeling well. Ketone strips should be ordered for all type 1 diabetics and those who are insulin dependent with risk for diabetic ketoacidosis (DKA).



Causes of high blood sugar:

- Not enough Insulin
- Stress, Illness, trauma, surgery
- Pain
- Skipping diabetes medications
- Consumption of carbohydrates (sugar)

EXERCISE

Exercise helps lower your blood sugar in two ways. First, regular exercise can help you shed unwanted pounds, which can bring your blood sugar levels down. Second, exercise at the right level can make your body more sensitive to insulin, which can lead to a drop in blood sugar levels.

The American Diabetes Association (ADA) recommends being active for at least 2 ½ hours (150 minutes) a week spread over 3 or more days a week. The ADA also recommends doing resistance exercise (weights or weight machine) 2-3x per week, with a rest day in between. Flexibility and balance exercises, such as yoga, are recommended for older adults 2-3x per week.

What time of day is best to exercise?

Earlier in the day is better. The earlier in the day you exercise, the more blood sugar you use throughout the day. Exercising at night can increase the risk of having low blood sugar when you are asleep. If you cannot exercise in the morning, exercise when you can.

The key is to move around as much as possible.

- Walk around baseball field when you take your child to practice.
- Walk around the mall or a large store when you are shopping.
- Do yoga for 10 minutes after meal.
- At work: park far away, take the stairs, walk during lunch.
- At home: walk your pet, do yardwork or garden, clean the house, go up and down the stairs, get up and move during commercials.



Tips for exercising with diabetes:

- Talk with your healthcare provider about getting started.
- Find out what types of exercises are right for you.
- Start slowly and gradually increase your pace and the amount of time.
- Walking is an effective way to get started, start with 5 minutes twice a day.
- If you experience any pain or discomfort, stop, and consult with physician.
- If you are unable to walk, chair exercises may be suggested.
- Check your blood sugar before and after you exercise (exercise can lower your blood sugar for 12-24 hours after your exercise session)
- Watch for signs of low blood sugar.
- If your blood sugar is >250 mg/dL, do not perform any type of vigorous exercise as it can cause your blood sugar to increase even more.
- If your blood sugar is <100 mg/dL, eat a light snack before exercising (15 grams carbohydrates)
- Do not inject fast-acting Insulin into an area of the body that you will use when you exercise. For example, if you are going to be biking, avoid using your legs as an injection site that day.
- Always carry an emergency source of carbohydrates in case of a low blood sugar (glucose tablets, lifesavers, Gatorade)
- Wear well-fitting athletic shoes, you need good support that fit your feet, wear socks, check your feet for red spots or blisters after exercise.
- Wear medical identification.

SICK DAY GUIDELINES

When you are sick, diabetes is harder to control. Even a slight cold can cause your blood sugar to be high.

Follow these guidelines when you are sick:

- Keep drinking fluids to stay hydrated (8 ounces per hour)
- **Always take your insulin or diabetes medications even if you do not feel well.** Call your healthcare provider if you are not sure how much to take.
- Try to stay on your meal plan/diet, try to eat same amount of carbohydrates to prevent low blood sugars.
- Evaluate your blood sugar often. You may need to test every 2-4 hours until you feel better, and your blood sugar levels return to target range

When to call your healthcare provider:

- Unable to eat or drink liquids.
- Vomiting or diarrhea that lasts 6-12 hours or longer.
- Feeling too ill to take your diabetes medications.
- Unable to control your blood sugar or have ketones in urine.
- Blood sugar > 240 mg/dL twice in a row (if this is uncommon for you)



DIABETES FOOT CARE

Over time, diabetes can damage the nerves in your body. Damage to your nerves can cause burning pain and loss of feeling in your feet and legs (Neuropathy). Diabetes can also damage your blood vessels meaning your feet and legs may not be getting a good supply of blood.

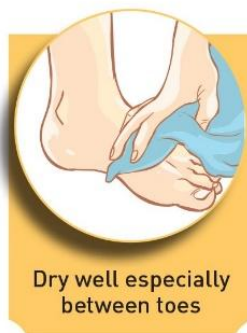
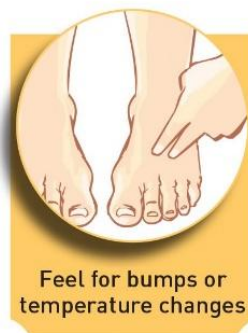
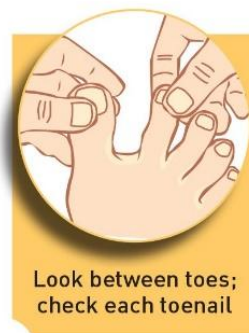
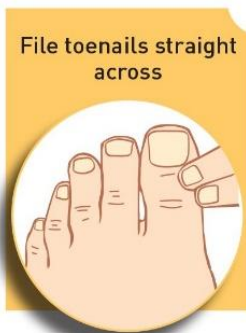
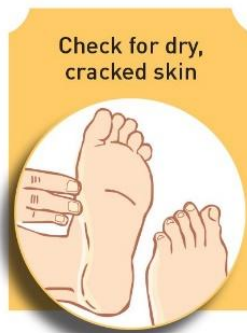
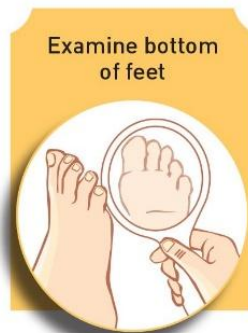
Prevention is the key!

Tips for foot care:

- Control your blood sugar.
- Check your feet daily; look for redness, swelling, sores, blisters, cuts.
- Be sure to check between your toes.
- Exercise daily if able.
- Wash your feet each day with soap and water (assess the temperature with your elbow before you step into water)
- Dry your feet carefully, especially between the toes.
- Always wear shoes and socks; do not go bare foot (even in your own house!)
- Wear sturdy supportive shoes that fit well; Medicare part B covers certain shoes and inserts for people with diabetes; discuss with your healthcare provider.
- Use padded, seamless socks that fit properly.
- Change your socks every day.
- Avoid exposing your feet to temperature extremes.
- Moisturize with unscented lotion; this can prevent fissures (cracks in the skin). Do NOT put lotion between the toes.
- Slowly break in any new shoes by wearing them for only 1-2 hours for several days

Warning signs to notify your healthcare provider:

- Redness or swelling
- Signs of ingrown toenails
- Slow healing sores
- Discoloration of skin
- Sensation changes (numbness, tingling, or burning)
- Drainage of any kind
- Change in temperature of the skin.



HEALTHY MEAL PLANNING

Learning how to eat well is an essential part of managing diabetes. The right foods can help you maintain a healthy weight and keep your blood sugar at a steady level.

Although there are some general guidelines, there is no universal nutrition plan that every person with diabetes should follow.

Meal plans should be tailored to each person's individual needs.

Reading labels

Check serving size. Information on the label is based on 1 serving. Keep in mind that packages often contain more than 1 serving. This example shows that the package contains 8 servings. But the food facts given are for only 1 serving.

Look at the amount of fat. Try to limit saturated fats and avoid trans fats.

Check how many grams of total carbs are in each serving. This number is important if you are counting carbs.

Notice how many grams of fiber are in each serving. Dietary fiber has many benefits on your body, such as helping to lower cholesterol. Therefore, try to choose foods with the most fiber.

Look at how many grams of added sugar the food contains. This is sugar that has been added as the food is made. Try to choose foods with less added sugar.

Nutrition Facts	
8 servings per container	
Serving size	2/3 cup (55g)
Amount per serving	
Calories	230
% Daily Value*	
Total Fat 8g	10%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 160mg	7%
Total Carbohydrate 37g	13%
Dietary Fiber 4g	14%
Total Sugars 12g	
Includes 10g Added Sugars	20%
Protein 3g	
Vitamin D 2mcg	10%
Calcium 260mg	20%
Iron 8mg	45%
Potassium 235mg	6%

* 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.

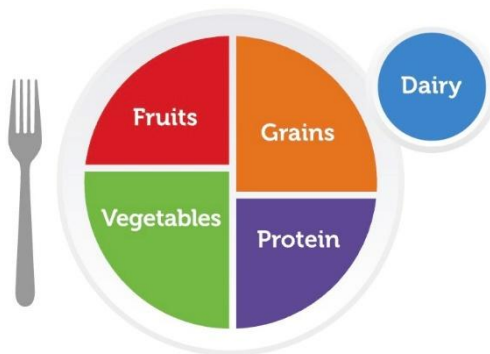
Carbohydrates affect blood sugar the most. They are the body's main source of energy.

General guide for planning a balanced meal (remember this is not for everyone)

	Inactive women	Women	Inactive men	Men
Carbs per meal	30-45 grams	45-60 grams	45-60 grams	60-75 grams
Protein per meal	2 oz. (14 grams)	2-3 oz. (14-21 grams)	2-3 oz. (14-21 grams)	3-54 oz. (21-28 grams)
Servings added Fat per meal	1 (5 grams)	1-2 (5-10 grams)	1-2 (5-10 grams)	2-3 (10-15 grams)
Calories per day	1200-1400	1500-1800	1500-1800	2000-2400
Carbohydrate per day	150 gm	200 gm	200 gm	300 gm
The amount of carbohydrates per day listed here should be distributed (eaten) evenly throughout the day.				

Inactive: Less than 30 minutes of exercise per day

Active: Greater than 30 minutes of exercise per day



Healthy eating tips:

- Eat a variety of foods in the right amounts.
- Eat regularly, the longer you go without eating, the more likely your body will use its own energy stores, which may lead to higher readings.
- Portion control!
- Aim for 3 balanced meals a day.
- Eat small snacks (15 grams carbs) between meals if you need them.
- Eat plenty of non-starchy vegetables, fruits, lean protein, and whole grain foods.
- Limit foods that are high in saturated fats
- Minimize foods containing added sugar and refined grains.
- Choose whole foods rather than highly processed foods.
- Drink 8-ounce glass of water 6-8 times a day (if no restrictions on fluid intake)
- Choose healthy fats in lesser amounts.
- Try to eat about the same amount of carbs at each meal.
- Fiber: women should eat 28 grams of fiber per day, Men should eat 38 grams of fiber per day

Snack ideas: The following snacks contain 15 grams of carbohydrates with protein.

- ½ of an English muffin with 1 Tbsp. peanut butter
- ½ of a sandwich (1 slice of bread) with 1 Tbsp. peanut butter, or 1 oz. cheese or meat
- 2 slices of lite bread with 1 Tbsp. peanut butter
- ½ cup of regular or sugar-free ice cream with peanuts
- ½ cup of lite canned fruit with ¼ cup of low-fat cottage cheese
- ½ cup of sugar- free pudding with cool whip
- 6 oz. lite yogurt

DIABETES MEDICATIONS

These are the most frequently prescribed oral medications for diabetes management. If your medication is not listed here, ask your healthcare provider or pharmacist for more information.

It is generally the normal progression of diabetes to eventually need medication and/or change the amounts/types of medications to effectively manage diabetes.

Type	Name	How it works	Possible side effects	Comments
Sulfonylureas	Glyburide Glipizide Glimepiride	Stimulates the pancreas to release more insulin	Low blood sugar	Take with meals
Biguanides	Metformin (Glucophage) Metformin XR	Decreases the amount of glucose that is produced by the liver and makes muscle tissue more sensitive to insulin.	Abdominal discomfort, nausea, diarrhea for 10-14 days	Metformin XR can be used to mitigate diarrhea. Take with food.
SGLT2 Inhibitors	Jardiance Invokana Farxiga Steglatro	Prevents kidneys from reabsorbing glucose, so that it can be passed out of the body in urine	Increased urination, UTI's, genital infections, hypotension	Important to stay hydrated, drink plenty of water
DPP-4 Inhibitors	Januvia Onglyza Tadjenta Nesina	Prolongs action of gut hormones, increases insulin secretion, delays gastric emptying	Headache and flu-like symptoms (nausea, joint pain)	Can be costly.
GLP-1 receptor agonist	Ozempic Trulicity Victoza Bydureon Mounjaro Rybelsus	Increases insulin release with food, slows gastric emptying, promotes satiety, suppresses glucagon	Nausea, vomiting, weight loss	All of these are once weekly Injections (not insulin) except for Rybelsus which is a pill

Tips for medication management:

- Keep a list of each medication you take in your wallet or purse.
- Report any side effects you have to your healthcare provider.
- Medications must be taken daily (exception weekly injectables), missing doses of medication will cause blood sugars to increase.
- Medicine does not cure diabetes; it helps control diabetes.
- It is important to eat after taking your medicine (some meds **must** be taken with meals; refer to prescription label for instructions on use)
- If you are not feeling well, you should still take your medications.
- If you have an upcoming procedure or have questions/concerns about stopping your medication(s), contact your healthcare provider.
- Make sure you refill your prescription before you run out.



INSULIN

If your body is not making enough insulin or using it efficiently, you may need insulin shots (injections). The purpose of insulin is to lower your blood sugar.

There are many kinds of insulin. They are different in how fast or how slow they work (see chart below)



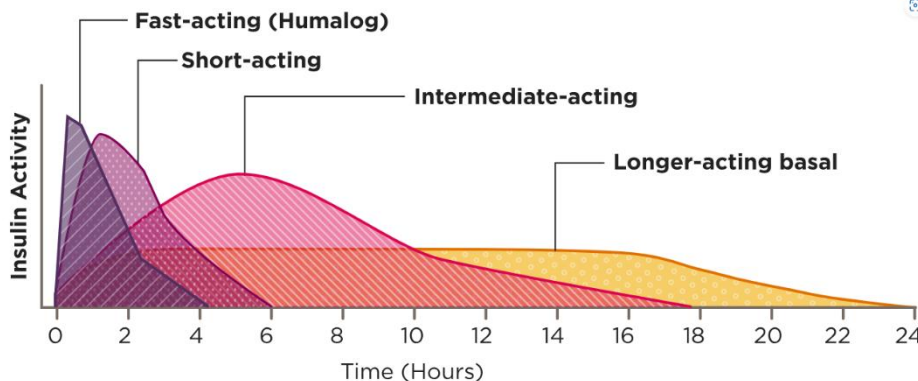
Basal Insulin (long acting): “background” insulin, continuous insulin that works throughout the day and night.

****Basal/long-acting insulin** should be taken at the same time each day, usually morning or bedtime.

Bolus insulin (known as rapid-acting or short-acting insulin): Needed to match the amount of carbs you eat in a meal or snack and to correct blood glucose that is too high.

			Effective			
Action		Insulin Name	Onset	Peak	Duration	Considerations
Bolus	Very Rapid Acting Analogs	Aspart (Fiasp)	16 - 20 min	1 - 3 hrs	5 - 7 hrs	Bolus insulin lowers after-meal glucose. Post meal BG reflects efficacy.
		Lispro-aabc (Lyumjev)	15 - 17 min	2 - 3 hrs	5 - 7 hrs	
	Rapid Acting Analogs	Aspart (Novolog)	20 - 30 min	1 - 3 hrs	3 - 7 hrs	Basal insulin controls BG between meals and nighttime. Fasting BG reflects efficacy.
		Lispro (Humalog*/ Admelog)	30 min	2 - 3 hrs	5 - 7 hrs	
	Glulisine (Apidra)	15 - 30 min	1 - 3 hrs	3 - 4 hrs		
	Short Acting	Regular*	30 - 60 min	2 - 4 hrs	5 - 8 hrs	
Basal	Intermediate	NPH	2 - 4 hrs	4 - 10 hrs	10 - 16 hrs	Side effects: hypoglycemia, weight gain.
	Long Acting	Detemir (Levemir)	3 - 8 hrs	No peak	6 - 24 hrs	
		Glargine (Lantus*/Basaglar/Semglee/Rezvoglar)	2 - 4 hrs		20 - 24 hrs	Typical dosing range: 0.5-1.0 units/kg body wt/day.
		Degludec (Tresiba)*	~ 1 hr		< 42 hrs	
Basal + Bolus	Intermediate + short	Combo of NPH + Reg 70/30 = 70% NPH + 30% Reg 50/50 = 50% NPH + 50% Reg	30 - 60 min	Dual peaks	10 - 16 hrs	Discard most open vials after 28 days. For pen storage guidelines, see package insert.
	Intermediate + rapid	Novolog® Mix - 70/30 Humalog® Mix - 75/25 or 50/50	5 - 15 min		24 hrs	

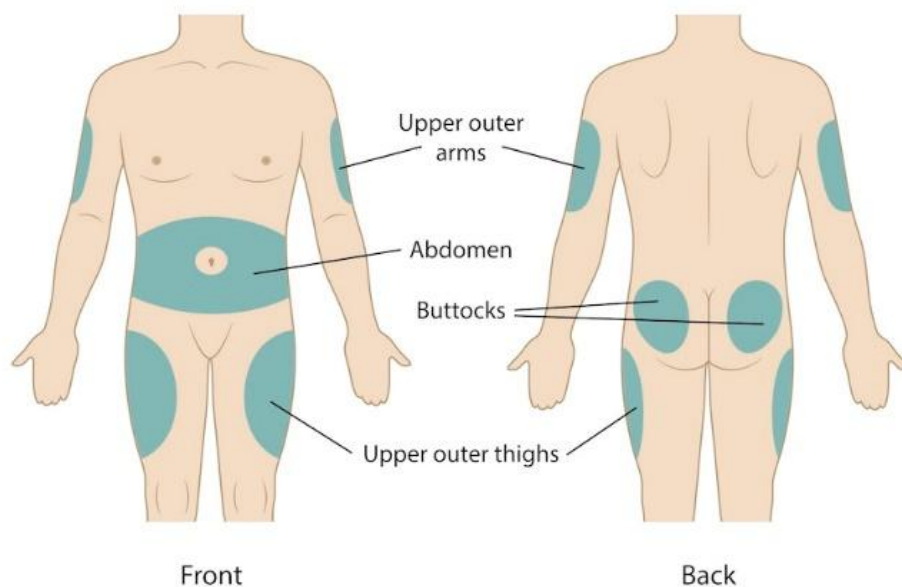
*Concentrated insulins available - see Concentrated Insulin Card for details. Insulin action times vary; time periods are general guidelines only.



More about insulin:

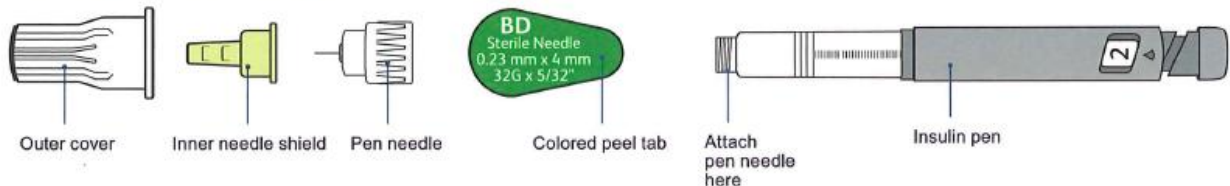
- Storage: the insulin vial or pen you are using does not have to be stored in the refrigerator once you have started using it. Extra unused vials or pens should be kept in the refrigerator.
- Insulin should be kept at a consistent room temperature between 36- and 86- degrees Fahrenheit. Do not leave your insulin in a hot or cold car.
- Insulin should be injected into the fatty tissue just under your skin. Best places to inject are abdomen, buttocks, hips, thighs, and upper arms.
- Different areas absorb insulin faster than other areas. Insulin enters the bloodstream fastest from the abdomen and more slowly from the buttocks.
- Injection sites: change the area (site) you use for your injections, using the same spot can cause sores, lumps, indentations, and thickening of the skin making it difficult for insulin to be absorbed.
- Do not inject insulin: near moles or scars, in areas that look red or infected, within 2 inches of the navel (in any direction)

Insulin injection sites



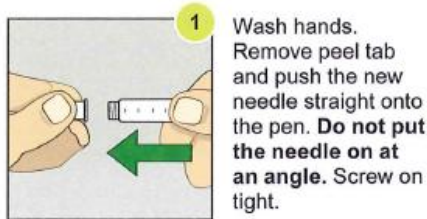
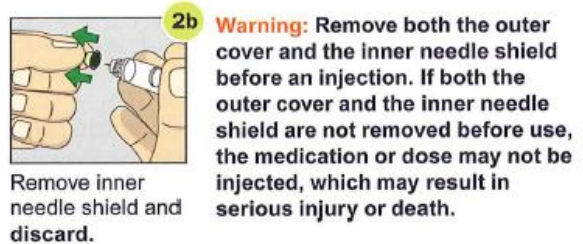
Injecting with insulin pen

Parts of a pen needle

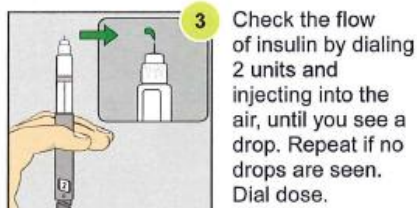
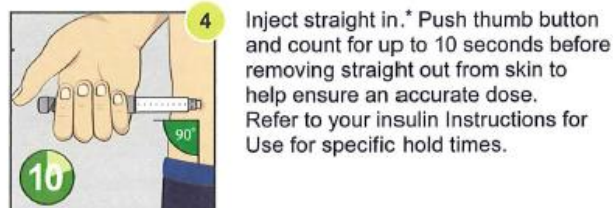


How to inject with a 4 mm pen needle

Please be sure to consult the pen manufacturer's instructions for injection of subcutaneous drugs other than insulin, as well as for additional preparation steps for insulin injection, including but not limited to removing the pen cap, dosage dialing and skin cleaning.



Warning: Remove both the outer cover and the inner needle shield before an injection. If both the outer cover and the inner needle shield are not removed before use, the medication or dose may not be injected, which may result in serious injury or death.



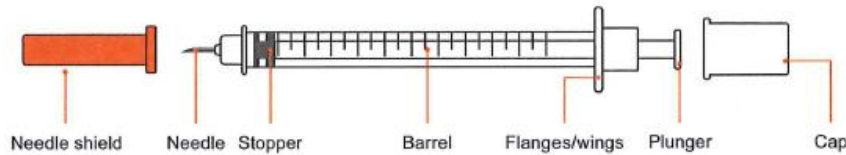
Safely dispose of pen needle immediately in appropriate sharps container.

For additional information, visit bd.com/sharpsdisposal

Consult the Instructions for Use and/or your Healthcare Professional about proper injection technique.

Injecting insulin with vial and syringe

Parts of an insulin syringe



How to inject

- 

1 Wash hands and gather supplies. To expose plunger, twist white cap then pull off.
- 

2 Wipe top of insulin bottle with an alcohol swab. If you are taking cloudy insulin, roll the bottle between your hands until it is uniformly cloudy. To avoid the formation of air bubbles do not shake the bottle of insulin.
- 

3 To expose the needle, twist the orange shield, then pull straight off, being careful not to bend the needle or let the needle touch anything.
- 

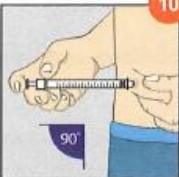
4 Pull the syringe plunger down to the desired number of units. You need air in the syringe equal to the amount of insulin you will take.
- 

5 Push the needle through the center of rubber top of insulin bottle and push plunger down completely.
- 

6 Leave the needle in the insulin bottle. Carefully turn the bottle and syringe upside down, so the bottle is on top.
- 

7 Pull the plunger down slowly, aligning the thin black line of the plunger with the desired number of units on the syringe.
- 

8 If air bubbles appear in syringe, push the plunger up, injecting insulin back into bottle and redraw insulin to desired number of units. Pull the syringe out of the bottle.
- 

9 Confirm the dose is correct and then clean a small area of skin. Ensure the skin surface is completely dry before injecting.
- 

10 Hold the syringe like a pencil. Pinch up your skin and push the needle quickly through the skin at 90° (straight in) to the skin surface. Push the insulin in with the plunger. Pull the needle out of your skin. Release the skin pinch.

Do not recap used needles. Use the needle once and dispose of it properly.

Consult the Instructions for Use and/or your Healthcare Professional about proper injection technique.

SHARPS DISPOSAL

1. Every medicine is different and some have specific disposal instructions
2. If your medicine is used by someone else, it could cause harm to them.
3. Ask your pharmacist/pharmacy before flushing unused medications down the toilet or sink. Some pharmacies may have a "mail-back" or drop off option.
4. Ask your local law enforcement department if they have a drop box or drug take back day.
5. All hospitals in New York State (except federal facilities) are required to take needles, SHARPS and syringes. If you can't get to a hospital, check with your trash service to see if you can put them in a "puncture-proof" container that is sealed and labeled.
6. If the medicine does not have disposal instructions and you do not have a "take-back" program available: Take the medication out of the bottle and mix with water, used coffee grounds, dirt, or cat litter. Put the mix into a container that can close such as a coffee tin, plastic container or sealable bag and place in your household trash container.

Do not mix unused medications with food. This will prevent human, pet or wildlife consumption.

Do not place needles, SHARPS or syringes in your trash, drop box or mail-back package.



SAFE MEDICATION DISPOSAL RESOURCES

New York State Department of Environmental Conservation (DEC) Bureau of Public Outreach
515.402.8044 or RX.takeback@dec.ny.gov

U.S. Food and Drug Administration (FDA)
www.fda.gov

Call the Drug Enforcement Administration (DEA) to find a collection receptacle location
800.882.9539

Call the Onondaga County Resource Recovery Agency (OCCRA)
315.453.2866 or info@ocrra.org

Hospital Collection Sites for Sharps in NYS:
www.health.ny.gov

Call your county, municipality or local police department.

Check with your mail order or local pharmacy.

General health tips for patients with diabetes

- Traveling: plan ahead, always carry diabetes medicines, and testing supplies with you. Carry extra food and snacks and check your sugar often,
- Regular office visits every 3-6 months with primary care doctor or endocrinologist (diabetes specialist)
- Regular dental visits every 6 months.
- Foot exam with sensory testing at least once per year
- Dilated eye exam once per year
- Complications associated with diabetes: kidney damage, nerve damage (neuropathy), eye disease (retinopathy, cataracts, glaucoma), heart disease (heart attack and stroke), skin conditions, foot problems, and more.
- Preventing complications: Maintain a healthy weight, exercise daily, do not use tobacco in any form, control your cholesterol and other blood lipids (fats), and control your blood pressure.
- Stress: your body reacts to stress by sending out hormones which can cause your blood sugar to increase. Identify the cause of the stress, eliminate the stressors that you have control over, exercise regularly, make time for fun, get enough sleep, meditation.

Online resources:

American Diabetes Association (ADA): Diabetes education library with over 170 free downloadable or printable PDF materials on a range of diabetes-related topics.

Breakthrough T1D (formerly JDRF): Leading global organization funding type 1 diabetes research

Joslin Diabetes Center: offers online diabetes classes and resources.

FINANCIAL RESOURCES

Walmart

Insulin (Walmart brand)

- ❖ Novolin R
- ❖ Novolin N
- ❖ Novolog 70/30

1 (10ml) vial= \$24.88

1 box of 5 pens= \$42.88

Reference:

Action	Name	Onset	Peak	Effective Duration
Short Acting	Regular (Novolin R)	30-60 min	2-3 hrs.	5-8 hrs.
Intermediate	NPH (Novolin N)	2-4 hrs.	4-10 hrs.	10-16 hrs.
Intermediate + Short	Novolog 70/30 70% NPH + 30% Reg	30-60 min	Dual peaks	10-16 hrs.

Oral medications

- Glimepiride (1mg, 2mg, 4mg) 30 tablets, \$4
- Glipizide (5mg, 10mg) 60 tablets, \$4
- Metformin (500mg, 850mg, 1000mg) 60 tablets, \$4
- Metformin ER 500mg 120 tablets, \$4
- Metformin ER 750mg 60 tablets, \$4
- Glipizide ER (2.5mg, 5mg, 10mg) 30 tablets, \$9
- Glyburide/Metformin (2.5mg-500mg, 5mg-500mg) 60 tablets, \$9

Glucometers

- Reli On Premier Classic glucometer \$9
- Reli On premier Blu (Bluetooth capabilities) \$18.98
- Reli On premier test strips
 - 25 ct. \$5
 - 50 ct. \$9
 - 100 ct. \$17.88
- Reli On lancing device \$5.92
 - Ultra-thin lancets 100 ct. \$1.62

Price Chopper Pharmacy: Diabetes Advantage Program

Oral Medications

- **FREE:** Glimepiride, Glipizide, Glipizide XL, Glyburide, Metformin, Metformin ER (500mg & 750mg tablets)

Glucose Meters

- GE100 Blood glucose meter: FREE
- GE blood glucose test strips, 50 ct. \$11.99
- Lancet device and lancets: FREE

Insulin Pen tips (4,5,6,8mm) 100 ct. \$9.99

Assistance with prescription Costs through Novo Nordisk

Link: www.novocare.com

Medications included in this program Include: Fiasp Insulin, Levemir Insulin, Novolog Insulin, Novolog 70/30 Insulin, Ozempic Injection, RYBELSUS, Tresiba Insulin, Victoza Injection, Xultophy 100/3.6 Insulin degludec and liraglutide injection.

Patient Assistance Program: Provides medication at no cost to those who qualify (Household income below 400% of FPL, no insurance, not receiving any other federal/state/gov program)

Patient can fill out application online or print it and fill it out. Last step of the application is PCP or MD who would be signing for Insulin. Patient will need the providers email address. The application is delivered electronically to the provider for signing. The medications are sent to the provider address for appropriate dispensing to the patient. This is a FREE program for those who qualify.

Savings offer: For commercial insurance, pt.'s may be eligible to pay as little as \$25 per 30-day supply for up to 24 months (co-pay/savings cards) can be downloaded on the novocare website or texted to patients' phone.

My \$99 Insulin: Patients may be eligible for monthly supply of any combination of Novo Nordisk Insulin products (up to 3 vials or 2 packs of pens). Offer is available each month during a calendar year. *Please note that 2 packs of pens may last a patient longer than 1 month*

Questions? Contact:

Kim Cerra, BSN, RN, CDCES

315-726-7101

Kimberly.cerra@sjhsyr.org

REFERENCES

1. DRAZNIN, B. (2016). *MANAGING DIABETES AND HYPERGLYCEMIA IN THE HOSPITAL SETTING*. AMERICAN DIABETES ASSOCIATION.
2. ELSAYED, N. A., GRAZIA ALEPPO, BANNURU, R. R., BRUEMMER, D., COLLINS, B., LAYA EKHLASPOUR, GALINDO, R. J., HILLIARD, M. E., JOHNSON, E. L., KAMLESH KHUNTI, ILDIKO LINGVAY, MATFIN, G., MCCOY, R. G., MARY LOU PERRY, PILLA, S. J., POLSKY, S., PRIYA PRAHALAD, PRATLEY, R. E., SEGAL, A. R., & JANE JEFFRIE SELEY. (2023). 16. DIABETES CARE IN THE HOSPITAL: *STANDARDS OF CARE IN DIABETES—2024*. *DIABETES CARE*, 47(SUPPLEMENT_1), S295–S306. [HTTPS://DOI.ORG/10.2337/DC24-S016](https://doi.org/10.2337/dc24-s016)
3. PRACTICAL INSULIN: A HANDBOOK FOR PRESCRIBING PROVIDERS. (2023). IN *AMERICAN DIABETES ASSOCIATION EBOOKS*. AMERICAN DIABETES ASSOCIATION. [HTTPS://DOI.ORG/10.2337/9781580407632](https://doi.org/10.2337/9781580407632)
4. AMERICAN DIABETES ASSOCIATION. (2022). *AMERICAN DIABETES ASSOCIATION*. DIABETES.ORG. [HTTPS://DIABETES.ORG/](https://diabetes.org/)