Keystone ACO

Diabetes mellitus

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Diabetes mellitus checklist for survival skills

Patient: _____ MR#: _____

Handouts recommended		Reviewed	Date	Initials	Comments
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Medication insulin	Medication insulin	Medication - Insulin Type Timing How to inject Appropriate injection sites Storage Shelf life Disposal of needles			
Monitoring	Monitoring	Glucose meter coding if applicable Preforming test Handwashing Testing schedule Disposal of needles			
Patient's monitoring schedule - recommended					
Hypoglycemia Glucagon	Hypoglycemia (if on insulin or insulin secretagogues)	Hypoglycemia Signs/Symptoms Rule of "15" When to call MD			
Hyperglycemia Ketones Sick day	Hyperglycemia Sick day	Hyperglycemia Signs/Symptoms Treatment Sick day rules When to call MD			
Diet	Diet	Eating plan Meal timing with meds Snacks yes/no			
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Section I - Introduction

What is diabetes?

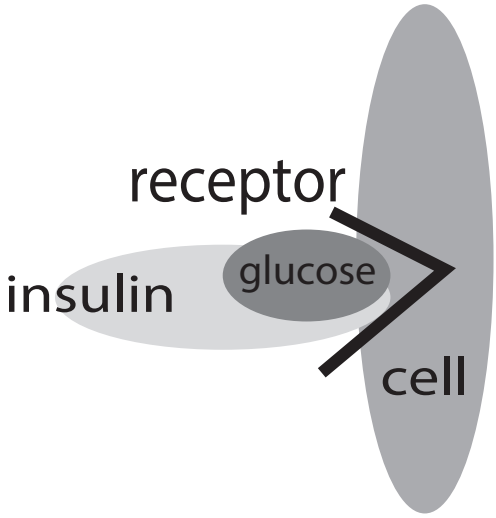
Diabetes is a condition in which your blood glucose (sugar) is too high. Higher than normal blood glucose levels lead to serious problems with the eyes, kidney, heart, blood vessels and nerves.

Blood glucose is the energy that runs your body once it is inside your cells. The food you eat is broken down into glucose so your blood can carry it to the cells.

Your pancreas releases a hormone called insulin. The insulin transfers the glucose from the blood stream into the cells throughout the body. The glucose is turned into energy to run your body.

High blood glucose occurs when there is a problem with how insulin is produced or used in your body. When your blood glucose is high, your body is not getting the energy it needs.

How glucose and insulin normally work:

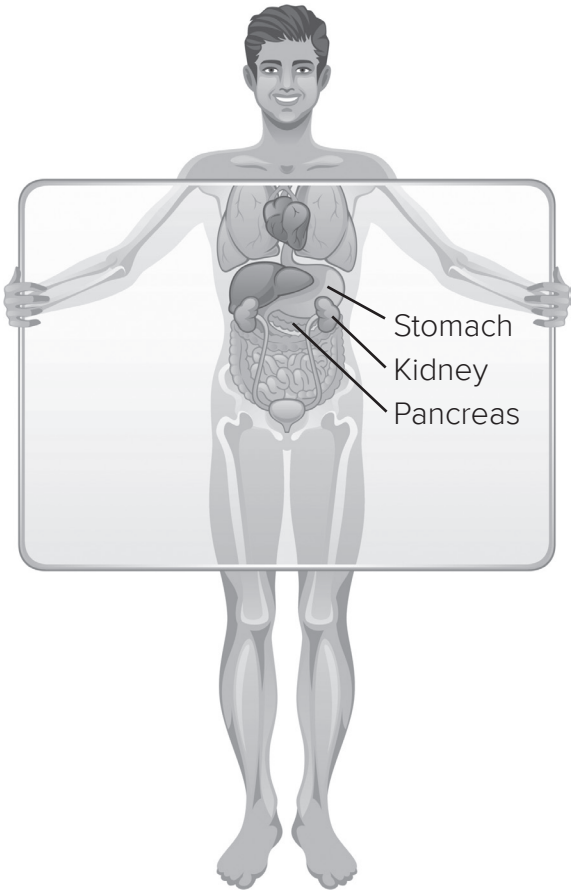


Glucose catch a ride with insulin to enter the cell through a receptor (door).

Managing diabetes means balancing your diet, your diabetes medication and your activity to maintain your blood glucose level as close to normal as possible.

Checking your blood sugar level will help you see the effect of your diet, activity and medication on your blood glucose.

The American Diabetes Association states that, in a person without diabetes, a blood glucose level tested after fasting (not eating) should be below 140mg/dl.



There are 2 main types of diabetes:

Type 1 diabetes – your pancreas stops making insulin. People with type 1 diabetes must take daily shots of insulin to replace the insulin that the body no longer makes.

Symptoms of type 1 diabetes:

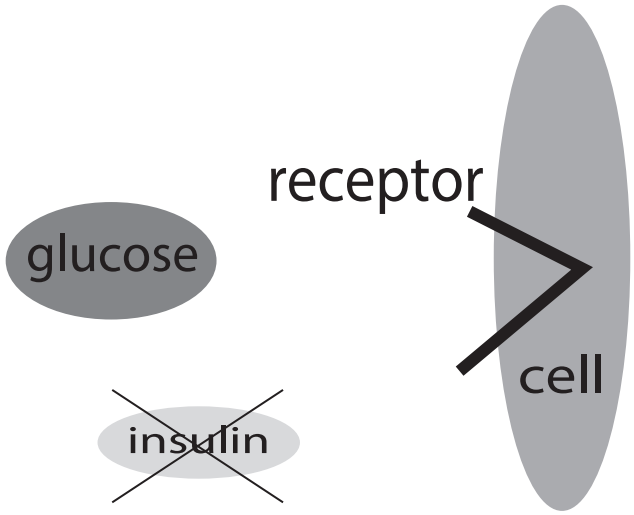
- Increased thirst
- Increased hunger
- Increased urination
- Sudden weight loss

At this time, we do not know the exact cause of type 1 diabetes, though there may be a history of diabetes in the family.

Sometimes there is a problem with the body's immune system which causes it to destroy the insulin making cells.

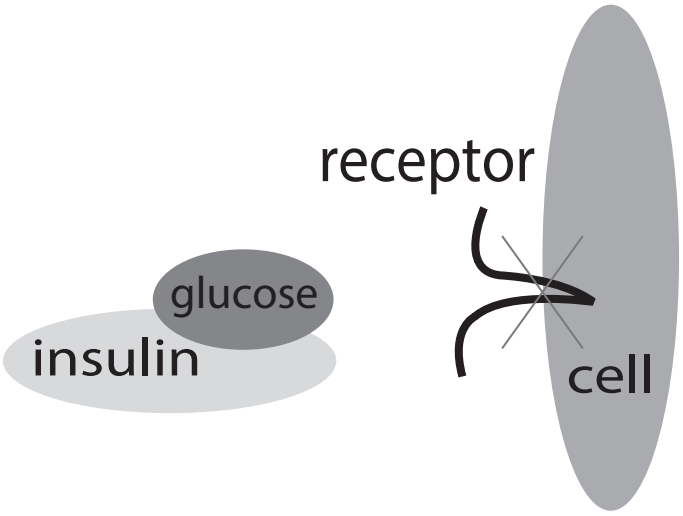
Type 1 diabetes

Glucose can not get into the cell, because the body makes no insulin.



Type 2 diabetes – the pancreas is still making insulin.

Cell receptors (door) are not working to let insulin – glucose enter the cell.



Type 2 diabetes – Your pancreas is still making insulin but the insulin your body makes is not used well by the cells. Over time, the body makes less and less insulin. Type 2 diabetes is often referred to as insulin resistance. The treatment of type 2 diabetes starts with diet and physical activity (exercise). Eventually oral medications and insulin may be needed.

Symptoms of type 2 diabetes:

- Feeling tired
- Frequent infections
- Blurred vision
- Slow healing cuts or sores
- Increased urination
- Increased thirst

Type 2 diabetes runs in families. While the exact cause is not known it is more likely to occur in people who:

- Are over 45 years old
- Are overweight or obese
- Have a history of diabetes when they were pregnant
- Are physically inactive
- Are Native American, African-American, Hispanic-American or Pacific Islander

Section 2 - Daily life

Monitoring your blood glucose:

- Shows how food changes your blood glucose.
- Helps your health care team know if the medication you are taking is working.
- Shows the effect physical activity has on your blood glucose.
- Shows when your blood glucose may be running too high or too low.

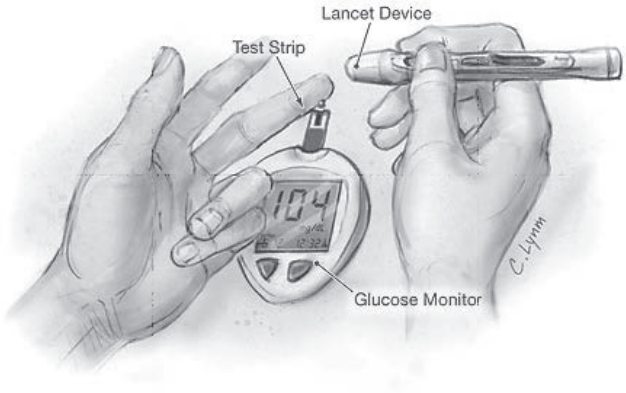
The more you test your blood glucose (sugar) the more you will learn about how your diabetes is controlled.

Tips for good blood glucose testing:

1. Wash your hands with soap and water just before you test.
    - Do not use hand sanitizers – it can affect your reading.
    - Be sure hands are dry – Moisture can affect the reading.
2. Make sure you know how to use the meter you have been given.
    - Some meters have “codes” and some meters do not.
    - If you have a meter that is not “coded” correctly – your blood glucose test will be off.
3. Do not use test strips past expiration date on the bottle.
4. When you open a new bottle or if you think your test strips may be bad use a control solution to check one of the test strips.
    - Check the owner’s manual for instructions and advice on how often you need to get control solution.

    OR

    - Ask your diabetes team.
5. Use your fingers to get the best results.
    - Make sure you use a different finger each time you test.
    - Ask your diabetes health care provider about using other sites to check your blood glucose.



6. Use a new lancet (needle) each time you test.
    - This helps lower pain, injury and risk for infection.
7. Place the lancet in a hard plastic or metal container like a detergent bottle or paint can.
    - Once filled, tightly seal and throw away in trash.
        - Check with your trash haulers for specific guidelines for where you live.
8. Write down your blood glucose numbers in a log book, on a piece of paper, or in a calendar to keep track of levels.
    - This will help you see if there are any “problem” times of day when you are always high or low.

How often should you test your blood glucose?

Talk with your health care provider. If you take insulin, or are having problems with your diabetes control, you may need to test several times a day.

Common testing times include:

- Before meals
- 1 - 2 hours after eating a meal
- Before or after physical activity
- At bedtime
- Middle of the night (2 - 3 a.m.)
- When you feel like your blood glucose is low or high
- When sick or stressed
- Before you drive (if on insulin)

What should you blood glucose level be?

Test times	Range for people without diabetes	Usual target rate for people with diabetes	Your goal
First thing in the morning	Less than 100 mg/dl	Less than 130 mg/dl*	
Before meals		Less than 130 mg/dl	
After meals	Less than 140 mg/dl	Less than 180 mg/dl*	

* American Diabetes Association 2014 Clinical Practice Recommendations

- The American Diabetes Association states that blood glucose goals should be individualized based on each persons needs and condition.

Bring your meter and your log book with you each time you see your doctor or your diabetes educator.

Notes:

Section 2 - Daily life

Eating and diabetes

Diabetes control is a daily life balancing act among

- The food you eat
- Your physical activity (exercise)
- Your diabetes medication

Balancing your diet for diabetes control is very important.

- A dietitian or diabetes educator with knowledge about diet can help you understand the effect your diet has on your diabetes control.

Depending on the type of diabetes that you have and what diabetes medications you are on today (if you are taking any), your meal plan may be different from a friend or family member who also has diabetes.

The food you eat provides you with calories (from proteins, fats or carbohydrates), vitamins and minerals–all are important for good health.

- The total number of calories that you eat determines if you gain, lose or maintain your weight. If you are overweight, losing weight will help your body use the insulin better.
- For a healthy diet, you should eat a variety of foods from all of the food groups.

The foods you eat and blood glucose control:

- Protein: Meats, fish, eggs, cheese, and nuts have very little effect on the blood glucose level.
- Fat: Butter, oils, salad dressings may or may not affect blood glucose. Different types of fat have different effects on the blood glucose.
    - Monounsaturated and polyunsaturated fats have little effect on the blood glucose.
        - Example: Canola oil and olive oil.
    - Saturated and trans fats cause insulin resistance – which means your insulin will not work as well.
        - Example: The fat in meat.
    - Saturated and trans fats also raise cholesterol and your risk for heart disease.
    - Carbohydrates turn almost 100% into blood glucose.
    - Because carbohydrates increase your blood glucose, you need to learn how much to eat and the time of day to eat it.
    - Do not stop eating carbohydrates!
    - Carbohydrates give your body needed energy and nutrients.
    - Foods containing carbohydrates are an important part of your diet.

It is important to know how the carbohydrates that you eat affect your blood glucose.

It is also important not to forget about your intake of fats and protein.

What foods contain carbohydrates?

Carbohydrates are found in many of the foods that you eat.

These include:

- Fruits and fruit juices
- Grains (breads, rice, cereal, pasta, corn, crackers)
- Starchy vegetables (potatoes, peas)
- Milk and yogurt
- Most snack foods
- Most desserts
- Sugar – sweetened drinks such as regular soda or sweetened teas.

The food label tells you how much carbohydrate content is in the food you eat.

As you check food labels you will find most of the foods that you eat contain some carbohydrates. Carbohydrates are measured in grams.

Serving size →

Carbohydrate grams →

Nutrition Facts

Serving Size 1 ounce — Servings in bag 4

Amount Per Serving

Calories 155 — Calories from Fat 93

	% **Daily Value***
Total Fat 11g	16%
Saturated Fat 3g	15%
Trans Fat	
Cholesterol 0mg	0%
Sodium 148mg	6%
Total Carbohydrate 14g	5%
Dietary Fiber 1g	5%
Sugar 1g	
Protein 2g	

Vitamin A	0%	• Vitamin C	9%
Calcium	1%	• Iron	3%

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

To manage your carbohydrate intake you can count carbohydrates in grams or by carbohydrate “choices”.

The foods listed on the next couple of pages are some of the foods that contain carbohydrates.

For the portion size listed – the amount of carbohydrates in each of the food choice is about 15 grams.

Carbohydrates

(Portion or choice)

1 serving = 15 grams of carbohydrate			
Bread	**Portion**	**Starchy vegetables**	**Portion**
Bagel	1/2 small	Baked beans	1/3 cup
Bread	1 slice	Corn	1/2 cup
Bread, lite	2 slices	Peas	1/2 cup
Hamburger bun	1/2 bun	Potatoes, mashed	1/2 cup
Pita bread	1/2 - 6 inch		
Tortilla, corn/flour	1 - 6 inch		
Cereals/grains	**Portion**	**Crackers/snacks**	**Portion**
Cereal, cold, unsweetened	3/4 cup	Animal crackers	8
Cereal, cold, sweetened	1/2 cup	Popcorn	3 cups
Cereal, cooked	1/2 cup	Pretzels	3/4 oz
Pasta, cooked	1/3 cup	Saltine crackers	6
Rice, cooked	1/3 cup	Snack chips	15-20 (3/4 oz)
Fruit	**Portion**	**Fruit**	**Portion**
Apple, small	1	Melon	1 cup cubed
Applesauce, unsweetened	1/2 cup	Peach, medium	1
Bananas, small	1/2	Orange, small	1
Blackberries	3/4 cup	Orange juice	1/2 cup
Blueberries	3/4 cup	Raisins	2 tablespoons
Grapes, small	17	Strawberries	1 1/4 cup
Grape juice	1/3 cup		
Milk	**Portion**	**Milk**	**Portion**
Whole; 2%; skim 8 grams fat	1 cup	Yogurt (plain)	1 cup
2% - 5 grams fat	1 cup		
1% - 3 grams fat	1 cup		

Sweets, desserts and other carbohydrates (carbohydrate varies)

(Note: Some portions have more than 15 grams of carbohydrate)

Food	Portion	Carbohydrate
Brownie, unfrosted	2 inch square	15 g
Cake, frosted	2 inch square	30 g
Fruit cobbler	1/2 cup	45 g
Gelatin, regular	1/2 cup	15 g
Glazed donut	2 oz	30 g
Ice cream	1/2 cup	15 g
Combination foods		
Macaroni & cheese	1 cup	30 g
Pizza (thick crust)	1 slice	45 g
Pizza (thin crust)	1 slice	30 g
Casserole	1 cup	30 g
Soup or stew	1 cup	15 g
“Sub” sandwich	6 inch	45 g
Taco	1 small	15 g

Nonstarchy vegetable list

1 portion (1/2 cup cooked or 1 cup raw) = 5 grams carbohydrate

Asparagus	Green beans	Squash	Onions
Broccoli	Brussels sprouts	Tomato	Zucchini
Carrots	Beets	Mushrooms	Tomato juice
Cauliflower	Cabbage	Spinach	

These vegetables are high in nutrients and lower in calories so they do not affect your blood glucose as much as the starchy vegetables.

- Often we say these are “free” foods because they contain so few carbohydrates.
    - Check with your diabetes educator to see if you need to count them.

The time of the day and the amount of carbohydrates you eat at these times help control your blood glucose.

From the list below, find the way you control your blood glucose. Then follow the meal planning guidelines appropriate to the one you follow.

- If you are taking a combination medication or your diabetes medication is not listed, ask your health care provider about the meal planning guidelines that you should follow.
- If you control your blood glucose with:
  - Diet and exercise alone
  - Metformin (Glucophage®)
  - Actos®
  - Avandia®
  - Januvia®, Onglyza®, Tradjenta® or Nesina®
  - Victoza® or Bydureon®
  - Invokana® or Farxiga™

How many carbohydrates you can eat is based on how high your blood glucose goes after you eat.

You do not have to eat at set times.

Many individuals in this group find that they have better glucose control eating 3 smaller meals and snacks.

Remember:

- Your target blood glucose goal after eating a meal is less then 180 mg/dl.
- If your blood glucose goes over 180 mg/dl after eating less than 30 grams of carbohydrates, you need to talk to your diabetes health care provider.
- If you control your blood glucose with (or if you take several medicines for diabetes and one of them are in the following list):
  - Glipizide (Glucotrol®) (Glucotrol XL®)
  - Glyburide (Micronase®, DiaBeta®, Glynase®)
  - Glimepiride (Amaryl®)
  - All 70/30, 75/25 or 50/50 insulins
  - Novolin® or Humulin®N (NPH) insulin

You need to eat a set amount of carbohydrate at the same times each day.

You cannot skip meals because your blood glucose could go too low.

- If you control your blood glucose with:
  - Repaglinide (Prandin®)/Nateglinide (Starlix®)
  - Set dose of meal insulin – R (regular), Apidra®, Novolog® or Humalog®
  - Byetta®
  - Acarbose (Precose®)/Miglitol (Glyset®)

You need to eat a set amount of carbohydrate when you take the medication.

If you skip a meal, you skip the medication, otherwise, your blood glucose can go too low.

- If you control your blood glucose with:
- Long-acting insulin (Lantus®, Levemir®)
- A short acting insulin (Apidra®, Novolog®, Humalog® or Regular)

and

- You have been taught to adjust your short-acting insulin dose to how much you eat.
- You do not have to eat a set amount of carbohydrates at a meal.
- You do not need to eat at set times during the day.
- You do need to match the amount of insulin you take to the amount of carbohydrates you eat.

No matter what medication you take, the important thing is to eat the right amount of carbohydrates to prevent your blood glucose from going too high. If your blood glucose goes too high when you eat only a small amount of carbohydrate, you may need a change in your medication.

How to check if the amount of carbohydrates you eat is right:

#1 Eat what you would normally eat.

- ✓ Check your blood glucose before the meal.
- ✓ Count the carbohydrates that you ate.
- ✓ Check your blood glucose after the meal (1 1/2 hours or 2 hours if on insulin)

Do for 2 – 3 days, then ask yourself these questions.

1. Did I follow the carbohydrate guidelines that were given for the medication I am taking?
2. Was my blood glucose less then 180 mg/dl after I ate? (if not on insulin) less than 120 – 140 mg/dl (on meal insulin)

If yes continue on same plan.
If no then contact your health care provider.

OR

#2 Try eating a set amount of carbohydrates at each meal.

Women: 30 – 45 grams at each meal.
Men: 45 – 60 grams at each meal.

Note: Your dietitian or diabetes educator may give you a different carbohydrate level.

- ✓ Check your blood glucose after the meal (1 1/2 hours or 2 hours if on insulin)

Do for 2 – 3 days, then ask yourself these questions.

1. Did I follow the carbohydrates guidelines that were given for the medication I am taking?
2. Was my blood glucose less then 180 mg/dl after I ate? (if not on insulin) less than 120-140 mg/dl on meal insulin

If yes continue on same plan.
If no then contact your health care provider.

Note: Your after meal glucose goal may be different. Check with your diabetes health care team for your goal blood glucose after a meal.

Protein and fat

Protein is an important part of your diet. It can be included at each meal to help fill you up.

A dietitian can help you to figure out how much protein you need in a day.

Fats: mainly saturated fats and trans fats are linked to insulin resistance and heart disease.

Foods that contain trans fats and saturated fats that should be limited in your diet include:

- Red meat
- Processed meats (bacon, sausage, bologna)
- Whole milk and whole milk dairy products, including most cheeses
- Butter, lard
- Vegetable shortening
- Cocoa butter
- Coconut oil
- Palm oil
- Stick margarine
- Baked goods like donuts and muffins
- Fried foods

A dietitian can help you to learn and understand more about the foods that contain saturated and trans fats.

A word on good nutrition...

For good health, everyone should eat a wide range of foods.

Try to include:

- Fruit and vegetables: At least 5 servings per day.
- Whole grains: At least 3 servings per day
- Low-fat or fat-free dairy products: At least 3 servings per day.

Notes:

Section 2 - Daily life (cont.)

Physical activity

Physical activity makes you healthier by:

- Giving you more energy and strength.
- Lowering cholesterol.
- Lowering blood pressure.
- Helping with weight.
- Strengthening muscle, bones and joints.
- Reducing stress.

When you have diabetes, physical activity also affects the way your body uses insulin.

- If you have diabetes or any diabetic complications talk to your doctor before starting any exercise more then brisk walking.

Type 1 diabetes:

If you have type 1 diabetes the body will usually need less insulin with activity.

- It is important to learn how your body responds to exercise.
- Blood glucose response to exercise or physical activity in people with type 1 diabetes can last up to 48 hours.

Work with your diabetes team to figure out the best changes to make with your insulin or food to keep your glucose under control.

General guidelines for persons with type 1 diabetes:

- Eat 15 grams of carbohydrates every 15 – 30 minutes of physical activity.
- Test blood glucose before physical activity.
  - If less then 100 mg/dl eat some carbohydrates before exercising to prevent low blood glucose.
    - Wait until blood glucose is over 100 mg/dl before beginning exercise.
  - If blood glucose is over 250 mg/dl and you do not have ketones.
    - You can start to exercise but you must retest in 10 – 15 minutes. Stop exercising if your blood glucose is rising.
    - Treat your high blood glucose level.
    - Do not resume exercising until blood glucose is under control.
  - If ketones are present then do not exercise until blood glucose levels are normal and ketones are negative. (See page 28, What are ketones?)

Type 2 diabetes:

If you have type 2 diabetes physical activity and exercise can improve your body's ability to use insulin.

You may actually be able to reduce the amount of diabetes medication needed.

- If you are on insulin or one of the following medications:
  - Glipizide (Glucotrol®)
  - Glyburide (Micronase®, DiaBeta®, Glynase®)
  - Glimeperide (Amaryl®)
  - Repaglinide (Prandin®)
  - Nateglinide (Starlix®)

Follow the general guidelines given under type 1 diabetes and talk to a member of your diabetes team for more information on exercising.

If you have type 2 diabetes and are not taking one of the medications mentioned above, physical activity and exercise will probably not drop your blood glucose level down below a normal range.

Starting out:

If physical activity is new to you, start slowly and increase weekly.

- Start with just 5 – 10 minutes a day.
- Add 1 – 5 minutes each week until you are up to 60 minutes of exercise a day.
- You can break up your exercise into 20 – 30 minutes mini exercise sessions.
- Pick activities that are fun for you and mix different activities if you get bored quickly.
    - Walking
    - Swimming
    - Biking
    - Dancing
- Ask a friend to join you – exercise time is a great way to catch up with friends.
- Make sure you get proper fitting shoes. Shoes should not be tight. You should be able to easily wiggle your toes.
    - If possible, go to a store that can fit the shoe for you.
    - Check your feet for blisters, sores or areas of redness daily.
- Always carry some form of identification, list of emergency contacts and medications.
- Tell someone where you will be exercising and when you are expected to return.
- If you are on a medication that can drop your blood glucose too low, always carry a carbohydrate-containing food.

Notes:

Section 3 - Medication - insulin

Medication – insulin

Your body needs insulin just to stay alive.

Your body also needs insulin to cover the food you eat.

All people with Type 1 diabetes need to take insulin.

Many individuals with Type 2 diabetes may need, at some point, insulin to control their blood glucose for example if you are sick and in the hospital.

The goal for your insulin use is to provide the insulin in a way that mirrors your body's insulin use.

There are different types of insulin.

Each type of insulin works in a different way.

It is important to understand:

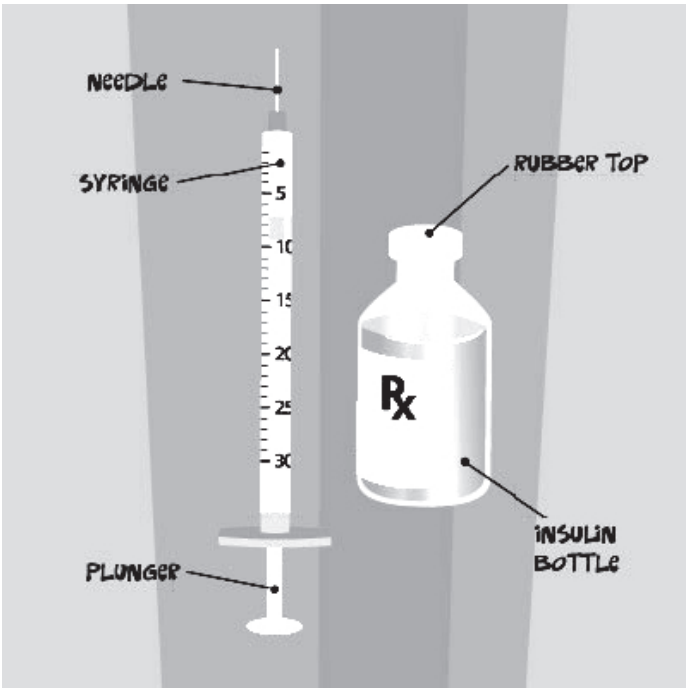
- The type of insulin you take.
- When you should take your insulin?
- How the insulin works?

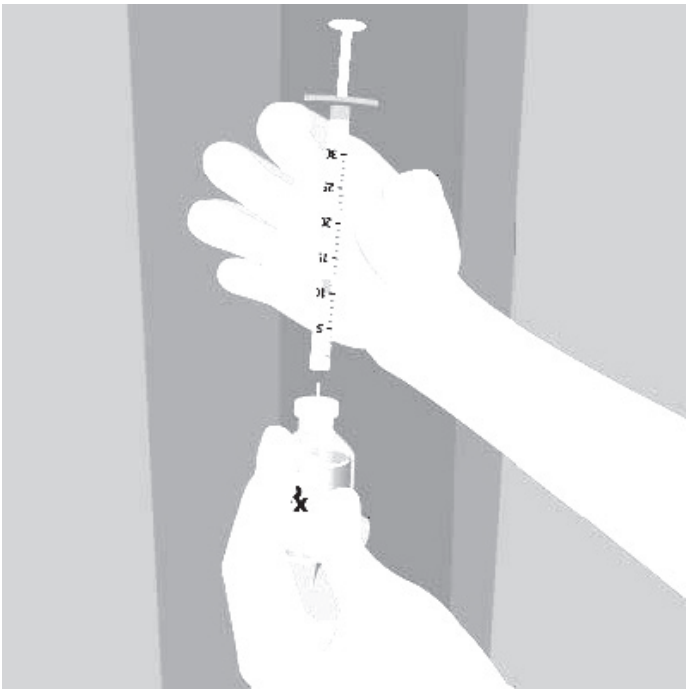
Types of insulin

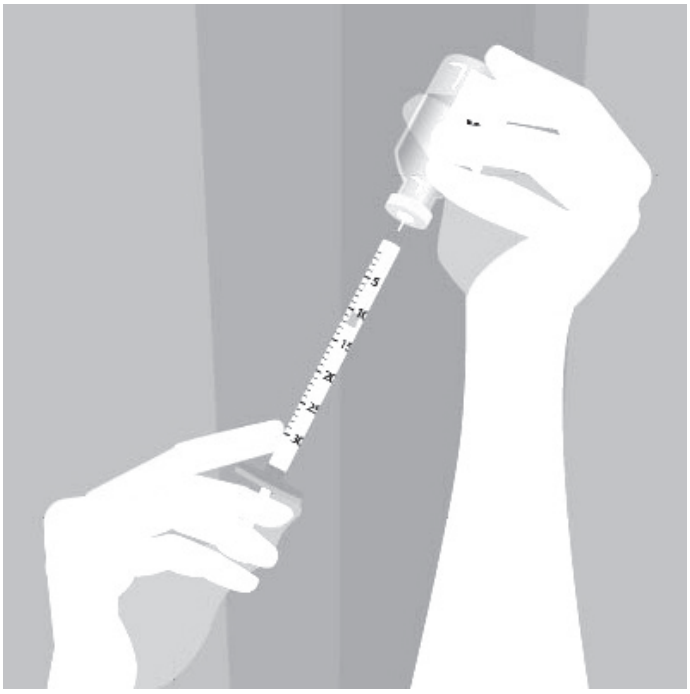
Your insulin	Insulin name	Use	Tips for taking
Fast acting	**lispro** (Humalog®) **aspart** (Novolog®) **glulisine** (Apidra®)	Insulin used to cover food and to treat high blood glucose levels	Clear insulin. Do not take if it looks cloudy **Take right before or up to 15 minutes before eating.**
Short acting	Novolin®R Humulin®R	Insulin used to cover food and to treat high blood glucose levels	Clear insulin. Do not take if it looks cloudy **Take right before or up to 30 minutes before eating.**
Intermediate acting	Novolin®R Humulin®R	Insulin used to cover the body's need for insulin	Cloudy insulin. Roll between hands to mix well before using. **Take at specified time** Do not use if clumps remain in insulin after mixing
Long acting	**glargine** (Lantus®) **detemir** (Levemir®)	Insulin used to cover the body's need for insulin	Clear insulin. Do not take if it looks cloudy. **Never** mix in the same syringe with any other insulin **Must be take at the same time each day**
	Novolin® Mix 50/50 Humulin® Mix 50/50 Novolin® Mix 70/30 Humulin® Mix 75/25 Novolin® 70/30 Humulin® 70/30	Pre-mixed with two types of insulin Used to cover the food eaten and the body's need for insulin	Cloudy insulin. Roll between hands to mix well before using. **Do not** use if clumps remain in insulin after mixing. If your insulin type ends in "**log**" take the insulin right before eating (example: Novo**log**®) Mix 70/30) If your insulin type ends in "**lin**" take the insulin 30 minutes before eating (example: Humu**lin**® 70/30) Note: You **can not** substitute a "**log**" insulin for a "**lin**" insulin

Taking insulin: using a syringe

1. Wash your hands.
2. Check the bottle (vial) label to make sure you have the right insulin.
3. If you are using cloudy insulin, roll the bottle between your hands for about 20 seconds.
4. Remove the cap from the bottom of the syringe. Remove the cover from the needle.
5. Pull the plunger back to pull air into the syringe. Fill the syringe with as much air as your insulin dose.
6. With the bottle flat on the table, put needle through the rubber top of the bottle and push plunger down to put into the bottle.
7. Keep the needle in the bottle. Turn the bottle upside down. Pull the plunger back. Fill the syringe with insulin to the number of units you need.





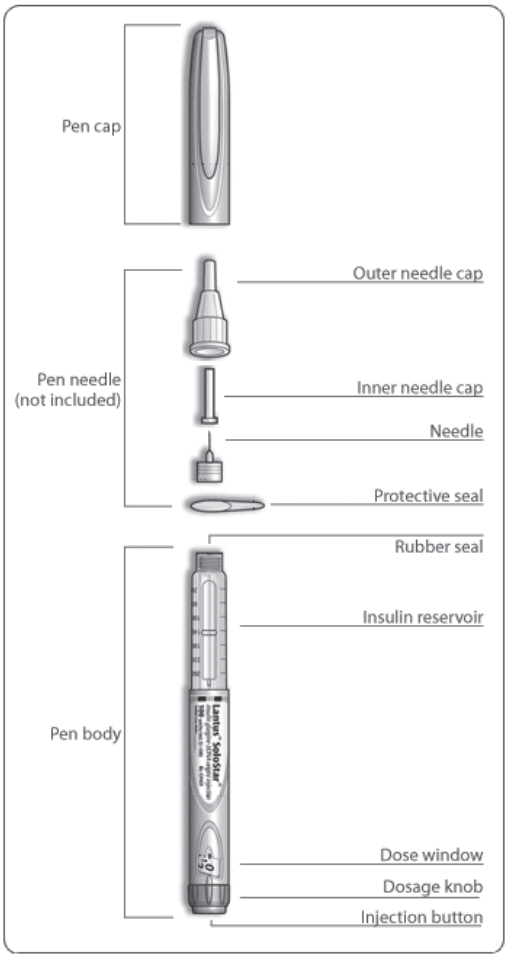


8. Look at the insulin in the syringe. If you see air bubbles, push the insulin back into the bottle and slowly draw up again.

Taking insulin: using a pen

Each type of pen comes with its own instructions. Below are general guidelines.

1. Wash your hands.
2. Check the pen label to make sure you have the right insulin.
3. If you are using cloudy insulin, roll the pen between your hands for about 20 seconds to mix well before using.
4. Remove the protective tape from the pen needle and screw the needle onto the pen.
5. Remove both the outer cap and the inner needle cap.
6. Make sure the dose knob is set at zero.
7. Dial the dose knob to 2 units. With the needle pointing up, press the button and make sure a drop of insulin comes out. Make sure the dose knob is back to zero. (This is called priming the pen or air shot).
8. Dial the number of units of insulin you need to inject.



Injecting insulin – syringe or pen

1. Once your syringe or pen is ready to go – choose your injection site.
2. Insulin should be injected into fatty tissue just under the skin. Make sure the injection site is clean.
3. Hold the syringe or pen like a pencil or dart. Insert the needle straight in. If you get a lump talk with your diabetes health care provider.
4. Inject the insulin by pressing slowly on the plunger or the end button of the pen. Hold down the plunger or button for 5 seconds after pushing all the insulin in to make sure that all the insulin has been injected.
5. Different areas of your body absorb insulin at different rates. Check with your diabetes care team on the best areas to use.
   - Most insulin absorbs better when injected into your abdomen or thigh.
   - If you take Humulin®N or Novolin®N or Levemir®, these work best when injected into your thigh.
6. For best results give all injections in one or two areas of your body. Rotate where you inject the insulin within that site. For example, you may inject your morning insulin in the thigh and your dinner insulin in the abdomen.
7. Check the chart on the next page. Make sure you are not giving your insulin in the same small area each time. Using the same small area will make it harder for your body to absorb the insulin.

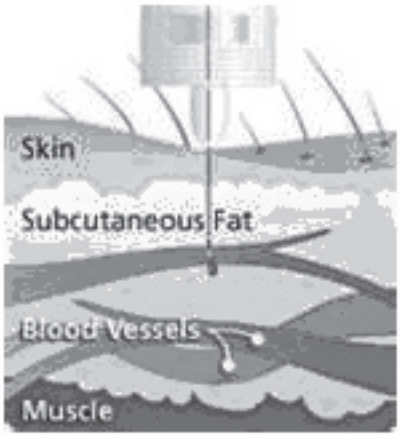
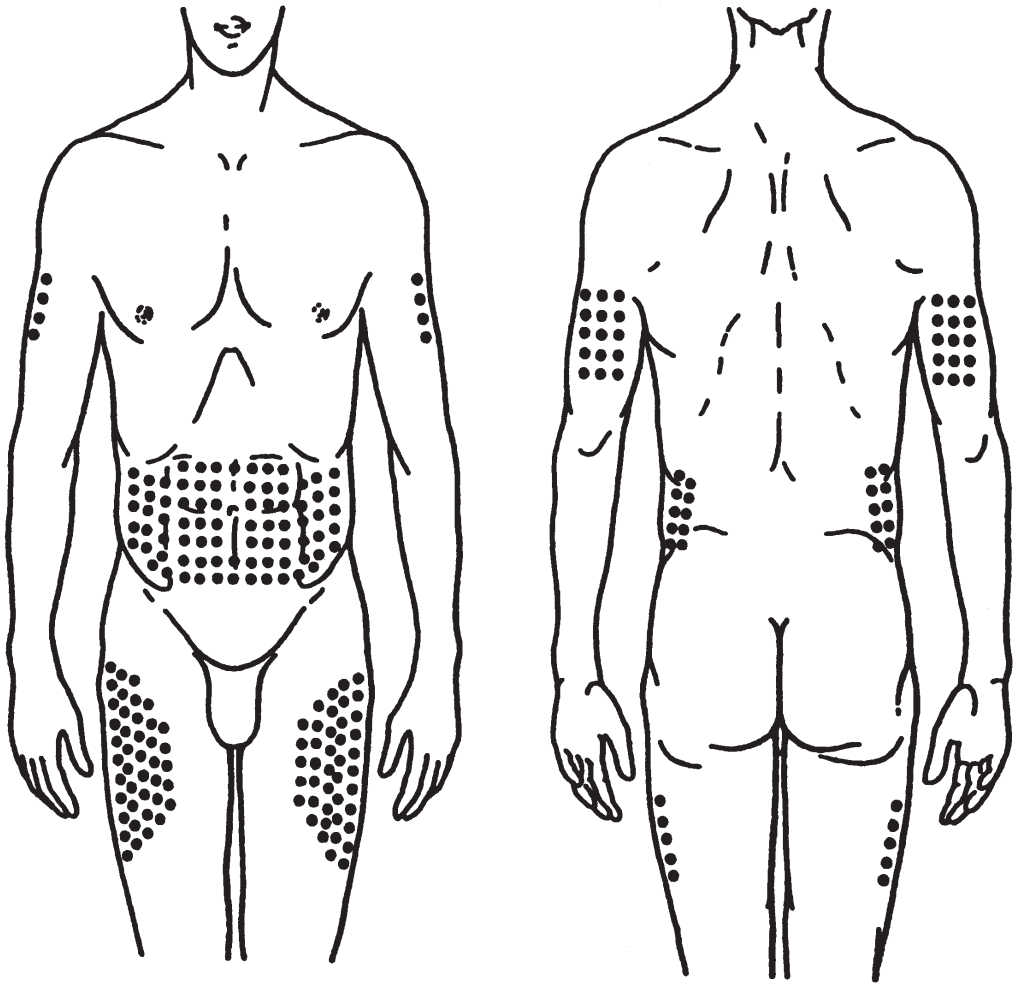


Chart for insulin injection

8. Pick an injection site that is at least 2 inches away from your belly button and at least 1 inch from any scars, moles, tattoos or from your last injection site.



Your insulin schedule		
Before breakfast		
Type _____	Dose _____	Time _____
Type _____	Dose _____	Time _____
Before lunch		
Type _____	Dose _____	Time _____
Before supper		
Type _____	Dose _____	Time _____
Type _____	Dose _____	Time _____
Before bed		
Type _____	Dose _____	Time _____
Type _____	Dose _____	Time _____

Insulin

Important notes for insulin use:

- Insulin comes in bottles (vials), pens and cartridges.
- Be sure you have the correct type of insulin.
- If you take more than one type of insulin, be sure to give the right one at the right time.
- Keep unopened insulin in refrigerator.
- Check the insulin you buy for expiration date and type. (Never use insulin your doctor did not order for you.)
- The bottle or pen you are using can be kept at room temperature (45°F – 86°F) for 10 – 30 days. See instructions in the insulin box for your type of insulin.
- Cold insulin can sometimes cause burning at your injection site. Allowing your insulin to reach room temperature before the injection can help.
- Bruising can occur. While you are inserting the needle nicking a small blood vessel may cause a small amount of bleeding under the skin. This blood will be reabsorbed and is not a problem.

When eating out:

- Take your insulin with you.
- Wait to take the insulin until the food arrives.
- Do not take your insulin injection at home before you leave for the restaurant.
- Do not wait until you get home.

This can cause high or low blood glucose levels.

- Only Humulin®N or Novolin®N insulin can be mixed with another type of insulin. If you are taking Humulin®N or Novolin®N check with your diabetes care team on how to mix insulins together the right way.
- Use a new syringe or needle for each injection. Using a syringe or needle more than once can cause increased pain, trauma, and infection to the skin.
- Throw away the syringe or needle by placing in a hard plastic container like a bleach or detergent bottle. Once filled, close cap tightly and throw away in trash. You may want to check with your trash haulers for specific guidelines for where you live.

Notes:

Section 3 - Medications for type 2 diabetes

Medications – for type 2 diabetes

- Different medications help to control the blood glucose in different ways.
- Many people with diabetes need more than one type of diabetes medication.
- Most people with diabetes will need medication to help control their diabetes.
- For people with type 2 diabetes:
  - Oral medications
  - Injectable medications
  - Insulin

The following chart lists the medications used for type 2 diabetes.

- Some oral medications have been combined with each other so that one pill may have two different medications.
  - The chart does not list these combinations.

Talk to a member of your diabetes care team if you are on a medication that is not listed here.

Oral medications			
Medications	**How do they work**	**When to take**	**Side effects**
Insulin secretagogues **Glyburide** (Micronase®, DiaBeta® and Glynase® press tabs) **Glipizide** (Glucotrol® and Glucotrol XL®) **Glimepiride** (Amaryl®) **Repaglinide** (Prandin®) **Nateglinide** (Starlix®)	Help the pancreas make more insulin	* General guideline – ask your healthcare professional when you should take your medication. Take with meal 1-2 times a day. Take 30 minutes before the meal (Glucotrol XL – take with meal). Take with the meal 1 – 2 times a day. Take 15 – 20 minutes before each meal. Take 30 minutes before each meal.	Low blood glucose (hypoglycemia). * *See handout on Hypoglycemia.
Insulin sensitizers Biguanides **Metformin** (Glucophage®, Riomet® – liquid) **Metformin ER** (Glucophage XR® Fortamet®, Glumetza®)	Works on the liver to decrease the production of excess glucose. Helps muscle and fat take up the glucose.	Take with meal to lower stomach upset.	Nausea, bloating, diarrhea and gas. Can not be used if any kidney problems. Does not cause low blood glucose by itself. Needs to be stopped before certain types of X-rays. Check with your doctor.
Thiazolidinediones – TZD **Pioglitazone** (Actos®)	Helps muscle and fat take up the glucose.	Take once or twice a day (depends on dose ordered).	Takes 3 – 4 weeks to see if works. Weight gain, edema (holding water). Liver function test need to be done to check effects on liver. Can cause worsening of heart problems. Does not cause low blood glucose by itself.

Oral medications			
Medications	How do they work	When to take	Side effects
Alpha-Glucosidase Inhibitors **Acarbose** (Precose®) **Miglitol** (Glyset®)	Slows down the absorption of food when you eat.	Take with first bite of each meal.	Gas, nausea, bloating, diarrhea.
DPP-4 inhibitors **Sitagliptin** (Januvia®) **Saxagliptin** (Onglyza®) **Linagliptin** (Tradjenta®) **Alogliptin** (Nesina®)	Increases insulin. Lowers output of extra glucose from liver.	Take at same time each day.	Does not cause low blood glucose. Takes 2 – 3 weeks to see if works.
SGLTZ **Canagliflozin** (Invokana®) **Dapagliflozin** (Farxiga™)	Increases urinary output of glucose.	Take before first meal of the day.	Can increase risk of urinary infections (UTI).

Injectable medications			
Medications	How do they work	When to take	Side effects
Exenatide (Byetta®) (Bydureon®) **Liraglutide** (Victoza®)	Lowers liver output of glucose. Lowers after meal blood glucose levels. Curbs appetite.	Take injection up to 60 minutes before meal. Usually 2 times a day breakfast and supper. Take once a week. Take once a day.	Nausea, diarrhea.
Pramlintide (Symlin®)	Lowers liver output of glucose. Lowers after meal blood glucose levels. Curbs appetite.	Take right before each meal.	Nausea, diarrhea. If on insulin – meal dose is often reduced.

Your type 2 diabetes medications	
Name(s)	
1. Medicine When to take	Dose
2. Medicine When to take	Dose
3. Medicine When to take	Dose
4. Medicine When to take	Dose
5. Medicine When to take	Dose

Section 4 - Complications

Hypoglycemia/low blood glucose

Hypoglycemia a blood glucose level below _____ mg/dl

May be a result of:

1. Too little carbohydrate containing food at the meal or delayed meals.
2. Increased exercise or physical activity without adding a snack or decreasing insulin.
3. Taking too much insulin or too many diabetes pills or taking them at the wrong time.
4. Drinking alcohol.

Signs and symptoms:

- Shaky, weak, feeling confused
- Hungry
- Tired
- Anxious or irritable
- Sweaty
- Headache
- Dizzy
- Blurred vision
- May have no symptoms

Treating a low blood glucose:
The rule of "15"

1. If you can, check your glucose.
2. Eat 15 grams of carbohydrates such as:
   - 3 – 4 glucose tabs or glucose gel.
   - Recheck blood glucose in 15 minutes.
3. If blood glucose is still below 80 mg/dl eat 3 – 4 more glucose tabs or another glucose gel.
   - Repeat step 3 until blood glucose is over 80.

Foods with about 15 grams of carbohydrates:

- 1/2 cup **regular** Jell-o
- 2 tablespoons of raisins
- 1/2 cup of sherbet
- 1 slice of bread
- 6 saltine crackers
- 1 small piece of fruit

Make sure you always test your blood glucose before driving if you take insulin.

Hyperglycemia/high blood glucose

Hyperglycemia a blood glucose level above _____ mg/dl

May be a result of:

- Too much food
- Too little exercise or physical activity
- Too little insulin or too few diabetes pills
- Stress, illness, or infection
- Spoiled or outdated insulin

Signs and symptoms:

- Increased thirst
- Increased urination
- Fatigue or tiredness
- Blurred vision
- Dry mouth or skin
- Hunger
- Slow healing wounds

Treating a high blood glucose:

1. Drink more water. High glucose levels can lead to dehydration.
2. Limit physical activity.
3. If you have type 1 diabetes and blood glucose is above 250 mg/dl, check your urine for ketones. If you have ketones (see page 28, What are ketones?) follow your sick day rules or call your health care team if you are not sure what to do. (See sick day rules)
4. If you have been instructed to treat high blood glucose with an insulin sliding scale or correction factor, use as directed.
5. Test blood glucose every 2 – 3 hours until your blood glucose has returned to goal.

Note: If you think your meter is reading wrong, try:

- Rechecking your blood glucose after washing and drying your hands.
- Use a control solution to see if your test strips are good.
- Call your health care provider if you have questions.

Sick day rules

"Sick" refers to anytime you have a cold, the flu, infections, nausea/ vomiting/diarrhea, surgery, injury, or major stress.

When a person with diabetes gets sick, the blood glucose will often be higher than usual, even if the person is eating less food.

When you are sick:

1. Always take your diabetes medication, unless your doctor tells you not to.
   Even if you cannot eat your usual meals, you need to take your medication to control your glucose.

   Sometimes more medication is required. Check with your doctor or diabetes educator.

2. Test your blood glucose every 2 hours or at least four times a day.

   Test for urine ketones (see this page, What are ketones?) if you have type 1 diabetes and your blood glucose is 250 or higher. (See ketone testing)

   Continue to test for urine ketones each time you go to the bathroom until the ketone level is negative.

   Write the results of your blood glucose and ketone tests down and have them ready if you need to call your doctor.

3. Drink plenty of fluids, about 6-8 ounces every hour you are awake to prevent dehydration. If you are unable to eat your meals, drink sugar-free fluids such as:

water	broth
decaffeinated tea	diet ginger ale

   If you are unable to eat and can only tolerate fluids, alternate sugar-free fluids and fluids containing sugar every hour. Examples of fluids containing sugar include:

7-up® or Sprite®	Gatorade®
apple juice	regular gelatin

4. Rest and take your temperature.

Call your doctor for any of the following reasons:

- Vomiting occurs more than once.
- Diarrhea that occurs more than 5 times or longer than 24 hours.
- If you are having low blood sugars.
- If you are unable to drink.
- If you have moderate or large ketones in your urine.
- If you have a fever.

Ketone testing – for type 1 diabetes

What are ketones?

Ketones are made when your body uses fat instead of glucose for energy. Ketones are normally easily removed from your body by your kidneys in your urine.

- With diabetes the presence of ketones is often the first sign that the body does not have enough insulin.
- With diabetes and a lack of insulin, ketones can build up faster than your kidneys can get rid of them.

High levels of ketones can lead to "ketoacidosis". Ketoacidosis is a serious, life threatening complication of diabetes that must be treated immediately.

When to test for ketones:

1. Blood glucose level higher than 250 mg/dl.
2. When ill or under more stress than usual.
3. With vomiting or diarrhea.
4. Pregnancy.

How to test for ketones:

The easiest way to check for ketones is to check your urine with a ketone strip. Ketone testing strips can be found at any drug store.

To test for ketones:

1. Urinate into a disposable (paper) cup.
2. Dip a ketone strip into the urine.
3. If the color of the strip changes, you have ketones. Match the color of the strip to the chart on the side of the bottle to see if you have a small, moderate or large amount of ketones.

If you have ketones:

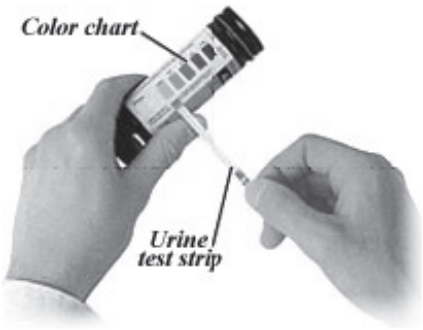
1. Drink 8 ounces (1 cup) of water every hour.
2. Test blood glucose every 2 – 3 hours until it is in goal range.
3. Check for ketones every 3 – 4 hours until they are no longer present.

When to call healthcare provider:

- If you have moderate or large ketones.
- If you are sick or have infection.
- If you have nausea, vomiting or have diarrhea.
- If you have stomach pain, fast breathing or fruity smelling breath.

Note: Ketone test strips come in a bottle

- Once the bottle is open the strips are only good for 6 months.



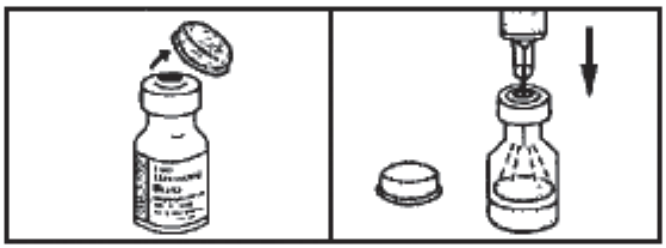
Emergent glucagon/glucagon injections for type 1 diabetes

- **Glucagon** is a hormone your body makes. It causes your liver to release stored glucose into the blood.
- **Glucagon** injections are used when you have:
  - Severe hypoglycemic reaction (very low blood glucose) or insulin coma.
  - And you are ***unable*** to treat yourself.
- It is important to teach family and close friends how to give glucagon injections.
- Family and friends should be instructed to give glucagon if:
  - You become unconscious (out cold).
  - You are unable to treat low blood. glucose by eating or drinking.
  - You are having a seizure.
- Follow the written or picture directions on the glucagon package.
  - After giving glucagon, turning the person on his/her side will prevent him/her from choking.
  - Once the person is awake and can swallow he or she needs to eat. The snack should contain at least 15 grams of carbohydrate.
  - If the patient does not awaken within 15 minutes give another shot of glucagon and contact emergency services (911) immediately.
  - Let your doctor know you had a severe low blood glucose that needed to be treated with glucagon.

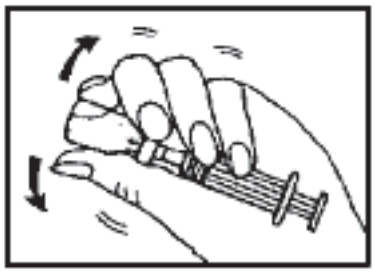
Section 4 – Complications (cont.)

Just in case – simple steps for use

- Remove needle cover from syringe and cap off of vial (bottle).
- Insert the needle through the stopper and inject all the liquid into the vial.

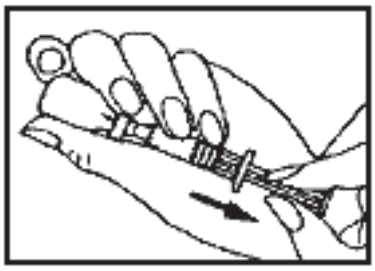


Step 1



Step 2

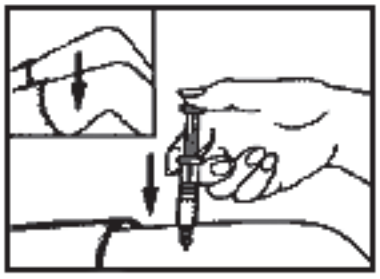
- Gently shake the vial (bottle). Leave the syringe in place and gently shake the vial until the powder is completely dissolved.



Step 3

- Withdraw all of the liquid from the vial (bottle) into the syringe. While the needle is still inside the vial, turn the vial upside down and while keeping the needle in the liquid, slowly withdraw all the liquid into the syringe.

- Inject the glucagon into muscle or fat tissue.
- Thigh, upper arm, belly, or buttocks



Step 4

Insert the needle into loose tissue and inject the glucagon solution.

To stay healthy with diabetes you want to control your blood glucose levels.

Studies have shown good (without lows or highs) blood glucose control lowers the risk for diabetes complications.

These complications result in long term health problems.

Some of the complications of diabetes are:

- Eye problems (retinopathy)
- Kidney problems (nephropathy)
- Nerve damage (neuropathy)
  - Nerve damage in the feet leads to foot ulcers and infections.
- Heart attacks and strokes
- Sexual problems
- Frequent and slow healing infections

Eyes:

- Diabetes is the leading cause of blindness.
- Have your eyes checked yearly if you are an adult or have had diabetes more than 5 years.
- Your eye exam should include dilating your pupils so your doctor can look at the retina to see if there is any damage from the diabetes.

Nerve damage -- Foot care:

- Nerve damage can cause loss of feeling in the feet. This can lead to injury of the foot resulting in serious infections.
- Check your feet daily – check between your toes.
  - Call your doctor right away if you see an open sore, redness, swelling or your foot feels warm.
  - Do not use home treatments.
- Wash your feet everyday with warm (not hot) water and mild soap.
- Use a moisturizing cream or lotion to soften dry skin, but not between your toes.
- Wear the correct size shoes.
  - Shoes that rub or don't fit properly cause, calluses, blisters and foot ulcers.
  - Incorrectly fitting shoes is a major cause of foot problems in people with diabetes.
- Cut your nails straight across. If you have poor vision, do not cut your own nails. Make an appointment with a foot doctor (podiatrist).

Have your feet checked each time you see your doctor.

Kidneys:

The kidneys are affected by both high blood glucose and high blood pressure.

- Have yearly urine microalbumin ratio test to check for kidney damage.

Blood glucose and blood pressure control are the best way to prevent kidney damage from diabetes. Your doctor may recommend that you take a blood pressure medication called an ACE angiotensin converting enzyme inhibitor even if you do not have high blood pressure. Certain types of blood pressure medication have been shown to help prevent early kidney damage.

Heart and blood vessels:

Diabetes can affect your heart and blood vessels too.

- Do not smoke or chew tobacco. Tobacco narrows blood vessels and increases your risk for heart disease.
- Control your cholesterol. Limit your intake of saturated and trans fats.
- Control your blood pressure. Have your blood pressure checked regularly.
- Limit your intake of salt.
- Get regular physical activity/exercise.

Your doctor may suggest a cholesterol lowering medication called a statin even if your cholesterol is in a good range. Statins have been shown to help prevent a heart attack.

Skin and teeth:

With diabetes you are at greater risk for more serious teeth and skin diseases.

- Bath or shower daily to keep your skin healthy.
- Keep small cuts, broken skin or insect bites clean and dry.
- Brush and floss your teeth daily.
- See a dentist at least every 6 months.

Sexual problems:

The blood vessel that play a role in sexual activity are some of the smallest blood vessels and can be the first to be affected by blood glucose and blood pressure problems.

- Keep you blood glucose and blood pressure in good control.
- Talk with your doctor about medication to help with sexual activity.

Pregnancy:

Planning for pregnancy is important for women who have diabetes. Diabetes that is not well controlled increases the risk for birth defects and miscarriage. Most birth defects occur within six weeks of conception, often before a woman even realizes she is pregnant.

- Start planning for pregnancy at least 6 months in advance.
- See your doctor and diabetes team to help with pregnancy planning.
- If you think you may be pregnant, see your doctor right away.

Section 5 – Taking charge

Dealing with diabetes

When you are first told you have diabetes you may feel the changes you have to make are too much to handle.

Sometimes you have trouble making the changes because you do not feel sick.

Sometimes the fear of the unknown is stressful.

You are not alone.

We know diabetes is something that you have to deal with every day, and this can be hard. Your diabetes team is here to help.

Steps to help:

- Learn about your type of diabetes. This will help you take control in making choices about your health.
  - Write down questions you have for your health care team.
  - Do not be afraid to ask why.
- Accept how you feel. Covering up how you feel will cause more stress.
  - Talk about your feelings with your health care provider.
- Enjoy life. Living with diabetes is about more than just diabetes.
  - Get out and do things with your family and friends.
  - If you have hobbies, keep doing them.
  - Keep your routine.
- Set real goals. Do not over estimate what you can and will do.
  - Setting goals you can reach will help you feel successful.
- Try new things. Change is not always bad; it is a chance to try something new. Who knows, you may like it.
- Have a strong support system. Family and friends are there when you need them.
  - Talk to them when you feel down.
  - It also helps to talk to other people living with your type of diabetes.
- Sometimes dealing with how you feel is too much. Talking with a counselor may help. Understanding why you feel the way you do may help you learn to make the changes you need to make.
  - Ask your health care professional to refer you to someone who can help you with your feelings or with day-to-day life issues.

Having a plan for problems that might happen can help you deal with the struggles you might have with diabetes. Think about some of the situations below that you might have to deal with.

- How can you best deal with them?
- If you are going on vacation what do you need to take with you so that your diabetes stays under control?
- If you get sick, what do you need to do or have on hand to make sure your diabetes stays in control?
- If you are out to eat and you forgot your medication, what food choices should you make?
- Is there something you have been struggling with in your diabetes care?
- What is it and who can you ask for help?
- If you always forget to take your meter with you, what can you do to help remember it?

Resources for help with diabetes:

American Diabetes Association
www.diabetes.org
1-800-342-2383

National Diabetes Information Clearinghouse
www.diabetes.niddk.nih.gov
1-800-860-8747

American Association of Diabetes Educators
www.aadenet.org
1-800-338-3633

Social Services:
Check the yellow pages for the local telephone number.

- Salvation Army
- County Human Services
- Local Church/Community Food Banks
- United Way
- Catholic Charities
- American Red Cross
- Catholic Social Services

Transportation:
Check the yellow pages for the local telephone number

County Area Agency on Aging

County Human Services Dept.

Medication assistance programs:

Free Medication Foundation
1-877-331-0362

Partnership for Prescription Assistance
1-888-477-2669

Special ACCESS Program
www.access2wellness.com
1-866-317-2775

Pace and Pacenet for Older Pennsylvanians
1-800-225-7223

Web pages for assistance with medication:
www.needymeds.org/
www.scbn.org
www.geisinger.org

Diabetes magazine subscriptions:

- *Diabetes Forecast*
- *Diabetes Self-Management*
- *Diabetes Health*

Diabetes websites:

- *www.diabetes.org*
- *www.eatright.org*
- *www.dLife.com*
- *www.cdc.gov/diabetes/ndep/index.htm*
- Meter/pharmaceutical company websites

Other sources for help and support

- Diabetes refresher courses.
- Take advantage of your annual Medicare benefits for DSMT and MNT.
- Join a fitness center, gym or senior center for activity/social support.
- Work site health programs.
- Attend community health fairs.
- Contact your health insurance company for case/chronic disease management programs.
- Join a weight loss program.
- Attend healthy cooking classes.

Numbers to know

	ADA target*	Your goal	Your number
Blood glucose Pre-meal Post-meal (1 1/2 - hours)	 Below 130 mg/dl Below 180 mg/dl		
A1c	Below 7%		
Blood pressure	Below 140/80		
Blood lipid (cholesterol) LDL - bad cholesterol If heart disease HDL cholesterol Triglycerides	 Below 100 mg/dl Below 70 mg/dl Men: over 40 mg/dl Women: over 50 mg/dl Below 150 mg/dl		
Urine-microalbumin ratio	Below 21 ug/mg		

* The American Diabetes Association states that blood glucose goals should be individualized based on each person's needs and condition.

Recommended tests:

- **A1c every 3 – 6 months**

Measures what the average blood glucose level has been during the 2 – 3 months before the test.

When you test your blood glucose you are only spot checking at certain times of the day. The A1c test takes the average of your blood glucose levels all day for 2 – 3 months.
It is not necessary to fast for this test.

- **Foot exam.**
  - Check your feet daily
  - By your health care provider – at least 1 time a year
- **Urine microalbumin yearly.**
  - Checks your kidneys for damage
- **Dilated eye exam yearly.**
  - To catch eye damage that could lead to blindness
- **Flu shot yearly.**
  - People with diabetes are at greater risk for complications when ill.
- **Pneumonia shot at least one time before age 65 and then again after age 65.**
  - People with diabetes are at greater risk for complications when ill.
- **Cholesterol once a year.**
  - LDL cholesterol plays a role in heart disease.
    - Your LDL (bad cholesterol) should be under 100 mg/dl.
- **Blood pressure every visit.**
  - Lower blood pressure helps prevent heart attacks, strokes and blood pressure damage.

How are you doing?

Diabetes score card

Fill out the diabetes score card. Give yourself 1 point for each yes answer.
See how close you are to a perfect “10”.

Questions	Your score
You’ve had an eye exam in the past year	
You’ve had a urine test for microalbumin	
Your last A1c was within the last 6 months and was under 7%	
You’ve had you cholesterol tested in the past year and your LDL level was below 100	
If heart disease below 70	
Your last blood pressure was less than 140/80	
You do not smoke	
You’ve had the flu vaccine	
You’ve had the pneumonia vaccine	
You exercise at least three times a week	
You’ve had your feet checked by a doctor in the last year	
Your total score	

Source Information: Health information provided by the experts at Geisinger Health System

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