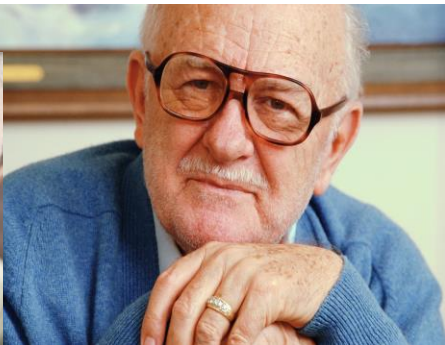




Staying Healthy With Diabetes

For: _____



uwhealth.org

We care. We will listen. We can help.

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Reference:

American Diabetes Association. Standards of Medical Care in Diabetes-2018. *Diabetes Care*. 2018;41(Suppl 1):S1-159.

Your health care team may have given you this information as part of your care. If so, please use it and call if you have any questions. If this information was not given to you as part of your care, please check with your doctor. This is not medical advice. This is not to be used for diagnosis or treatment of any medical condition. Because each person's health needs are different, you should talk with your doctor or others on your health care team when using this information. If you have an emergency, please call 911. Copyright© 1/2018 University of Wisconsin Hospitals and Clinics Authority. All rights reserved. Produced by the Department of Nursing. HF#6671

About Diabetes

Types of Diabetes

- **Type 1 diabetes** means that your body no longer makes insulin. It is often diagnosed early in life but can occur at any age. Insulin must be taken to stay alive.
- **Type 2 diabetes** means that your body does not respond to insulin as it should. Over time, the body may stop making enough insulin to keep glucose levels controlled. When this happens, insulin is needed. Type 2 is the most common type of diabetes.
- **Medication-induced diabetes** means that certain medications, like steroids, can cause blood glucose levels to rise above normal.
- **Prediabetes** means that blood glucose levels are higher than normal but not high enough to be diagnosed with diabetes. If action is taken and blood glucose levels are controlled, type 2 diabetes can be delayed or even prevented.

With all types, your body has a harder time changing the food you eat into energy. Glucose levels rise and you have less and less energy. The glucose that stays in the bloodstream can damage blood vessels throughout the body over time. This can lead to damage to your heart, eyes, kidneys, and many other parts of your body.

Risk Factors for Type 2 Diabetes

- Over age 45
- Family history
- Ethnicity (African American, Latino, Native American, Asian American and Pacific Islander)
- Overweight
- Delivered a baby weighing more than 9 pounds or have had gestational diabetes
- Sedentary lifestyle

What the Numbers Mean

Diabetes is often diagnosed by checking fasting blood glucose levels.

Normal: 70-99 mg/dL

Prediabetes: 100 – 125 mg/dL

Diabetes: 126 mg/dL or higher on two tests or anytime glucoses are more than 200 mg/dL with symptoms

A1C and eAG

The A1C or hemoglobin A1C measures the average amount of glucose in your blood over the past 2-3 months. Studies show that any decrease in A1C will help to reduce the risk of long term problems from diabetes. The chart below shows how the A1C relates to the estimated average glucose or “eAG”.

| | A1C | eAG (mg/dL) |
|---------------------|------------|-------------|
| Take Action | 15 - 17 % | 384 - 441 |
| | 14 % | 355 |
| | 13 % | 326 |
| | 12 % | 298 |
| | 11 % | 269 |
| | 10 % | 240 |
| | 9 % | 212 |
| | 8 % | 183 |
| Goal | 7 % | 154 |
| Diabetes | 6.5 % | 140 |
| Pre-diabetes | 5.7 -6.4 % | 117-137 |

Talk with your health care team about how often you need an A1C checked. It often depends on your most recent result.

| | A1C | eAG |
|------------------------|-----|-----|
| My Goal | | |
| Last result | | |
| Next A1C (date) | | |

Blood Glucose Testing at Home

You can check your blood glucose levels at home using a glucose meter. The results tell you what your glucose levels are at certain times of the day. Your meal choices, activity, medicines, and how you feel will affect the results.

There are many kinds of glucose meters. It is best to find out which meter is covered by your insurance.

Before testing, always wash your hands with soap and water. You will poke your clean finger for the blood sample. Apply the drop of blood on a test strip and wait a few seconds for the result.

Your Glucose Goals

Talk with your health care team about setting goals that make sense for you. Use the boxes below to record your goal.

| Goals for People with Diabetes* | Your Goal |
|---|------------------------|
| Before Meals: 80-130 mg/dL | _____ to _____ |
| 1-2 hours after starting a meal: less than 180 mg/dL | Less than _____ |
| Bedtime/Before Driving: 100-140 mg/dL | _____ to _____ |

*Source: American Diabetes Association (2018)

My Self-Testing Plan

How often you test your blood glucose levels at home depends on your treatment plan. Some people check a few times per week. Others need to check four or more times per day. Talk to your team about the best times for you to test.

My Testing Schedule:

- Before meals Bedtime
- 2:00AM
- Before/during/after exercise
- Anytime you have signs or symptoms of low or high blood sugar

Record your results in a logbook and/or store results electronically. **Bring your logbook and/or meter to every clinic visit for your health care team to review.**

Testing on Sick Days

If you get sick with a cold or flu or if you have an infection, you may need to check your blood glucose levels as often as every two hours. Stay in close contact with your health care team during these times.

- Keep taking your diabetes pills or insulin (if possible).
- Drink at least 4 oz (1/2 cup) of fluids every 30 minutes.
- If you cannot eat a meal, then fluids should contain sugar.

When to Call Your Doctor

- If you have had vomiting or diarrhea for more than 6 hours
- If your glucose stays above 300 mg/dL for more than 6 hours or below 70 mg/dL after repeated treatment
- If you have moderate to large ketones

High and Low Blood Glucose (Sugar) Reactions

Low Blood Glucose (Hypoglycemia)

Less than _____ mg/dL

Causes

- Too much insulin or diabetes pills
- Late/skipped meal or smaller than usual meal
- More activity/exercise than usual
- Alcohol intake without food

Symptoms (happen quickly)

- Shaky, sweaty or clammy
- Light-headed, weak, blurry vision
- Hungry, irritable, anxious or confused

These are the most common symptoms. Get to know your symptoms and act quickly. If not treated quickly, you may lose consciousness.

Treatment Options (if able to swallow)

Get treatment quickly. Take 15 grams of quick-acting carbohydrate (sugar).

Examples:

- 4 oz. (½ cup) juice or regular (non-diet) soda
- Glucose liquid or gel (read label for amount)
- 4 glucose tablets (chew them)
- Soft, chewable candy (amount varies)

Check your blood glucose 15 minutes after treatment. If your glucose is still below 70 mg/dL, repeat treatment.

Call 911 if you feel too sick to eat or if the glucose levels stay below 80 mg/dL after 30 minutes.

Informing Others

It is important to wear a Medical Alert bracelet or necklace that is easy to see by others. Carry a wallet card that states that you have diabetes.

High Blood Glucose (Hyperglycemia)

More than _____ mg/dL

Causes

- Not enough or missed dose of insulin or diabetes pills
- Less activity than usual
- Overeating
- Illness (cold, flu, infection)
- Pain or injury
- Stress (physical or emotional)
- Some medicines (such as steroids)

Symptoms (happen over time)

- Thirst, frequent urination
- Nausea/vomiting
- Unexplained weight loss
- Slow healing or frequent infections
- Fatigue or sleepy
- Blurred vision

Many people do not have symptoms until glucose levels are very high, but this varies for each person. If not treated, high blood sugars can be life-threatening.

Prevent High and Low Blood Glucoses

- Know what causes your low and high blood glucose levels and take steps to prevent those causes.
- Test your glucose levels as advised by your health care team. Know your target glucose levels.
- Keep a log of your results. If you notice patterns of high or low glucose levels, call your doctor or nurse to discuss.
- Take your insulin or diabetes pills as prescribed. If you think the doses are a cause of your low or high blood glucose levels, talk with your health care team.
- Follow your meal plan. Do not skip meals and avoid overeating.
- Check your blood sugar before exercise and before driving. Eat a snack if needed.

Basics of Healthy Eating

- Aim to eat meals and snacks at about the same time each day. Avoid skipping meals. This will prevent you from getting too hungry and overeating.
- Eat breakfast every day. Healthy examples: 1 piece of whole grain toast and an egg, or yogurt and a piece of fruit, or a small bagel with peanut butter.
- Choose a variety of foods at each meal to help your body get the nutrients it needs.
- Use a 9” plate to help you pay attention to portion sizes. Fill ½ of it with fruits and vegetables, ¼ with protein, and ¼ with grains.
- If you need to lose weight, eat smaller portions and become more active!
 - Losing 5-10 pounds can improve your blood glucose levels, blood pressure, and cholesterol.
 - Start by cutting out 100 calories a day (8 oz regular soda, 1 Tbs. Butter, margarine or regular salad dressing).
 - Walk 10 minutes more each day. Small changes count!



- Eat high-fiber foods. Aim for:
 - 3 grams or more of fiber per serving
 - 25 – 35 grams of fiber per day
- Limit foods high in fat. Use foods with less saturated and trans fat, sugar and sodium.
- Choose lower calorie options when you eat out. Share a meal or bring home left-overs to control portions.
- Use jams, jellies and syrup made with low sugar or no sugar.
- Choose unsweetened drinks such as black coffee, diet soda, or drinks with an artificial sweetener. Use unsweetened canned fruits in natural juices.

Carbohydrates

Foods contain carbohydrates, proteins, and fats. All three are part of a well-balanced meal plan. Carbohydrates raise blood sugar while protein and fat do not.

You still need to eat carbohydrates for many reasons.

- They are a good source of energy for the body, especially the brain and red blood cells.
- They can be a great source of fiber, vitamins and minerals.
- They taste good!

Examples of Carbohydrates

- Breads, cereals, rice, and pasta
- Starchy vegetables (white and sweet potatoes, corn, green peas, and winter squash) and legumes (dried beans, lentils, and split peas)
- Fruits and fruit juice
- Milk and yogurt
- Sweets and snacks such as cakes, ice cream, cookies, chips, and pretzels
- Regular sodas, jelly, syrup, honey, and table sugar

Carbohydrate Counting

Carbohydrate (“carb”) counting is a method of meal planning. It is used to help improve glucose results. It is not a special diet, nor does it cut out any of your favorite foods. In fact, it is just a way to keep track of the foods you eat that contain carbohydrate.

Getting Started

Aim for consistent carbohydrate amounts with meals and snacks. This should help you meet your blood glucose goals.

Generally, adults with type 2 diabetes, eat:

- 135-180 grams per day
- 45-60 grams per meal
- 15-30 grams per snack

Food Labels

- Read food labels carefully. Be sure to look at the serving size and the **Total Carbohydrate** line. You don’t need to look at the grams of sugar because they are included in the Total Carbohydrate grams.
- Sugar-free foods may still contain carbohydrate, so be sure to check the total carbohydrate content.
- Sugar alcohols like sorbitol or mannitol are used in sugar-free gum and candy. Sugar alcohols can cause stomach cramping or diarrhea if used in large amounts.
- Foods with less than 20 calories or less than 5 grams of total carbohydrate per serving will have little effect on your blood sugar levels, if used in small amounts.

Working with a Dietitian

One of the first things to do is decide on a meal plan with a dietitian. Based on your usual intake, weight, height, activity level, and age, he or she will suggest how many carbohydrate servings you should have each day and how to divide them between meals and snacks.

| 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% |
| <small>* 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.</small> | |

Image source: U.S. Food and Drug Administration, Changes to the Nutrition Facts Label 11/11/2017).

| Serving Sizes and Carbohydrate Content | | |
|---|---------------------|-------------------------------|
| Grains, Beans and Starch Vegetables | Portion Size | Total Carbohydrate (g) |
| Beans (black, garbanzo, kidney, navy, etc.), cooked or canned | ½ cup | 15 |
| Bread, any kind | 1 slice (1 oz) | 15 |
| Bun, hamburger or hot dog | 1 | 25-30 |
| Cereal, cooked | ½ cup | 15 |
| Cereal, unsweetened, dry | ¾-1 cup | 20-30 |
| Corn | 1/2 | 15 |
| Crackers, graham | 2 squares | 10 |
| Crackers, saltines | 4 squares | 9 |
| Pasta, cooked | 1/2 cup | 22 |
| Peas | ½ cup | 15 |
| Potato, cooked | ½ cup | 15 |
| Rice, cooked | 1/2 cup | 22 |
| Tortilla, flour, 8" | 1 | 25 |
| Fruits | Portion Size | Total Carbohydrate (g) |
| Apple | 1 medium | 22 |
| Banana | 1/2-1 | 15-30 |
| Berries (strawberries, blueberries, raspberries) | 1 cup | 15-20 |
| Canned fruit in juice | ½ cup | 14 |
| Canned fruit in heavy syrup | ½ cup | 23 |
| Grapes | 1 cup | 27 |
| Juice (grape, cranberry, prune) | 1/3 cup | 15 |
| Juice (apple, orange, grapefruit) | 1/2 cup | 15 |
| Milk and Yogurt | Portion Size | Total Carbohydrate (g) |
| Milk, 1% and fat-free | 1 cup | 13 |
| Milk, 2% and whole | 1 cup | 12 |
| Yogurt, fruited, sweetened | 6 oz cup | 25-35 |
| Yogurt, light, fat-free, artificially sweetened | 6 oz cup | 15-20 |
| Foods You Eat | | |
| | | |
| | | |
| | | |

Using Common Objects to Estimate Portion Sizes



1 fist = 1 cup of cooked cereal, pasta or rice



Tennis ball = 1 medium piece of fruit



DVD = 1 pancake or slice of bread



1 palmful = 1 ounce of nuts or candy
2 handfuls = 1 ounce of snacks like chips, pretzels and similar items



Palm of hand or deck of cards = 3 ounces of cooked meat, poultry or fish



Index finger = 1 ounce of cheese



Tip of thumb = 1 teaspoon
Use for butter, margarine, sugar, honey, jelly or other condiments



Golf ball = 2 tablespoons
Use for peanut butter, ketchup, dressing or other condiments or sauces

Staying Healthy to Avoid Complications of Diabetes

High blood glucose levels over time can cause damage to your blood vessels, eyes, kidneys, nerves, and feet. This means you can be at risk for heart attack, stroke, blindness, kidney disease, and loss of toes and limbs. Review the chart below for things you can do to lower your risk of these problems.

| What You Need | How Often | Reason | Goal |
|---|--|--|---|
| A1C Test | Every 3 or 6 months | Know if blood sugar levels are in your goal range | < 7% for most people <i>If you do not know your A1C goal, ask.</i> |
| Urine Microalbumin /Creatinine Ratio Test | Yearly | Check the health of your kidneys. High blood sugar levels and high blood pressure damage blood vessels in the kidneys. | < 30 mg/L |
| Cholesterol Test | Every 5 years or more often as needed | If cholesterol levels are not in goal range, discuss changes that could help reduce risk of stroke, heart attack, kidney and eye problems. | Triglycerides: < 150 LDL: < 100 HDL: > 40 for men; > 50 for women |
| Blood Pressure Check | Each Visit | If blood pressure is not in goal range, discuss changes that could help reduce risk of stroke, heart attack, kidney and eye problems. | < 140/90 for most <130/80 for some |
| Clinic Appointment | Every 6 months or more often if needed | Discuss your test and exam results, home blood sugar readings, alcohol intake, smoking habits, exercise and any concerns you have. | Set or revise personal health goals |
| Dilated Eye Exam | Every 1-2 years | Check for small blood vessel damage in the back of the eyes | Prevent eye problems that can affect vision and lead to blindness |
| Dental Exam | Every 6 months | Check for tooth or gum problems | Prevent gum problems and tooth decay |
| Complete Foot Exam | Yearly | Check nerve function, circulation, and any nail or skin problems | Prevent ulcers and amputation of toes, feet, legs |
| Flu/Pneumonia Vaccinations | As needed; ask your doctor | To protect against illness | Prevent high blood sugar levels due to illness |
| Diabetes Education | When diagnosed and yearly | Learn about how to stay healthy with diabetes; help you set personal health goals | Attend a class taught by dietitians and/or nurses who are certified diabetes educators (CDE); include family or support persons to learn with you |

Other Healthy Choices

Regular check-ups and immunizations go a long way in keeping you healthy. There are a number of other things you can do as well.

Activity

Activity helps control your blood glucose levels. Here are some key points to follow:

- Have a check-up first!
- Start gradually.
- Set goals.
- Choose activities you enjoy.

Safety First

- Test blood glucoses before and after activity. Low blood glucose can happen hours later.
- Always warm up and cool down.
- Keep water nearby to stay hydrated.
- Be prepared to treat low blood glucoses.
- Carry identification.

Foot Care

- Wear well-fitting shoes and socks.
- Look at your feet daily. If you have trouble seeing your feet, use a mirror or ask a family member to look for you.
- Be sure to report any signs of cuts, sores, redness, or drainage.
- Ask for help from your doctor if you need help cutting your nails. You might need help from a podiatrist (foot doctor).

Tobacco Use

If you use tobacco, there are some key things to know that relate to diabetes.

- Smoking raises your blood sugar levels AND lessens your body's ability to use insulin. Smoking ONE cigarette lowers the body's ability to use insulin by 15%.

- People with diabetes who smoke are twice as likely to have circulation and wound healing problems.
- You are 11 times more likely to die of a heart attack or stroke if you have diabetes and smoke.
- Smokers with diabetes are more likely to get nerve damage and kidney disease.

Make a Quit Plan

- The best way to quit is to combine medicines with counseling and/or the Tobacco Quit Line. Using both makes successful quitting four times more likely!
- Tobacco users can call toll free, **1-800-QUIT-NOW** (800-784-8669) to talk to counselors about how to quit. The calls are private and advice is tailored to each person.

Managing Your Emotional Health

Dealing with diabetes or any chronic condition can be overwhelming. Be sure to find others who can provide support. This might include family, friends, and your diabetes care team. Find ways to manage the stress you might have. Emotional stress can even affect your blood glucose levels.

Ways you deal with stress:

If you are feeling helpless or hopeless, or have trouble sleeping or eating, talk with your provider. These can be signs of depression.

Oral Diabetes Medications (Pills)

There are many medications taken by mouth for high blood glucose. These may also be called “oral agents.” They are used along with healthy eating and exercise. Some of them are listed below. If oral agents are prescribed for you, be sure to find out more about how each one works.

| Medicine Names | How It Works | A1C Effect | Notes |
|--|---|------------|--|
| <p>Biguanides Examples:</p> <ul style="list-style-type: none"> • Glucophage[®] (metformin, regular release) • Fortamet[®], Glucophage XR[®], Glumetza[®] (metformin extended release) | <ul style="list-style-type: none"> • Help muscle cells use sugar • Lower the amount of glucose your liver makes • Lower how much sugar your body absorbs from the food you eat | 1-2% | <ul style="list-style-type: none"> • Take with food to decrease side effects of upset stomach, diarrhea • Must swallow extended release tablets whole • May need to stop for surgery, certain scans or x-rays |
| <p>Sulfonylureas Examples:</p> <ul style="list-style-type: none"> • Amaryl[®] (glimepiride) • Glucotrol[®] (glipizide) • Glucotrol XL[®] (glipizide Extended Release) • Diabeta[®], Micronase[®] (glyburide) | <ul style="list-style-type: none"> • Help your pancreas make more insulin | 1-2% | <ul style="list-style-type: none"> • Can cause low blood sugars • Do not take if you will not be eating within 30 minutes • Avoid with sulfa allergy |
| <p>Dipeptidyl Peptidase-4 (DPP-4) inhibitors Examples:</p> <ul style="list-style-type: none"> • Onglyza[®] (saxagliptin) • Januvia[®] (sitagliptin) • Tradjenta[®] (linagliptin) | <ul style="list-style-type: none"> • Raise the amount of insulin your body makes after you eat • Lower the amount of glucose the liver makes | 0.4 – 0.8% | <ul style="list-style-type: none"> • Do not cause weight gain |
| <p>Thiazolidinediones (“TZDs”) Examples:</p> <ul style="list-style-type: none"> • Actos[®] (pioglitazone) • Avandia[®] (rosiglitazone) | <ul style="list-style-type: none"> • Help muscles use glucose • Lower the amount of glucose the liver makes | 1-1.5% | <ul style="list-style-type: none"> • Can cause swelling and weight gain • Should not be used for people with heart failure • Discuss other risks/restrictions with provider |
| <p>Sodium-Glucose Co-transporter 2 (SGLT2) Inhibitor Examples:</p> <ul style="list-style-type: none"> • Invokana[®] (canagliflozin) • Farxiga[®] (dapagliflozin) • Jardiance[®] (empagliflozin) | <ul style="list-style-type: none"> • Help remove glucose from the body through the urine | 0.5-1% | <ul style="list-style-type: none"> • Take before the first meal of the day • Likely to have increased urination • More risk for urinary tract and fungal infections |

Insulin and Non-Insulin Injectables

Insulin is used when a meal plan, exercise, and oral agents are not enough to control your blood glucose levels. If you have type 1 diabetes or your pancreas has been damaged or removed, insulin must be used. The chart below tells you more about how different insulins work. **Onset** means how long it takes to start to work. **Peak** means when it works at its best. **Duration** means how long it affects your blood sugars.

Other treatment options may be prescribed for adults with type 2 diabetes. Exenatide (Byetta[®], Bydureon[®]), liraglutide (Victoza[®]), and dulaglutide (Trulicity[®]) can lower blood glucose levels. These medicines are not insulin, but must be injected. If you have questions, please ask your team who can give you more details.

| Insulin Name | Onset | Peak | Duration | Key Points |
|---|---------------|------------|-------------|---|
| Novolog [®] (aspart) Humalog [®] (lispro) Apidra [®] (glulisine) Humalog [®] U-200 | 5-15 minutes | 1-2 hours | 4-6 hours | Take within 10 minutes before or after eating. |
| Regular | 30-60 minutes | 2-4 hours | 6-10 hours | Take within 30 minutes of eating. |
| NPH | 1-2 hours | 4-8 hours | 10-20 hours | This insulin is cloudy. Always roll the vial or pen before using. |
| Detemir (Levemir [®]) | 1-2 hours | 8-12 hours | 12-24 hours | Never mix in the same syringe with any other insulin. |
| Degludec (Tresiba [®] U-100/U-200) | 1 hour | 12 hours | 42+ hours | Only available in a pen (no vials) |
| Glargine (Lantus [®] /Basaglar [®]) | 1-2 hours | None | 24+ hours | Never mix in the same syringe with any other insulin. |
| Glargine U-300 (Toujeo [®]) | 6 hours | None | 36 hours | Only available in a pen (no vials) |

Expiration

Using expired medicine will affect your blood sugar control. Key points:

- Check your vials for an expiration date. Use this date if the vial has not been opened yet.
- Mark the date you start to use a vial or pen. Once in use, insulin expires whether or not you refrigerate or store at room temperature.
- Do not refrigerate insulin pens after first use unless instructed to do so.

Expiration dates for vials

- Levemir[®]: 42 days
- All other insulin types: 28 days

Expiration dates for insulin pens

- NPH: 14 days (disposable) or 7 days (cartridge)
- Levemir[®] and Toujeo[®]: 42 days
- Tresiba[®]: 56 days
- 70/30, 50/50, 75/25: 10 days (disposable) or 7 days (cartridge)
- All other insulin types: 28 days

Expiration dates for non-insulin injectables

- Byetta[®] (exenatide): 30 days
- Bydureon[®] (exenatide XR): 28 days if stored at room temperature
- Victoza[®] (liraglutide): 30 days
- Ozempic[®] (semaglutide): as directed
- Trulicity[®] (dulaglutide): as directed

Correction Insulin

Correction insulin is meant to “correct” or lower high blood sugars before meals. It is often given **in addition to** the usual dose that you take to cover your meal. Some people also take it if blood sugars are high at bedtime.

Types of Correction Insulin

Short-acting or rapid-acting insulin can be used. Examples include:

- Regular
- Novolog[®] (aspart)
- Humalog[®] (lispro)
- Apidra[®] (glulisine)

My Insulin Type: _____

Key Points

- Do **not** eat less food because of the high blood sugar. This can put you at risk for low blood sugars.
- Do not take correction insulin more often than every 4-6 hours unless you have been told to do so.
- If you need to use correction insulin daily, for three or more days in a row, call your health care team. Your usual doses may need to be changed.
- Exercise will likely lower your blood sugars. You may not need correction insulin at the meal before or after you exercise. Discuss this with your health care team.

My doses as of this date _____ are:

| Before Meals | |
|----------------------|------------------------------|
| If Blood Glucose is: | Add this much extra insulin: |
| Less than 150 mg/dL | No extra insulin |
| 151 - 200 | units |
| 201 - 250 | units |
| 251 - 300 | units |
| 301 - 350 | units |
| 351 - 400 | units |

| Before Bedtime | |
|-----------------------|------------------------------|
| If Blood Glucose is: | Add this much extra insulin: |
| Less than 200 mg/dL | No extra insulin |
| 201 - 250 | units |
| 251 - 300 | units |
| 301 - 350 | units |
| 351 - 400 | units |
| More than 400 | units |

Example



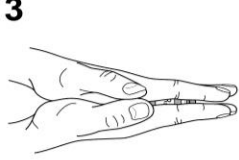





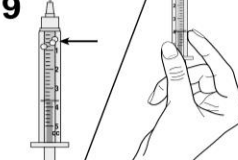
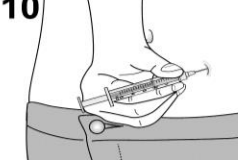
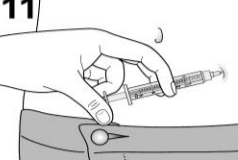
Your blood sugar before lunch is 285 mg/dl.

Your usual dose is _____ units.

Your correction dose is _____ units.

Total Dose = _____

Steps to Draw Up and Inject Insulin

| | | | |
|--|--|--|---|
|  |  |  |  |
| <p>1 Always wash your hands.</p> | <p>2 Get all of your supplies.</p> | <p>3 Roll the insulin vial between your hands, if using a cloudy insulin.</p> | <p>4 Wipe the top of the vial with an alcohol swab.</p> |
|  |  |  |  |
| <p>5 Pull the syringe plunger down to the desired units.</p> | <p>6 Push the syringe needle into the vial.</p> | <p>7 Push the plunger down.</p> | <p>8 Turn the vial upside down. Pull the plunger down to withdraw insulin.</p> |
|  |  |  | |
| <p>9 Remove all the air bubbles. Check to see if your dose is correct.</p> | <p>10 Pick a clean injection site. Push the needle into the skin.</p> | <p>11 Push the plunger in. Pull the needle out of the skin.</p> | |

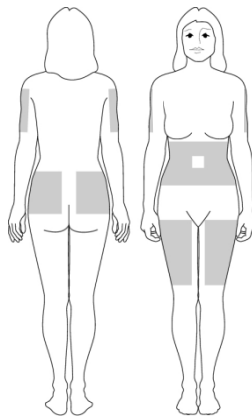
Needle Disposal

Drop the used syringe or pen needle into the “Sharps Box” or other hard plastic container. Close the lid and move the box out of the reach of children and pets. For more information visit, <http://www.fda.gov/safesharpsdisposal>.

Injection Sites

Insulin injections are given into fatty tissue. Areas of fatty tissue are shaded in the image below.

Abdomen: If using this site, do not use the area within one inch of your belly button. Avoid using the belt line area since rubbing may irritate the site. Avoid scars from surgery.



Arms: Use the back side of your upper arm in the fatty tissue. It can be hard to reach this area yourself. You can try pinching up the tissue by placing your arm over the back of a chair or brace it against a wall.

Thighs: Use middle and outer areas where you can pinch up tissue.

Buttocks: Use any area where you can pinch up tissue. This site is not often used since it’s hard to reach.

Site Rotation

Rotate your injection sites to prevent tissue damage. If tissue is damaged, the insulin may not absorb as well. This may make it harder to control your blood sugars. Some people keep a record of where their last shot was given to avoid these problems. If you choose one site, like the abdomen only, be sure to rotate shots within that site.

Drawing Up Two Types of Insulin

If you need two types of insulin at the same time of day and prefer to inject once, you may be able to combine them in one syringe. See the key points below.

(Not all insulin types can be mixed. Be sure to ask your health care team if it makes sense to mix the insulin types you take.)

Key Points:

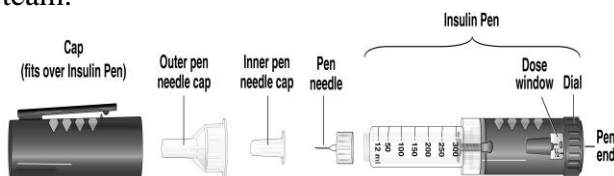
- Inject air into both vials before drawing up insulin.
- Always draw up your clear insulin before the cloudy insulin.
- If you draw too much cloudy insulin, discard the syringe and start again.

Drawing Up Insulin Before Dose Is Needed

- NPH and Regular insulin can be pre-filled up to 21 days before using.
- Keep these pre-filled syringes in the refrigerator with the needle tip pointed upward. Rotate the syringe to mix the two insulins before using.
- If NPH and rapid-acting insulin are mixed in the same syringe, give the dose as soon as you can after drawing it up.
- Glargine should not be pre-filled. Inject it as soon as you can after drawing it up.

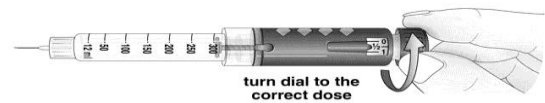
Using Pens or Devices

Insulin and other medications can be given using devices that may be shaped like pens. (See image below.) You can “draw up” your dose by turning a dial to the amount you need. Some people find this is easier than using a syringe. Pens may cost more, so be sure to discuss this with your health care team.



Steps for Using an Insulin Pen

1. Wash your hands and be sure your injection site is clean.
2. Check the label on the pen to make sure you are using the correct type of insulin.
3. Clean the rubber stopper on your pen by rubbing it with an alcohol wipe.
4. Remove the foil seal on the pen needle. Attach the pen needle to your pen by twisting it on the end of the pen until tight.
5. Pull off the outer pen needle cap and inner pen needle cap. Set aside.
6. Prime the pen by dialing in 2 units (of 5 units if using U-500 pen). Hold your pen with the needle pointing up. Push the end of your pen like a plunger to push out the 2 units. You should see a drop of insulin at the needle tip. If not, repeat this step. (Do this priming step each time you attach a new needle.)
7. Turn the dial to the number of insulin units you need.



8. Locate the injection site. Inject the pen needle into your skin at a 90 degree angle as shown in the picture.
9. Push the end of your pen down all the way until pen dose reads “0”.
10. Wait 5-10 seconds before pulling the pen out of your skin.
11. Withdraw the pen and pen needle from your skin.
12. Unscrew and remove the pen needle.
13. Throw your used pen needle in a sharps box.



Source of images: Media Solutions, UW School of Medicine and Public Health. Permission for use granted by the Wisconsin Diabetes Prevention and Control Program.

Frequently Asked Questions

We expect that you will have questions as you learn more about insulin. The questions below are a few that are often asked.

Sometimes, a little insulin leaks out of the skin after my shot. Should I repeat the dose or give a little more?

Do not give more insulin – there is no way to guess the amount that leaked out. When giving the next dose, leave the needle in the skin for a few seconds after injecting. If you are using a pen instead of a syringe, make sure to leave the needle in the skin and count to 10 before pulling out the needle.

What should I do if I draw up/dial up the wrong dose?

If you are using a vial and syringe, and only one type of insulin, you can push the insulin back into the vial until you are at the correct dose. If you are using a pen, make sure to turn the dial back to zero (0). Do not push the dialed end in if there is no pen needle attached. The pressure created may cause damage. Never dial in a dose of insulin without a pen needle attached.

What if I forget to take my insulin?

If you are taking only one injection of insulin a day, you may take your shot if you remember before going to bed. If you forget at night, do not take a dose the next morning. Just take your prescribed dose the next evening. Expect your blood glucose readings to be higher during the day after no insulin.

What if there is air in my syringe?

With the needle pointing up, “flick” the syringe to move the air bubble to the top. Then push the plunger up to force the air out. Draw up more insulin if needed to get the dose you need. If you inject air into yourself, the air will not hurt you, but you will not get your full dose of insulin.

What if there is air in my insulin pen?

Sometimes air gets into the insulin in your pen. This often happens when a pen needle is left on the pen during storage. Always remove the pen needle after you have given your shot. If air is present in the insulin, attach a pen needle, dial up 2 units and hold the pen straight up and down with the needle pointing up. Push the dialed dose in – to shoot out the air. Repeat 2 units until a drop (or spray) of insulin comes from the tip of the needle.

What if I can't see to draw up my dose of insulin? There are magnifiers available for syringes and for some pen devices. You may also choose to have a family member or friend draw up syringes of the correct dose ahead of time.

Where should I throw away my needle?

Needles should be disposed of in a hard plastic jug, like a laundry detergent bottle. A red “Sharps Box” can be used if you prefer. These can be purchased at any pharmacy. Some laboratories will accept needles that are in a hard plastic container.

Can I mix my insulin before I need it?

- NPH and Regular insulin can be pre-filled up to 21 days before using.
- Keep these pre-filled syringes in the refrigerator with the needle tip pointed upward. Rotate the syringe to mix the two insulins before using.
- If NPH and Novolog[®] or NPH and Humalog[®] are mixed in the same syringe, these doses should be given right after filling the syringe.
- Glargine should not be pre-filled. Inject it as soon as you can after drawing up your dose.

Your Insulin Action Plan

Doses may change when you leave the hospital or after a clinic visit. Please use the most recent orders from your doctor and/or refer to your discharge paperwork.

Date: _____ (Please update as changes are made.)

Blood Sugar Goals: _____ (before meals) _____ (at bedtime)

Testing Schedule: Before meals Bedtime 2:00AM Before/during/after exercise
 Anytime you have signs or symptoms of low or high blood sugar

| Type of Insulin | Breakfast | Lunch | Dinner | Bedtime |
|--|---|-------------|-------------|-------------|
| Long-acting insulin: (basal) | _____ units | _____ units | _____ units | _____ units |
| Meal time insulin: (bolus) | _____ units | _____ units | _____ units | |
| | <input type="checkbox"/> Skip usual meal dose if you skip a meal. <input type="checkbox"/> Take ½ of your usual meal dose if you eat less than half of your meal. | | | |
| Correction insulin: | With meals? <input type="checkbox"/> Yes <input type="checkbox"/> No At Bedtime? <input type="checkbox"/> Yes <input type="checkbox"/> No (See below for doses) | | | |

Correction Insulin

Note: If you need to use correction insulin daily, for 3 or more days in a row, call your health care team. Your usual doses may need to be changed.

| With Meals | |
|----------------------|------------------------------|
| If Blood Glucose is: | Add this much extra insulin: |
| Less than 150 mg/dL | No extra insulin |
| 151 - 200 | _____ units |
| 201 - 250 | _____ units |
| 251 - 300 | _____ units |
| 301 - 350 | _____ units |
| 351 - 400 | _____ units |

| At Bedtime | |
|----------------------|------------------------------|
| If Blood Glucose is: | Add this much extra insulin: |
| Less than 200 mg/dL | No extra insulin |
| 201 - 250 | _____ units |
| 251 - 300 | _____ units |
| 301 - 350 | _____ units |
| 351 - 400 | _____ units |
| More than 400 | _____ units |

We hope this booklet will help you to stay healthy with diabetes. We know it can be overwhelming at times. Remember... *We care. We will listen. We can help.*