DIABETES

A to Z

6TH EDITION

What You Need to Know About Diabetes—Simply Put

DIABETES

A to Z

6TH EDITION

What You Need to Know About Diabetes—Simply Put

American Diabetes Association®

Director, Book Publishing, Robert Anthony; Managing Editor, Abe Ogden; Acquisitions Editor, Victor Van Beuren; Editor, Rebekah Renshaw; Production Manager, Melissa Sprott; Composition, ADA; Cover Design, pixiedesign, llc; Printer, Transcontinental Printing.

Printed in Canada
1 3 5 7 9 10 8 6 4 2

♾ The paper in this publication meets the requirements of the ANSI Standard Z39.48-1992 (permanence of paper).

American Diabetes Association
1701 North Beauregard Street
Alexandria, Virginia 22311

Library of Congress Cataloging-in-Publication Data
Diabetes A to Z. -- 6th ed.
p. cm.
Includes bibliographical references and index.
ISBN 978-1-58040-329-0 (alk. paper)
1. Diabetes--Popular works. I. American Diabetes Association.
RC660.4.D526 2010
616.4'62--dc22

2010010645

Diabetes A to Z, 6th Edition

Table of Contents

Foreword

The number of people developing diabetes continues to grow at a rapid pace worldwide. Perhaps you, a family member, or friend has diabetes. Whether you are newly diagnosed, or have had diabetes for a number of years, *Diabetes A to Z*, 6th edition, can enhance your journey toward a long life of optimal health.

A diagnosis of diabetes brings with it a countless number of questions. Questions that can't wait until your next health care appointment. Questions that deal with the foods you are eating, physical activities, or complications, just to name a few. At times, you may not know what questions to ask. *Diabetes A to Z* is a great resource that you can use to answer your questions. It provides answers to many issues affecting people with diabetes in a concise, straightforward format. Answers that direct you to solutions to better self-manage your diabetes.

Diabetes self-management requires lifelong education and learning to obtain balance in your life. We hope *Diabetes A to Z* will increase your understanding and help you to live a healthier, happier life by improving your control of diabetes, by reducing the risk of complications, and by enhancing the quality of life.

Christine Tobin RN, MS, CDE
President Health Care and Education
American Diabetes Association

Acknowledgments

Many thanks to the reviewers of this edition:

Robert M. Anderson, EdD

Charlotte A. Hayes, CDE, MS, MSc, RD

Mary Korytkowski, MN, MD, MSN

Andrew J. Ahmann, MD

Melinda D. Maryniuk, MEd, RD, CDE, FADA

Neil Sheffler, DPM

Craig Williams, PharmD

Florence M. Brown, MD

Patti Geil, MS, RD, FADA, CDE

M. Sue Kirman, MD (ADA)

Gary Gross, Director of Legal Advocacy (ADA)

Katie Hathaway, Legal Advocacy (ADA)

Crystal Jackson, Legal Advocacy (ADA)

Brian L. Dimmick, Government Affairs and Advocacy (ADA)

Naomi P. Senkeeto, MA, Policy and Strategic Alliances (ADA)

A1C Test

Hemoglobin is a protein inside red blood cells. Hemoglobin carries oxygen from the lungs to all the cells of the body. Like other proteins, hemoglobin can join with sugars, such as glucose. When this happens, it becomes glycated hemoglobin, referred to as A1C or glycohemoglobin (or sometimes as HbA1c).

The more glucose there is in the blood, the more hemoglobin will join with it. Once joined, hemoglobin and glucose stay that way for the life of the red blood cell—about 4 months.

The A1C test measures the amount of glycohemoglobin in your red blood cells. The A1C test is usually done by a lab. A sample of your blood is taken. The blood can be taken at any time of the day. It does not matter what food you last ate. It does not matter what your blood glucose level is at the time of the test.

What the A1C Test Can Do

- Tell you about your average blood glucose level for the past 2 to 3 months. You can then see how your blood glucose control has been. An A1C < 7% is good for most people, while an A1C > 9% is considered very poor control. Some reports will now give the A1C value expressed as a percent together with an average blood glucose value in mg/dl. This is known as your estimated average glucose (eAG). (See Calculating Your eAG, next page.)
- Allow you to compare the A1C test results with blood glucose checks you do yourself or tests your doctor has done. If the tests do not agree, you may need to change the way or the times you check your glucose levels at home.
- Help you judge whether your diabetes care plan is working. If your

glycohemoglobin indicates that your blood glucose level was high during the past 2–3 months, something in your plan may need to be changed.

- Show you how a change in your plan has affected your diabetes. Perhaps you started to exercise more. An A1C test can confirm the good effects exercise has had on your blood glucose control.

CALCULATING YOUR eAG

A1C (%)	eAg (mg/dl)
5	97
5.5	111
6	126
6.5	140
7	154
7.5	169
8	183
8.5	197
9	212
9.5	226
10	240
10.5	255
11	269
11.5	283
12	298

When to Get an A1C Test

An A1C test is typically used to diagnose diabetes at this time. If your A1C is greater than or equal to 6% at the time of the test, you will be diagnosed with diabetes. After that, have the test done at least 2–4 times a year.

Why to Keep Doing Self-Checks of Blood Glucose

The A1C test can't replace the checks you do each day to measure the level of glucose in your blood (see Blood Glucose, Self-Checks, page 19). Self-checks help you decide how to treat diabetes at that moment. What you do to keep daily blood glucose levels in range will show up in your A1C test results.

Activity

Activity is good for everyone, especially people with diabetes. Activity helps your insulin (whether made by your pancreas or taken by injections) work better, which means you may need less insulin or fewer diabetes pills to control your diabetes. Moderate activity lowers your risk of heart disease and high blood pressure and may reduce your risk for colon cancer. It can improve your blood fat levels, reduce your body fat, and help you lose weight.

Activity keeps your joints, muscles, and bones healthy and strong. It improves balance and agility and lowers your risk of falling. Activity can also increase your energy; relieve feelings of depression, anxiety, and stress; and improve your mood. In short, activity could help you have a longer, happier, healthier life.

So go ahead. Get up and move whenever you can. When you are active and moving, you use two to three times more energy than when you are inactive.

WAYS TO GET MOVING

- Get up to change TV channels instead of using the remote.
- Do the ironing while watching TV.
- March in place while watching TV or walk around your house during commercials.
- Wash dishes, load the dishwasher, or load the washer or dryer during commercials.
- Mop the kitchen floor.
- Vacuum the living room.
- Sweep your sidewalk.

- Wash and wax your car.
- Use a rake instead of a leaf blower.
- Use a push lawn mower instead of an electric one.
- Plant and maintain an herb or vegetable garden.
- Take your pet for a walk.
- Push your baby in a stroller.
- Play actively with children.
- Volunteer to work for a school, hospital, or local park.
- Walk to the subway or bus stop.
- Take the stairs instead of the elevator or escalator.
- Stand or walk around while you're on the phone.
- Walk during lunch, during your break, or while waiting for an appointment.
- Do a few minutes of extra walking when you go grocery shopping or to a mall.
- Park your car farther away from your destination.
- Take a walk with someone you want to talk with.

Be sure to check with your health care provider before increasing your level of physical activity. If you have not been active lately, you may need to start with just 5 to 10 minutes of an activity and work up to longer or harder activity sessions.

Alcohol

One or two drinks a day will have little effect on your blood glucose level if you have good control of your diabetes, are free of complications, and drink the alcohol close to or with a meal. But drinking two or more drinks on an empty stomach can cause low blood glucose if you are taking certain diabetes pills or insulin or if you were just exercising or about to exercise.

Alcohol and Low Blood Glucose

Insulin lowers your blood glucose. Certain diabetes pills (sulfonylureas and meglitinides) make your body release more insulin to lower blood glucose. Exercise makes your insulin work better at lowering blood glucose.

Usually, if your blood glucose drops too low, the liver puts more glucose into the blood. (The liver has its own supply of glucose, called glycogen.) But when alcohol, a toxin, is in the body, the liver wants to get rid of it first. While the liver is taking care of the alcohol, it may let blood glucose drop to dangerous levels.

If you have low blood glucose after you drink, people might smell the alcohol and think you are drunk. The signs are the same. Tell them you have low blood glucose. Tell them what they need to do to help you take care of it. Wear a medical I.D. bracelet stating that you have diabetes. This will help in case you can't talk.

If you drink and then drive when you have low blood glucose, you may be pulled over for drunk driving. You may even have an accident. When you drink—even a small amount—let someone else drive. Pick a responsible person ahead of time.

HOW TO AVOID LOW BLOOD GLUCOSE

- Always eat something with carbohydrate when you drink alcohol.
- Check your blood glucose before, during, and after drinking. Alcohol can lower blood glucose as long as 8 to 12 hours after your last drink.
- Follow the recommendations of the Dietary Guidelines for Americans of no more than two drinks per day for men and no more than one drink per day for women. A drink equals a 12 oz beer, 5 oz wine, or 1.5 oz liquor.

Alcohol and Complications

Alcohol can worsen nerve damage, high blood pressure, and high blood fats. If you have any of these problems, ask your health care provider how much alcohol, if any, is safe for you to drink.

Cooking With Alcohol

When alcohol is heated in cooking, either on top of the stove or in the oven, some of it evaporates. How much of it evaporates depends on how long you cook it. If you cook it for 30 minutes or less, about one-third of the alcohol calories will remain. You'll need to count them in your meal plan. If you use alcohol regularly (3 times a week) in your cooking, the calories can add up.

Alcohol and Your Meal Plan

Work with a dietitian to include your favorite drink in your meal plan. Be aware that regular beer, sweet wines, and wine coolers will raise your blood glucose more than light beer, dry wines, and liquors (such as vodka, gin, and whiskey) because they contain more carbohydrate. Carbohydrate is the main nutrient that raises blood glucose.

HOW TO CUT CALORIES

- Use 80 proof in place of 100 proof alcohol. The lower the proof number, the less alcohol in the liquor. Each gram of alcohol has 7 calories.
- Put less liquor in your drink.
- Use no-calorie mixers, such as diet soda, club soda, or water.
- Choose light beer over regular beer.
- Choose dry wine over sweet or fruity wines and wine coolers.
- Try a wine spritzer made with a small amount of wine and a lot of club soda.

If you are watching your weight, be aware that alcoholic drinks can have anywhere from 60 to 300 calories each. Just cutting down on the number of drinks or changing the type of drink can help with weight loss.

SERVING SIZES

Drink	Serving	Calories	Exchanges
Liquor	1.5 oz	107	2 Fats
Table wine	5.0 oz	100	2 Fats
Wine cooler	12 oz	196	3 Fats, 1 Starch
Regular beer	12 oz	151	2 Fats, 1 Starch
Light beer	12 oz	97	2 Fats

Blood Glucose

The foods you eat are broken down into glucose by your body. Glucose is a form of carbohydrate or sugar. Glucose travels through your blood to your cells. Cells use glucose for energy. To get inside your cells, glucose needs the help of insulin.

In people with diabetes, there is a problem with the insulin. Sometimes there is no insulin (see Type 1 Diabetes, page 169). Other times insulin is present, but the levels are not adequate and the body has trouble using it (see Type 2 Diabetes, page 171).

When insulin is not able to do its job, glucose cannot get into the cells. Instead, glucose collects in the blood. The amount of glucose in your blood is called your blood glucose level. It is usually measured and reported as milligrams per deciliter (mg/dl) or as mmol/liter.

Too much glucose in the blood is called hyperglycemia or high blood glucose. Too little glucose in the blood is called hypoglycemia or low blood glucose. Blood glucose levels that are too high or too low can make you feel ill and harm your body (see Blood Glucose, High, page 13; Blood Glucose, Low, page 15).

To feel good and stay healthy, try to avoid high or low blood glucose levels and aim for a range your doctor advises. See the table on the next page.

Keeping your blood glucose in range and avoiding the highs and lows takes some effort. You can do it by balancing food, activity, and diabetes medicines or insulin. One of your best tools is a blood glucose meter. See some tips for success on pages 10-12.

RECOMMENDED BLOOD GLUCOSE RANGES FOR PEOPLE WITH DIABETES WHO ARE NOT PREGNANT

Time	Glucose (mg/dl)
In the morning, before breakfast	70 to 130
Before meals	70 to 130
Two hours after a meal	Under 180

These blood glucose checks are based on blood glucose checks you do at home (see Blood Glucose, Self-Checks, page 19) rather than lab tests. These may not be the best ranges for you. Talk to your health care team about what your ranges should be. These levels are recommended for the majority of people with diabetes. For some people, it may be reasonable to aim for glucose levels as low as 70, while others may be uncomfortable with any blood glucose level <100 mg/dl. Discuss this with your doctor.

Continuous Glucose Monitoring Devices

In addition to blood glucose meters that can be used to check glucose levels several times a day, there are now devices called continuous glucose monitoring devices (CGMs) that can be used by some people with diabetes that can provide information about their blood glucose levels at all times. These devices require the insertion of a sensing device under the skin that sends information about circulating glucose levels to a device that displays the result. The sensor transmits the results to the device every one to five minutes, depending on the brand. This is beneficial because you will know what your blood glucose is at all times, so you can better adjust your treatment plan.

There are currently only three models on the market. Check with your insurance provider to see whether a specific device is covered before you start shopping around. Insurance coverage is the reason why continuous glucose monitors aren't for everyone. Many insurance plans still don't cover CGMs for people with type 2 diabetes, so it's important to find out beforehand if you are covered.

Food

- Follow your meal plan (see Meal Planning, page 123).
- Include snacks in your meal plan only if your diabetes care provider or dietitian recommends it.
- Try to eat three meals each day that are spaced at least 4 hours apart.
- Don't skip or delay meals or snacks.
- If you vary the amount of food you eat from day to day, it is important to discuss this with your doctor as the doses of some medications or insulin may need to be adjusted.
- If you take insulin, ask your diabetes care provider how to adjust your dose when you want to eat more or less than usual.

Activity

- Follow your exercise program.
- If you take insulin or certain diabetes pills (the sulfonylureas, the meglitinides) and if you are going to exercise for more than 1 hour, you may need to eat snacks. Examples of snacks are a piece of fruit, 1/2 cup of juice, 1/2 bagel, or a small roll. Talk with a dietitian or diabetes educator about how much and when to eat.
- Be sure to check your blood glucose levels after exercise. Exercise lowers blood glucose for as long as 10 to 24 hours afterward. Some people can experience an elevation in their blood glucose levels immediately following exercise. This can occur as a result of an intense exercise program or as a result of decreasing the dose of medication too much prior to exercise. Your doctor can assist you in how to adjust your medications for exercise in these situations.
- If you take insulin, ask your diabetes care provider if you need to adjust your dose for exercise.

Diabetes Medicines or Insulins

- There are three types of medications for treating people with diabetes: pills, insulin, and non-insulin injectables. Pills can be used to treat people with type 2 diabetes. Insulin is absolutely essential for the treatment of type 1 diabetes but is also necessary to help control blood glucose levels in many people with type 2 diabetes. There are two non-insulin injectable medications available: pramlintide can be used in combination with insulin by people with type 1 and type 2 diabetes; incretins can be used by people with type 2 diabetes to help control blood glucose levels. Incretins require that insulin-producing cells are present in order to work.
- Take insulin or diabetes medicines as your doctor has directed.
- Talk with your doctor about changing your insulin or diabetes medicines if your blood glucose levels are not in the range that has been recommended. Perhaps a different dose or type of insulin or medicine would work better for you.
- If you take insulin, ask your diabetes care provider about the best places on your body to inject it. Some people find that taking their insulin in the same area at the same time of day keeps blood glucose steadier.
- Consider an insulin pump. Pumps imitate the natural release of insulin better than injections do (see Insulin Pumps, page 103).

Checking Blood Glucose

- Check your blood glucose as often as recommended by your diabetes team. Your doctor will tell you how often you should check your blood glucose levels. People who take insulin more than twice a day usually need to check their blood glucose at least four times a day.
- If you check only once a day, it is usually advisable to vary the time you check so you and your doctor can see what your blood glucose level is during the day as well as the morning.

- Check your blood glucose more often if:
  - You do not feel well and are not certain if your blood glucose level is low or high
  - You ate too much or too little food or tried a new food
  - You delayed or skipped a meal or snack
  - You are sick
  - You are under stress
  - You did not take your insulin or diabetes medicines
  - You took too much insulin
  - You took too many diabetes medicines
  - You did not do your usual exercise
  - You exercised harder or longer than usual.

Blood Glucose, High

Too much glucose in the blood is called hyperglycemia or high blood glucose. High blood glucose is one of the signs of diabetes. Over time, high blood glucose can damage your eyes, kidneys, heart, nerves, and blood vessels.

CAUSES OF HIGH BLOOD GLUCOSE

- You ate too much food.
- You ate too much carbohydrate.
- You took too little insulin.
- You did not take your insulin.
- You took too little diabetes medicines.
- You did not take your diabetes medicines.
- You are sick.
- You feel stressed.
- You skipped your usual exercise or activity.

High blood glucose is harder to sense than low blood glucose. If your glucose is very high, you may feel some of the signs of high blood glucose listed on the next page.

SIGNS OF HIGH BLOOD GLUCOSE

- Headache
- Blurry vision
- Thirst
- Hunger
- Upset stomach
- Frequent urination
- Dry, itchy skin

You may not be able to tell that your glucose is too high by these signs alone. The only sure way to know is to check your blood glucose.

How to Treat High Blood Glucose

If your blood glucose is between 180 and 250 mg/dl

1. **Do as your doctor has advised you.** You may have been told to try one of the following:
   - A small extra dose of short-acting insulin
   - A smaller upcoming meal or snack.
2. **Check your blood glucose again after 1–2 hours.**

If your blood glucose stays above 250 mg/dl

Check for signs of diabetic ketoacidosis (see Urine/Blood Ketone Test, page 173). If you have any of the signs, call your doctor right away.

If your blood glucose stays above 350 mg/dl

Call your doctor.

If your blood glucose stays above 500 mg/dl

Call your doctor and have someone take you to a hospital emergency room right away.

Blood Glucose, Low

Too little glucose in the blood is called hypoglycemia or low blood glucose. Low blood glucose may occur if you use insulin or take certain diabetes medicines (the sulfonylureas, the meglitinides). If not treated, low blood glucose can make you pass out. At worst, low blood glucose may cause seizures, coma, and even death.

Warning Signs of Low Blood Glucose

There are many warning signs of low blood glucose. Your own signs may be different from what someone else feels. Learn your early warning signs of low blood glucose. Share your signs with someone who can help you notice them. See a list of common warning signs on the next page.

CAUSES OF LOW BLOOD GLUCOSE

- You ate too little food.
- You ate too few carbohydrates.
- You delayed a meal or snack.
- You skipped a meal or snack.
- You exercised harder or longer than usual.
- You were more active than usual.
- You took too much insulin or too many diabetes medicines.
- You drank alcohol on an empty stomach.

WARNING SIGNS

Your signs may not be on this list.

- Angry
- Sick to stomach
- Anxious
- Light-headed
- Clammy
- Nervous
- Stubborn
- Clumsy
- Numb
- Sweaty
- Confused
- Pale
- Tense
- Hungry
- Sad
- Tired
- Impatient
- Shaky

You may also have blurry vision, a dry mouth, a headache, or a pounding heart. When any of your warning signs occur, you need to treat low blood glucose right away. This is especially true if your blood glucose has been high for a long time, and will go away as your body gets used to better glucose control.

Some people may get symptoms of low blood glucose with any blood glucose below 100 mg/dl. If this happens to you, it is ok for you to have one of the foods listed (on the next page) to bring your level to a level about 100 mg/dl and improve the way you feel. It is important to avoid overeating as this can result in a high blood glucose level.

Some people many not feel symptoms even when their blood glucose is very low. This is called hypoglycemia unawareness. If this happens to you, your doctor may ask you to check your blood glucose levels more often, to identify what causes the low blood glucose episodes and try to avoid these, and to have you ask those who are close to you to inform you if you are behaving in a way that may be caused by a low blood glucose level (i.e., talking very slowly).

Treat Yourself for Low Blood Glucose

1. **Check your blood glucose with a meter if you can (see Blood Glucose, Self-Checks).**
   - If your blood glucose is under 70 mg/dl, go to steps 2 and 3. If you can't check, go to steps 2 and 4.

2. **Eat or drink something with about 15 grams (1/2 oz) of carbohydrate.** Foods with 15 grams of carbohydrate are listed in the table below.

3. **Wait 15 to 20 minutes, then check again.**
   - If your blood glucose is still below 70 mg/dl, repeat steps 2 and 3. If you have repeated steps 2 and 3 and your blood glucose is still below 70 mg/dl, call your doctor or have someone take you to a hospital emergency room. You may need help to treat your low blood glucose. Or something else may be causing the signs.
   - If your blood glucose is over 70 mg/dl, stop drinking and/or eating foods listed in the table. You may still feel the signs of low blood glucose even after your blood glucose is back up. Go to step 4.

4. **If your next meal is more than an hour away, eat a small snack of carbohydrate and protein.** Try a slice of bread with reduced-fat peanut butter or six crackers with low-fat cheese.

TREAT LOW BLOOD GLUCOSE WITH THESE FOODS

- Glucose tablets or gel (dose is printed on the package)
- 1/3 cup (4 oz) of fruit juice
- 1/3 can (4 oz) of a regular (not sugar-free) soft drink
- 1 cup (8 oz) of fat-free milk
- 2 tablespoons of raisins
- 3 graham crackers
- 1 tablespoon of granulated sugar
- 6 saltine crackers
- 1 tablespoon of honey or syrup

Have Someone Else Treat Your Low Blood Glucose

Sometimes you will not be able to treat low blood glucose yourself. Maybe you do not notice your signs. Or maybe low blood glucose has made you too confused to treat yourself. Whatever the reason, teach someone else ahead of time to do it.

Keep foods to treat low blood glucose near you at all times. Place a small box of juice in your desk drawer at work or your locker at school. Put glucose tablets or gel in your purse or coat pocket and in the glove compartment of your car. Tell others where you keep them.

If you take insulin, get a glucagon emergency kit. Your doctor can prescribe one. Glucagon is a hormone that is made in the pancreas. Glucagon makes the liver release glucose into the blood.

A glucagon kit comes with a syringe of glucagon and instructions on how to use it. Keep the kit with you. Tell family, friends, and coworkers where you keep it. You or a member of your health care team can teach them how to use it.

If you can swallow

1. Have someone get you to eat or drink something with carbohydrate (sugar) in it.

If you cannot swallow or if you pass out

1. Have someone inject you with glucagon in the front of the thigh or the shoulder muscle.
2. Have someone turn you on your side. This will keep you from choking if you throw up from the glucagon. (Some people feel sick to their stomach after glucagon.)
3. Once you are alert, eat a snack of carbohydrate that's easy on your stomach. Try six saltine crackers. Follow it up with a snack of protein, such as a slice of turkey breast or low-fat cheese.
4. Check your blood glucose every 30 to 60 minutes to make sure low blood glucose is not coming back.

If you cannot swallow and glucagon is not available OR If you cannot swallow and nobody knows how to use glucagon

1. Have someone call 911 for an ambulance.

Blood Glucose, Self-Checks

Self-checks are those you do yourself. A blood glucose self-check tells you how much glucose is in your blood at any one time. Anyone with diabetes can benefit from self-checks.

Why Check Blood Glucose

When you found out you had diabetes, you and your health care team worked out a diabetes care plan. The plan was set up to help you keep your blood glucose levels in your range (see Blood Glucose, page 8). Your plan may include healthy eating, regular exercise or activity, insulin, or diabetes medicines.

One of the best ways to keep track of how well your diabetes care plan is working is to check your blood glucose. Checking helps you find out what happens to your blood glucose level when you eat certain foods, do certain exercises or activities, or lose weight. Checking helps you find out what happens to your blood glucose level when you take insulin or diabetes medicine, are sick, or are under stress.

A blood glucose check can help you decide how to take care of your diabetes. It may prompt you to eat a snack, take more insulin, or exercise more. It may alert you to treat high or low blood glucose.

When to Check Blood Glucose

Your diabetes care provider can help you figure out when to check your blood glucose. Checking at specific times can be useful. For instance, a check done 1 or 2 hours after a meal lets you see how high your blood glucose rises after you eat certain kinds and amounts of foods. A check at

2 or 3 A.M. tells you whether you have low blood glucose at night. There are many possible check times:

1. Before breakfast
2. 1 to 2 hours after breakfast
3. Before lunch
4. 1 to 2 hours after lunch
5. Before supper
6. 1 to 2 hours after supper
7. Before bedtime
8. At 2 or 3 A.M.

The more you check, the more you will know about your blood glucose levels. And the more you know about your blood glucose levels, the better able you will be to get those levels in your range.

HOW TO CHECK BLOOD GLUCOSE

1. Wash your hands with soap and water. Dry them.
2. Prick the side of your finger with a lancet.
3. Squeeze out a drop of blood.
4. Let the drop of blood fall on a test strip pad, or be drawn up into the strip, as instructed.
5. Insert the test strip into your glucose meter.
6. Read your blood glucose number in the window on the meter.
7. Dispose of the lancet the same way as your syringe needles.
8. Record your finding.

Do Extra Blood Glucose Checks

- When your team is trying to find the best dose of insulin or diabetes medicine for you
- When you change your exercise program or meal plan
- When you start a new drug that can affect your glucose level
- When you think your glucose is low or high
- When you are sick
- When you are pregnant
- Before and after exercise (during exercise when you have been exercising for more than an hour)
- Before you drive
- Before activities that take a lot of concentration.

Keep Records

Be sure to write down your results, date, and time. Do this even if you have a meter with a memory. Writing down your blood glucose levels can help you and your health care team determine if there is a particular pattern to your results. A good way of recording blood glucose levels to determine if there is a pattern is to have a column for the time of day and rows for each day (see table on next page).

Your health care team may ask you to record additional information, particularly when there are high or low readings. This information may include:

- The foods you eat and when you eat them
- Times that you miss meals or snacks
- Times that you eat large or small meals
- Times that you drink alcohol and how much you drink
- How much you weigh
- How much insulin or how many diabetes pills or other non-insulin injections you take and when

- When and how long you exercise
- When and how you treat low or high blood glucose
- When you are ill, injured, stressed, or have just had surgery.

Share your records with your health care team. Together, you can make needed changes in your diabetes care plan. A better plan makes it easier for you to care for your diabetes.

BLOOD GLUCOSE DAILY LOG

Date	Breakfast	Lunch	Dinner	Bedtime

Blood Vessel Damage

The enemies of your blood vessels are high blood glucose, high blood pressure, and high blood fats (see Lipids, page 120). All four can damage your blood vessels over time. Often, you will not notice any signs until the damage has been done.

When blood vessels are damaged, they become weak, narrow, or blocked. Less blood flows through them to nourish the parts of your body with oxygen. When your body parts get less oxygen, they don't work as well and can become damaged or die. When large vessels are affected, your heart, brain, or legs and feet might get damaged. When very small vessels are affected, your eyes, kidneys, and nerves might get damaged.

Blood vessel damage comes on slowly. It may begin in childhood and continue throughout life. People with diabetes are more likely to develop blood vessel damage and to get it at a younger age than people without diabetes.

Reduce Your Risk of Blood Vessel Damage

Quit smoking. Smoking narrows blood vessels. Quitting can be hard but worth it. You can get support from a stop-smoking program or your health care team. Medications prescribed by the doctor can sometimes help. It often takes several tries to quit, so don't get discouraged!

Control high blood pressure. High blood pressure can weaken blood vessels. Many people can lower their blood pressure by losing weight through healthy eating and exercise. Some people can lower blood pressure by cutting salt intake. Often, blood pressure drugs are also needed. If your doctor has prescribed blood pressure drugs, be sure to take them.

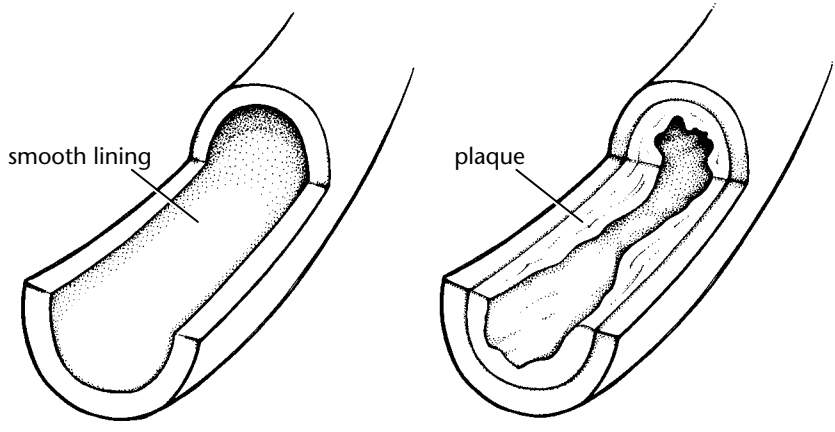
Nudge that cholesterol level down. High cholesterol means more cholesterol in the blood to stick to vessel walls and cause atherosclerosis or hardening of the arteries (see the figure below). This is especially true for saturated fats, which are solid at room temperature. These fats include butter, margarine, and lard. Trans fats are another form of fat that should be excluded from the diet. Try low-fat or reduced-fat versions of your favorite foods. Monounsaturated fats found in foods such as nuts, olive oil, and canola oil are better choices for your blood vessels.

Exercise regularly. Even a daily walk around the block helps. Find exercises and activities you enjoy. If tolerated, exercising 30 minutes at least 5 days weekly should be a goal.

Aim for a healthy weight. Being overweight causes your body to leave more fat in your blood. Combine an exercise program with a meal plan that suits your schedule and your tastes.

Get your diabetes under good control. Check your blood glucose. Take your insulin or diabetes pills. Follow your meal plan. Stick with your exercise program. Keep records.

Get regular medical checkups. Your doctor will check for blood vessel damage and help you keep tabs on your blood pressure, blood fat levels, and blood glucose levels.



Healthy artery

Atherosclerosis

Complications

Diabetes can lead to other diseases and conditions called complications. Complications can affect your blood vessels, brain, eyes, heart, kidneys, legs and feet, and nerves. Your best defenses against complications are keeping your body weight down and your lipid, blood pressure, and blood glucose levels in a normal range. The closer you can get to a normal range, the more likely you are to prevent or delay complications. Both the Diabetes Control and Complications Trial (DCCT) and the United Kingdom Prospective Diabetes Study (UKPDS) proved it.

Diabetes Control and Complications Trial

The DCCT was a 10-year-long (1983–1993) medical study sponsored by the National Institutes of Health. It found that people with type 1 diabetes who kept their blood glucose levels close to normal had fewer complications than people whose blood glucose levels were higher.

Doctors studied complications in 1,441 people with type 1 diabetes. Some people used standard therapy at the time, injecting insulin once or twice daily. The other half of the people used more intensive therapy (injecting three or more times daily) or used an insulin pump. The intensive group also monitored their glucose more often (four or more times a day) and adjusted the insulin dose according to the blood glucose checks, how much they were going to eat, or what exercise they were going to do.

People on intensive therapy had glucose levels closer to normal (7.1% vs. 9.1%); however, they also had severe low blood glucose three times as often and gained more weight than people on the standard therapy.

The important finding in this study was that the individuals in the intensive treatment group with a lower blood glucose average had far fewer complications. When the study was reported in 1993, the chances of developing eye disease, kidney disease, or nerve disease were all reduced

by at least 50% in the intensive group compared to the standard therapy.

When the study ended, the participants were allowed to use whatever treatment their doctors and they preferred. Those in the standard therapy group tended to change to more insulin injections and glucose monitoring. Soon after the study was over, the average glucose levels were similar for both of the original groups of people. The people who participated in the DCCT study continued to be followed by the study doctors for 13 years. After that time, it was found that as the individuals became older, those who had been in better glucose control during the study continued to have fewer complications and had a lower chance of heart disease.

United Kingdom Prospective Diabetes Study

The UKPDS followed 5,102 people with newly diagnosed type 2 diabetes for an average of 10 years. People were recruited between 1977 and 1991 in 23 centers within the United Kingdom.

Like the DCCT, people were divided into an intensive therapy group and a conventional therapy group. Both groups used various combinations of insulin and/or diabetes pills to lower their blood glucose levels.

The intensive therapy group aimed for a fasting plasma glucose (FPG) of 108 mg/dl (tight control). The conventional group used only diet and exercise until the FPG reached 270 mg/dl. Those maintaining tight control reduced their risk of eye disease, kidney disease, and nerve disease.

People with high blood pressure were further divided into two groups. Both groups were treated with drugs to lower blood pressure. One group maintained an average blood pressure of 144/82 mmHg (tight control). The other group maintained an average blood pressure of 154/87 mmHg. People maintaining tight blood pressure control reduced their risk of stroke, diabetes-related death, heart failure, vision loss, and complications of the eyes, kidneys, and nerves.

ACCORD, ADVANCE, and VADT Studies

Three additional studies were conducted in 2008 concerning the relationship between blood glucose levels and heart disease in people with type 2 diabetes. Heart disease is, by far, the leading cause of death in

people with diabetes. The ACCORD, ADVANCE, and VADT studies examined whether intensive glucose lowering to near-normal levels would prevent heart disease.

ACCORD studied the effects of intensive blood glucose, blood pressure, and cholesterol management, as compared to standard management in 10,251 people who had heart disease or who were at risk for getting it. The intensive blood glucose management part of the study was stopped because of a small increase in death rates in the intensive arm compared with the standard arm. The cause of the increased mortality rates is unknown.

The ADVANCE study compared the cardiovascular effects of lowering blood glucose and blood pressure in 11,140 people 55 and over who had a history of either heart disease or microvascular (small blood vessel) disease. The results of the study found no difference in the two arms for the risk of heart disease; however, the study did identify a 14% reduction in microvascular complications with intensive therapy.

The VADT study was created to determine the effect of intensive glucose control on cardiovascular risk in 1,791 people with type 2 diabetes. The results found that cardiovascular events were slightly lower in the intensive glucose arm, but the results were not conclusive. The trial also achieved excellent blood pressure control, high levels of aspirin and statin usage, and a high degree of smoking cessation.

These three trials caused the ADA, the American Heart Association, and the American College of Cardiology to reexamine the recommendations for glycemic targets in patients with diabetes.

What These Studies Mean for You

Talk with your diabetes care team about what the results of these studies mean for you. You will probably want to try to keep your blood glucose and blood pressure levels in a normal range, or as close to normal as possible. An A1C <7% and blood pressure goals of 130/80 are recommended and good numbers to shoot for. There is more than one way to gain control. You and your diabetes care team can work out a plan that is right for you.

Coping with Complications

Learn all you can about your complication. The more you know about your complication, the more in control you will feel.

Talk with family and friends. Tell them what's going on and what they can do to help.

Seek counseling. If you find it hard to talk with family and friends, you may want to get counseling from a social worker or psychologist.

Join a support group. Other people who have your complication can give you moral support. And you may get new ideas on treatment options or doctors. Your health care team or local American Diabetes Association office may be able to help you find a support group.

See a specialist. It may be valuable to see a specialist who deals with your complication. Your own doctor may be able to refer you to one.

Ask questions about treatments. What are the treatments? What are the side effects of the treatments? How much do these treatments cost? How often will I need treatments? How many patients with this problem have you treated? What has happened to those patients? What do studies show about preventing complications?

Try to get a second opinion. Check your health insurance. It might cover a second opinion if you aren't having success or have major concerns with your care.

Look for organizations that focus on your complication. Organizations such as the National Kidney Foundation, the American Foundation for the Blind, and the National Amputation Foundation have programs and services. To find out more about them, search the Internet or look in *The Encyclopedia of Associations*. It's in most libraries. The American Diabetes Association has a lot of valuable information on complications at www.diabetes.org.

Think positive. Thinking good thoughts about yourself and about things in your life can make your life happier and maybe even longer. Thinking too much about things you don't like or that make you angry or sad can only make living with complications harder for you and your loved ones.

Coping with Diabetes

Diabetes is a chronic disease that can be controlled, but not cured. Living with diabetes is not only hard on your body but also hard on your mind. You may deny that you have diabetes or feel angry or depressed about it. These feelings are normal. They may help you cope with having diabetes. They can be part of the process you go through before you accept diabetes. Accepting diabetes does not have to mean viewing it in a positive light; however, some people are able to view diabetes positively (i.e., it made them start exercising, lose weight, eat healthy, etc.).

Accepting diabetes means acknowledging that you have a chronic illness and taking responsibility for managing it, staying in good health, and living a full life. But what if you get stuck in the process? If you are stuck in denial, anger, or depression for a long time, you may stop taking care of your diabetes.

Denial

Almost everybody goes through denial when they are first diagnosed with diabetes, but continued denial keeps you from learning what you need to know to stay healthy. If you hear yourself thinking or saying some of these words, you may be denying some part of your diabetes care. "A second helping just this once won't hurt. "This sore will heal by itself." "I'll go to the doctor later." or "I don't have time to do it."

BREAKING AWAY FROM DENIAL

- Write down your care plan and your health goals. Know why each part of your plan is important. Accept that it will take time to reach your goals.

- Talk to your diabetes educator about your diabetes care plan. Together you may be able to come up with a better plan.
- Tell your friends and family how you take care of your diabetes. Tell them how they can help you. If you do not tell them how they can help they may try to help you in ways that you will not find helpful (e.g., nagging).

Anger

Anger is a powerful emotion. If you don't use anger, it will use you. To gain control over your anger, learn more about it. Start an anger diary. Write down when you felt angry, where you were, who you were with, why you felt angry, and what you did. After a few weeks, read it over. Try to understand your anger. What are you angry about? Usually under your anger are hurt feelings.

The better you understand your anger, the better you will be able to control it. How you use the energy of your anger is up to you. Plan to use your anger in a way that helps you next time.

HOW TO CONTROL YOUR ANGER

Defuse it. Talk slowly, take deep breaths, get a drink of water, sit down, lean back, keep your hands down at your sides.

Let it out. Do a physical activity like jogging or raking leaves. Cry over a sad movie. Write down on a piece of paper what you feel like saying or shouting.

Make it trivial. Ask yourself just how important it is. Some things are just too trivial to be worth your anger.

Laugh at it. Find something funny about it. Sometimes laughter can push out anger.

Depression

Feeling down once in a while is normal. But feeling sad and hopeless for 2 weeks or more might be a sign of serious depression. You may be depressed if:

- You no longer take interest or pleasure in things you used to enjoy doing.
- You have trouble falling asleep, wake often during the night, or want to sleep a lot more than usual.
- You wake up earlier than usual and cannot get back to sleep.
- You eat more or less than you used to. You quickly gain or lose weight.
- You have trouble concentrating. Other thoughts or feelings distract you.
- You have no energy. You feel tired all the time.
- You are so nervous or anxious, you can't sit still.
- You are less interested in sex.
- You cry often.
- You feel you never do anything right and are a burden to others.
- You feel sad or worse in the morning than you do the rest of the day.
- You feel you want to die or are thinking about ways to hurt yourself.

If you have three or more of these signs, get help. If you have one or two of these signs and have been feeling bad for 2 weeks or more, get help. Talk to your doctor first. There may be a physical cause for your depression. If you and your doctor rule out physical causes, your doctor will likely refer you to a mental health professional. Treatment may involve counseling or antidepressant medication or both.

HOW TO COPE WITH DIABETES

Once you have made it through any denial, anger, or depression, you are on your way to accepting your diabetes. Accepting your diabetes is the way to cope with it.

- Accept that diabetes care is up to you. You are the one who decides what to eat, how much to exercise, and when to check your blood glucose. Accept this for what it is—control. You are in control.
- Learn as much about diabetes as you can. The American Diabetes Association can help. Go to www.diabetes.org or call 1-800-diabetes. Read. Ask questions. Take diabetes education classes. Go to diabetes support groups.
- Share what you have learned with your family and friends. The more they know, the better they will be able to help you. Tell them how you feel about diabetes.
- Keep active in your hobbies, activities, and sports. You'll show everyone, including yourself, that you're still the same person. You can still have lots of fun.

Dental Care

Having diabetes puts you at risk for gum disease and other mouth infections. Infections can make your blood glucose level go up. A high blood glucose level can make it more difficult for a mouth infection to get better. You can protect yourself by knowing the signs of gum disease and other mouth infections and by knowing how to take care of your teeth.

Dental problems can be prevented by controlling your blood glucose, brushing your teeth after meals, flossing at least once a day, and maintaining regular visits with the dentist. Early recognition and treatment of dental problems that do occur can prevent them from getting worse.

Gum Disease

Periodontal disease is an infection of your gums. It starts when a sticky film of bacteria, called plaque, forms on your teeth and at your gum line. You need to brush and floss your teeth to remove the plaque, or it hardens into tartar. Plaque and tartar irritate your gums. Your gums can become red, sore, and swollen. Then, even gentle brushing can make your gums bleed. This is called gingivitis. If you ignore gingivitis, gum disease can get worse.

As gum disease gets worse, your gums begin to pull away from your teeth. The root of your tooth may begin to show or your teeth may look longer. Pockets may form between your teeth and gums. These pockets fill with bacteria and pus. This is called periodontitis.

Periodontitis can destroy your jaw bone. Your teeth may start to move. You may notice a change in the way your teeth fit when you bite or in the way your partial dentures fit. Your teeth may get loose, fall out, or have to be pulled. Know the warning signs of gum disease so you don't let it get this far.

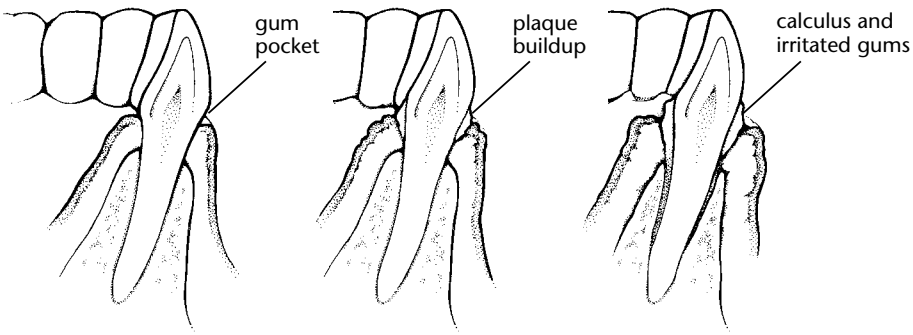
SIGNS OF GUM DISEASE

- Red gums
- Swollen or tender gums
- Gums that bleed when you brush or floss
- Gums that have pulled away from your teeth
- Pus between your teeth and gums when you press on the gums
- Bad breath
- Loose teeth
- Teeth that are moving away from each other
- A change in the way your teeth fit when you bite
- A change in the way your partial dentures fit

See your dentist if you have any of these signs.

Other Mouth Infections

Mouth infections affect small areas in your mouth rather than your whole mouth. They can be caused by bacteria or a fungus. Know the warning signs of mouth infections.



SIGNS OF MOUTH INFECTIONS

- Swelling around your teeth or gums or anywhere in your mouth
- Pus around your teeth or gums or anywhere in your mouth
- White or red patches anywhere in your mouth
- Pain in your mouth or sinuses that does not go away
- Dark spots or holes on your teeth
- Teeth that hurt when you eat something cold, hot, or sweet
- Pain when chewing

See your dentist if you have any of these signs.

HOW TO PROTECT YOUR TEETH

Control your blood glucose. If you keep your blood glucose at healthy levels, you'll lower your risk of gum disease and other mouth infections.

Keep your teeth clean. Brush your teeth with a fluoride toothpaste at least twice a day. Better yet, brush after every meal. Be careful not to brush too hard. You may wear away your gums. A soft toothbrush with rounded or polished bristles is easiest on your gums. Be sure to replace your toothbrush every 3 or 4 months, or sooner if the bristles are worn. Floss your teeth at least once a day. If you don't like to use floss, try interdental picks or sticks. Flossing cleans plaque and bits of food from between your teeth. Another option is an ultrasonic toothbrush, which uses moving bristles and ultrasonic waves to remove plaque between teeth and on the surface.

Go to your dentist. Have your dentist or dental hygienist clean your teeth every 6 months.These cleanings get rid of plaque and tartar. Make sure your dentist takes full mouth X-rays every 2 years to check for bone loss. Let your dentist know you have diabetes.

Dietitian

A dietitian is an expert in food and nutrition. Food is a key part of your diabetes care. A dietitian can help you figure out your food needs based on your weight, lifestyle, diabetes pills or insulin, and your health goals. Dietitians can teach you many useful skills, such as how to:

- Make and use a meal plan
- Fit favorite foods into your meal plan
- Choose wisely when grocery shopping
- Choose wisely from restaurant menus
- Turn a fatty recipe into a low-fat one
- Find healthy cookbooks and food guides
- Find out how the foods you eat affect your blood glucose levels
- Treat yourself for low blood glucose.

When your weight, lifestyle, medical needs, or health goals change, your food needs are likely to change, too. Your dietitian can help you adjust your meal plan to those changes.

When You Look For a Dietitian

Look for the initials RD after a dietitian's name. RD stands for registered dietitian. An RD has met standards set by the American Dietetic Association. You might see the initials LD after a dietitian's name. LD stands for licensed dietitian. Many states require dietitians to have a license.

Look for a dietitian who has worked with people who have diabetes. The letters CDE after a dietitian's name mean that he or she is trained in diabetes care and treatment. CDE stands for Certified Diabetes Educator.

Your doctor or area hospitals may be able to recommend a dietitian. You can also call the American Dietetic Association Consumer Nutrition Hot Line at 1-800-366-1655 or go to www.eatright.org.

Doctor

Your diabetes doctor may be an internist, a family practitioner, or a general practitioner. Your doctor may be an endocrinologist or a diabetologist. An endocrinologist is a medical doctor who has special training and certification in treating diseases such as diabetes. A diabetologist is a medical doctor who has a special interest in diabetes. Many people see a nurse practitioner or a physician's assistant as their diabetes care provider.

The kind of diabetes care provider you go to is not as important as the kind of care you get. The American Diabetes Association has guidelines to let your doctor know how to care for you. These guidelines are called "Standards of Medical Care for Patients with Diabetes Mellitus." They can be found in the *Clinical Practice Recommendations,* a yearly supplement to the January issue of the journal *Diabetes Care.* Be sure to let your doctor know about them.

The guidelines can help you, too. They let you know what to expect from your doctor. That way, you can check whether your doctor is giving you the best care. Here's a sample of what the guidelines cover.

First Visit

During your first visit to a new doctor who will treat your diabetes, ask the doctor to help you put together a health care team (see Health Care Team, page 81). Listed below are questions that you may be asked at your first visit with your doctor or other health care team member:

- When did you learn you had diabetes?
- What were your blood glucose results at the time of diagnosis?
- Who else in your family has diabetes?
- How do you treat your diabetes?
- What type of diet do you follow and when do you eat?

- How often and how hard do you exercise?
- Have you gained or lost weight?
- Do you smoke?
- Do you have high blood pressure?
- Do you have high cholesterol?
- Do you test your urine for ketones? If yes, when and what results do you get?
- Have you ever had a low blood glucose reaction? If yes, how often does this occur and what type of symptoms do you get?
- What infections have you had?
- Do you have any diabetes-related complications (eyes, kidneys, nerves, heart disease, stroke, peripheral vascular disease)?
- What treatments have you been given?
- What drugs are you taking?
- What other medical problems have you had?

EXAMINATION

Your initial exam will include the following:

- Measure your height, weight, and blood pressure
- Look in your eyes and ask about eye problems
- Look in your mouth and ask about dental problems
- Feel your neck to check your thyroid gland
- Listen to your heart through a stethoscope
- Feel your abdomen to check your liver and other organs
- Look at your bare feet
- Check your ability to feel vibration and touch on your feet
- Check pulses in your feet
- Check your skin
- Test your reflexes
- Take your pulse
- Request blood and urine samples for tests

Future Visits

Your doctor will tell you when to come for another checkup. Your doctor may want to see you two to four times a year. If you take insulin or if you are having trouble reaching your blood glucose goals, your doctor may want to see you four or more times a year.

If you have complications or if you start something new in your diabetes care plan, your doctor may want to see you even more often. When you return, expect your doctor or other health care team members to:

- Ask to see your blood glucose records.
- Ask if your blood glucose has been too high or too low.
- Ask about signs that might mean you are getting a complication.
- Ask if you have been sick since your last visit.
- Ask what drugs you are taking now.
- Ask if you have had problems with your plan.
- Weigh you and take your blood pressure.
- Look in your eyes.
- Look at your bare feet.
- Request blood for an A1C test.
- Request a urine test (only once a year).
- Request tests of kidney function (only once a year).
- Request tests of blood fat levels (cholesterol).
- Go over your plan to see if you have met your goals.
- Discuss changes in your plan if you both agree that changes are needed.

Eating Disorders

Two eating disorders—anorexia and bulimia—may be more common in people with diabetes. Researchers are not sure why this is so, but both diabetes and eating disorders have in common a focus on food and weight.

Anorexia

People with anorexia have an intense fear of becoming fat. To stay thin, they starve themselves. They may have secretive or strange eating habits, such as cutting food into tiny pieces. They may refuse to eat with other people. To lose more weight, they may exercise very hard. People with anorexia see themselves as fat even when they are very thin. Anorexia is a very serious disorder and in some cases it can even be fatal.

Bulimia

People with bulimia are overly concerned with their body shape and weight. They will binge and purge to prevent weight gain. Bingeing is eating a large amount of food (often several thousand calories worth) at one time.

During a binge, people with bulimia feel out of control and frightened. After a binge, they feel depressed and have low self-esteem. They purge themselves by making themselves throw up or by taking laxatives or diuretics to cause diarrhea or fluid loss. They may also try to severely control their weight by strict dieting or fasting, or by exercising very hard. People with bulimia may be overweight, underweight, or of normal weight. No matter their weight, they will see themselves as overweight.

Eating Disorders and Diabetes Control

Most people with diabetes who have an eating disorder have poor diabetes control. A few manage to keep their diabetes in good control. Those with bulimia may take more insulin after a binge. Those with anorexia may lower their insulin dose to match their lower food intake. Others just work hard to keep their eating disorder under control so that they do not upset their diabetes control.

Eating Disorders and Weight Control

An eating disorder makes weight control very difficult. People with diabetes who have an eating disorder may reduce or omit their insulin dose to lose weight. Many people who try this are overweight. Others are of normal weight or even low weight.

Stopping insulin causes a dangerous kind of weight loss. The body loses water weight and can become dehydrated. Without enough insulin, the body does not get enough blood glucose for energy. The body uses up its stores of glycogen in the liver. Then it starts to break down fat tissues, muscles, and body organs. If insulin is not resumed, the person eventually dies.

Eating Disorders and Health

People with eating disorders are more likely to have digestion problems, heart problems, and other problems brought on by starvation, self-induced vomiting, and abuse of laxatives and diuretics. In addition, people with diabetes who have an eating disorder are more likely to get:

- High ketones
- High blood glucose
- Low blood glucose
- Eye disease
- Kidney disease
- Nerve disease.

Help for Eating Disorders

A person with an eating disorder needs the help of a physician, mental health professional, and dietitian. Ask a family doctor or counselor for a referral. Some clinics and health care centers specialize in treating people with eating disorders. Check the white pages of a phone book under "Eating Disorders." You might also be able to find information or a support group through the Internet.

Most eating disorders can be treated with outpatient psychotherapy or behavioral therapy and family or group therapy. Drugs for depression are sometimes used. If a person with an eating disorder refuses help and his or her life is in danger, he or she may be admitted to the psychiatric unit of a hospital for treatment.

Employment Rights

Some employers are afraid to hire people who have diabetes. They worry that diabetes will interfere with the job, or that it will make health insurance premiums higher for the company. Because of this, people with diabetes may have a harder time finding jobs than people who do not have diabetes. And they may lose jobs more easily. As a worker with diabetes, you should be aware of your legal rights and how to protect those rights.

Antidiscrimination Laws

Several federal laws prohibit discrimination in the workplace based on disability. The Americans with Disabilities Act applies to private employers, labor unions, employment agencies with 15 or more employees, and state and local government. The Rehabilitation Act of 1973 generally covers employees who work for the executive branch of the federal government or for an employer that receives federal money. The Congressional Accountability Act covers employees of Congress and most legislative branch agencies.

These laws prohibit an employer from taking any adverse employment action because of a person's disability. This means that an employer cannot discriminate in hiring, firing, discipline, pay, promotion, job training, fringe benefits, or any other term or condition of employment. Employers are also prohibited from retaliating against an employee for asserting his or her rights. You are usually not required to tell employers that you have diabetes, but the laws protect you from discrimination only if your employer knows about your disability.

In order to be protected by these antidiscrimination laws, you must show that you are a "qualified individual with a disability." The first step is establishing that you have a disability. A disability is defined in these laws as a mental or physical impairment that substantially limits one or more

major life activity. Major life activities for people with diabetes revolve around eating or the functioning of your endocrine system. Because diabetes results in a substantial limitation on endocrine system functioning, virtually all people with the condition will be found to have a disability. If you have a previous record of a disability, or can prove that your employer regarded you as disabled, this can be used to establish your disability.

You also have to establish that you are qualified for the job in question. You are considered a qualified worker if you satisfy the skill, experience, education, and other job-related requirements of the position held or desired, and—if you're given reasonable accommodation—you can

HOW TO ADDRESS DISCRIMINATION

Educate and negotiate. Discrimination based on diabetes is often the result of ignorance. Problems can sometimes be resolved by educating others about the disease and about your medical needs. When education alone is not enough, try to figure out a compromise that benefits everyone.

Litigate. Sometimes it takes legal action to end discrimination. Usually, you are required to begin by filing a charge of discrimination with the appropriate government agency. If the employer is a private company or state or local government, file a charge with either the Equal Employment Opportunity Commission or your state antidiscrimination agency. If the employer is the federal government, contact the internal Equal Employment Opportunity office of the agency where the discrimination occurred. You must act promptly because the time limits for taking action are very short. If the agency does not resolve the problem, you can file a lawsuit in federal or state court claiming discrimination on the basis of disability.

Legislate. Sometimes it is necessary to work to change laws and policies that are unfair to people with diabetes.

perform the essential functions of that position. An accommodation is any change or adjustment to a job or work environment that enables you to do the job. All states have their own antidiscrimination laws and agencies responsible for enforcing these laws.

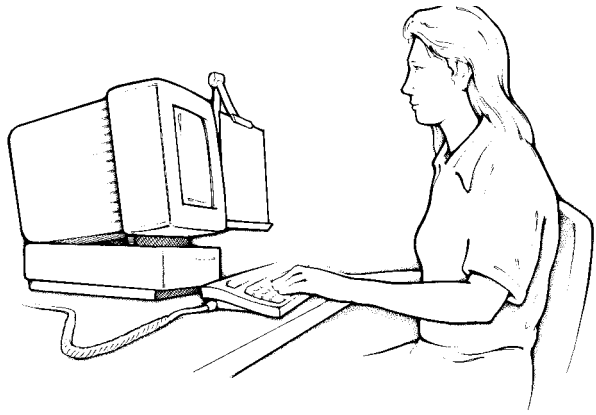
In addition, the Family and Medical Leave Act requires most private employers with over 50 employees, and most government employers, to provide up to 12 weeks of unpaid leave per year because of a worker's, or an immediate family member's, serious health condition.

Accommodations

Employers are required to make a "reasonable accommodation" if requested by an employee with a disability, unless the accommodation would cause an "undue hardship" on the employer because of significant difficulty or expense. The accommodations that people with diabetes need are usually inexpensive. You might require accommodations such as:

- Breaks to check blood glucose, eat a snack, or go to the bathroom
- The ability to keep diabetes supplies and food nearby
- The opportunity to work a modified schedule or to work a standard shift, as opposed to a swing shift.

If you want more information about employment rights, visit www.diabetes.org/discrimination or call 1-800-DIABETES for the ADA's packet on discrimination or to request help from a legal advocate.



Exercise, Aerobic

Aerobic exercise uses your heart, lungs, arms, and legs. By working these parts of your body, you can improve your blood flow, reduce your risk of heart disease, and lower your blood pressure. You can also lower your LDL cholesterol and triglycerides.

When you do aerobic exercises, you breathe harder and your heart beats faster. This builds your endurance and increases your energy. You may find that aerobic exercise helps you sleep better, feel less stressed, balance your emotions, and improve your sense of well-being.

Aerobic exercise is good for your diabetes and your overall health. It helps your insulin to work more efficiently, reduces your body fat, and helps you lose weight. If you don't exercise already, your doctor may advise you to start.

What to Do Before You Start

Walking at a brisk pace is safe for almost everyone. However, if you plan to increase your activity above this amount, it is important to check with you doctor first. Your doctor may want to run some tests to see how your heart, blood vessels, eyes, feet, and nerves are doing. Your blood pressure, blood fat levels, A1C levels, and body fat might also be checked. Your health care team can help you to adjust your diabetes plan for exercise.

What Aerobic Exercises to Do

Find out from your doctor or a qualified exercise professional what kinds of exercises are safe for you to do. This is especially important if you have certain health conditions like heart disease, or eye, feet, or nerve problems. Your doctor or exercise professional can help you identify exercises that are safe and that you will enjoy.

EXAMPLES OF AEROBIC EXERCISES

- Aerobics classes or videos
- Bicycling
- Dancing
- Jogging
- Jumping rope
- Rowing
- Running
- Skating (roller, ice, in-line)
- Skiing
- Stair climbing
- Swimming
- Walking
- Water exercises

How Long and How Often to Exercise

If you are just beginning to exercise after a long time of little or no activity, start out by adding a small and comfortable amount of activity to your daily routine. For example, do 5 minutes of walking two or three times per day. Then, gradually build up to doing at least 10 minutes of non-stop aerobic exercise per session. Your goal is to do at least 30 minutes of physical activity, 5 days a week. To get this amount of activity, you might try brisk walking or stair climbing for 10 minutes three times a day or for 15 minutes twice a day.

For important health benefits, all adults should do at least 2 1/2 hours (150 minutes) of moderate exercise each week. You can get even more health benefits by increasing your amount of aerobic exercise to 5 hours per week.

A warm-up will slowly raise your heart rate, warm your muscles, and help prevent injuries. A cool-down will lower your heart rate and slow your breathing. Warm up for 5 to 10 minutes before aerobic exercise, and cool down for 5 to 10 minutes after aerobic exercise. As a warm-up or a cool-down, slowly walk or bicycle and gently stretch to increase your flexibility.

How Hard to Exercise

Your doctor or an exercise professional can tell you how hard to exercise by giving you a heart rate goal. The number is a percentage of your

maximum heart rate, which indicates your capacity for exercise. It may be as low as 55% or as high as 79%. Here's a way to figure out your heart rate.

HOW TO CALCULATE YOUR TARGET ZONE

1. Subtract your age from 220 to figure out your maximal heart rate (HRmax).
   220 – your age = HRmax
   220 – 50 years old = 170 [example for 50-year-old person]
2. Multiply your HRmax by 50% and 70% to figure out your target zone in heartbeats per minute (or 55% and 65% if you are just starting out).
   HRmax x 0.50 = bottom of your target zone (170 x 0.50 = 85)
   HRmax x 0.70 = top of your target zone (220 x 0.50 = 119)
3. Divide your target zone numbers (heartbeats per minute) by 6 to figure out your 10-second pulse count.
   Bottom target ÷ 6 = Bottom 10-second count (85 ÷ 6 = 14)
   Top target ÷ 6 = Top 10-second count (119 ÷ 6 = 20)

So, using this formula, we can see that a 50-year-old would have a target zone of between 14 and 20 heartbeats every 10 seconds.

If you have nerve damage or take certain blood pressure drugs, your heart may beat more slowly. Check with your doctor about this. If your heart does beat more slowly, your heart rate is not a good guide for how hard to exercise. Instead, exercise at what you feel is a moderate level of exertion. Moderate is not too hard and not too easy. You should be able to talk, but not sing, while you're exercising.

SIGNS THAT YOU ARE EXERCISING TOO HARD

- You can't talk while exercising.
- Your 10-second pulse is higher than the number you are trying to maintain.
- The exercise you are doing feels hard, very hard, or as if you can't keep it up for the amount of time you plan to exercise.

When to Check Your Blood Glucose

Exercise usually makes your blood glucose level go down. But if your blood glucose level is high before you start exercising, your blood glucose level can go up even higher.

If you take insulin or certain diabetes medicines (the sulfonylureas, the meglitinides), your blood glucose level can fall too low when you exercise. The best way to find out how exercise affects your blood glucose is to check before and after exercising.

Check your blood glucose twice before exercise. Check 30 minutes before you plan to start exercise and again just before you begin. This tells you whether your blood glucose level is rising, stable, or dropping. If it is higher than 250–300 mg/dl, think about reasons why your glucose level could be this high (such as eating a high carbohydrate meal or being stressed), and consider how you are feeling. If you take insulin, it is also a good idea to check your blood or urine for ketones. If your ketones are negative and you are feeling good, you do not need to delay doing moderate exercise. However, if you have ketones and you are not feeling good, it is safest to delay exercising.

If your glucose is dropping rapidly or is below 100 mg/dl, you should consume a carbohydrate snack before you start to exercise. When your glucose is above 100 mg/dl and stable, it is safe to begin your exercise.

Be ready to check your blood glucose during exercise. There are times during exercise that you may want to stop and check your blood glucose, such as:

- When you are trying a new physical activity for the first time and want to see how it is affecting your blood glucose
- When you feel your blood glucose might be going too low
- When you will be exercising for more than 30 minutes (check every 30 minutes).

Check your blood glucose after exercise. When you exercise, your body uses glucose that is stored in your muscles and liver. After exercise, your body restores glucose to your muscles and liver by removing it from your blood. This can take up to 24 hours. During this time, blood glucose levels can fall too low.

When to Eat Snacks

Depending on how hard and how long you exercise, you may need to eat extra snacks. A snack can be 1 carbohydrate choice, which provides 15 grams of carb, such as a piece of fruit, half a cup of juice, 4-6 crackers, or a small roll.

Talk with your dietitian about the best snack options for you and when it is best for you to eat them. For prolonged periods of activity, you may need to eat a small, carbohydrate snack before, during, or after exercise.

If your blood glucose level is less than 100 mg/dl before exercise

You may need to eat a snack before you start.

If your blood glucose level is between 100 and 150 mg/dl before exercise AND you will be exercising for more than 1 hour

You may need to eat 15 grams of carbohydrate for every 30 to 60 minutes of activity.

If your blood glucose level is between 100 and 250 mg/dl before exercise AND you will be exercising for less than 1 hour

You probably will not need to eat a snack before you start.

If your blood glucose level falls below 100 mg/dl during exercise

You may need to eat a snack with 15 to 30 grams of carbohydrate. Then continue to take in 15 grams of carbohydrate every 30 to 60 minutes during exercise.

If your blood glucose level is below 100 mg/dl after exercise

You may need a carbohydrate snack after exercise, especially if it is a while until your next planned meal.

When and What to Drink

Exercise makes you sweat, and when you sweat, you lose fluid. To replace lost fluids, be sure to drink plenty—about a cup of fluid every 15 to 20 minutes during exercise and more after exercise.

Water is usually the best choice when it comes to hydration, but if you are exercising for a long time, you may want a drink that contains carbohydrate. Choose drinks that are about 15 grams of carbohydrate per 8-ounce serving, such as sports drinks or diluted fruit juices (1/2 cup fruit juice, 1/2 cup water).

When to Exercise

The best time to exercise is a time of day that it fits into your schedule. In terms of glucose control, exercising 1 to 3 hours after you finish a meal or snack can be a good time. Exercise at this time can lessen how much your glucose level goes up after you eat, and the food you have eaten will keep your blood glucose level from falling too low. This may not be true if you take rapid-acting insulin before you eat. Talk with your health care team if you have questions about the best time for you to exercise.

WHEN NOT TO EXERCISE

- Your blood glucose level stays over 300 mg/dl and you have ketones in your urine.
- You feel ill.
- You have numbness, tingling, or pain in your feet or legs.
- You are short of breath.
- You have an injury that could be made worse by contact.
- You feel dizzy.
- You feel sick to your stomach.
- You have pain/tightness in your chest, neck, shoulders, or jaw.
- You have blurred sight or blind spots.

Report any unusual symptoms to your health care team.

Exercise, Flexibility

Stretching is a type of exercise that improves muscle flexibility and range-of-motion of joints. Stretching reduces muscle and joint stiffness, resistance, or pain, and flexible muscles and joints are less likely to get injured when you use them.

One of the best ways to become more flexible is to stretch every day. Stretch a little bit throughout the day to relieve muscle tension and stress. Make stretching a part of your physical activity routine.

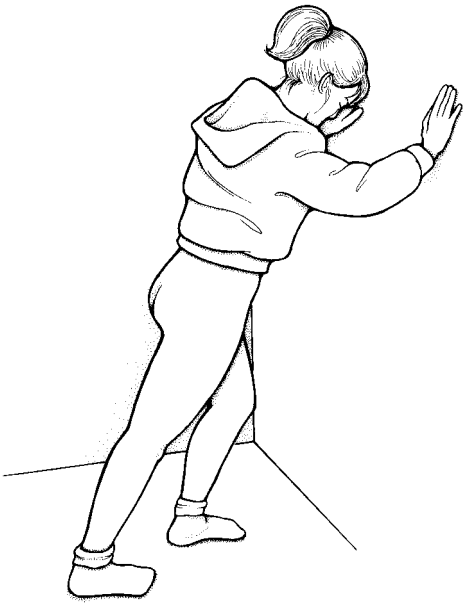
You increase your risk of injury by starting to do hard stretches at the beginning of an exercise routine. It is best to stretch your muscles after they have been warmed up. For example, do leg stretches after you've been walking for at least 10 minutes. If you don't have a chance to warm up the muscles, begin with only very gentle stretches.

There are lots of different stretches. You can find them in books, on videos, and in exercise classes. Here are a few stretches for you to try. But first, some tips for keeping stretching safe and comfortable.

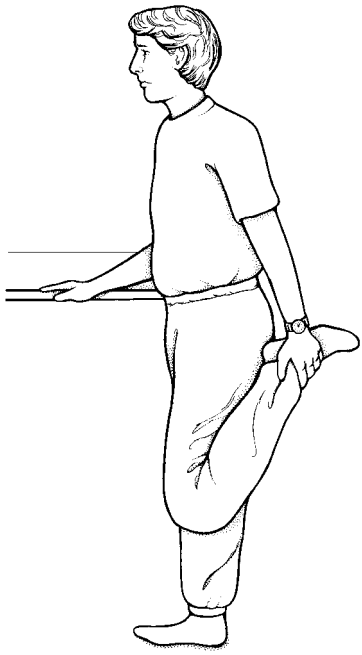
STRETCHING TIPS

- Go slowly and smoothly.
- Practice relaxed breathing.
- Don't bounce.
- Relax and let go of any tension you feel.
- Go only as far as you can without pain.
- Hold for at least 10–20 seconds.

Types of Stretches



Calf stretch



Quadriceps (front of thigh) stretch

Calf stretch. Face a wall and stand about a foot away. Stand with one foot in front of the other, toes straight ahead. Keep both feet flat on the floor. Bend your front knee. Slowly lean forward and rest your forearms on the wall. Press your rear heel into the floor. Repeat with your other leg.

Quadriceps (front of thigh) stretch. Stand with knees slightly bent. Bend one leg back, lifting your foot off the floor. Grab the ankle of the bent leg with the opposite hand. You may want to hold on to something for balance. Gently pull your foot up so your heel is headed for your bottom and hold. Release. Repeat with your other leg.

Hamstrings (back of thigh) stretch. Lie on your back. Bend your legs, feet on the floor. Lift one leg up. Keep it slightly bent. Grasp the leg at the thigh just above the knee with both hands. Holding on to your leg, try to straighten it. Release. Straighten again and release. Repeat with your other leg.

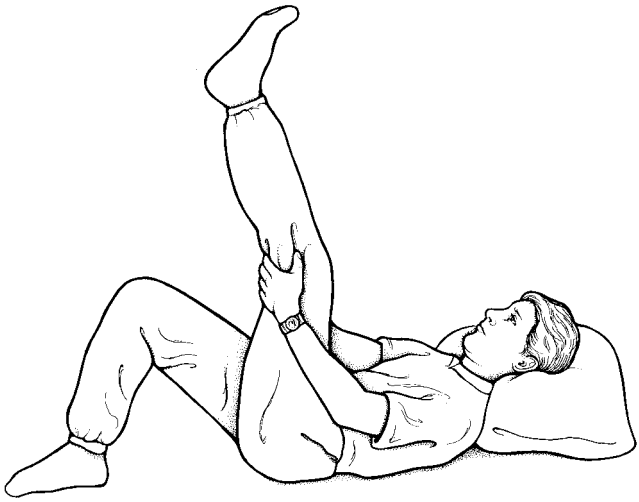
Back and hips stretch. Sit with your legs straight out. Bend one knee and cross your bent leg over your straight leg. Place the foot of your bent leg on the floor next to the knee of the straight leg. Support yourself by placing the arm on the side of your bent knee on the floor behind you. Place the elbow of the opposite arm against the outer side of your bent knee. Slowly twist your upper body in the direction of your bent leg. Continue turning and gradually look over your shoulder and behind you. Keep your shoulders relaxed and your chin level. Focus on relaxed breathing. Slowly unwind and rest both legs on the floor. Repeat on the other side.

Lower back stretch. Lie on your back. Bring your knees to your chest. Hold your knees with your arms. Hug your knees to your chest and press your lower back into the floor. Release arms. Lower legs.

Shoulders and chest stretch. Lace your fingers together behind you. Slowly lift your arms up. Focus on keeping your back straight and looking forward. Hold. Breathe. Slowly lower and let go. Repeat.

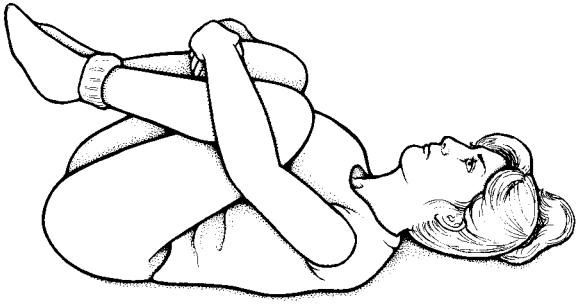
Arms stretch. Raise your arms over your head. Lace your fingers together with palms up. Press your arms upward.

Neck stretch. Center your head over your shoulders. Look down. Let your head roll toward your chest. Bring your head back to the center. Look over one shoulder. Bring your head back to the center. Look over the other shoulder. Repeat slowly.



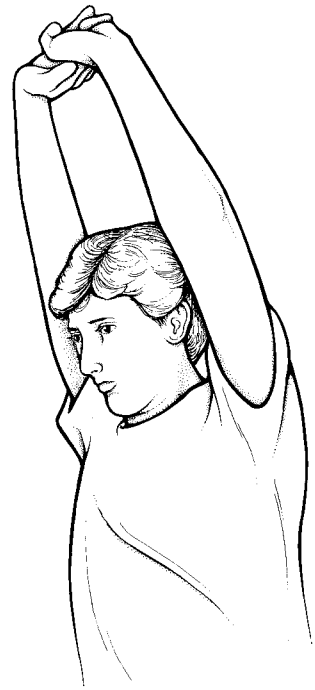
Hamstrings (back of thigh) stretch

Back and hips stretch



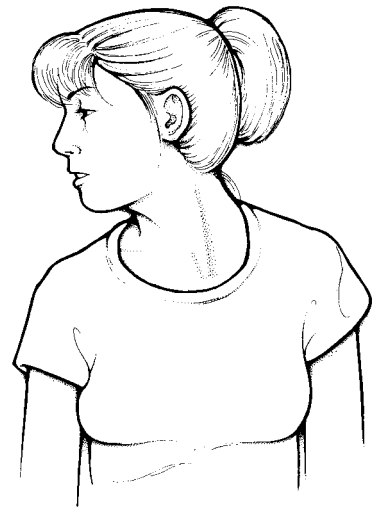
Lower back stretch

Shoulders and chest stretch



Arms stretch

Neck stretch 1



Neck stretch 2

If you would like more of a challenge for your muscles and joints, consider one of these other forms of exercise that promote flexibility:

- Ballet
- Pilates
- Martial arts
- Modern dance
- Yoga (see Yoga, page 189)
- Water aerobics.

Before you try any of these flexibility exercises, check with your doctor to make sure the movements are safe for you. It is best if you can learn flexibility exercises from an instructor. Many places offer classes for beginners. Community recreation centers often have low-cost classes.

If you are thinking of taking a class, you may want to watch at least one session before signing up. You might also want to ask whether the teacher has experience teaching people with diabetes.

Exercise, Strength

Strength exercises are ones that work your muscles against a weight or resistance. Strength exercises include using weight machines, exercise bands, medicine balls, or stability balls; lifting free weights; doing calisthenics; or circuit training.

Weight Machines

Weight machines allow you to change how much weight you lift by either placing a pin in a stack of weights or turning a valve that controls fluid pressure. Some well-known brands of weight machines are Nautilus, Universal, and Cybex.

Free Weights

Free weights are not attached to another piece of equipment. Free weights include dumbbells and barbells. A dumbbell is a short bar you can lift with one hand. A barbell is a long bar you lift with both hands.

Calisthenics

In calisthenics, the weight you use is your own body. Calisthenics include push-ups, pull-ups, sit-ups, leg lifts, and squats. You can make your muscles work harder by strapping weights to your wrists or ankles or by using elastic bands.

Circuit Training

In circuit training, you go through a series of stations. At each station, you do a different exercise. You might use a weight machine, lift free weights, do an aerobic exercise, or do calisthenics. After you finish one station, you have a short rest period before you go on to the next station.

Why Do Strength Exercises?

Strength exercises make your muscles stronger and more flexible and your bones sturdier. Strong muscles and bones are less likely to become injured. The stronger you are, the easier everyday physical tasks become, and the longer you can stay active without tiring. Muscles burn more calories than fat, so strength exercises actually increase metabolism and may help with weight loss.

What to Do Before You Start

See your doctor. Talk to your doctor before you start strength exercises. Some exercises may be better for you than others. Some may not be safe for you at all.

Choose your exercises. When you know the kinds of strength exercises that are safe for you, pick out 8 to 10 different ones. Be sure to pick ones that will work your legs and hips, chest, back, shoulders, arms, and abdomen. The idea is to work all your muscle groups. Your health care team or a qualified fitness professional may be able to help you choose these exercises.

Learn how to do your exercises. Once you have chosen your exercises, learn the right way to do them. If you do exercises the wrong way, you might injure yourself. If the exercises you have chosen require you to use equipment that is new to you, learn how to use and adjust it. Find out how to use any safety equipment that goes along with your exercise, too.

How to Strengthen with Weights and Calisthenics

As with any other exercise, warm up for 5 to 10 minutes before you begin, and cool down for 5 to 10 minutes after you finish. Try gentle stretching and slow walking or bicycling.

After you warm up, start with just 1 set of each exercise. A set is the number of times you repeat an exercise before you rest. Have a qualified fitness professional help you figure out how many repetitions to do of each exercise. Here are some general guidelines:

If the strength exercise is easy for you

Do it 15 to 20 times. Rest for 1 minute or less between sets.

If the strength exercise is moderate for you (that is best in terms of safety and getting results)

Do it 8 to 12 times. Rest for 1 or 2 minutes between sets.

If the strength exercise is hard for you

Do it 2 to 6 times. Rest for 3 to 5 minutes between sets.

Remember, start with just 1 set. As you become stronger, you will be able to do more sets. Work your way up a little bit at a time until you can do 3 sets of each exercise. Once you are doing 2 or 3 sets easily, you are ready to make the exercise harder by adding more weight.

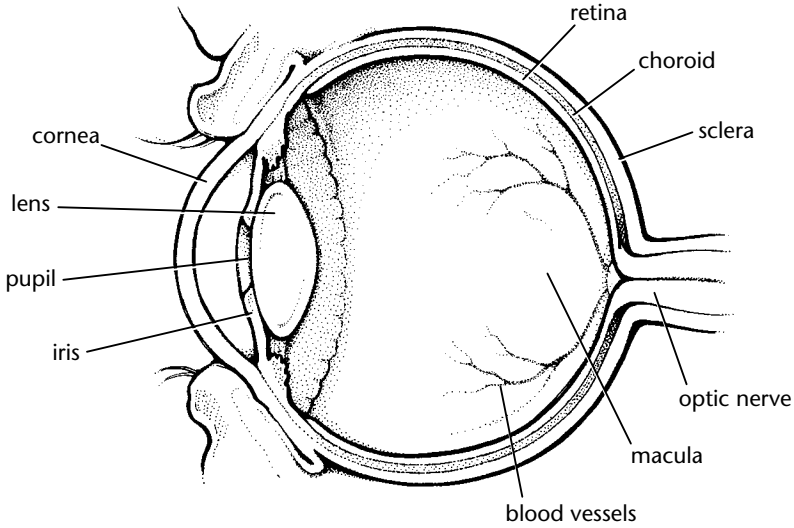
Another thing to remember is to move your muscles through their full range of motion. This is important for increasing both strength and flexibility. And keep breathing! Breathe in as you lower. Breathe out as you lift. If you don't like this pattern, then just breathe normally.

How Long and How Often to Exercise

Do your strength exercises for 20 to 30 minutes two or three times a week. Allow at least 1 day of rest between days you do the same strength exercises. To grow stronger, muscles need rest as well as exercise.

Eye Diseases

People with diabetes are more likely to get an eye disease than people without diabetes. The three main eye diseases that people with diabetes get are retinopathy, cataracts, and glaucoma. Of the three, retinopathy is the most common and carries the highest risk of reducing your vision.



Retinopathy

The retina is the lining at the back of the eye that senses light. Small blood vessels bring oxygen to the retina. Retinopathy damages the small blood vessels in the retina. The two major types of retinopathy are called nonproliferative and proliferative.

Nonproliferative Retinopathy

In nonproliferative retinopathy, the small blood vessels in the retina bulge and form pouches. This weakens the blood vessels. They may leak a bit of fluid. This leaking does not usually harm your sight. And often, the disease never gets worse.

If the disease does get worse, the weak blood vessels leak a larger amount of fluid. They also leak blood and fats. This causes the retina to swell. The swelling will usually not harm your sight, unless it occurs in the center of the retina.

The center of the retina is called the macula. The macula lets you see fine details. Swelling in the macula is called macular edema. Macular edema can blur, distort, reduce, or darken your sight.

Proliferative Retinopathy

Nonproliferative retinopathy may progress to proliferative retinopathy. In proliferative retinopathy, the small blood vessels are so damaged that they close off. In response, many new blood vessels grow in the retina. As these new blood vessels grow, they branch out to other parts of your eye.

SIGNS OF RETINOPATHY

- Your sight gets blurry.
- You see floating spots.
- You see a shadow or dark area.
- You can't see things out of the sides of your eyes.
- You have trouble seeing at night.
- You have trouble reading.
- Straight lines do not look straight.

If you have any of these signs, go to your eye doctor right away. Special note: Usually, you can't see (or feel) the early signs of damage to your retina, but your eye doctor can. Be sure to have your eyes checked for retinopathy every year.

These changes may not affect your sight. Or, these changes will make you less able to see things out of the sides of your eyes. You might also find it harder to see in the dark and to adjust from light to dark.

The new blood vessels are weak and can cause problems. They may break and bleed into the clear gel that fills the center of the eye. This is known as a vitreous hemorrhage. The most common signs of vitreous hemorrhage are blurring and floating spots. Vitreous hemorrhage can cause you to lose sight if not treated.

The new blood vessels may cause scar tissue to grow on the retina. Scar tissue can wrinkle the retina and pull it out of place. A retina that has been pulled away from the back of the eye is called a detached retina. A detached retina will cause you to see a shadow or large dark area. It can endanger your sight.

Cataracts

A cataract clouds the eye's lens. The eye's lens is usually clear. The lens lies behind the iris (the colored part of your eye) and the pupil (the dark opening). The lens focuses light onto the retina. Clouding of the lens blocks light from entering.

Cataracts usually start out small. Some of them never worsen your sight. Others block most or all of your sight. How a cataract will affect your sight depends on three things:

1. how large or small it is
2. how thin or thick it is
3. where it is on the lens.

If cataracts are significantly affecting your vision, surgery may be appropriate. Cataract surgery has become a highly successful outpatient surgery.

Because of these three things, signs that you have a cataract may vary.

SIGNS OF A CATARACT

- Your sight is hazy, fuzzy, or blurry.
- You think you need new glasses.
- Your new glasses don't help you see better.
- You find it harder to read and do other close work.
- You blink a lot to see better.
- You feel you have a film over your eyes.
- You feel you are looking through a cloudy piece of glass, veils, or a waterfall.
- Light from the sun or a lamp seems too bright.
- At night, headlights on other cars cause more glare than before or look double or dazzling.
- Your pupil, which is usually black, looks gray, yellow, or white.
- Colors look dull.

If you have any of these signs, see your eye doctor.

Glaucoma

Glaucoma is a buildup of fluid in the eye. The fluid buildup causes increased pressure. The pressure can damage your optic nerve. Your optic nerve tells your brain what your eye sees. There are two different kinds of glaucoma.

The most common type is chronic open-angle glaucoma. In this type, fluid pressure rises slowly over many years. You usually won't notice it. You might feel the increased pressure in your eye or your eyes may keep tearing.

As the glaucoma worsens, you may notice that your sight is slightly blurry or foggy. You may feel that your glasses should be changed. You may have a hard time seeing in the dark. If the glaucoma is not treated, you may lose your sight.

The less common type of glaucoma is acute angle-closure glaucoma. In this type, fluid pressure builds up quickly. Your eyes hurt a lot. They are blurry and keep tearing. You see colored halos around bright lights. You may even vomit. If you have any of these signs, go to a hospital emergency room right away.

HOW TO KEEP YOUR EYES FREE OF DISEASE

- **Keep your blood glucose levels close to normal.** Keeping your blood glucose levels close to normal lowers your risk of getting eye diseases and slows down those that have started.
- **Control high blood pressure.** High blood pressure can make eye diseases worse. You may be able to bring blood pressure down by losing weight, eating less salt, and avoiding alcohol. Your doctor can tell you about drugs to lower blood pressure.
- **Quit smoking.** Smoking damages your blood vessels.
- **Lower high cholesterol.** High cholesterol can also damage your blood vessels.
- **Get yearly dilated eye and visual exams by an eye doctor.** Many eye diseases can do damage without causing signs you can see. An eye doctor has the tools and tests to find damage early. The earlier damage is found, the greater the chance that treatments can save your sight.

Food Labeling

Food labels tell you almost everything you need to know about the foods you buy. The more you know about foods, the better food choices you can make, and the better you can follow your healthy eating plan (see Healthy Eating, page 85; and Meal Planning, page 123).

One of the first things you might see on a food package is a nutrient claim, such as "reduced fat" or "low calorie." These claims have standard meanings. Some of these terms and their meanings are listed at the end of this section. But the most useful information on a food package is found in the Nutrition Facts box.

Serving Sizes

Serving sizes are now more uniform in all brands of similar foods. In this way, you can more easily make comparisons. And the serving sizes are closer to the amounts people really eat. Serving sizes are given in both household (e.g., cup) and metric (e.g., gram) measures. The label also gives the number of servings per container.

Lists of Nutrients

Nutrition Facts list calories, calories from fat, total fat, saturated fat, trans fat, cholesterol, sodium, total carbohydrate, dietary fiber, sugars, and protein. Nutrients that may also be listed include calories from saturated fat, polyunsaturated fat, and monounsaturated fat. Nutrients listed are followed by a number. This number is the amount of that nutrient in grams (g) or milligrams (mg) in one serving of the food.

Nutrition Facts
Serving Size 1 cup (228g)
Servings Per Container 2

Amount Per Serving

Calories 260	Calories from Fat 120
	% Daily Value*
Total Fat 13g	**20%**
Saturated Fat 5g	**25%**
Cholesterol 30mg	**10%**
Sodium 660mg	**28%**
Total Carbohydrate 31g	**10%**
Dietary Fiber 0g	**0%**
Sugars 5g	
Protein 5g	

Vitamin A 4%	•	Vitamin C 2%
Calcium 15%	•	Iron 4%

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

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

Vitamins and Minerals

Nutrition Facts also list the amounts of vitamin A, vitamin C, calcium, and iron. Other vitamins and minerals may be listed. After the name of the vitamin or mineral is a number followed by a percent sign (%). This number is the percentage of the daily amount of the vitamin or mineral in one serving of the food. Higher numbers mean the food has more of that vitamin or mineral.

Daily Values

Daily Values tell you how much total fat, saturated fat, cholesterol, sodium, potassium, total carbohydrate, fiber, and protein you need each day based on the number of calories you eat in a day. There is no Daily Value for sugars.

All Nutrition Facts labels give Daily Values for a person eating 2,000 calories a day. Some labels also list Daily Values for a person eating 2,500 calories a day.

Your own Daily Values may be higher or lower than those on the label. The more calories you need to eat in a day, the higher your Daily Values. The fewer calories you need to eat in a day, the lower your Daily Values. With the help of a dietitian, you can figure out your own Daily Values to fit your calorie needs.

NUTRIENT CLAIMS

Term	Description
Calorie free	Less than 5 calories per serving
Cholesterol free	Less than 2 mg of cholesterol per serving and 2 g or less of saturated fat per serving
Fat Free	Less than 0.5 g of fat per serving
Saturated fat free	Less than 0.5 g saturated fat per serving
Sodium free	Less than 5 mg of sodium per serving
Sugar free	Less than 0.5 g of sugar per serving
Low calorie	40 calories or less per serving
Low cholesterol	20 mg or less of cholesterol per serving and 2 g or less of saturated fat per serving
Low fat	3 g or less of fat per serving
Low saturated fat	1 g or less saturated fat per serving
Low sodium	140 mg or less of sodium per serving
Extra lean	Less than 5 g of fat, 2 g of saturated fat, and 95 mg of cholesterol per serving
Lean	Less than 10 mg of fat, 4.5 g of saturated fat, and 95 mg of cholesterol per serving
Light or lite	33.3% fewer calories or 50% less fat per serving than comparison food
Reduced	25% less per serving than comparison food. Check label carefully. Some of these foods are still too high in fat and calories.

Percent Daily Values

Percent (%) Daily Values, listed on the right side of the Nutrition Facts label, tell you what percentage of the Daily Value you are getting in one serving of the food.

Ingredients Lists

Ingredients are listed on food packages according to their weight. The ingredient weighing the most is listed first. The ingredient listed last weighs the least. It pays to read the ingredients list, because claims on packages can be misleading.

Using Food Labels

The Nutrition Facts on a food label will tell you exactly how many grams of carbohydrate, grams of fat, and calories are in a serving of food. This makes carbohydrate counting, fat gram counting, and calorie counting straightforward.

If you use *Choose Your Foods: Exchange Lists for Diabetes* (see Meal Planning, page 123), you will need to compare the serving size on the label to the serving size of an exchange. They may not be the same. For example, the label may list a serving size as 1 cup, but the exchange may list the serving size as 1/2 cup. In this case, 1 cup of the food would be equal to 2 exchanges.

Foot Care

People with diabetes can get many kinds of foot problems. Even minor ones can turn into serious ones.

Nerve Damage

Nerve damage can make your feet less able to feel pain, heat, and cold. Nerve damage can affect the nerves that cause sweating. As a result of decreased sweating, your feet may become dry and scaly. The skin may peel and crack. Nerve damage can also deform your feet. Your toes may curl up. The ball of your foot may stick out more. Your arch may get higher. These changes can cause some parts of your feet to bear more weight. Those areas are then more likely to get corns and calluses (see page 72).

Tips to Deal With Lost Feeling in Your Feet

If you have lost some of the feeling in your feet

- Don't go barefoot. You could hurt your foot and not notice it. If you are going swimming, wear footwear made for water.
- Check your shoes before putting them on. Make sure there are no stones, nails, pins, or other sharp objects in them. Be sure the inside of the shoe is smooth and free of tears or rough edges.

If your feet sweat a lot

- Try wearing socks made of silk or thin polypropylene under your regular socks. They wick away sweat and help reduce friction. Be sure you have enough room in your shoes to fit both pairs of socks. You can also buy specialty socks that are designed to wick away sweat. These socks are available at most athletic stores.

If your feet are dry and scaly

- Use a moisturizer twice a day. But don't put the moisturizer between your toes. The extra moisture can lead to infection.
- Don't soak your feet. Soaking dries out your skin.

If the shape of your foot has changed

- Ask your diabetes care provider or podiatrist about shoe inserts or special shoes.

Corns and Calluses

Calluses are areas of thick skin caused by regular or prolonged pressure or friction. A corn is a callus on a toe. Corns and calluses can develop on your feet when your body weight is borne unevenly. There are several things you can do to prevent calluses from forming.

Wear shoes that fit. Shoes that fit are comfortable when you buy them. Almost all new shoes are a little stiff at the start and mold to your feet with wear. But this is different from buying the wrong size and trying to break them in. Make sure there is room for you to move your toes.

Wear shoes with low heels and thick soles. Thick soles will cushion and protect your feet. Low heels distribute your weight more evenly.

Try padded socks. They not only cushion and protect feet but also reduce pressure. Be sure your shoe is large enough to fit this thicker sock. You may need extra-deep shoes.

Try shoe inserts. Ask your diabetes care provider or foot doctor about shoe inserts to better distribute your weight onto your feet.

If you get a callus or corn, have it trimmed by your diabetes doctor or foot doctor. Trying to cut corns or calluses yourself can lead to infections. Trying to remove them with over-the-counter chemicals can burn your skin. Untrimmed calluses can get very thick, break down, and turn into ulcers.

Foot Ulcers

Foot ulcers are open sores or holes in the skin. Ulcers form most often over the ball of the foot or on the bottom of the big toe. They can also form on the sole, the heel, or the other toes. Ulcers can be caused by a cut, callus, or blister that is not taken care of. Ulcers on the sides of a foot are usually caused by shoes that don't fit well.

An ulcer can be very painful. But if you have nerve damage (see above), you may not feel it. Even though you may not feel any pain from an ulcer, you need to get medical attention right away. Walking on an ulcer can cause it to become larger and infected. Even waiting a few days can cause the infection to spread. An infected ulcer can lead to gangrene and amputation (see below).

HOW TO PREVENT FOOT ULCERS

- Wear shoes that fit.
- Wear new shoes for just a few hours at a time.
- Throw away worn-out shoes and sneakers.
- Wear socks that fit.
- Wear socks without seams, holes, or bumpy areas in them.
- Put on clean socks each day.
- Put or rolling your socks on gently.
- Check for pebbles or other objects before you put your shoes on.

Poor Circulation

Damage to the blood vessels in the legs and feet can lead to poor circulation. Poor circulation can make your feet feel cold or look blue or swollen.

If your feet are cold

- Wear warm socks.
- Do not use hot water bottles, heating pads, or electric blankets. They may burn your feet without your noticing.
- Keep your feet out of water that is too hot or too cold. Check the water first with your elbow.

If your feet are swollen

- Try shoes that lace up. You can tighten or loosen the laces to fit the shoes to the shape of your feet.

Poor circulation can slow the healing of wounds and infections. It can also cause dry gangrene (see below). Be alert to the signs of blood vessel damage to the legs and feet.

SIGNS OF BLOOD VESSEL DAMAGE

- Cramping or tightness in one or both legs while walking but not at rest, known as intermittent claudication
- Cold feet
- Pain in the legs or feet while at rest
- Loss of hair on the feet
- Shiny skin
- Thickened toenails.

Gangrene and Amputation

Gangrene is death of tissues. There are two types of gangrene: dry and wet. Dry gangrene can be treated by improving blood circulation to the foot. Antibiotics can be taken to prevent the area from becoming infected with bacteria. If infection sets in, you have wet gangrene. The only treatment for wet gangrene is amputation. Amputation is removal of the dead tissues. It might mean you lose a toe, several toes, a foot, or part of a foot.

Special note: Many people with diabetes who need amputations are smokers.

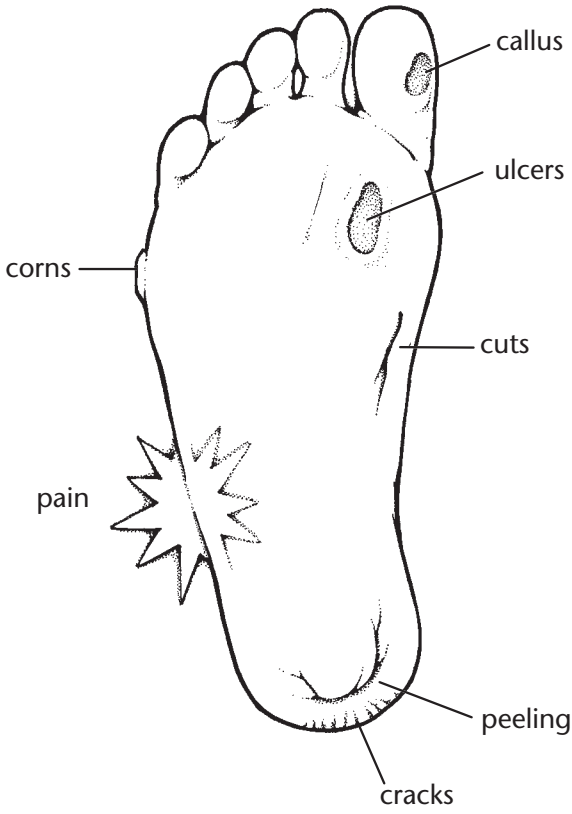
How to Care for Your Feet

Keep your feet clean. Wash and dry them well. Don't forget to dry between your toes.

Keep your toenails trimmed. Trim your toenails to follow the curve of your toe. If you can't trim them yourself, have a member of your health care team do it.

Check both your feet each day. Look all over your feet. If you cannot see well, have a friend or relative who can see well do it for you. Compare one foot to the other. Use a mirror to help see the bottom of your feet. Look for any of the foot problems listed below:

- Cuts
- Blisters
- Cracks
- Breaks
- Scratches
- Calluses
- Ingrown toenails
- Swelling
- Redness
- Changes in color
- Changes in shape
- Pain
- Cold spots
- Loss of feeling
- Hot spots
- Corns
- Ulcers
- Dryness
- Holes
- Peeling



Have your feet checked regularly. Take your shoes and socks off at every regular office visit to remind your doctor to check your feet. Have your care provider or podiatrist check your feet for blood vessel, muscle, and nerve damage at least once a year.

Keep blood glucose levels in your range. If blood glucose levels are high, you are more likely to get foot problems.

Don't smoke.

Keep your doctor informed. Call your diabetes doctor or your podiatrist if you have a foot problem, no matter how minor.

Gestational Diabetes

Gestational diabetes is high blood glucose levels that occur only in pregnant women who do not already have diabetes. It appears at around 24–28 weeks of pregnancy. At that time, the placenta, which nourishes the baby, is making large amounts of hormones to help the baby grow. It is thought that these hormones block insulin. When something in the body does not allow insulin to do its job, it is called insulin resistance.

In most pregnant women, the body makes enough insulin to overcome the insulin resistance. In other pregnant women, the insulin that is made cannot overcome the insulin resistance. These women have gestational diabetes. Most women with gestational diabetes have healthy babies. But close follow-up by a doctor is still important. You are at greater risk for gestational diabetes if one or more of the following statements are true:

- You are 25 years old or older.
- You are overweight.
- You have a family history of diabetes.
- You are Hispanic, Native American, African American, Asian, or a Pacific Islander.
- You have given birth to a baby weighing 9 pounds or more.

Gestational diabetes can be hard on you and your baby. If gestational diabetes is not treated, you and your baby are more likely to have the following problems.

Macrosomia

Macrosomia means large body. If your blood glucose is too high during pregnancy, the extra glucose in your blood goes into your baby. This causes your baby to make more insulin. The extra glucose and the extra insulin cause your baby to grow bigger and fatter than normal, making delivery harder. Babies who are larger than normal are more likely to have health problems and are more prone to diabetes later in life.

Hypoglycemia

Hypoglycemia is low blood glucose. If your blood glucose is too high right before or during labor, your baby may have low blood glucose at birth. The extra glucose in your blood goes into your baby. This causes your baby to make more insulin.

After delivery, your baby no longer gets extra glucose from you. The extra insulin your baby made causes your baby's blood glucose level to fall. Hypoglycemia in your baby can be treated in the hospital right after birth.

Jaundice

Before your baby is born, he or she makes lots of red blood cells. After delivery, your baby no longer needs as many red blood cells, and they are broken down. One breakdown product of red blood cells is bilirubin. Your baby's liver metabolizes the bilirubin. If your baby's liver is not mature enough, it may have trouble doing this. The extra red blood cells and bilirubin remain in your baby's body.

Bilirubin colors your baby's skin yellow. This is called jaundice. Jaundice can be taken care of in the hospital using special lights. It can be dangerous if it is not treated. Ask your doctor about it before you take your baby home from the hospital.

High Ketones

Ketones are made when your body burns stored fat for energy. Large amounts of ketones can harm you or your baby. Testing your urine first

thing in the morning can let you and your doctor know whether you are making too many ketones. Ketones are more likely to build up if you are not eating and drinking enough for both you and your baby. Be sure to eat all meals and snacks at your scheduled times.

Preeclampsia

Preeclampsia (also called toxemia) is high blood pressure, and leaking of protein into your urine during pregnancy. Other signs include headache, nausea, vomiting, abdominal pain, and blurred sight. If not treated, preeclampsia can cause seizures, coma, and death to you or your baby. Your doctor will watch for signs of preeclampsia.

Urinary Tract Infection

When your blood glucose is high, you are more likely to get a urinary tract infection. Urinary tract infections are usually caused by bacteria. Bacteria grow much better and faster in high glucose.

Signs of a urinary tract infection include the need to urinate often, pain or burning when you urinate, cloudy or bloody urine, low back pain, or abdominal pain, fever, and chills.

How to Care for Gestational Diabetes

If you are pregnant, get tested for gestational diabetes between the 24th and 28th weeks of pregnancy. If you are obese or have a history of impaired fasting glucose or impaired glucose tolerance (also known as "prediabetes"), or have a family history of diabetes in a parent or a sibling, or have previously delivered a baby that weighed more than 9 pounds, you should be screened for diabetes as soon as possible (first trimester). If you have gestational diabetes, your doctor may ask you to meet with a diabetes educator who will help you learn to:

Follow a meal plan. A meal plan will help you avoid too high or too low blood glucose.

Follow an exercise program. Exercise can help lower your blood glucose level.

Self-monitor your blood glucose. This lets you know how your gestational diabetes care plan is working.

Check your urine for ketones. The earlier you detect ketones, the quicker you can stop them from getting worse. Ask your doctor when and how often you should check.

Take insulin. When you have gestational diabetes, your body may not be able to make and use all the insulin it needs for pregnancy. You may need to inject insulin. The use of diabetes pills glyburide and metformin is controversial. Glyburide may help control mother's blood glucose and does not appear to cross the placenta, but fetal outcomes have not been well studied. Metformin crosses the placenta, and long-term safety data in the infant is not available.

Gestational diabetes usually goes away after you give birth. But once you have had gestational diabetes, you are more likely to get type 2 diabetes in the future. Depending on your ethnic background, your risk of type 2 diabetes is approximately 50% in the next 7–10 years, and the risk continues to increase after this.

After pregnancy, many women retain some of the weight that they gained during the pregnancy. It is important that you lose all the weight that you gained during pregnancy. If you are overweight or obese, you should lose an additional 7% below your preconception weight, as this will reduce your chance of developing diabetes by 50 to 60%. You can lose weight by eating healthy nutritious food and by exercising daily. See www.diabetes.org/food-and-fitness/food/my-food-advisor/ or www.mypyramid.gov for nutrition recommendations. Have your blood glucose checked (by the lab) at your 6-week follow-up visit with your doctor after your baby is born. Discuss your long-term weight-loss goals with your primary care physician.

Health Care Team

A health care team is a group of health care professionals who help you manage your diabetes. You are a part of the team that may include a diabetes doctor (see Doctor, page 37), a diabetes educator nurse, a dietitian (see Dietitian, page 36), an eye doctor, a foot doctor, a dentist (see Dental Care, page 33), and a pharmacist. Your diabetes doctor may help you find the other members of the team, such as an exercise physiologist or a mental health professional.

Your team teaches you about diabetes and how to make diabetes care a part of your life. Your health care team depends on you to tell them how your diabetes care plan is working and when you need their help. That is why you are the most important member of the team.

Diabetes Nurse Educator

Nurses teach and advise you on the day-to-day management of your diabetes. Nurses can teach you what diabetes is and how to:

- Use diabetes pills
- Use non-insulin medications that are given by injection
- Use insulin
- Give yourself insulin injections
- Use an insulin pump
- Check your blood glucose at home using a meter
- Perform urine testing for ketones
- Keep track of your diabetes control
- Know the signs of low and high blood glucose
- Take care of low or high blood glucose
- Handle sick days
- Stay healthy during pregnancy.

You may work with a diabetes nurse practitioner, a nurse clinician, or a nurse educator. Look for the initials RN after a nurse's name. RN stands for registered nurse. Some nurses also have a bachelor's degree (BSN) or a master's degree (MSN). Many nurses are certified diabetes educators (CDE). A certification for Advanced Practice nurses, dietitians, and pharmacists is indicated by BC-ADM (Board Certified, Advanced Diabetes Management).

Certified Diabetes Educator

The letters CDE after a person's name stand for certified diabetes educator. When you see these letters, you know the person is specially trained to teach or care for people with diabetes. These letters may come after the names of any of the people on your health care team.

A diabetes educator becomes certified only after spending a minimum of 1,000 hours dedicated to the care of people with diabetes and then passing a test offered by the National Certification Board for Diabetes Educators. This independent organization was established in 1986 to promote the interests of diabetes educators and the public at large by granting certification to qualified health professionals involved in teaching persons with diabetes.

Once certified, CDEs must stay up-to-date on diabetes care and treatment in order to pass a recertification test every 5 years. To find a diabetes education program in your area, call the American Diabetes Association at 1-800-DIABETES or visit http://professional.diabetes.org/erp_zip_search.aspx.

Mental Health Professional

Mental health professionals include social workers, psychologists, and psychiatrists. These people can help you recognize and manage the emotional side of living with diabetes.

Look for a licensed clinical social worker (LCSW) with a master's degree in social work (MSW) and training in individual, group, and family therapy. Social workers can help you and your family cope with any

stress or anxieties related to diabetes. They can help you locate community or government resources to help with medical or financial needs.

A clinical psychologist has a master's or doctoral degree in psychology and training in individual, group, and family psychotherapy. Clinical psychologists counsel patients with emotional problems.

A psychiatrist is a medical doctor who can provide counseling and prescribe drugs to treat physical causes for emotional problems.

Exercise Physiologist

An exercise physiologist is trained in the science of exercise and body conditioning. An exercise physiologist helps you plan a safe, effective exercise program.

Look for someone with a master's or doctoral degree in exercise physiology. Or find a licensed health care provider who has graduate training in exercise physiology. Certification from the American College of Sports Medicine is a good sign. Always get your doctor's approval on any exercise program.

Eye Doctor

Your eye doctor is either an ophthalmologist or an optometrist. Ophthalmologists are medical doctors who detect and treat eye diseases. They may prescribe eye medicines and perform eye surgery. Optometrists are not medical doctors. They are trained to examine the eye for vision problems and other minor problems. When you go to an eye doctor, find out whether the eye doctor:

- Knows how to spot eye diseases
- Treats many patients with diabetes
- Performs eye surgery
- Will send regular reports to your diabetes doctor.

Foot Doctor

A foot doctor is called a podiatrist. A podiatrist is trained to treat foot and lower leg problems. Podiatrists have a doctor of podiatric medicine (DPM) degree from a college of podiatry. They have also done a residency (hospital training) in podiatry. When you go to a foot doctor, find out whether the foot doctor:

- Knows the foot problems diabetes can cause
- Treats many patients with diabetes
- Will work with your diabetes doctor.

Pharmacist

A pharmacist is trained in the chemistry of drugs and how drugs affect the body. A pharmacist has at least a bachelor of science in pharmacy degree (BScPharm) or a doctor of pharmacy degree (PharmD).

Your pharmacist can help you in several ways. Most pharmacists offer free counseling. They can tell you:

- How often to take your prescription drugs
- Whether to take your drugs with meals or on an empty stomach
- What side effects to watch for
- Whether to stay out of the sun
- What foods to avoid
- What other drugs might react with your new drug
- When to take a missed dose
- How to store your drugs
- What nonprescription drugs work best with your other drugs.

Other Team Members

As your health changes, you may need other members on your team. If you plan to have a baby, you will need an obstetrician. If you have blood flow problems in your legs or feet, you may need a vascular surgeon. Your diabetes doctor can help you find the specialist you need.

Healthy Eating

A healthy eating plan is low in saturated fat and cholesterol, moderate in protein, high in whole grains and fiber, and moderate in sodium and sugars. This kind of eating can help protect you from heart disease, blood vessel damage, heart attack and stroke, colon and intestinal diseases, and some cancers.

Low in Saturated Fat, Trans Fat, and Cholesterol

The three main kinds of fat in food are saturated fat, trans fat, and unsaturated fat. Saturated fat is highest in animal foods. Foods with a lot of saturated fat include meat, whole-milk dairy products, lard, shortening, and coconut and palm oils.

Saturated fats raise your cholesterol level more than anything else you eat. Cholesterol is found only in animal foods. Foods high in cholesterol include eggs, whole milk, regular cheeses, and meats.

Most plant foods are either low in fat or high in unsaturated fat. Some unsaturated fats actually lower your cholesterol level. Unsaturated fats can be polyunsaturated or mono-unsaturated.

Vegetable oils, such as corn, cottonseed, safflower, soybean, and sunflower, are high in polyunsaturated fats. Oils that have mostly mono unsaturated fats include olive, avocado, almond, canola, and peanut.

Trans fats are a form of unsaturated fat that are bad for you. They raise your LDL cholesterol and total cholesterol. Look on food labels to see if foods contain trans fat. If they do, it's best to limit them in your diet.

How to Cut Saturated Fat, Trans Fat, and Cholesterol

Dairy

- Use fat-free in place of whole milk, half and half, or cream.
- Use plain low-fat or nonfat yogurt in place of cream, sour cream, or mayonnaise.
- Use pureed low-fat or nonfat cottage cheese with a little lemon juice in place of sour cream.
- Use low-fat or nonfat cream cheese or pureed low-fat or nonfat cottage cheese in place of regular cream cheese.
- Use low-fat or nonfat cheeses in place of regular cheeses.
- Use frozen low-fat or nonfat yogurt, ice cream, or sherbet in place of premium ice cream.

Eggs

- Limit whole eggs to three or four a week. You can use egg substitutes.
- In recipes, replace some of the whole eggs with egg whites. Two egg whites equal one whole egg.

Fats and oils

- Replace butter, regular margarine, lard, or shortening with soft tub, liquid, light, or diet margarine. You'll get less saturated fat.
- Replace butter or margarine with unsaturated oils. Try to cook food in a tablespoon or less of an unsaturated oil.
- Replace cooking oils with nonstick vegetable sprays, wine, or low-fat or nonfat broth.
- Replace regular oil-based salad dressings with low-fat or nonfat salad dressings. On salads, try lemon juice, or just salt and pepper, instead of dressing.

Meats

- Try to eat less meat. Keep your portion size to 3 oz—about the size of a deck of cards.
- Choose lean cuts rather than fatty cuts. Lean cuts include top round steak, eye round, pork tenderloin, lamb shank, and veal leg.

- Use low-fat cooking methods, such as grilling or broiling, instead of frying.

Poultry

- Choose chicken and turkey breast. They have the least amount of fat.
- Don't eat the skin.

Fish

- Try to eat more fish. Most fish are naturally low in fat and calories. Fattier fish, such as salmon, mackerel, lake trout, herring, and sardines, have omega-3 fatty acids, which may protect you from heart disease.
- Steam, poach, or grill your fish.

Moderate in Protein

Protein is found in both animal and plant foods. For healthy eating, it's best to get your protein from foods that are low in fat, calories, and cholesterol.

Meats, eggs, milk, and cheese are high in protein. But they are also high in saturated fat and cholesterol. If you eat them, stick with lean cuts and low-fat versions.

Better choices for protein are chicken without skin, fish, and shellfish. Most fish and shellfish are lower in saturated fat and cholesterol than meat.

You can also get protein from legumes (beans, peas, and lentils), grains, and vegetables. These are good choices for protein because they are low in fat and calories and have no cholesterol. Nuts and seeds have a good amount of protein, and most of the fat they contain is unsaturated.

High in Whole Grains and Fiber

Starches are one of the two major types of carbohydrate. (The other major type is sugar; see next page.) Carbohydrate is the main nutrient in food that causes your blood glucose to rise. Starches include breads,

cereals, pasta, rice, potatoes, corn, whole grains, dry beans, and peas. Most starches have very little fat or cholesterol.

Fiber, the part of plants that your body can't digest, is part of the total carbohydrate in a food. Fiber is found in fruits, vegetables, legumes (beans, peas, and lentils), and grains. All are low in fat and calories and have no cholesterol.

Moderate in Sugars

Sugars are one of the two major types of carbohydrate. (The other major type is starch.) Carbohydrate is the main nutrient in food that causes your blood glucose to rise.

Research has shown that sugars do not raise your blood glucose level any more than starches or other carbohydrates. Because of these findings, a moderate amount of sugars can be part of your healthy eating plan.

Sugars include honey, molasses, syrups (such as corn syrup and maple syrup), processed sugars (such as table sugar, brown sugar, and powdered sugar), and natural sugars (such as lactose in milk and fructose in fruits).

Foods with natural sugars are usually good sources of nutrients, such as vitamins, minerals, fiber, and protein. Many other nutritious foods, such as breakfast cereals, breads, and low-fat salad dressings, contain some added sugars. Some other foods with added sugar, such as chocolate, baked goods, and ice cream treats, provide lots of calories and fat with few nutrients.

Fructose may cause a smaller rise in your blood glucose level than other sugars. But large amounts of fructose may increase your cholesterol level. Because of this, there is no reason to use fructose in place of other sugars.

There is also no advantage to using fruit juice or fruit juice concentrates in place of other sugars. They provide just as many calories, and they raise blood glucose about as high as other sugars do.

Moderate in Sodium

Many foods contain salt as sodium. Foods high in sodium include canned foods, cured and smoked meats (bacon, sausage, salami, hot dogs, and bologna), pickles, cheeses, salad dressings, mustard, ketchup, soy sauce, breakfast cereals, frozen dinners, fast foods, and salty snacks (chips and pretzels).

HOW TO CUT SODIUM

- Choose low-sodium, reduced-sodium, or unsalted versions of foods.
- Rinse salted canned foods (such as vegetables, beans, fish, shellfish, and meats) with cold water for 1 minute to remove some of the sodium.
- Substitute chicken or turkey for prosciutto, ham, or other salty cured meats.
- Flavor your foods with lemon juice, flavored vinegars, peppers, garlic, onions, salt-free seasoning blends, and other herbs and spices in place of salt.

Heart Attack

A heart attack occurs when blood flow to the muscle of the heart is stopped. Without blood, the heart can't get the oxygen it needs. Part of the heart muscle gets damaged or dies.

Blood flow can be cut off by a buildup of fat and cholesterol in the blood vessels (atherosclerosis) that lead to the heart. Or blood flow can be cut off by a clot stuck in one of the blood vessels.

People with diabetes are more likely to have a heart attack than people without diabetes. You can't change the fact that you have diabetes. But there are things you can do to keep your heart healthy.

How to Avoid Risk of Heart Attack

Control your diabetes. Keeping your blood glucose levels in your range (see Blood Glucose, page 8) and meeting your A1C goals (see A1C Test, page 1) may prevent or delay blood vessel damage.

Toss the cigarettes. Smoking narrows blood vessels and promotes the buildup of fat and cholesterol on blood vessel walls. Smoking may even make your blood clot faster.

If you have high blood pressure, work with your health care team to control it. High blood pressure makes your heart work harder. This weakens your heart. You can bring your blood pressure down by healthy eating, exercising, losing weight, and taking blood pressure drugs. Get a good low-fat, low-cholesterol cookbook and learn healthy, tasty ways to cook. High cholesterol can damage your blood vessels.

Exercise for as little as 15 minutes a day three times a week, with a goal of working up to 30 minutes five times a week. Try walking, biking, or swimming. These and other aerobic exercises (see Exercise, Aerobic, page 46) can lower blood pressure, lower LDL cholesterol, raise

HDL cholesterol, and lower triglycerides. Aerobic exercises can improve overall heart health, promote weight loss, and reduce stress.

If you are overweight, lose a few pounds! Losing even a little weight with healthy eating and exercise lowers blood pressure and improves cholesterol levels.

Know your lipid levels—HDL, LDL, and triglycerides. In most cases it is advisable to take a medication called a "statin" to reduce LDL cholesterol and reduce the chance of strokes or heart attacks.

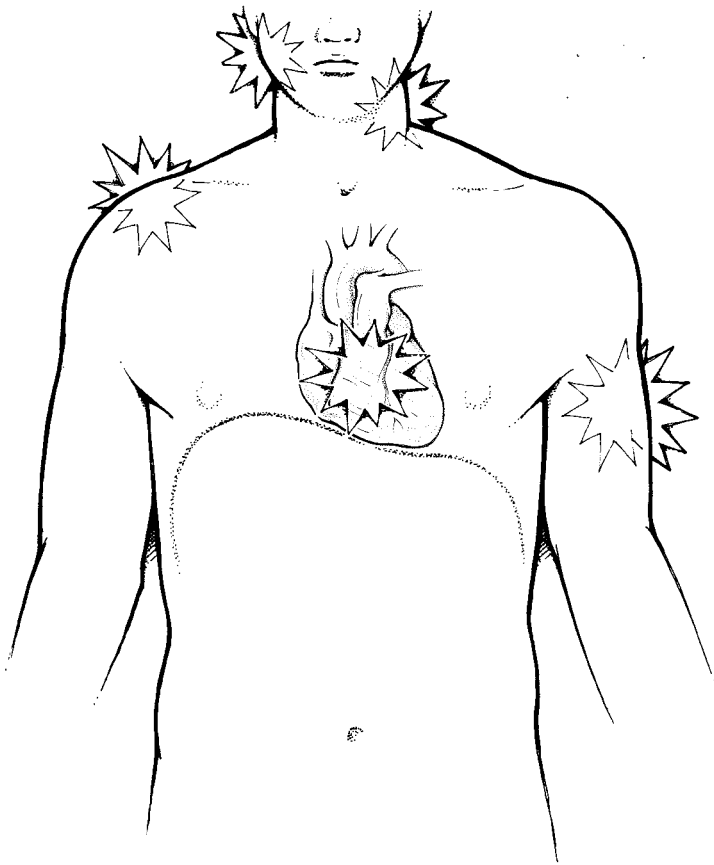
Remain calm in the face of stress (see Relieve Stress page 151). Excess stress can raise blood pressure and blood glucose levels.

Be alert to the warning signs of a heart attack. Know what to do if the warning signs occur.

WARNING SIGNS OF A HEART ATTACK

- Prolonged pain, tightness, pressure, or squeezing in the chest
- Pain that spreads to the neck, shoulders, arms, or jaw
- Shortness of breath or hiccups
- Dizziness or fainting
- Sweating
- Nausea

Special note: People with diabetes may have little or no pain.



A heart attack may cause pain in the chest, neck, shoulders, arms, or jaw

IF YOU THINK YOU ARE HAVING A HEART ATTACK

1. Call 911 for an ambulance.
2. Tell those around you that you think you are having a heart attack. Otherwise, if you pass out, they may waste time trying to figure out what's wrong.

High Blood Pressure

Blood pressure is the force of your blood as it travels through your blood vessels. The higher your blood pressure, the more force on your blood vessels. Added force on your blood vessels can weaken and damage them.

Blood vessels carry nourishment and oxygen to your organs and nerves. When blood vessels are weakened and damaged by high blood pressure, they don't nourish your organs and nerves as well as they should. Your organs and nerves become damaged.

People with diabetes are more likely to have high blood pressure than people without diabetes. High blood pressure increases your chances of having a heart attack or stroke (see Heart Attack, page 90; and Stroke, page 166) and may worsen nephropathy (kidney disease) and retinopathy (eye disease).

Symptoms of High Blood Pressure

High blood pressure usually has no symptoms. The only way to know whether you have it is to get it checked. Your blood pressure is probably checked each time you visit your doctor. Be sure to know the results before you leave the doctor's office.

Causes of High Blood Pressure

Sometimes, there is a specific cause, such as a kidney problem, hormone disorder, pregnancy, or the use of birth control pills. When high blood pressure is linked to a specific cause, it is called secondary hypertension. If you have secondary hypertension, your doctor will treat the cause first.

Most of the time, there is no obvious cause for high blood pressure. When there is no obvious cause, it is called essential hypertension. If you have essential hypertension, there are things you can do to bring your blood pressure down without having to take drugs.

Checking Your Blood Pressure

Blood pressure can be checked with a device called a sphygmomanometer. A soft cuff is wrapped around your upper arm. The cuff is inflated until it tightens enough to stop the flow of blood. As the cuff is deflated, the force of the blood is heard through a stethoscope.

Blood pressure is reported as two numbers. The first number is the systolic pressure. Systolic pressure is the force of your blood when your heart contracts. The second number is the diastolic pressure. Diastolic pressure is the force of your blood when your heart relaxes.

A reading of "120 over 80" means a systolic pressure of 120 and a diastolic pressure of 80. It is written as 120/80 mmHg (millimeters [mm] of mercury [Hg]).

Hypertension is another name for high blood pressure. If you find out that your blood pressure is high, you and your health care team can take steps to control it. Your doctor will first try to find out any unusual cause of your high blood pressure.

BLOOD PRESSURE READING

	Blood Pressure Reading (in mmHg)
Normal Blood Pressure	Less than 120/80
Prehypertension	121/81 to 139/89
Stage 1 hypertension	140/90 to 159/99
Stage 2 hypertension	More than 160/100

Adapted from The U.S. Department of Health and Human Services, The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (Washington, D.C., 2003).

How to Lower Your Blood Pressure

Lose excess weight. Losing even a little extra weight may be enough to return your blood pressure to normal. The only way to lose weight and to keep it off is to follow a weight-loss plan. Your health care team can help you make a plan that you can live with.

Stop smoking. Smoking causes high blood pressure by damaging blood vessels. Quitting smoking can do more to lower your risk of hypertension-related death than taking blood pressure drugs.

Drink less alcohol. Drinking more than 2 oz of alcohol a day may cause high blood pressure. Your doctor may advise you to drink no more than 1 oz of alcohol a day. There is about 1 oz of alcohol in one mixed drink, one glass of wine, or a can of beer.

Eat less salt. Avoiding your salt shaker and foods with added salt may be enough to lower your blood pressure. If your doctor wants you to try a low-sodium diet, plan one with a registered dietitian.

Reduce stress. Stress may aggravate high blood pressure by causing your blood vessels to constrict and your heart to work harder. For tips on reducing stress, see Relieve Stress, page 151.

If you are not able to bring your blood pressure down by these changes, your doctor will likely put you on drugs to lower your blood pressure.

Blood pressure drugs used most often in people with diabetes are ACE (angiotensin-converting enzyme) inhibitors, ARBs (angiotensin-receptor blockers), calcium antagonists, and thiazide diuretics in small doses.

These blood pressure drugs do not raise blood glucose levels, but they all have side effects. Ask your doctor or pharmacist about them.

Insulin

Insulin is a hormone that helps glucose get inside your body's cells. Your cells use glucose for energy. Insulin is made in the pancreas. Your pancreas lies behind your stomach.

If you have type 1 diabetes, your pancreas no longer makes insulin, or it makes only a tiny amount. That's why you need to take insulin.

If you have type 2 diabetes, your pancreas still makes insulin. But it doesn't make enough, or the insulin doesn't work as well in your body, or both. You may need to take diabetes pills or you may need to take insulin.

Insulin Strength

Insulins come dissolved in liquids. Most people use U-100 insulin. This means that there are 100 units of insulin per milliliter of fluid. If you inject insulin, it is important to use a syringe that matches the strength of your insulin. For instance, if you use U-100 insulin, use a U-100 syringe. This can be an issue if you travel outside the U.S.

Insulin Action

Insulin's action has three parts: onset, peak, and duration. Onset is how long insulin takes to start working. Peak is when insulin is working its hardest. Duration is how long insulin keeps working.

The times for onset, peak, and duration are given as ranges in the following table. The main reason for these ranges is that insulin may work slower or faster in you than in someone else.

INSULIN ACTION

Type	Onset	Peak	Effective duration	Maximum duration
Aspart	5 min	1 hr	2–4 hrs	4–6 hrs
Lispro	5 min	1 hr	2–4 hrs	4–6 hrs
Glulisine	5 min	1 hr	2–4 hrs	4–6 hrs
Regular	30 min–1 hr	2–3 hrs	3–6 hrs	6–10 hrs
NPH	2–4 hrs	4–10 hrs	10–16 hrs	14–18 hrs
Glargine	3–5 hrs	No peak	24 hrs	24 hrs
Detimir	3–5 hrs	No peak	24 hrs	24 hrs

Insulin Storage

Insulin makers advise storing your insulin in the refrigerator before being opened. Do not put your insulin in the freezer or allow it to warm in the sun. Extreme temperatures and excessive sunlight can destroy insulin. Insulin can be safely stored at room temperature for up to a month. Insulin can be safely stored in the refrigerator until the expiration date on the vial. If one vial of insulin lasts longer than 30 days (for example, if you only use 15 units a day, the vial will last for about 2 months; however, once opened, the vial should only be used for 28 days), then it should be stored in the refrigerator during the time that you are using it.

Insulin Safety

Check the expiration date before opening your insulin. If the date has passed, don't use the insulin. If the date is yet to come, look closely at the insulin in the bottle. If you are looking at insulin aspart, insulin lispro, insulin glargine, or regular insulin, it should be clear, with no particles

or color. If you are looking at NPH insulin, it should be cloudy. But it should not have particles or crystals.

If the insulin does not look as it should, return the unopened bottle of insulin to the place you bought it for an exchange or refund.

Insulin Therapy

Your doctor will help you plan what kinds of insulin to take, how much, and when. It is important to follow this plan closely. Your plan may be a standard or an intensive one.

Standard insulin therapy means you inject insulin one or two times a day at the same dose and same times each day. Often, you give yourself one injection in the morning and one in the evening.

Standard therapy may work well for you, or it may leave your blood glucose levels too high. But you usually won't have severe high or low blood glucose levels.

Intensive insulin therapy means you inject insulin three or more times a day or use an insulin pump. You change your insulin dose to fit the results of your blood glucose checks, how much you are planning to eat, or what exercises or activities you are going to do.

Intensive therapy aims to keep your blood glucose levels very close to normal. Because you are keeping your blood glucose levels lower, your chances of having severe low blood glucose are greater. You may also gain some weight.

Talk with your health care team about which insulin therapy is best for you. The best therapy is the one that helps you meet your blood glucose and A1C test goals.

Insulin Injections

Insulin cannot be taken in a pill. It would be broken down like food before it could work. Insulin needs to be injected under the skin to work well. Injecting under the skin is much less painful than injecting into muscle. Besides, if you inject into muscle, the insulin will not work as well. Usually it will work too fast.

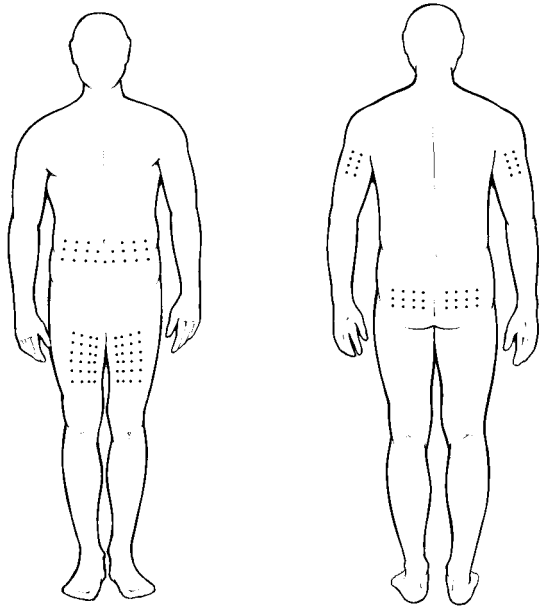
Where to Inject Insulin

When choosing a place to inject insulin, consider the area and the site. Areas are the places on your body where it is good to inject insulin. Four good areas are your:

1. Abdomen (anywhere except within 2 inches of your navel)
2. Upper arms (outside part)
3. Buttocks (anywhere)
4. Thighs (front and outside parts, not inner thigh, not right above your knee), but only if you have fat on your thighs. Some men may not have enough fat to inject here.

These areas absorb insulin at different speeds. Your abdomen absorbs insulin the fastest, followed by the arms, buttocks, and thighs. Using the muscles around the area where you just injected can also increase the rate of absorption. You may prefer to inject insulin in the same area so that you know how it will act. Or you may want to choose your area according to how fast or slow you want the insulin to start working.

One plan is to inject your breakfast and lunch insulin doses into your arms and abdomen (the areas that absorb faster) and to inject your supper and bedtime doses into your buttocks and thighs (the areas that absorb slower). Your diabetes educator may suggest another plan for you.



Sites for insulin shots

Whatever plan you try, keep track of how your body responds by checking your blood glucose and recording the results.

Now pretend that each area is covered with circles that are 1 inch apart. Each circle is one site. The number of sites you have depends on how big your body is. The bigger your body, the more sites you have in each area.

Within each area, it is best to change sites with each injection. This is called site rotation. To rotate sites, you use a different circle for each injection until all the circles have been used up. Then you start all over again. If you take all your injections in the same place, you can damage the tissue under your skin. You can also cause the fat cells in that area to get bigger, which can change how insulin is absorbed from that site.

How to Make the Injection More Comfortable

Syringes for injecting insulin have tiny needles with a slick coating so that they go in easily. Most people find that insulin injections hurt very little, if done correctly.

- Inject insulin at room temperature. Using cold insulin right from the refrigerator may make it hurt more.
- Make sure there are no air bubbles in the syringe before you inject the insulin.
- Relax your muscles in the area.
- Puncture the skin quickly.
- Keep the needle going in the same direction when you put it in and take it out.
- Use sharp, not dull, needles.

How to Reuse Syringes

Makers of disposable syringes recommend that they be used only once. The makers cannot guarantee that the syringe will stay sterile. If you want to use your syringes more than once, check with your doctor first. Many doctors feel it is alright to use one needle per day.

- Recap the needle after each use to keep it clean.
- Keep the needle from touching anything but clean skin and your insulin vial stopper.
- Store the used syringe at room temperature.
- Throw away the syringe when the needle is dull, has been bent, or has come into contact with any surface other than your skin or insulin vial stopper.
- Don't try to clean the needle with alcohol. Alcohol may remove the slick coating that makes injections less painful.
- Watch out for infection at the site.

How to Dispose of Syringes

The best way to dispose of syringes and needles is to place them in a puncture-proof container of heavy-duty plastic or metal with a screw cap or other lid that can be sealed shut before it is placed in the garbage. Another way to dispose of needles is with a needle-clipping device that clips, catches, and keeps the needles in a closed compartment.

Some states require you to destroy used insulin syringes and needles.

But be careful if you recap, bend, or break a needle—you or someone else could get pricked with it.

There may be special rules for getting rid of syringes and needles where you live. Ask your local garbage company or city or county waste authority what method meets their rules.

HOW TO INJECT INSULIN

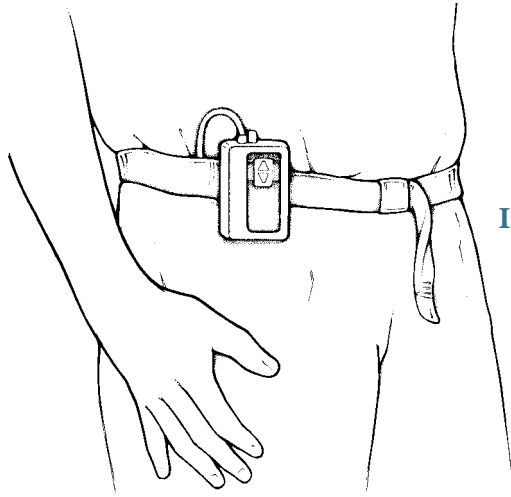
1. Wash your hands with soap and water. Dry them.
2. Clean the site.
3. Wipe the top of the insulin vial with 70% isopropyl alcohol (rubbing alcohol).
4. Gently roll the vial in your hands to mix the insulin. (You only need to do this with NPH insulin.) Do not shake the vial.
5. Draw air into the syringe. Stop at the mark for the insulin dose you want. Inject the air into the vial. This prevents a vacuum.
6. Turn the bottle upside down. Draw insulin into the syringe. Stop at the mark for the number of units you want. When mixing types of insulin, inject air into each vial and draw the shorter-acting insulin first.
7. Check for air bubbles. If there are air bubbles, flick your forefinger against the upright syringe a couple of times to get them out.
8. Gently grasp a fold of skin between your thumb and forefinger.
9. Push the needle through the skin at a 90-degree angle. If you are thin, you may need to push the needle in at a 45-degree angle to avoid muscle.
10. After the needle is in, push the plunger to inject the insulin.
11. Pull the needle out.

Insulin Pumps

An insulin pump is a battery-powered, computerized device about the size of a cell phone. Inside the pump is a vial of insulin with a gear-driven plunger. A thin tube, 21 to 43 inches long, is attached to the pump. At the other end of the tube is a needle or catheter. You insert the needle or catheter under your skin, usually in your abdomen or thigh. Insulin is delivered through the tube and needle or catheter into your body.

You program the pump. You tell it how much insulin you want and when you want it. You tell the pump to give you tiny amounts of insulin continuously throughout the day and night (basal), just the way a normal pancreas would. Then, before each meal, you tell the pump to give you extra insulin just before you eat (bolus).

You wear an insulin pump pretty much all the time, either inside or outside your clothes. A pump may be waterproof or come with a waterproof case for showers and swimming.



Insulin pump

You can, of course, take the pump off. If you'll have the pump off for more than 1 hour, you may need an injection of insulin. Check your blood glucose to be sure. Yes, you still need to check your blood glucose. At least four times a day is recommended.

A different solution available now is the tubeless pump, worn directly on the skin like an infusion set. The wireless device used to program tubeless pumps is carried separately. Some people like the tubeless pump for the greater freedom of movement it affords. But others find it bulky, less comfortable, and harder to hide.

What the Pump Can Do for You

Get your blood glucose levels closer to normal. This is called tight control. If your insulin injections have not controlled your blood glucose levels, an insulin pump might work better for you.

Smooth out blood glucose swings. If you have frequent blood glucose swings, the insulin pump can help smooth them out.

Take care of nighttime lows and morning highs. Your body needs less insulin at night than at dawn. If you try to lower the dose of your injected evening insulin to avoid low blood glucose at night, you won't have enough insulin in the morning. Then you'll have high blood glucose when you wake up.

With an insulin pump, you can program it to give you less insulin at night and more insulin before dawn. This will help you avoid nighttime low blood glucose and morning high blood glucose.

Be Aware

Ketoacidosis. When your body has too little or no insulin, you risk getting ketoacidosis. Ketoacidosis is a dangerous buildup of ketones in your blood. Because you only get short-acting insulin with a pump, you're at risk to get ketoacidosis quickly if your insulin delivery is interrupted.

If the tube to your insulin pump gets blocked or twisted or the needle comes out, you won't be getting insulin and you may not know it. (Pumps do have alarms that signal when the tube is blocked, the insulin

is low, or the battery is low. But they don't signal when the needle has come out.)

Ketones can start to build up in as little as 1 hour, especially if you are ill or exercising. Ketoacidosis can develop in as little as 6 hours. Your best protection is to check your blood glucose levels often. If your blood glucose level is above 250 mg/dl, check your urine for ketones, especially if you feel ill.

Infection. The place where the needle or catheter enters your body may become infected. To lessen your chances of infection, clean the area before you insert the needle or catheter, change sites within the area every 48 hours (see Insulin Injections, page 99), and use an antibiotic ointment and protective cover.

Skin allergy. You may have an allergic reaction around the needle or catheter site. Try nonallergenic tape or Teflon catheters.

Insurance

Diabetes can be costly, so finding the best possible health insurance coverage is important. Health insurance plans and policies vary greatly on what costs they will cover. Before you sign up for a health insurance plan, find the answers to these questions:

QUESTIONS TO ASK ABOUT INSURANCE

- How much is the monthly premium and what are the co-payments for each service or item covered by the policy?
- Does the plan have a preexisting exclusion that will make you pay before receiving coverage for diabetes needs?
- Are visits to your diabetes doctor covered? How many visits are allowed? How much will you have to pay at each visit?
- What supplies are covered? Are there co-payments, cost limits, or restrictions on the amount of supplies you can purchase?
- Does the plan cover diabetes education or the services of a dietitian?
- What mental health benefits are covered?
- Does the plan cover the services of specialists, such as an endocrinologist, eye doctor, podiatrist, or dentist?
- What medications are paid for? Is there a prescription plan? How often can prescriptions be refilled? Is a co-payment required for each prescription?
- Is home health care and nursing home coverage included? Are there any limitations?

Group Coverage

If you're employed, you may have the option of joining a group policy offered by your employer. If an employer grants insurance to one employee, it must offer the same policy to all employees. The health plan may require you to reveal your health history before covering some or all of your diabetes needs if this is your first time purchasing insurance through a group, or if you were uninsured for a long time before enrolling in the insurance plan.

Fees for group insurance vary. Many policies will also cover your spouse and children for an additional fee. Health care is nontaxable, so if you pay a fee, you may deduct it from your paycheck before taxes are taken out. If your employer does not offer health insurance, you may still be able to obtain group insurance through membership in a professional, trade, or religious association.

Individual Coverage

If you are not eligible for group insurance, you may try to purchase an individual health insurance policy. Unfortunately, this can be difficult for a person with diabetes and/or the cost can be very expensive, often with fewer benefits than offered in a group plan. Also, most states allow health insurers to charge more for individual health insurance policies that cover people with diabetes (New York, New Jersey, Vermont, Massachusetts, Pennsylvania, Hawaii, and Michigan have laws to protect against this).

Check to see if your state has a high-risk health insurance pool available to people with chronic diseases like diabetes. Though the requirements to qualify for high-risk pools are sometimes difficult and the policies may be expensive, many states do make high-risk pools available to people with chronic conditions.

Types of Health Plans

Fee-for-Service Plan. In a fee-for-service plan, you and/or your employer pay a yearly or monthly fee called a premium. The insurance company then pays for all or part of your medical care. Usually, the insurer will start paying after you pay a small amount of the cost (the deductible). You may also have to pay a small amount (co-pay) for visits or health care. An advantage of a fee-for-service plan is that you pick the health care providers you want to go to.

Managed Care Plans. Under a managed care plan, you must obtain your health care from a specified group of health care providers unless you want to pay more for services provided by someone outside of the group. Types of managed care plans include health maintenance organizations (HMOs), preferred provider organizations (PPOs), and exclusive provider organizations (EPOs).

Like a fee-for-service plan, you and/or your employer pay a yearly or monthly premium. The insurance company then pays for all or part of your medical care. If you go to a doctor who is not a member of your managed care group, you'll have to pay more for service—maybe the entire bill. You may also have to pay a co-pay for visits to providers within your group.

Consolidated Omnibus Budget Reconciliation Act

Under the Consolidated Omnibus Budget Reconciliation Act (COBRA), your employer must allow you to keep an equal health insurance policy for up to 18 months after you leave your job. You will have to pay for the entire cost of coverage and may be charged up to 2 percent extra, but this is usually less expensive than paying for a new short-term policy on your own. If you are disabled, you can be covered by COBRA for 29 months. Dependents can continue their coverage for up to 36 months. Once you have been laid off or leave an employer, you have 60 days to accept COBRA benefits. During that 60-day period, your employer must pay insurance bills for you or your dependents. Em-

ployers with fewer than 20 employees, the federal government, employers that go out of business, and churches are exempt from COBRA, though they may still offer COBRA benefits to employees.

If you are not eligible for COBRA, or if your COBRA coverage runs out, you still have options. Many states require employers to offer you a conversion policy regardless of your health or physical condition, usually at a higher cost and with less benefits (15 states and the District of Columbia do not require this). However, it may be your only choice and is better than going without insurance. Once your COBRA insurance runs out or you leave your job without COBRA eligibility, you have 31 days to accept or reject a conversion plan. For more on COBRA, call the COBRA hotline at 202-219-8776.

Health Insurance Portability and Accountability Act of 1996

According to this law, insurers and employers may not make insurance rules that discriminate against workers because of their health. All workers eligible for a certain health insurance plan must be offered enrollment at the same price. Insurers who sell individual policies must offer an individual policy without preexisting condition exclusions to anyone who has had continuous coverage in a group plan for the previous 18 months, is not currently eligible for coverage under a group plan, and has used up COBRA coverage.

The law also helps you keep coverage when you change jobs. If you have had diabetes for more than 6 months and have had continuous coverage in an insurance plan and then leave your job, you cannot be denied coverage by your new employer because of a preexisting condition. If, however, you have been recently diagnosed (within 6 months) and you change jobs, your new employer may refuse or limit your health insurance coverage for a year. This is a one-time waiting period, and it can be reduced by the number of months you had coverage at your previous job since your diagnosis.

Medicare

Medicare is a federal health insurance program for people age 65 and over and for some people with disabilities who can't work. Medicare serves all eligible beneficiaries without regard to income or medical history. Even with Medicare, you may still have to pay for a large part of your medical bills. You can sign up for Medicare three months before the month of your 65th birthday. Medicare is organized into four parts: A, B, C, and D (see 4 Parts of Medicare, on next page.

Medicare has relatively high cost-sharing, no limit on out-of-pocket spending, and a coverage gap in the prescription drug benefit. Medicare does not pay for many services of critical importance to elderly and disabled beneficiaries, such as long-term care, dental, or vision. To help with cost-sharing requirements and fill in the benefit gaps, most Medicare beneficiaries have some form of supplemental insurance, including employer-sponsored retiree health plans or Medicaid.

There are many diabetes-related services and supplies Medicare will and won't pay for. To learn more about Medicare, call 1-800-MEDICARE (633-4227) and ask for a copy of *Medicare Coverage of Diabetes Supplies and Services,* or visit www.medicare.gov to get the information online. For a detailed explanation of Medicare, get a free copy of *Your Medicare Handbook* from the Social Security Administration at 1-800-772-1213.

Medicaid

If your income is very low, or you're disabled, a senior citizen, or a child, you might be able to get Medicaid. Medicaid is a federal and state assistance program. Each state decides what income level it thinks is very low and each state decides what medical services and supplies to cover. Call your state's Medicaid office to find out whether you qualify and what health costs are covered.

4 PARTS OF MEDICARE

Part A

Part A pays for medical care provided through inpatient hospital stays, skilled nursing facility stays, home health visits (also under Part B), hospice care, and nursing homes. It will not cover custodial care (help with daily activities, such as walking, getting dressed, etc.) if that is the only care you need. Though most people covered by Medicare get Part A, Part B (available for a monthly fee) is critical, especially if you have diabetes.

Part B

Part B pays for physician visits, outpatient services, preventive services, home health visits, ambulance services, diagnostic tests, outpatient hospital services, outpatient physical therapy, speech pathology services, and medical equipment and supplies. Coverage has expanded to include diabetes education, nutrition services, and many diabetes supplies. Your doctor must certify in writing that you need all of these items to manage your diabetes. Make copies of this written statement and give a copy to your pharmacist each time you purchase supplies.

Part C

Part C refers to the Medicare Advantage program, through which you can enroll in a private health plan, such as a health maintenance organization (HMO), and receive all Medicare-covered benefits, and often extra benefits, such as eyeglasses or hearing exams.

Part D

Part D is the voluntary prescription drug benefit, with subsidies for people with low incomes. The Part D drug benefit is offered under private plans that contract with Medicare through prescription drug plans (PDPs) and Medicare Advantage prescription drug plans (MA-PDs).

Social Security Disability Insurance (SSDI)

SSDI is a government program that pays cash benefits to you if you cannot work in any job (not just your previous jobs) because you are disabled. To qualify for SSDI benefits, you must be disabled, have very little (or no) work income, and have worked long enough and recently enough in jobs covered by Social Security (generally five out of the past 10 years for those over age 30).

Qualifying as disabled requires showing that you either have one of the Social Security Administration's listed medical conditions that prevent you from working or that your disability prevents you from doing the job you previously held and any other jobs available in the economy for a person with your skills, training, and experience. The disabilities that are listed include diabetes with certain kinds of neuropathy, acidosis, amputation, or retinopathy. Benefits are also available under similar federal programs for adults with disabilities who have not worked recently and whose income and resources are very limited, and for children with disabilities. For more information, call the Social Security Administration on weekdays at 1-800-772-1213 or visit www.socialsecurity.gov.

Juvenile Rights

Children with diabetes must be medically safe while at school and day care and also have the same access to educational opportunities as other children. The best way to ensure good diabetes care for your child is to communicate openly with school personnel and to make sure staff members understand their roles in meeting your child's medical needs through the development of written care plans (described below). It is also important for you to understand your rights and what you can do to make sure your child receives fair treatment and appropriate care during the school day and at all school-sponsored activities in which your child is a direct participant.

Laws

Section 504 of the Rehabilitation Act of 1973 protects individuals with disabilities, such as diabetes, against discrimination in any program or activity receiving federal funds. This includes all public schools, private schools, and day care centers that receive federal assistance. Schools can lose federal funding if they do not comply with this law. For children who are covered under the law, a Section 504 Plan should be developed (this describes the accommodations, special education, and/or related services that a student will be provided in order to have equal access to education).

The Americans with Disabilities Act (ADA) prohibits all schools and day care centers, except those run by religious organizations, from discriminating against children with disabilities. The Individuals with Disabilities Education Act (IDEA) protects a child with a disability who can show that the disability adversely affects his or her educational performance. Once shown, parents and school officials develop an Individualized Education Program (IEP), a plan describing the special education

and related services that will be provided to a student. In addition to these federal laws, some state laws provide even more protection.

Your Rights

As a parent or legal guardian of a child with diabetes, you have the right to have your child assessed, to hold a meeting with school personnel, to develop an education plan that specifically states what services will be provided to meet your child's needs, and to be notified of any proposed changes to your child's plan and to approve any changes.

Diabetes Medical Management Plan

It is important for you, your child's health care team, and school personnel to work together to ensure a medically safe environment for your child, while making sure he or she is able to fully participate in all school-sponsored activities. Parents/guardians should work with their child's health care team to develop a Diabetes Medical Management Plan (DMMP) that prescribes the diabetes care regimen that needs to be followed in the school setting. In addition, the DMMP is the foundation for your child's Section 504 Plan, IEP, and other education plan.

Education Plans to Meet Needs

In addition to the DMMP, depending upon which federal law is applicable, how your child's needs will be met should be documented in an education plan, such as a Section 504 plan or an IEP. The plan should outline your child's academic and diabetes needs (in accordance with the DMMP) and state the services and modifications that will be provided to meet these needs. Your child's education plan may include requirements such as:

- Assuring the on-site availability of trained personnel
- Allowing your child to self-administer and self-treat
- Ensuring full participation in all school activities including sports, extracurricular events, and field trips
- Immediate access to diabetes supplies and snacks

- Extra trips to the bathroom and water fountain
- Permitting extra absences for medical appointments and sick days.
- Allowing alternate times for taking exams if blood glucose levels are high or low.

HOW TO ADDRESS DISCRIMINATION AT SCHOOL

If you believe your child has been discriminated against and is not receiving appropriate diabetes care from his or her school, the best course of action is to educate, then negotiate, litigate, and, if necessary, legislate.

Educate. Discrimination based on diabetes is often the result of ignorance. It is important to educate school personnel about diabetes and how it affects your child and help the school to understand its legal obligations to meet your child's diabetes needs.

Negotiate. When education alone is not enough, try to negotiate a resolution to the problem.

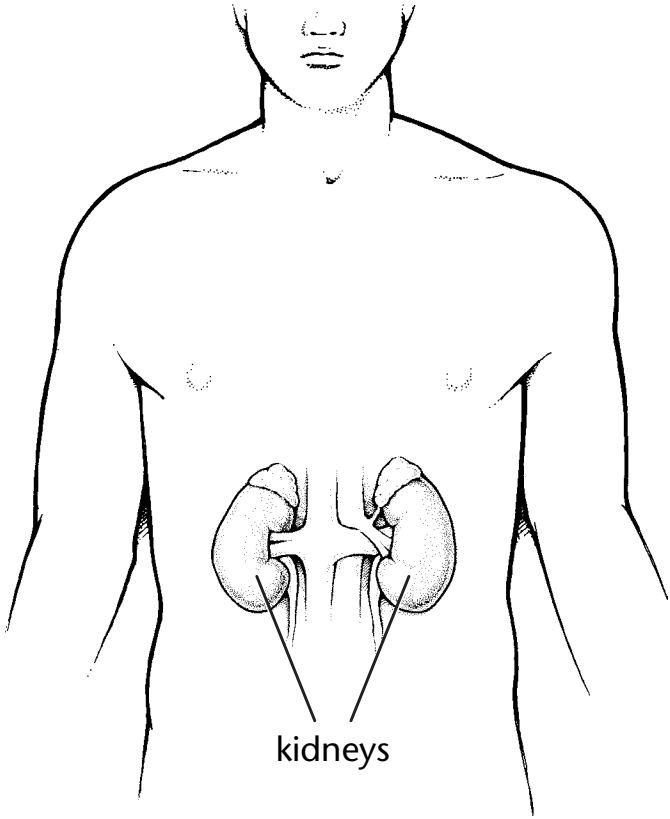
Litigate. If your child's needs are not being met, you have the right to file an administrative complaint or a lawsuit in court.

Legislate. If you find the current laws and policies are not providing your child with the needed protection, your next step might be working to change the rules at a local, statewide, or national level.

If you want more information about your child's rights at school or day care, review the resources at ADA's website at www.diabetes.org/safeatschool and call 1-800-DIABETES for the ADA's packet on school discrimination or to request help from a legal advocate.

K Kidney Disease

Kidneys clean your blood. Your blood flows through filters in your kidneys. In healthy kidneys, the filters let wastes pass out to your urine while keeping good and useful things in your blood. But having diabetes can make your kidneys unhealthy. Unhealthy kidneys can get kidney disease. Kidney disease is also called nephropathy.



Kidneys are located on either side of the small of your back.

The Progress of Kidney Disease

In kidney disease, kidneys go from being overworked, to leaky, to not being able to filter, and finally, to failure.

Overworked filters. People with diabetes often have high levels of glucose in their blood. High levels of glucose make your kidneys filter blood more often than is really needed. This extra work can be hard on the filters. The filters can become overworked.

Leaky filters. Overworked filters may start to leak. One thing they can leak is a protein called albumin. The filters leak albumin into the urine. A small amount of albumin in the urine is the first outward sign of kidney damage. As more and more albumin leaks into the urine, the level of albumin in the blood falls.

Very leaky filters. One job of albumin is to hold water in the blood. If there is not enough albumin in the blood, water leaks out of the blood vessels. The water can end up in the ankles, the abdomen, and the chest.

Water in your ankles makes them swell. Water in your abdomen causes bloating. Water in your chest makes it hard to breathe. These may be the first physical signs that something is wrong with your kidneys. But they are late signs of kidney disease.

Filters that don't filter well. After a time, some of the overworked leaky filters just stop working. This makes more work for the filters that are still good. At first, the good filters work harder to make up for the ones that have stopped. Then they, too, stop working.

As more filters stop, fewer filters are left to do the work. Eventually, none of the filters are able to remove wastes. Wastes build up in the blood.

Filters that fail. Wastes in the blood rise to toxic levels when the kidneys' filters are no longer working. This is called kidney failure or end-stage renal disease.

SYMPTOMS OF KIDNEY FAILURE

- Foul taste in the mouth
- Easy bruising
- Poor appetite
- Restless legs
- Upset stomach
- Loss of sleep at night
- Throwing up
- Lack of concentration

A person with kidney failure needs to have either a kidney transplant or dialysis. In a kidney transplant, the person gets a new kidney from someone else. In dialysis, a solution or a machine cleans the blood. There are steps you can take to slow down kidney disease before kidney failure.

How to Slow Down Kidney Disease

Keep your blood glucose levels close to normal. Keeping your blood glucose close to normal can prevent and slow the progress of kidney disease.

Have your doctor check how your kidneys are working. There are urine tests and blood tests to detect the start and progress of kidney disease. Your doctor should perform an annual test to assess urine albumin excretion (leaking of kidneys) in all patients with type 2 diabetes starting at diagnosis, and in patients with type 1 diabetes annually after five years of diagnosis. A blood test (serum creatinine) should be done annually in all adults with diabetes regardless of the degree of urine albumin excretion. A urine test (creatinine clearance) tells how well your kidneys are getting rid of wastes.

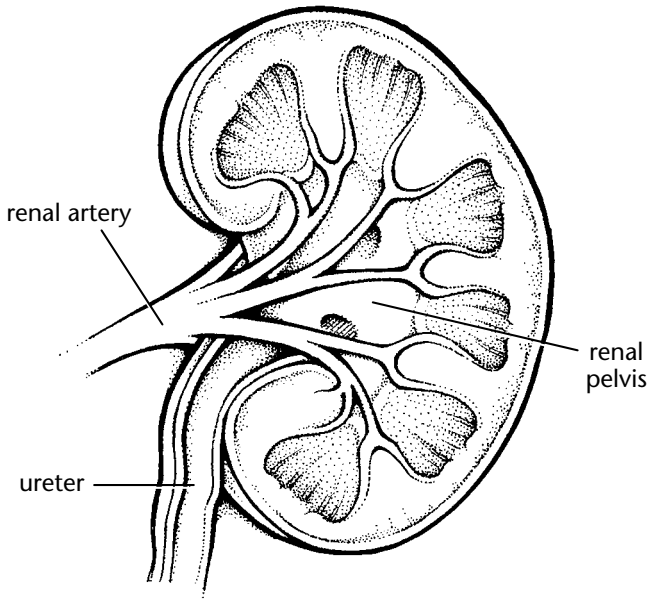
Keep an eye on your blood pressure. When your kidneys' filters are not working well, extra salt and water stay in the body. This can raise blood pressure. High blood pressure makes the kidneys work harder, and they can get more damaged.

If you have high blood pressure, try to get it under 130/80. Some ways to bring blood pressure down are by losing weight, eating less salt, and avoiding alcohol.

Ask your doctor about drugs to lower blood pressure. Two classes of blood pressure drugs, called ACE (angiotensin-converting enzyme) inhibitors and ARBs (angiotensin-receptor blockers), may even slow the progress of kidney disease.

Limit protein. Some researchers have found that if you limit the amount of protein you eat, you may slow down kidney disease. But experts have not agreed on how much protein is best.

The American Diabetes Association recommends that people with signs of kidney disease get about 0.8 g per kg of body weight from protein daily. Foods high in protein include meat, fish, poultry, eggs, milk, cheese, legumes, whole grains, and nuts and seeds. Work with a dietitian to make a low-protein meal plan, if needed.



Detail of a kidney

Lipids

Lipids is another word for blood fats. Fats are part of every cell in your body. Fats include cholesterol and triglycerides. Both cholesterol and triglycerides are made by your body. You can also get cholesterol from the animal foods you eat.

Your body uses cholesterol to build cell walls and to make certain vitamins and hormones. Your body uses triglycerides as stored fat. Stored fat keeps you warm, protects your body's organs, and gives you energy reserves.

Cholesterol and triglycerides travel through your body in your blood. These two blood fats can only travel by being carried. They are carried by lipoproteins (lipo means fat), which is why they're referred to as lipids. Three kinds of lipids are:

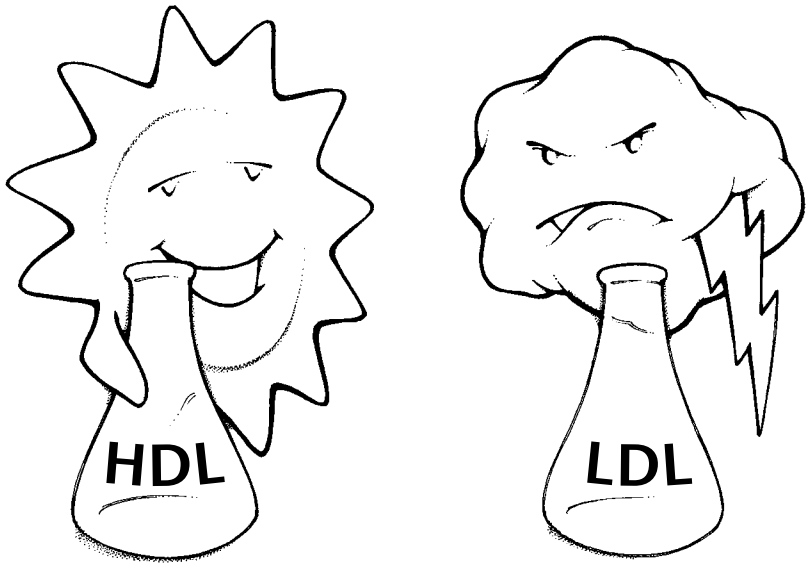
1. Very-low-density lipoprotein (VLDL). VLDL carries triglycerides, cholesterol, and other fats. VLDL drops off triglycerides and other fats in fat tissue. VLDL then becomes LDL.
2. Low-density lipoprotein (LDL). LDL carries cholesterol to parts of the body that need it. Along the way, LDL cholesterol can stick to blood vessel walls. Cholesterol on blood vessel walls can lead to atherosclerosis or hardening of the arteries. The less LDL in your blood, the better.
3. High-density lipoprotein (HDL). HDL carries cholesterol away from the blood vessel walls to the liver. The liver breaks down the cholesterol and sends it out of the body. The more HDL in your blood, the better.

People with diabetes often have high LDL and VLDL levels, and low HDL levels. Abnormal lipid levels put you at risk for heart disease, heart attack, and stroke. If you want to reduce your risk, first find out what your lipid levels are.

THE HEALTHIEST LIPID LEVELS

- Total cholesterol under 200 mg/dl
- LDL cholesterol under 100 mg/dl
- HDL cholesterol over 40 mg/dl for men and over 50 mg/dl for women
- Triglycerides under 150 mg/dl

If your lipid levels match these, great! If your lipid levels do not match these, try the following steps. Have your lipid levels checked at least once a year or more often if your doctor recommends.



HOW TO IMPROVE LIPID LEVELS

- First, control your diabetes. Controlling your diabetes means keeping your blood glucose in a range set by your doctor. When your diabetes is out of control, it is harder to improve lipid levels.
- Lose weight if you need to. Extra weight makes it harder to control blood glucose and can raise LDL and triglycerides. Besides, losing weight raises your good HDL cholesterol.
- Start cutting back on saturated fat (see Healthy Eating, page 85). Your liver uses the fat you eat to make VLDL. The more fat you eat, the more VLDL the liver makes. More VLDL means more bad LDL cholesterol.
- Replace saturated fats (butter, lard) with monounsaturated fats (canola and olive oil). Saturated fats raise your LDL and total cholesterol levels. Monounsaturated fats lower them.
- Stay away from foods that contain trans fat.
- Eat fewer high-cholesterol foods. Foods high in cholesterol include organ meats—such as liver—and egg yolks. If you eat eggs every day, try cutting back to three or four a week. You can also try using just the egg whites or an egg substitute.
- Eat more high-fiber foods. Soluble fiber helps remove cholesterol from the body. Oats, beans, peas, fresh fruits, and brown rice are great fiber choices.
- Take a hike or go for a walk. Aerobic exercises, such as brisk walking, jogging, swimming, and skiing, raise your good HDL cholesterol. Find exercises you enjoy.
- If you smoke, cut down or quit. Smoking lowers your good HDL cholesterol.
- Take the medication prescribed by your doctor.

Meal Planning

Most people with diabetes have a meal plan. A meal plan tells you what to eat, how much to eat, and when to eat. A dietitian can help you make a meal plan that is right for you. It should be based on:

- What you like to eat and drink
- When you like to eat and drink
- How many calories you need
- Your level of activity
- What exercises you do and when
- Your health
- What medications you take
- Your family or cultural customs.

A typical meal plan includes breakfast, lunch, supper, and a bedtime snack. You may also have snacks at midmorning and midafternoon. Your meal plan can include plans for sick days, pregnancy, and travel. A healthy meal plan includes a variety of foods: grains, fruits, vegetables, legumes, dairy products, meats, and fats.

Being consistent is a big part of meal planning, especially if you take insulin. Try to eat the same number of calories, the same amounts of food, and the same kinds of foods at the same times each day, or vary your insulin accordingly. Doing this helps you control your blood glucose levels. If you skip a meal or snack, you risk large swings in your blood glucose levels. Know your pre/post meal BG goals and your A1C goal. A meal plan can help you meet other health goals as well, including:

- Better blood fat levels
- Normal blood pressure
- A healthy weight.

Three meal-planning tools for people with diabetes are exchange lists, carbohydrate counting, and the plate method. For additional meal planning tools, visit http://tracker.diabetes.org/myfoodadvisor.html for the American Diabetes Association's My Food Advisor, or www.diabetes.org/food-and-fitness/food/what-can-i-eat/.

Exchange Lists

Exchange lists are lists of foods grouped together because they are alike. One serving of any of the foods on a list has about the same amount of carbohydrate, protein, and fat. Any food on a list may be "exchanged" or traded for any other food on the same list.

Your dietitian can help you work out a plan using the exchange lists. The meal plan will tell you the number of food exchanges you can eat at each meal and snack. You then choose foods that add up to those exchanges. When choosing foods, be aware that the serving size on a food label may not be the same as the serving size of an exchange.

With exchange lists, as long as you follow your meal plan, you are eating a balanced diet. The most recent edition of the exchange lists were

HEALTHY MEAL PLANNING CHOICES

Work together with a dietitian to determine how many servings you should include in your daily meal plan. The actual amount of each depends on the number of calories you need, which in turn depends on your sex, size, age, and activity level. For teenagers and adults, a healthy meal plan includes at least:

- 2 to 3 servings of nonstarchy vegetables
- 2 servings of fruits
- 6 servings of grains, beans, and starchy vegetables
- 2 servings of low-fat or fat-free milk
- about 6 oz of meat or meat substitutes
- small amounts of fat and sugar.

published in *Choose Your Foods: Exchange Lists for Diabetes* (American Diabetes Association and the American Dietetic Association, 2008). The different exchange lists groups are: starch; fruits; milk; sweets, desserts, and other carbohydrates; nonstarchy vegetables; meat and meat substitutes; fats; free foods; combination foods; fast foods; and alcohol.

Carbohydrate Counting

When you eat a healthy meal or snack, it is usually a mixture of carbohydrate, protein, and fat. However, your body changes carbohydrate into glucose faster than it changes protein and fat into glucose. It is the carbohydrate that makes your blood glucose level go up.

In carbohydrate counting, you count foods that are mostly carbohydrate. These include starches (breads, cereals, pasta), fruits and fruit juices, milk, yogurt, ice cream, and sugars (honey, syrup). You do not count most vegetables, meats, or fats. These foods have very little carbohydrate in them.

You can find out how much carbohydrate a food has by looking at *Choose Your Foods: Exchange Lists for Diabetes, Count Your Carbs: Getting Started,* or the Nutrition Facts on food labels (see Food Labeling, page 67), or by asking your dietitian.

Knowing how much carbohydrate a food has can help you control your blood glucose levels. If you take at least three or four doses of insulin a day or use an insulin pump, you can learn to adjust each insulin dose to cover the amount of carbohydrate you eat. If you do not take insulin, you can learn how to space carbohydrate throughout the day to improve your blood glucose levels.

Plate Method

The plate method was designed to help you assemble healthy meals in the correct proportions and to spread the carbohydrate content of the meal evenly within each meal. Focus on filling your plate with nonstarchy vegetables and having smaller portions of starchy foods and meats.

The plate method is an easy way to get started with managing your blood glucose levels. Plus, you don't need any special tools: all you need

is your plate. Start by drawing an imaginary line down the center of your dinner plate. On one side, cut it again so you should have 3 sections on your plate. Fill the largest section with non-starchy vegetables, such as spinach, carrots, cabbage, green beans, or broccoli. In one of the small sections, include starchy foods, such as whole-grain breads, rice, pasta, beans, or peas. In the other small section, put your meat or meat substitutes, such as chicken, turkey, fish, shrimp, beef, or pork. Add an 8-oz glass of non-fat or low-fat milk and a piece of fruit to round out your meal. Your plate will look slightly different at breakfast. Use half of your plate for starchy foods. You can add fruit in the small part and a meat or meat substitute in the other. Once you've changed your portion sizes, you can work on making healthier foods choices from each food group.

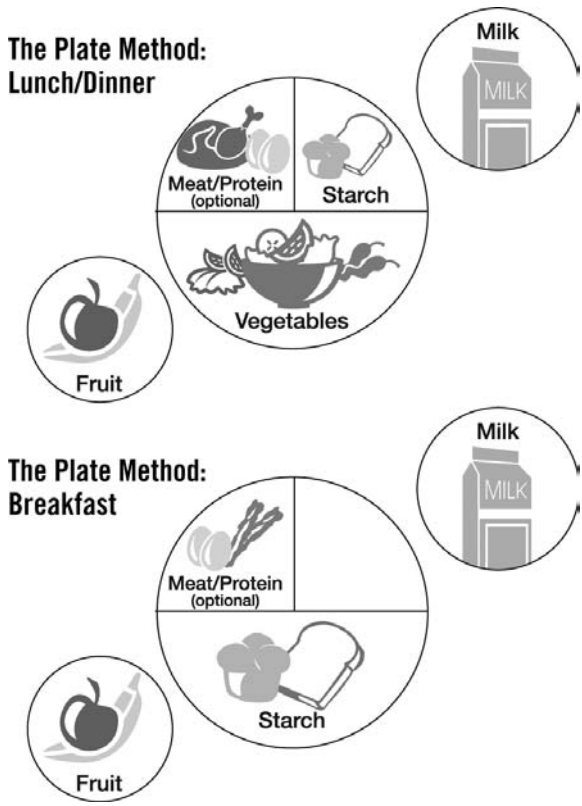


Illustration of the Plate Method for breakfast, lunch, and dinner.

Nerve Damage

Nerve damage is called neuropathy. Neuropathy affects the nerves outside your brain and spinal cord. These are called peripheral nerves. There are three types of peripheral nerves: motor, sensory, and autonomic. Neuropathy can affect any of these nerves.

Motor nerves control your voluntary movement. Voluntary movements are those you make yourself do, such as sitting, standing, and walking. Damage to the motor nerves can make your muscles weak and not able to do these things.

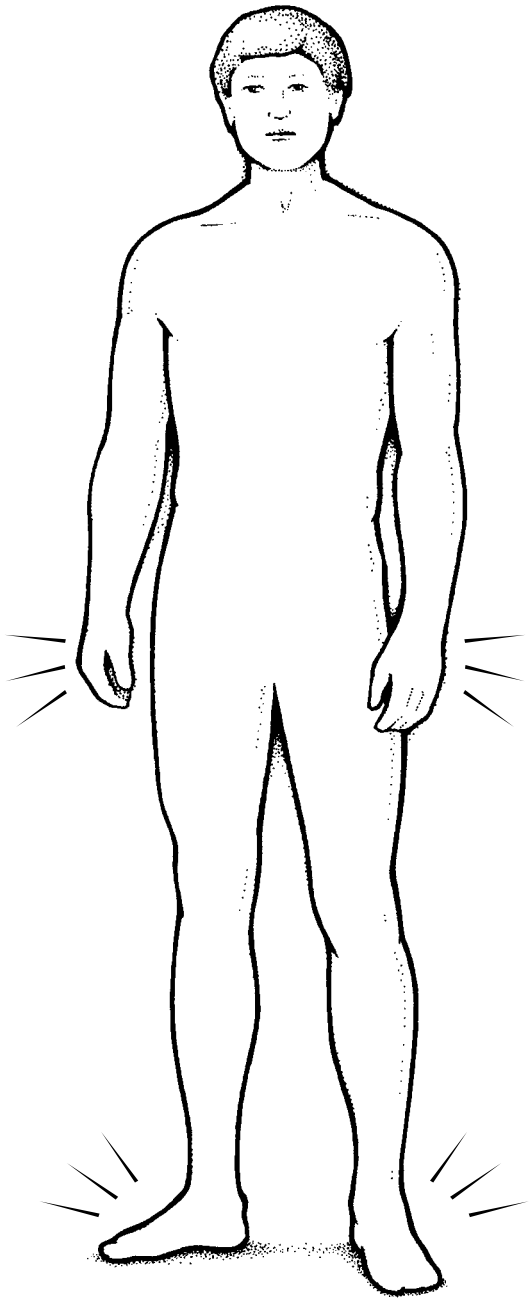
Sensory nerves allow you to feel and touch. Sensory nerves tell you if something is hot or cold. With sensory nerves, you can feel whether something is smooth or rough, soft or hard. Sensory nerves also let you feel pain. Damage to the sensory nerves can cause a loss of feeling. These are the types of nerves that are most often damaged.

Autonomic nerves control involuntary activities. Involuntary activities are those your body does without you having to tell it to. You do not have to tell your lungs to breathe in and out or your heart to beat. You do not have to tell your stomach to digest food. Damage to the autonomic nerves can make it hard for your body's organs to work.

There are many types of neuropathy. Two of the most common are distal symmetric polyneuropathy and autonomic neuropathy.

Distal Symmetric Polyneuropathy

Distal symmetric polyneuropathy is nerve damage to the feet and legs and sometimes to the hands. Distal means it affects parts of the body that are far from the trunk. Symmetric means it occurs on both sides of the body. Polyneuropathy means that more than one nerve is damaged.



Distal symmetric polyneuropathy can affect your feet, legs, or hands.

SYMPTOMS OF NERVE DAMAGE

- Coldness, numbness
- Tingling, burning
- Itching, prickling
- Sensation of bugs crawling over your skin
- Sensation of walking on a strange surface
- Muscle weakness
- Deep aching
- Overly sensitive skin
- Pain on contact with sheets or clothing
- Electric shock-like sensations
- Jabs of needle-like pain

If you feel any of these symptoms, tell your doctor. The symptoms of nerve damage to the feet, legs, or hands tend to be worse at night. Symptoms often get better if you get out of bed and walk around a bit.

Autonomic Neuropathy

Your autonomic nerves control your heart, lungs, blood vessels, stomach, intestines, bladder, and sex organs.

Heart, lungs, and blood vessels

Nerve damage to your heart, lungs, and blood vessels can affect your heart rate and blood pressure. Your heart may pound hard and fast when you are at rest. You may get dizzy or feel faint when you stand up quickly. Your blood pressure may go up when you are sleeping and down when you are standing. You may have a painless heart attack.

Stomach, intestines, and bladder

Nerve damage to your stomach can affect digestion. You may feel bloated, even after a small meal, and sick to your stomach. You may vomit food that you ate more than one meal before.

Damage to nerves in your intestines can cause diarrhea or constipation. If the nerves in your bladder are damaged, you will not be able to tell when your bladder is full of urine. You may dribble or wet yourself. The urine that stays in your bladder may cause a urinary tract infection.

Signs of a urinary tract infection include the need to urinate often, pain or burning when you urinate, cloudy or bloody urine, low back pain or abdominal pain, fever, and chills.

Sex organs

Nerve damage to the sex organs can cause erectile dysfunction in men and vaginal dryness or loss of sensation in women (see Sex and Diabetes, page 155).

How to Prevent or Lessen Nerve Damage

Keep blood glucose levels close to normal. When you have too much glucose in your blood, a lot of it goes into your nerve cells. Once inside nerve cells, this excess glucose forms sugar alcohols. The sugar alcohols build up, and your nerve cells don't work as well. After years of too much glucose, the nerves become damaged.

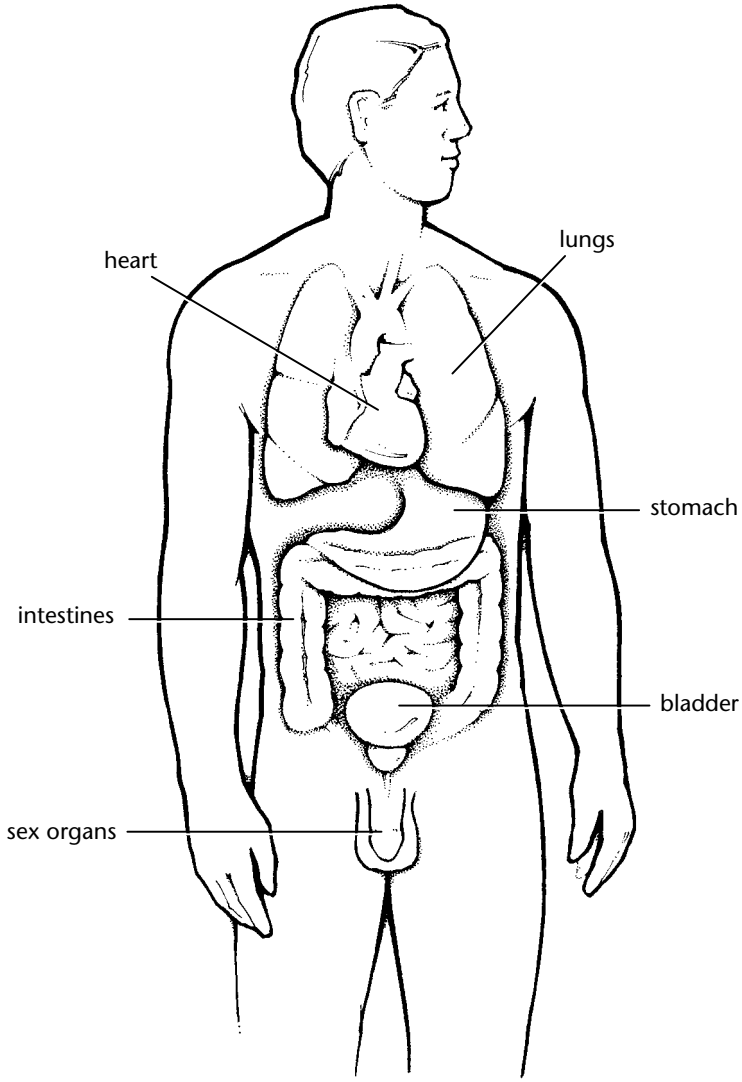
Stop smoking. Your nerves are fed by small blood vessels. Smoking damages these small blood vessels. Damaged blood vessels don't get oxygen to your nerves. Nerves without oxygen get damaged. If you already have nerve damage, smoking will make it worse.

Drink less alcohol. Drinking too much alcohol may cause nerve damage. If you already have nerve damage, drinking alcohol will make it worse.

Keep blood pressure under 130/80 mmHg. High blood pressure is hard on your blood vessels. Weakened blood vessels don't nourish your nerves as well. The nerves get damaged.

Keep LDL cholesterol levels under 100 mg/dl. High cholesterol can damage your blood vessels. Damaged blood vessels can't give your nerves the oxygen they need. Your nerves get damaged.

Have a yearly check for nerve damage. A doctor can do several different physical exam tests to find out how your nerves are doing. If damage is found, you can get treatments. The earlier damage is detected, the better the response to treatment.



Autonomic neuropathy can affect your heart, lungs, blood vessels, stomach, intestines, bladder, or sex organs.

Nutrition

Nutrition means getting nutrients—protein, carbohydrates, fats, vitamins, and minerals—from what you eat and drink. What you eat and drink will affect your blood glucose level and your weight.

The American Diabetes Association (ADA) sets nutrition guidelines for people with diabetes. Many of these guidelines are the same for people without diabetes.

Calories

The ADA recommends that you and your health care team decide how many calories you need to eat in a day to stay at a healthy weight.

Remember, fat has more than twice as many calories as carbohydrate or protein. One gram of carbohydrate has 4 calories. One gram of protein also has 4 calories. One gram of fat has 9 calories.

Carbohydrate

The ADA recommends that you and your health care team decide exactly how much carbohydrate you will eat in a day. Carbohydrate includes both sugars and starches (see Healthy Eating, page 85).

Cholesterol

The ADA recommends that you eat less than 300 milligrams of cholesterol per day. If you have high LDL cholesterol levels, eat less than 200 milligrams per day.

Fat

If your blood fat levels are normal and you are not overweight

- Get less than 30 percent of calories from fat (on a 2,000 calorie diet, this would equal about 65 grams of fat).
- Get less than 10 percent of calories from saturated fat (about 22 grams of saturated fat on a 2,000 calorie diet).

If you have high LDL cholesterol levels

- Get less than 30 percent of calories from fat.
- Get less than 7 percent of calories from saturated fat (about 16 grams saturated fat on a 2,000 calorie diet).

If you are overweight

- Get 20 to 25 percent of calories from fat.

Fiber

The ADA recommends that you get 20 to 35 grams of fiber per day. This recommendation is the same whether you have diabetes or not.

Protein

The ADA recommends that you get 10 to 20 percent of your daily calories from protein. If you have kidney disease, the ADA recommends that you get about 10 percent of your daily calories from protein.

Sodium

One general rule is to get no more than 1 milligram of sodium for each calorie you eat in a day. For example, if you are on a 2,000-calorie diet, you would get no more than 2,000 milligrams of sodium each day. The ADA recommends that:

If you have normal blood pressure

Get no more than 2,300 milligrams of sodium per day.

If you have mild to moderately high blood pressure

Get less than 2,000 milligrams of sodium per day.

If you have high blood pressure and kidney disease

Get 1,500 milligrams or less of sodium per day.

Sugar Substitutes

The ADA approves the use of five no-calorie sweeteners that have been approved through the FDA's food additive approval process and a newer group of stevia-based sweeteners, which have been approved through another FDA process called GRAS (Generally Recognized as Safe). All of these sweeteners have undergone lengthy research and have been shown to be safe for everyone including people with diabetes and pregnant women.

The no-calorie sweeteners approved as food additives are: aspartame (Nutrasweet, Equal), saccharin (Sweet'n Low, Sprinkle Sweet, Sweet-10, Sugar Twin), acesulfame potassium (Sweet One, Sunette), sucralose (Splenda), and neotame.

The newest group of no-calorie sweeteners approved by the FDA's GRAS program is stevia (Rebaudioside A [Reb A or rebiana]). There are now a few highly purified based stevia sweeteners available as both a tabletop sweetener and available to manufacturers to use in foods and beverages. The commercial names of these are: PureVia, Sun Crystals, Stevia in the Raw, and Truvia. More stevia-based products are expected to hit the market in the future.

Oral Diabetes Medications

Right now, oral diabetes medications consist of diabetes pills that help people with type 2 diabetes control blood glucose levels. They are not insulin. (However, new types of oral medications are always being developed.) Doctors may prescribe diabetes pills for people who are not able to keep their blood glucose at safe levels with healthy eating and exercise.

There are now six classes of diabetes pills available in the U.S.: sulfonylureas, biguanides, alpha-glucosidase inhibitors, thiazolidinediones, meglitinides, and DPP-4 inhibitors.

Sulfonylureas

The first class of diabetes pills is the sulfonylureas. Newer drugs in this class include glimepiride (Amaryl) and glipizide (Glucotrol and Glucotrol XL). Glyburide (Diabeta, Glynase PresTab, Micro-nase) is also commonly used.

Sulfonylureas help your body send out more of its own insulin. And they may stop your liver from putting stored glucose into your blood. These actions lower your blood glucose.

POSSIBLE SIDE EFFECTS OF SULFONYLUREAS

- Low glucose reactions (see Blood Glucose, Low, page 15)
- Skin reactions: itching, hives, rash, sun sensitivity
- Weight gain

Alert your doctor to any possible side effects you experience. Do not take sulfonylureas if you are pregnant, have allergies to sulfa drugs, or have liver or kidney disease.

Biguanides

The second class of diabetes pills is the biguanides. Metformin (Glucophage) is the only biguanide currently available in the United States. Biguanides cause your liver to release stored glucose more slowly. They may also help your body respond to insulin. These actions keep your blood glucose levels more even.

Biguanides can cause lactic acidosis in people with heart, kidney, or liver disease, or in those who have taken an X-ray dye test. Lactic acidosis is a life-threatening buildup of acid in the blood. Do not take biguanides if you have heart, kidney, or liver disease, or when you are having an X-ray dye test.

POSSIBLE SIDE EFFECTS OF BIGUANIDES

- Nausea
- Bloating
- Cramping
- Diarrhea
- Loss of appetite

These side effects can be minimized by starting with a low dose and by taking the drug with foods.

Alpha-glucosidase Inhibitors

The third class of diabetes pills is the alpha-glucosidase inhibitors. The two currently available drugs in this class are acarbose (Precose) and miglitol (Glyset).

Alpha-glucosidase inhibitors slow the time it takes for your intestines to break down some carbohydrates into glucose. This causes glucose to enter your blood more slowly. Your blood glucose level then stays more even, with fewer highs and lows. Acarbose is especially helpful at flattening out the sharp rise in glucose that may occur after meals.

SIDE EFFECTS OF ALPHA-GLUCOSIDASE INHIBITORS

- Gas
- Bloating
- Diarrhea

These side effects can be minimized by starting with a low dose and very slowly working up to higher doses. Alpha-glucosidase inhibitors generally shouldn't be used if you have any gastrointestinal diseases.

Thiazolidinediones

The fourth class of diabetes pills is the thiazolidinediones. This class includes pioglitazone hydrochloride (Actos) and rosiglitazone (Avandia). These drugs make your muscle cells more sensitive to insulin. They may also reduce the release of stored glucose by the liver.

Thiazolidinediones can cause liver damage. Because of this, the U.S. Food and Drug Administration (FDA) recommends a liver test before starting any of them. The FDA also advises periodic testing for those using either Avandia or Actos.

POSSIBLE SIDE EFFECTS OF THIAZOLIDINEDIONES

- Weight gain
- Edema
- Congestive heart failure

SIGNS OF CONGESTIVE HEART FAILURE

- Nausea
- Vomiting
- Abdominal pain
- Fatigue
- Loss of appetite
- Dark urine
- Jaundice

Call your doctor right away if you have any of the signs of congestive heart failure. Do not use thiazolidinediones if you are pregnant, have liver disease, or have congestive heart failure.

Meglitinides

The fifth class of diabetes pills is the meglitinides. Repaglinide (Prandin) and Starlix (nateglinide) are the only meglitinides currently available in the United States. Like the sulfonylureas, meglitinides help your body send out more of its own insulin. This lowers your blood glucose. Unlike the sulfonylureas, meglitinides work very quickly and are meant to be taken just before meals. This keeps glucose levels from rising too high after meals.

POSSIBLE SIDE EFFECTS OF MEGLITINIDES

- Low blood glucose
- Headache
- Nausea
- Upper respiratory tract infection
- Nasal and sinus inflammation
- Bronchitis
- Back pain

You can reduce the risk of low blood glucose if you always take the drug with food.

DPP-4 Inhibitors

The sixth class of diabetes pills are DPP-4 inhibitors. Sitagliptan (Januvia) and saxagliptin (Onglyza) are currently the only DPP-4 inhibitors in the U.S. DPP-4 inhibitors enhance the secretion of insulin and suppress glucagon secretion. These medicines generally do no suppress appetite and are considered weight neutral.

POSSIBLE SIDE EFFECT OF DPP-4 INHIBITORS

- Allergic reactions
- Cold symptoms
- Sore throat
- Upset stomach
- Headache

Part of a Diabetes Care Plan

Diabetes pills do not take the place of healthy eating and exercise. They work with healthy eating and exercise. In fact, if you do not follow your meal and exercise plans, diabetes pills may not work for you.

Sometimes, diabetes pills work for a little while, then stop working. This often happens after several years. If your pills stop working, then your doctor may put you on another pill, two or three different types of pills, a pill and insulin, or insulin alone. You and your health care team will need to work together to find the best treatment for you.

Pre-Diabetes

Pre-diabetes is a condition where blood glucose levels are higher than normal, but not high enough to be diagnosed as diabetes. Generally, a person with pre-diabetes has either impaired fasting glucose (IFG) or impaired glucose tolerance (IGT). Although pre-diabetes is not a type of diabetes, if you have it, you are more likely to get diabetes.

Many people with pre-diabetes show no signs of illness and may have normal or near-normal A1C levels (see A1C Test, page 1) of 5.7—6.4%. The only way to know for sure whether you have pre-diabetes is through the following blood tests done by your doctor.

Fasting Blood Glucose Test

This test is used to determine whether or not you have IFG, a component of pre-diabetes. In the fasting blood glucose test, your blood glucose level is measured when you have not eaten for 8 to 12 hours. That is why it is usually done first thing in the morning.

A person without diabetes or IFG has a fasting blood glucose level below 100 mg/dl. A person with diabetes has a fasting blood glucose level of 126 mg/dl or above. A person with IFG has a fasting blood glucose level between 100 and 126 mg/dl.

Oral Glucose Tolerance Test

This test is used to determine whether or not you have IGT, another form of pre-diabetes. In the oral glucose tolerance test, your blood glucose levels are measured at fasting and then 2 hours after the test. First, your blood glucose is measured when you have not eaten for 8 to 12 hours (same as the fasting blood glucose test).

Then you drink a liquid with 75 grams of glucose in it (100 grams for pregnant women). Your blood glucose is then measured at 2 hours after the drink.

In a person without IGT or diabetes, the blood glucose level is below 140 mg/dl at 2 hours after the drink. In a person with diabetes, the blood glucose level is 200 mg/dl or above at 2 hours after the drink. In a person with IGT, the blood glucose level is between 140 and 200 mg/dl at 2 hours after the drink.

What to Do If You Have Pre-Diabetes

If you have pre-diabetes, you are more likely to be overweight, to have high triglyceride levels, to have low HDL levels, and to have high blood pressure. These put you at increased risk for heart disease.

If you have pre-diabetes, go back to your doctor at least once a year to have your blood glucose tested. In the meantime, there are a few things you can do to return your blood glucose levels to normal and decrease your other risk factors:

- Lose weight (if you are overweight). A weight loss of 7% (if you weigh 200 pounds that's a weight loss of 14 pounds) will improve your blood glucose levels.
- Lower your triglyceride and LDL cholesterol levels (if they are high).
- Lower your blood pressure (if it is high).
- Exercise or increase your activity—150 minutes of exercise a week (or about 20 minutes per day) will lower your risk for diabetes.
- Eat healthy foods. Healthy eating for diabetes is the same as healthy eating for anyone: low-fat, high-fiber grains, beans, fruits, and vegetables; small portions of low-fat meat and protein foods, and limited amounts of fats, sweets, and alcohol.

Pregnancy

Most women with diabetes have healthy babies. Often the biggest fear of women with diabetes is that their baby will eventually get diabetes. In fact, the chances that their baby will get diabetes are small.

The Chances that Your Child Will Get Diabetes

If the mother has type 1 diabetes

The child has a 1 to 3 percent chance of getting type 1 diabetes.

If the father has type 1 diabetes

The child has a 3 to 6 percent chance of getting type 1 diabetes.

If either parent gets type 2 diabetes after age 50

The child has a 7 percent chance of getting diabetes.

If either parent gets type 2 diabetes before age 50

The child has a 14 percent chance of getting diabetes.

Although your child may be safe from diabetes, there are other potential dangers to your baby's health and your own.

High Blood Glucose

One of the biggest dangers to you and your baby is high blood glucose levels. High blood glucose levels can lead to birth defects, premature delivery, macrosomia (see below), and low blood glucose in your baby and to preeclampsia and urinary tract infections in you.

Birth defects. In women with pre-existing diabetes, high blood glucose levels during the first 8 weeks of pregnancy can cause birth defects. It is during these early weeks that your baby's organs are forming. This is why it's important to get your diabetes under control BEFORE you get pregnant.

Birth defects can affect any part of your baby. The heart, spinal cord, brain, and bones are most often affected. If you have high blood glucose, birth defects are more likely to be severe and to cause miscarriages.

Macrosomia. Macrosomia means large body. If your blood glucose is too high during pregnancy, your baby may grow bigger and fatter than normal. This makes delivery harder. Babies who are larger than normal are more likely to have health problems.

Low blood glucose. High blood glucose levels during pregnancy or during labor can cause your baby to have low blood glucose after delivery.

Urinary tract infections. When your blood glucose is high during pregnancy, you are more likely to get a urinary tract infection. Urinary tract infections are usually caused by bacteria. Bacteria grow much better and faster in high glucose.

Signs of a urinary tract infection include the need to urinate often, pain or burning when you urinate, cloudy or bloody urine, low back pain or abdominal pain, fever, and chills.

High Ketones

Ketones are made when your body burns stored fat for energy. Large amounts of ketones can harm you or your baby. Ketones are more likely to build up if you are not eating and drinking enough for both you and your baby. Be sure to eat all meals and snacks at your scheduled times. In patients with type 1 diabetes, the presence of ketones in the urine or blood may be a sign of a dangerous condition called diabetic ketoacidosis (DKA).

DKA occurs when there is not enough insulin to process glucose and the body breaks down fat as an energy source instead. Forgetting to take insulin doses, inadequate insulin doses, infections or other illnesses may precipitate DKA. It is important to know and use your sick day rules to prevent this condition from occurring. This may also occur in women who use insulin pumps when their catheters occlude. Women who use insulin pumps should know that if they have high blood glucoses, with or without ketones in their urine, they should take an injection by syringe

to correct the high blood glucose, drink water to clear the excess glucose and ketones and change the pump infusion set.

Diabetes Pills

Diabetes pills are not used during pregnancy because they are not effective in women with pre-existing diabetes. Some may cause birth defects and low blood glucose in your baby. It is best to transition to insulin before you get pregnant to make sure that your diabetes is under excellent control. If you become pregnant and you are taking either metformin or glyburide it is best that you continue these until you can be safely transitioned to insulin. During any transition from oral medication to insulin during pregnancy, it is important to avoid high blood glucoses.

Preeclampsia

Preeclampsia (also called toxemia) is high blood pressure, swelling of your feet and lower legs, and leaking of protein into your urine during pregnancy. Other signs include headache, nausea, vomiting, abdominal pain, and blurred sight. If not treated, preeclampsia can cause seizures, coma, and death to you or your baby. Your doctor will watch for signs of preeclampsia.

Hydramnios

Hydramnios is excess amniotic fluid in your uterus. Signs of hydramnios are abdominal discomfort, larger-than-usual uterus, shortness of breath, and swelling of your legs. Hydramnios may cause premature labor. Your doctor will watch for signs of hydramnios.

HOW TO ENSURE YOUR BABY'S HEALTH

- Get your blood glucose in control before pregnancy. If your blood glucose is in poor control, try to bring it into good control 3 to 6 months before you plan to get pregnant. If you wait until you know you are pregnant, your baby could already be harmed. Target an A1C under 7% and as close to 6% as possible without increasing low blood glucose events.
- Keep your blood glucose in good control during pregnancy. This will require more frequent blood glucose checking—sometimes up to eight times a day. Staying in good control will reduce the risk of problems for both you and your baby.
- Check your urine for ketones every day. If you have moderate to large amounts of ketones in your urine, contact your doctor. You may need a change in your meal plan or insulin.
- Get fit before you get pregnant. Exercising before pregnancy may increase your endurance, lower your blood glucose, help you lose weight, and build strength and flexibility. Achieve a normal body mass index (BMI) before you get pregnant.
- Exercise during your pregnancy. Pregnancy is not the time to start a vigorous exercise program, but you will most likely be able to continue an exercise you were doing regularly before pregnancy. If you were not exercising regularly, ask your doctor about exercises that would be safe for you and your baby. Some good exercises for pregnant women include walking, low-impact aerobics, swimming, and water aerobics.
- Follow your pregnancy meal plan. A meal plan is designed to help you avoid high and low blood glucose while providing what your baby needs to grow. Three meals and three snacks a day are common. It may be necessary to meet with your dietitian every 3 months during the pregnancy to update the plan based on the changing needs of your body and the baby.

Quit Smoking

Quitting smoking is good for your diabetes. Quitting smoking is good for your health. When you quit smoking, you lower your blood pressure. When you quit smoking, you raise your HDL cholesterol (the good kind) and your oxygen intake. You even raise your life expectancy!

Quit smoking and you can reduce your risk for heart disease, blood vessel damage, kidney disease, nerve damage, dental disease, and cancer (mouth, throat, lungs, and bladder). You can reduce your risk of heart attack and stroke, miscarriage or stillbirth, limited joint mobility, and colds, bronchitis, and emphysema.

Quit smoking and you can even reduce your risk for insulin resistance (when your body does not respond to insulin). No wonder people try to quit. Here are some helpful hints.

Before You Quit Smoking

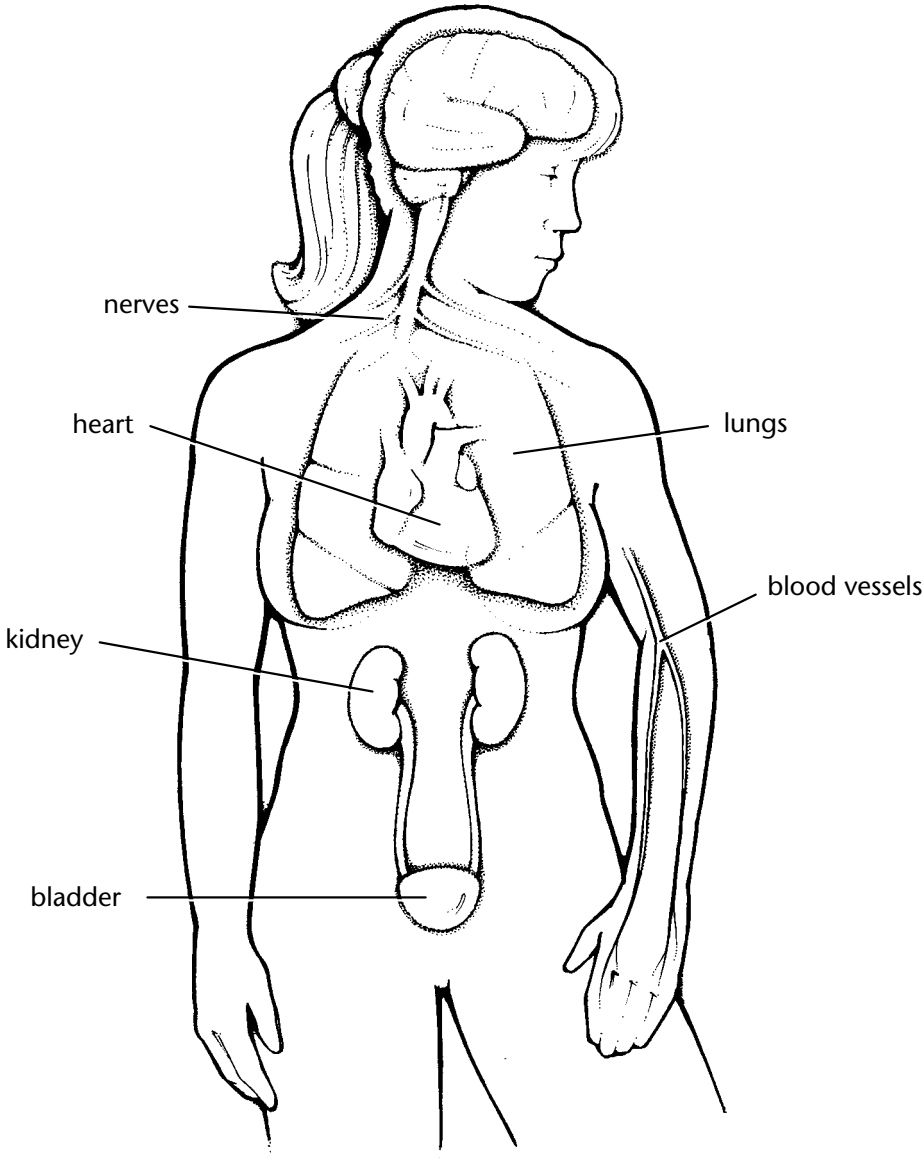
Write down each time you smoke for a week. Write down any event or activity you were doing or about to do. Save the list.

Write down all the reasons you want to quit. Read the list each day of the week before you quit.

Pick a day to quit and write it down. Choose a day with few pressures. That way, stress won't tempt you to smoke. You may want to do it when you've got some time off from work.

Tell others you plan to quit. Let family, friends, and coworkers know. Seek their support. Tell them how they can help you. For example, ask them not to offer you a cigarette. Tell them what to expect when you first quit (see below).

Choose a method of quitting. There are many ways to quit smoking. Not every method works for every person. Your diabetes care team



Smoking can damage your heart, lungs, blood vessels, nerves, kidneys, and bladder. Smoking increases your risk of heart attack, stroke, miscarriages, and stillbirth.

may be able to help you find a method that will work for you. It could be quitting "cold turkey." It might be using a nicotine patch or chewing gum. Hypnosis helps some people stop smoking. For others, acupuncture stops the craving to smoke.

Consider joining a stop-smoking class. You may find it easier to quit with other people. Check for classes at local hospitals or local branches of organizations, such as the American Lung Association, the American Heart Association, and the American Cancer Society.

Practice deep breathing. Relaxation tapes may help.

Stock up on low-fat, low-calorie snacks. Your appetite may increase after you quit smoking. You may gain weight (the average gain is 7 pounds). You may crave sweet foods.

Begin to exercise a few weeks before you quit smoking. More activity will help you combat withdrawal symptoms and weight gain. Exercise can take the place of smoking or help you control the urge to eat. Try brisk walking, cycling, or swimming.

Plan rewards for not smoking. For example, you might play a favorite game one week, and go to a movie the next week.

When You Quit Smoking

You may go through withdrawal for a few days or weeks. The table on the next page lists some of the symptoms you may feel and how to deal with them.

WITHDRAWAL

Symptoms	Duration	Solution
Urge to smoke	Strong first 2 weeks, then off and on	Do something else.
Blood glucose goes up/down	Varies	Monitor closely.
Irritable, tense, on edge	Several weeks	Take a break or a walk. Listen to a relaxing tape.
Trouble concentrating or feel "out of it"	Several weeks	Break up big tasks into smaller ones. Take short breaks.
Extra energy or restlessness	Varies	Exercise.
Sleepy during the day.	2 to 4 weeks	Talk a walk or a nap.
Trouble sleeping at night	Less than 7 days	Try deep breathing. Avoid caffeine after 5 p.m.
Constipation	3 to 4 weeks	Add fiber to meal plan. Drink 6 to 8 glasses of water/day.
Coughing	Less than 7 days	Sip water.
Headache, cramps, nausea, or sweating	Few days	Try a warm bath or some quiet time.

HOW TO STAY SMOKE-FREE

The first 3 months or so after quitting are the hardest. Most people who return to smoking do so then. Try these tactics for staying smoke-free.

- Refer to the list you made of events or activities that were going on around the time you smoked. The next time any of those events or activities come up, avoid them. For example, if you always smoke at happy hour, don't go. If you can't avoid the event, replace the cigarette with something else. Hold something else in your hand. Try a strand of beads, a polished stone, or a pen. Put something else in your mouth, like gum or ice.
- If you smoke to relax, find another way to relax. Try deep breathing or relaxation exercises. If you smoke to perk up, try a walk or stretching.
- Throw away your cigarettes, butts, lighters, matches, and ashtrays.
- Put your list of reasons for quitting where you had kept your cigarettes.
- Read your list of reasons for quittng. Remind yourself that you don't want to smoke.
- Remind yourself that all it takes is one cigarette to become a smoker again. Try to avoid even one.
- Make a list of things you like about not smoking.
- If you are woried about gaining weight, talk with your dietitian about changing your meal and exercise plans.

Relieve Stress

Our lives are full of things that can cause stress. Traffic jams, holiday travel, unemployment, divorce, or an illness, such as diabetes, can all cause stress. Working to relieve this stress can have a dramatic impact on your diabetes care and your well-being.

What Causes You to Feel Stressed?

Each one of us is different. What causes little or no stress for you may cause great stress for somebody else. Make a list of the people or things that stress you.

How Your Body Reacts to Stress

When you feel stressed, your body gets ready for action. It pumps stress hormones into your blood. Stress hormones make your body release stored glucose and stored fat for extra energy. This extra energy helps your body face up to or run away from the stress. But the extra glucose and fat can only be used by your body if there is enough insulin.

In people with diabetes, there may not be enough insulin. And the stress hormones themselves may make it harder for your body to use the insulin that is there. When there is not enough insulin, glucose and fat build up in the blood. This can lead to high glucose levels and high ketones. To avoid high glucose and high ketones, you need to know what happens to your blood glucose level when you are under stress.

How Stress Affects Your Blood Glucose

The type of stress you are under may make a difference. Physical stress, such as an injury or an illness, causes blood glucose levels to go up in most people with diabetes. Mental stress, such as problems with your

marriage or finances, causes some people's glucose levels to go up and other people's glucose levels to go down. To see which way your blood glucose level goes, try the following test.

BLOOD GLUCOSE STRESS TEST

1. Before you check your blood glucose, rate your level of stress (from 1 to 10 or high, medium, or low). Write down your stress rating.
2. Check your blood glucose. Record your results. Do this for a week or two. This will be especially helpful if you feel stressed.
3. Compare the blood glucose results with your stress ratings. Does high blood glucose occur with high stress? If so, you may need more insulin when you are under stress. Check with your diabetes care provider first.

How Do You React to Stress?

Pay attention to how you react. How you react may be different from how someone else reacts. You may react by feeling tense, anxious, upset, or angry. You may react by feeling tired, sad, or empty. Your stomach, head, or back may hurt.

Some people react by laughing nervously or being self-critical. Others become easily discouraged or frustrated or bored.

How Do You Handle Stress?

How you handle each stressful situation determines how much stress you feel. You can handle stress in a way that makes you feel in control. Or you can handle stress in a way that makes you feel worse.

Some people choose to handle stress in ways that are damaging. They may turn to alcohol, caffeine, nicotine, or anything they think might lift or calm them. Some choose to binge on food.

Any excessive behavior, even gambling or oversleeping, may be a way to try to get away from stress. These solutions seldom work, and with diabetes, most of them are dangerous. There are other, safer stress relievers.

HOW TO HANDLE STRESS SAFELY

Breathe deeply. Sit or lie down. Uncross your legs and arms. Close your eyes. Breathe in deeply and slowly. Let all the breath out. Breathe in and out again. Start to relax your muscles. Keep breathing in and out. Each time you breathe out, relax your muscles even more. Do this for 5 to 20 minutes. Do it at least once a day.

Let go. Lie down. Close your eyes. Tense, hold, and then release the muscles of each body part. Start at your head and work your way down to your feet.

Loosen up. Circle, stretch, and shake parts of your body.

Stay active. Some of the best activities for relieving stress are cross training, cross-country skiing, bicycling, rowing, running, and swimming. If you don't like any of these, find another activity you like and do it often.

Get a massage. Put yourself in the hands of a licensed massage therapist.

Think good thoughts. Your thoughts affect your feelings. Put a rubber band on your wrist. Snap it each time you think a bad thought. Replace that bad thought with a better thought. Or repeat a happy poem, prayer, or quote that calms and focuses you.

Talk about it. Find someone to talk to when something is bothering you. It may make you feel better. Confide in family or friends. Consult a therapist or join a support group. Others may be having the same troubles you are.

Put it on paper. Write down what's bothering you. You may find a solution. Or draw or paint your worries away.

Try something new. Start a hobby or learn a craft. Take a class. Join a club or a team. Volunteer to help others. Form a discussion group on books, movies, or whatever interests you. Start a potluck dinner group.

Get away. Go on a minivacation or overnighter. Take a long weekend. Form a baby-sitting cooperative with other parents so you can get out more.

Listen up. Listen to music you find soothing. Or play a tape of nature sounds, such as birds or ocean waves.

Soak in a warm bath. The most comfortable bath water is about the same temperature as your skin—probably between 85° and 93° F. Linger in the bath for 20 to 30 minutes. Add bubbles or soothing herbs if you like.

Say "no." Especially to things you really don't want to do. You may feel stressed if you take on too much.

Laugh about it. Have a hearty, healthy laugh every day. Seek out funny movies, funny books, and funny people.

Look at nature. Look at the world around you. Flowers, trees, even bugs. The sun, the moon, the stars. Clouds, wind, and rain. Just go outside and spend time there. If you can't go outside, look out a window. Even looking at pictures of nature can help you slow down and relax.

Eat wisely. When you are under stress, your body may use up more B vitamins, vitamin C, protein, and calcium. Replenish your B vitamins by eating more whole grains, nuts, seeds, and beans. Boost your vitamin C with oranges, grapefruits, and broccoli. Beef up your protein with chicken, fish, and egg whites. Stock up your calcium with low-fat milk, yogurt, and cheese.

Sleep on it. Sometimes things look better the next day. Get your daily 7 to 9 hours of sleep.

Sex and Diabetes

Diabetes and its complications can hurt your sex life. Sexual problems may have both physical and psychological causes. Doctors usually look for physical causes of sexual problems first.

Physical Causes

Too tired. If your blood glucose levels are high, you may feel too tired to have sex. Getting your diabetes under better control can help.

Urinary tract infection. When your blood glucose level is high, you are more likely to get a urinary tract infection. Sex may be painful or uncomfortable if you have a urinary tract infection. Urinary tract infections can be treated with antibiotic drugs.

SIGNS OF A URINARY TRACT INFECTION

- Frequent urination
- Pain or burning during urination
- Cloudy or bloody urine
- Low back pain or abdominal pain
- Fever or chills

Lack of bladder control. If you have nerve damage to your bladder, you will not be able to tell when your bladder is full. You may dribble or wet yourself during sex. Try emptying your bladder before and after sex.

Damaged limbs or joints. If you have nerve damage to a limb, are missing a limb, or have a joint disease, sex may be awkward or uncomfortable. Try different positions. Some may be better than others.

Supporting yourself with several pillows may help. A physical therapist may be able to suggest ways for you to be more comfortable during sex.

Women Only

Loss of sensation. Nerve damage to the sex organs can cause a loss of sensation. This can make it harder for a woman to reach orgasm. Kegel exercises, changes in position during sex, and more intense direct stimulation of the sex organs may help.

Vaginal infection (vaginitis). Women with diabetes tend to get more vaginal infections than women without diabetes. Most vaginal infections are caused by the fungus *Candida albicans*. High blood glucose levels encourage the fungus to grow.

Vaginitis can cause irritation, discomfort, or pain during or after sex. Antifungal creams or drugs can clear up most vaginal infections. Getting your blood glucose under control may help prevent them.

SIGNS OF VAGINITIS

- Thick white discharge
- Itching
- Burning
- Redness
- Swelling

Vaginal dryness. Nerve damage to the cells that line your vagina can cause vaginal dryness. Vaginal dryness can cause irritation, discomfort, or pain during or after sex. Over-the-counter or prescription lubricants can help. Getting your blood glucose under control may slow nerve damage.

Vaginal tightness (vaginismus). The pain or discomfort that you feel from vaginal infections or vaginal dryness can make you more likely to have vaginismus. Vaginismus is an involuntary spasm of the muscles around the vaginal entrance. It can make sex difficult or painful. Learning to relax these muscles through Kegel exercises can help. Trying positions in which you have more control over penetration can also help.

Men Only

Erectile dysfunction. About half of men with diabetes have erectile dysfunction (ED). ED means that the penis does not become or stay hard enough for sex. There are many causes of ED. The most common causes of ED in men with diabetes are:

- Damage to the nerves in your penis
- Damage to the blood vessels in your penis
- Poor control over your blood glucose levels.

Physical impotence usually happens slowly and gets worse. Signs include a less rigid penis and fewer erections. Eventually, there are no erections. Keeping your blood glucose levels under control is the best way to avoid impotence. If you do become impotent, talk with your doctor. There are many treatment choices for physical impotence.

Psychological Causes

If you and your doctor have not been able to find a physical cause for your sexual problem, there may be a psychological cause. A sexual problem may be psychological if:

- You are not able to talk with your partner about sex.
- You and your partner argue over money, children, or work.
- You are stressed, worried, or anxious.
- You fear impotence.
- You fear pregnancy.
- You are sad, depressed, or angry.
- You had an inadequate sex education.
- You had a restrictive upbringing.
- You have been sexually abused.

If you think a psychological cause is a part of your sexual problem, seek out a mental health professional who specializes in this area. This might be a psychiatrist, psychologist, or licensed social worker.

Sick Days

Being sick with a cold or the flu can upset your diabetes care plan. You may not be able to eat as you usually do or take your usual diabetes pills or insulin. When you are sick, your blood glucose levels may go up too high or down too low.

Your health care team can help you make a sick-day plan before you get sick. Your sick-day plan will include what medicines to take, what to eat and drink, how often to check your blood glucose, when to call your diabetes care provider, and what to tell him or her.

What Medicines to Take

Only your diabetes care provider can tell you for sure what medicines to take. But most likely, you'll keep taking your insulin or diabetes pills.

If you control your diabetes with insulin, you may need to adjust your usual doses. If you control your diabetes with healthy eating and exercise or with diabetes pills, your health care provider may want you to take insulin when you are sick.

You may decide to take other kinds of medicines to care for your sickness. Some of these medicines may raise your blood glucose level and others may lower it. Ask your doctor or pharmacist whether the medicines you plan to take will affect your blood glucose level.

What to Eat and Drink

Eat foods from your usual meal plan if you can. If you can't eat your usual foods, follow your sick-day meal plan. It will include foods that are easy on your stomach. You may want to set aside a small area of your cupboard for sick-day foods.

If you have a fever, are throwing up, or have diarrhea, you may lose too much fluid. Try to drink a cup of fluid each hour.

If your blood glucose level is above 250 mg/dl, drink sugar-free liquids, such as water, caffeine-free tea, sugar-free ginger ale, or broth (chicken, beef, or vegetable).

If your blood glucose level is below 250 mg/dl, drink liquids with about 15 grams of carbohydrate in them (see list of sick-day foods and fluids below).

SICK-DAY FOODS WITH 15 G CARBOHYDRATE

- 6 saltine crackers
- 5 vanilla wafers
- 3 graham crackers
- 1 fruit juice bar
- 1 slice toast or bread
- 1 cup soup
- 1 cup low-fat milk
- 1 cup sports drink
- 1/3 cup fruit juice
- 1/2 cup regular gelatin
- 1/2 cup ice cream
- 1/2 cup cooked cereal
- 1/2 cup mashed potatoes
- 1/3 cup cooked rice
- 3/4 cup plain yogurt
- 1/3 cup frozen yogurt
- 1/4 cup sherbet
- 1/2 cup applesauce, unsweetened
- 1/4 cup pudding
- 1/2 cup canned fruit

When to Check Blood Glucose and Urine Ketones

Usually, you will need to check your blood glucose and urine ketones more often when you are sick. The sick-day plan you work out with your health care team will tell you how often to check.

If you have type 1 diabetes, you may need to check your blood glucose and ketones every 3 to 4 hours. If you have type 2 diabetes, you may need to check your blood glucose four or five times a day.

WHEN TO CALL YOUR PROVIDER

Call your health care provider when:

- You have been sick for 2 days and you are not getting better.
- You have been throwing up or have had diarrhea for more than 6 hours.
- Your blood glucose level is staying above 250 mg/dl.
- Your blood glucose level is staying below 60 mg/dl.
- You have moderate or large amounts of ketones in your urine.
- You have any of these signs: chest pain, trouble breathing, fruity breath, or dry and cracked lips or tongue.
- You are not sure what to do to take care of yourself.

WHAT TO TELL YOUR PROVIDER

Keep written records so you can tell your diabetes care provider:

- How long you have been sick
- What medicines you have taken and how much
- Whether you have been able to eat/drink and how much
- Whether you are thowing up or have diarrhea
- Whether you have lost weight
- Your temperature
- Your blood glucose levels
- Your urine ketone levels.

Know where to reach members of your health care team or their backups on weekends, holidays, and evenings. If you must talk to someone other than a member of your health care team, be sure to tell him or her about your diabetes.

How About Exercise?

Exercising when you are sick can make your blood glucose levels go down too low or up too high. If you exercise when you are sick, it may take longer for you to get better. Do not exercise when you are sick. Find out from your diabetes care provider when it is safe to start exercising again. Because you may be less fit after being sick, ease into your exercise program. You might try exercising at a lower intensity, for a shorter time, or on fewer days.

Skin Care

Diabetes makes skin problems more likely. Some skin problems are ones that anyone can have but that people with diabetes get more easily. These include bacterial infections and fungal infections. Other skin problems happen mostly to people with diabetes. These include diabetic dermopathy and digital sclerosis.

Bacterial Infections

Three bacterial infections that people with diabetes get more easily than people without diabetes are sties, boils, and carbuncles. All three are most often caused by staphylococcal bacteria. All appear as red, painful, pus-filled lumps.

A sty is an infected gland of the eyelid. A boil is an infected hair root or skin gland. A carbuncle is a cluster of boils. Boils and carbuncles often occur at the back of your neck, armpits, groin, or buttocks.

If you think you have a sty, boil, carbuncle, or other bacterial infection, see your doctor.

FUNGAL INFECTIONS

Four fungal infections that people with diabetes get more easily than people without diabetes are jock itch, athlete's foot, ringworm, and vaginal infections.

Jock itch is a red, itchy area that spreads from your genitals outward over the inside of your thigh. In athlete's foot, the skin between your toes becomes itchy and sore. It may crack and peel, or blister.

Ringworm is a ring-shaped, red, scaly patch that may itch or blister. It can appear on your feet, groin, scalp, nails, or body.

Vaginal infections are often caused by the fungus *Candida albicans*. It causes a thick white discharge from your vagina and/or itching, burning, or irritation. If you think you have a fungal infection, call your doctor.

Diabetic Dermopathy

Some people with diabetes get a skin condition called diabetic dermopathy. It causes red or brown scaly patches to form, usually on the front of your legs. Diabetic dermopathy is harmless and needs no treatment.

Diabetic dermopathy causes red or brown patches on the front of your legs.

Digital Sclerosis

People with diabetes may also get digital sclerosis. Digital refers to your fingers or toes. Sclerosis means hardening.

Digital sclerosis causes the skin on your hands, fingers, or toes to become thick and tight and look waxy or shiny. It can also cause aching and stiffness in your fingers. It may even limit movement so that you cannot easily bring the palms of your hands together, as if praying.

There is no treatment for digital sclerosis. However, painkillers and anti-inflammatory drugs can relieve aching joints.

Digitial sclerosis can make it hard to press your palms together.

How to Care for Your Skin

Keep your diabetes in good control. High blood glucose levels make it easier for you to get bacterial and fungal infections. High blood glucose levels also tend to give you dry skin.

Keep your skin clean. Take warm, not hot, baths or showers. Hot water can dry out your skin.

Keep dry parts of your skin moist. Use moisturizers and moisturizing soaps. Keep your home more humid during cold, dry months. Drink plenty of water. It helps keep your skin moist, too.

Keep other parts of your skin dry. Areas where skin touches skin need to be kept dry. These areas are between your toes, under your arms, and at your groin. Using powder on these areas can help keep them dry.

Protect your skin from the sun. The sun can dry and burn your skin. When you are out in the sun, wear a waterproof, sweatproof sunscreen with an SPF (sun protection factor) of at least 15. Wearing a hat also helps.

Treat minor skin problems. Over-the-counter products can be used to treat skin problems. But it's best to check with your diabetes care provider before using any skin treatment.

See a skin doctor. If you are prone to skin problems, ask your diabetes care provider about adding a skin doctor (dermatologist) to your health care team.

Stroke

A stroke occurs when blood flow to the brain is blocked. Without blood, the brain can't get the oxygen it needs. Part of the brain gets damaged.

Blood flow can be cut off by a buildup of fat and cholesterol in the blood vessels that lead to the brain (atherosclerosis). This type of stroke is called an ischemic stroke. It is the most common type.

If blood flow to the brain is blocked for only a brief time, it is called a transient ischemic attack, or TIA. Your body may release enzymes that dissolve the clot quickly and restore blood flow. If you have TIAs often, you are more likely to have an ischemic stroke.

Another type of stroke is called a hemorrhagic stroke. It occurs when a blood vessel in your brain leaks or breaks. The most common cause of hemorrhagic strokes is high blood pressure. High blood pressure can weaken blood vessels. Weak blood vessels are more likely to leak or break.

Having diabetes doubles your chances of having a stroke. If you have other risk factors, your chances of having a stroke are even greater.

RISK FACTORS FOR STROKE

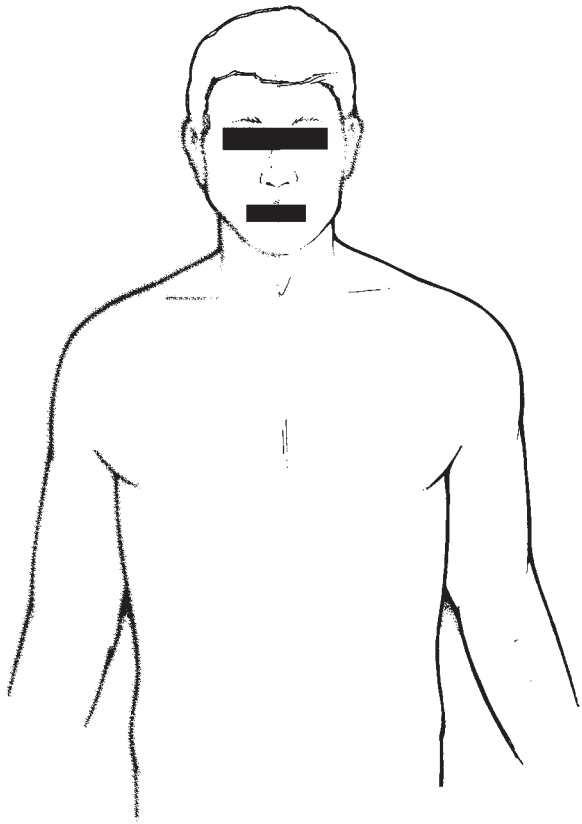
- You have had TIAs.
- You have high blood pressure.
- You smoke.
- You have high cholesterol.
- You are overweight.
- You do not exercise.
- You drink too much alcohol.

You can't change the fact that you have diabetes. But you can reduce your other risk factors.

WARNING SIGNS OF A STROKE OR TIA

- You are suddenly weak or numb in your face, an arm, or a leg.
- Your sight is suddenly dim, blurred, or lost.
- You can't speak or can't understand someone else who is talking.
- You have a sudden headache.
- You feel dizzy or unsteady, or you suddenly fall.

Be alert to the warning signs of stroke. Know what to do if the warning signs occur.



A stroke can cause difficulty seeing or talking or lead to weakness on one side of your body.

How to Reduce Your Risk of Stroke

Control your diabetes. Try to keep your blood glucose levels in your range (see Blood Glucose, page 8). This may prevent or delay blood vessel damage caused by high blood glucose.

Control high blood pressure. Work with your health care team to bring your blood pressure down with healthy eating, exercise, weight loss, and blood pressure drugs. Cutting down on sodium (salt) lowers blood pressure for some people.

Quit smoking. Smoking narrows blood vessels and promotes the buildup of fat and cholesterol on blood vessel walls. Smoking also makes your blood clot faster.

Eat less fat. Eating less saturated animal fats and cholesterol can lower your cholesterol level. High cholesterol can damage blood vessels.

Lose a few pounds! Losing even a little weight with healthy eating and more activity lowers blood pressure and improves cholesterol levels.

Get moving. Try walking or biking for as little as 15 minutes a day, three times a week. These types of aerobic exercise can lower your blood pressure, lower your bad LDL cholesterol and triglycerides, and raise your good HDL cholesterol.

Cut back on alcohol. Drinking too much alcohol can raise your blood pressure. Men, drink no more than two drinks a day. Women, drink no more than one drink a day. A drink equals a 12 oz beer, 5 oz wine, or 1.5 oz liquor. Don't drink at all if you have a drinking problem or a medical reason not to drink.

IF YOU THINK YOU ARE HAVING A STROKE

1. Call 911 for an ambulance.
2. Remain calm.
3. Do not eat or drink anything.

Type 1 Diabetes

In type 1 diabetes, your body stops making insulin or makes only a tiny amount. When this happens, you need to take insulin. Without insulin, glucose cannot get into your cells. (Your cells need to burn glucose for energy.) Glucose collects in the blood. Over time, high levels of glucose in the blood may hurt your eyes, kidneys, nerves, heart, and blood vessels.

Type 1 diabetes begins most often in people under age 30. But it can develop at any age. The symptoms can come on suddenly and be severe.

Causes of Type 1 Diabetes

No one knows for sure why people get type 1 diabetes. Some people are born with genes that make them more likely to get it. But many other people with those same genes do not get diabetes. Something else inside or outside the body triggers the disease. Experts don't know what that something is yet. But they are trying to find out.

Most people with type 1 have high levels of autoantibodies in their blood before they are first diagnosed. Antibodies are proteins your body makes to destroy bacteria or viruses. Autoantibodies attack your body's own tissues. In people with type 1 diabetes, autoantibodies may attack the cells in the pancreas that make insulin.

SIGNS OF TYPE 1 DIABETES

- Frequent urination
- Fatigue
- Constant hunger
- Edginess
- Constant thirst
- Mood changes
- Weight loss
- Nausea
- Weakness
- Vomiting

Treatment of Type 1 Diabetes

There is no cure for diabetes. But there are things you can do to live well and care for type 1 diabetes. The things you do to care for your diabetes help you bring blood glucose levels within your range.

1. Take insulin. Insulin injections or an insulin pump replace the insulin your own body no longer makes. Insulin lets your cells take in and use glucose for energy.
2. Follow a healthy meal plan (see Healthy Eating, page 85, and Meal Planning, page 123).
3. Stay physically active. Being active helps insulin work to make your cells take in and use glucose.
4. Check your blood glucose and urine ketones as recommended by your doctor or health care provider. Self-checks help you keep track of how well your diabetes care plan is working.
5. Get regular checkups. Your health care team can help you make any needed changes in your diabetes care plan.

What About Wide Swings in Blood Glucose?

Some people with type 1 diabetes have wide, unpredictable swings in blood glucose. This occurs because their bodies have exaggerated responses to food, medication, and stress.

Food is not absorbed in the same amount of time every time you eat. Insulin is also absorbed from an injection site at different rates. Stress creates the release of stress hormones that can interfere with how quickly or effectively insulin works. These things can work alone or together to cause wide swings in blood glucose levels.

If you have wide swings in your blood glucose levels, speak with your health care team about your insulin dose and injection technique. The site, depth, and timing of insulin injections can all affect your blood glucose readings. You may be asked to keep careful records for several days or even weeks until you and your team can figure out what is causing those extreme highs and lows.

Type 2 Diabetes

In type 2 diabetes, your body does not make enough insulin, or has trouble using the insulin, or both. A person with type 2 diabetes may need insulin to control blood glucose levels but does not depend on it to live.

If there is not enough insulin or if it's not working right, your cells cannot use the glucose in your blood to make energy. Instead, glucose stays in the blood. This can lead to high blood glucose levels. Over time, high blood glucose levels may hurt your eyes, kidneys, nerves, heart, and blood vessels.

Most people who get type 2 diabetes are over 40 years old. However, type 2 diabetes often occurs in younger people—even children. Often, the signs of disease may be so mild or develop so gradually that they go unrecognized by the person with the disorder. For this reason, it is important that people who are at risk for type 2 diabetes have blood glucose testing performed every 3 years to find out if they have diabetes.

Some of the risk factors for type 2 diabetes include: having a parent, sibling, or child with type 2 diabetes or being overweight.

SIGNS OF TYPE 2 DIABETES

- Frequent urination
- Tingling or numb hands/feet
- Constant hunger
- Fatigue
- Constant thirst
- Dry, itchy skin
- Weakness
- Blurred vision

Causes of Type 2 Diabetes

Experts don't know for sure what causes type 2 diabetes. They do know that you cannot catch it from someone else, like the flu. They also know it is not caused by eating too much sugar. It does run in families. If other members of your family have type 2 diabetes, you are more likely to get it. But it usually takes something else to bring on the disease.

For many people with diabetes, being overweight brings it on. When you are overweight, your body has a harder time using the insulin that it makes. This is called *insulin resistance*. In insulin resistance, your pancreas keeps making insulin to lower blood glucose, but your body does not respond to the insulin as it should. After years of this, the insulin-producing cells in your pancreas may stop working so hard. Some people refer to this as "burn out" of the insulin-producing cells.

Treatment of Type 2 Diabetes

There is no cure for diabetes. But there are things you can do to live well and treat it yourself. At first, eating healthier foods and doing more exercise or activity may help you lose weight.

Losing weight may help you get your blood glucose levels into a more normal range and help your body use the insulin it has. If this does not bring your blood glucose levels down to where they should be, you may need to take diabetes medicine.

Diabetes medicines are drugs that lower blood glucose levels. They are not insulin. If eating healthier foods, increasing activity, and taking diabetes medicines do not lower your blood glucose enough, you may need to add insulin. Or you may need to use insulin instead of diabetes medicine.

To find out how your treatments are working, there are two things you can do: 1) check your blood glucose levels and 2) have regular medical checkups.

Urine/Blood Ketone Test

Ketones are substances that your body makes when it uses stored fat to produce energy. Your body burns fat when it can't get glucose to use for energy. This can happen in people with type 1 diabetes for the following reasons:

High glucose. High glucose means you have too much glucose and not enough insulin in your blood. Your body needs insulin to use glucose for energy. If you don't have enough insulin, your body starts to burn fat for energy.

Exercise. When you exercise, your body needs lots of energy. If you don't have enough insulin or glucose when you exercise, your body will burn too much fat.

Stress. It may be a physical stress, such as surgery. Or it may be a mental stress, such as an exam or family problem. Whatever kind of stress you're under, your body needs energy to handle it. Your body needs so much energy that it will burn fat if you don't have enough insulin to help you use glucose.

Illness. You may have a cold, a sore throat, a fever, or an infection. You may have diarrhea or an upset stomach. When you are sick, your body needs extra energy to fight it. Your body may get some of that extra energy from fat.

Pregnancy. When you are pregnant, your body needs to provide energy for two. If you are not eating enough, your body may turn to fat for the energy it needs.

What Ketones Can Do to Your Body

If your body burns too much fat too quickly, high levels of ketones can build up in your blood. Ketones make your blood more acidic. Acidic blood upsets your body's chemical balance. Ketones are passed into your urine.

If blood glucose is high, glucose also passes into your urine. Glucose makes your urine thick. Your body pulls fluid from everywhere to thin out the urine. Your body can make a lot of urine when blood glucose levels are high, and can cause you to become dehydrated if it is not treated.

If you are dehydrated and your ketones are high, you may get ketoacidosis. This can be life-threatening and needs to be treated quickly. Ketoacidosis can develop quickly. Most people who get ketoacidosis have type 1 diabetes. But everyone with diabetes needs to be alert for the signs of it.

Urine/Blood Test for Ketones

If you have signs of ketoacidosis or are ill, pregnant, or under stress, check your urine or blood for ketones. Check also if your blood glucose is above 250 mg/dl, especially if you are going to exercise.

Urine and/or blood ketone test kits are available at your local pharmacy. You don't need a prescription. Follow the directions provided in the package. Go over the correct way to check with your diabetes care provider.

SIGNS OF KETOACIDOSIS

- Dry mouth
- Great thirst
- Fruity breath
- Loss of appetite
- Stomach pain
- Nausea
- Vomiting
- Dry, flushed skin
- Fever
- Fatigue
- Drowsiness
- Frequent urination
- Labored breathing

HOW TO TEST YOUR URINE FOR KETONES

1. Dip the test strip or tape in a sample of your urine, OR urinate on the test strip, OR put drops of urine on the tablet.
2. Wait to see if the tape, strip, or tablet changes color. The directions will tell you how long to wait. You may need to wait anywhere from 10 seconds to 2 minutes.
3. Match the tape, strip, or tablet color to the color chart provided.
4. Record your results. You should record the type of test, the date and time, the result, and anything unusual. For example, maybe you forgot to take your insulin.

Blood Ketone Test

Blood ketone tests are very similar to glucose tests. Most times you merely apply a drop of blood to a testing strip, which has been placed in the meter, and then read the results.

If the result shows trace or small amounts of ketones

1. Drink a glass of water every hour.
2. Check blood glucose and ketones every 3 or 4 hours. If blood glucose and ketone numbers are not going down after two checks, call your doctor.

If the result shows moderate or large amounts of ketones

1. Call your doctor right away! Don't wait. If you wait, your ketone levels may go higher.

IMPORTANT: Even if your ketone test shows small amounts of ketones, if you are nauseated or vomiting, you will need to seek prompt medical attention such as going to an emergency room for treatment.

Vegetarian Diets

Vegetarian diets are based on plant foods. Plant foods include fruits, vegetables, grains, legumes (beans, peas, and lentils), nuts, and seeds. Plant foods have no cholesterol. Most are low in fat and calories. All are high in fiber, vitamins, and minerals.

A vegetarian diet can be a healthy choice for people with diabetes. Vegetarians are less likely to be overweight, to have high cholesterol levels, or to have high blood pressure. Vegetarians are less likely to get heart disease, blood vessel damage, colon or lung cancer, or osteoporosis.

People with type 1 diabetes who become vegetarians may need less insulin. People with type 2 diabetes who become vegetarians may lose weight. Losing weight may improve blood glucose control.

Will I Get Enough Protein?

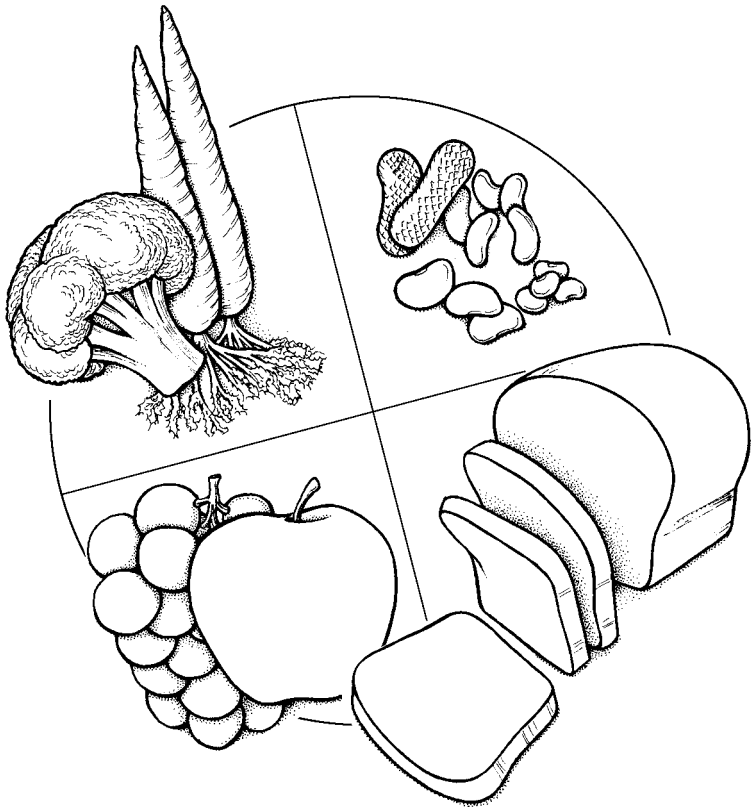
Many people who think about eating a vegetarian diet wonder whether they will get enough protein. But there is little need to worry. Most vegetarians are able to get all the protein they need from high-protein grains, legumes, nuts, and seeds. Other vegetarians also get protein from certain animal foods, such as low-fat dairy products, fish, shellfish, and poultry.

Types of Vegetarians

Whether a vegetarian eats animal foods depends on the kind of vegetarian he or she is. There are five kinds of vegetarians: vegan, lacto-vegetarian, ovo-vegetarian, lacto-ovo-vegetarian, and semi-vegetarian. See the table that follows to find out what each kind of vegetarian eats.

TYPES OF VEGETARIANS

Type	Eats	Does Not Eat
Vegan	Fruits, vegetables, legumes, grains, nuts, seeds	Meat, fish, shellfish, poultry, dairy products, eggs
Lacto-Vegetarian	Fruits, vegetables, legumes, grains, nuts, seeds, dairy products	Meat, fish, eggs, shellfish, poultry
Ovo-Vegetarian	Fruits, vegetables, legumes, grains, nuts, seeds, eggs	Meat, fish, poultry, shellfish, dairy products
Lacto-Ovo-Vegetarian	Fruits, vegetables, legumes, grains, nuts, seeds, eggs, dairy products	Meat, fish, shellfish, poultry
Semi-Vegetarian	Fruits, vegetables, legumes, grains, nuts, seeds, eggs, dairy products, fish, shellfish, poultry	Meat



A healthy meal plan contains foods from different food groups

Trying a Vegetarian Diet

If you would like to try a vegetarian diet, talk with a dietitian. A dietitian can help you substitute foods for those you want to take out of your meal plan. A dietitian can help you make sure you get all the nutrients—vitamins, minerals, protein, fats, and carbohydrates—that your body needs. There are a few ideas for "going vegetarian" on the next page.

TIPS FOR TRYING A VEGETARIAN DIET

- Start by eating one vegetarian meal a week for several weeks. Stick with familiar foods at first, such as spaghetti with marinara sauce.
- Read vegetarian cookbooks for recipe ideas.
- Try eating out at a vegetarian restaurant. You may be surprised by the variety of tasty dishes you'll find.
- Eat less meat, poultry, fish, and shellfish in your meals. An ideal portion is 3 oz—about the size of a deck of cards.
- Cut meat into cubes or strips and add to a salad or grain dish.
- Eat more grains, legumes, and vegetables in your meals.
- Try cooked beans in place of some of the meat in your chili, stir-fries, stews, and casseroles.
- Remember that replacing meat with vegetable proteins, such as beans, will increase the amount of carbohydrates you eat. Make sure you test your blood sugar and work with your physician and dietitian during the process.

V Vitamins & Minerals

The right amounts of vitamins and minerals help your body function well. You can get vitamins and minerals from the foods you eat. You can also get vitamins and minerals from pills. These are called supplements.

Most people with diabetes get enough vitamins and minerals by eating a variety of foods. Some people with diabetes may be deficient in certain vitamins and minerals. Being deficient means your body does not have enough of a vitamin or mineral.

Vitamin Deficiencies

Most people with diabetes get enough vitamin A. Most people with diabetes also get enough vitamin E and vitamin C, but a few people may need more. Check with your doctor about this.

People with diabetes usually get enough of the B vitamins. The B vitamins include vitamin B_1 (thiamin), vitamin B_2 (riboflavin), vitamin B_3 (niacin), vitamin B_6 (pyridoxine), vitamin B_{12}, and folate. If your diabetes is in poor control, though, you risk losing the B vitamins in your urine. Your diabetes care provider may advise you to eat more foods high in the B vitamins.

Research has shown that a deficiency in vitamin B_6 may be related to impaired glucose tolerance. Impaired glucose tolerance means your body has a hard time using insulin.

FOOD SOURCES OF VITAMINS & MINERALS

Vitamin A	Liver, tuna, deep-orange fruits and vegetables, leafy greens
Vitamin B_1 (thiamin)	Pork, sunflower seeds, whole grains
Vitamin B_2 (riboflavin)	Liver, duck, mackerel, dairy foods
Vitamin B_3 (niacin)	Poultry, fish, veal
Vitamin B_6 (pyridoxine)	Potatoes, bananas, chickpeas, prune juice, poultry, fish, liver
Vitamin B_{12}	Fish, shellfish, liver
Vitamin C	Citrus fruits, melon, strawberries, kiwifruit, bell peppers, broccoli, Brussels sprouts
Vitamin D	Fish, milk, butter, margarine, eggs
Vitamin E	Nuts, seeds, oils, mangos, blackberries, apples
Folate	Legumes, leafy greens, asparagus, liver, wheat germ
Calcium	Yogurt, milk, cheese
Chromium	Wheat germ, brewer's yeast, bran, whole grains, liver, meats, cheese
Copper	Crab, liver, nuts, seeds, prunes, raisins
Iron	Shellfish, meats, liver, soybeans, pumpkin seeds
Magnesium	Nuts, seeds, legumes, whole grains, leafy greens, fish
Manganese	Whole grains, vegetables, nuts, fruits
Potassium	Fruits, vegetables, legumes, fish, milk, yogurt
Selenium	Shellfish, fish, liver, nuts, whole grains
Zinc	Meats, liver, shellfish

Mineral Deficiencies

Chromium. Most people with diabetes get enough chromium. But a few people with diabetes have a chromium deficiency. A chromium deficiency can cause higher blood glucose and blood fat levels and impaired glucose tolerance.

If a lab test shows that you have a chromium deficiency, your doctor may have you take a chromium supplement. If you already get enough chromium, taking extra will not help your blood glucose or blood fat levels.

Copper and manganese. Deficiencies in copper and manganese have been linked to impaired glucose tolerance. But most people with diabetes get enough copper and manganese. So deficiencies are not likely.

Selenium and iron. Deficiencies in selenium in people with diabetes are not likely. And most people with diabetes are not at any greater risk for iron deficiency than people without diabetes.

Magnesium. People with diabetes who have poor blood glucose control or have very high ketones are more likely to become deficient in magnesium. A lack of magnesium may make your body less sensitive to insulin. If a lab test shows that your magnesium level is low, your doctor may have you take magnesium supplements.

Zinc. Deficiencies in zinc are more likely in people with diabetes, especially those in poor control. Lack of zinc may cause impaired glucose tolerance. If a lab test shows you do not have enough zinc, your doctor may have you take a supplement or eat more foods high in zinc.

Vitamin or Mineral Supplements

Check with your health care team to be sure you are getting the vitamins and minerals you need. If your team finds that you lack some vitamins and minerals, they may recommend a supplement.

If you try to lose weight and take in fewer than 1,200 calories each day

You may need iron and folate.

If you eat no animal foods at all

You may need vitamin B_{12}, calcium, iron, vitamin B_2 (riboflavin), and zinc.

If you are at risk for bone diseases

You may need vitamin D, calcium, and magnesium.

If you are over 65 years old

You may need calcium and folate.

If you are pregnant or breastfeeding

You may need extra iron, zinc, calcium, and folate.

If you take diuretics (water pills)

You may need magnesium, calcium, potassium, and zinc.

Check with your doctor before taking any supplement.

The Right Dose

The National Academy of Sciences establishes Recommended Dietary Allowances (RDAs) and Safe and Adequate Intakes for vitamins and minerals. These are the minimum amounts of vitamins and minerals that most people need. Healthy people with diabetes need to get these amounts.

RECOMMENDED DIETARY ALLOWANCES OF VITAMINS & MINERALS FOR MEN AND WOMEN AGED 25 TO 50 YEARS

	Men	Women
Vitamin A	1,000 mg RE	800 mg RE
Vitamin B_1 (thiamin)	1.5 mg	1.1 mg
Vitamin B_2 (riboflavin)	1.7 mg	1.3 mg
Vitamin B_3 (niacin)	19 mg	15 mg
Vitamin B_6 (pyridoxine)	2 mg	1.6 mg
Vitamin B_{12}	2.0 mg	2.0 mg
Vitamin C	60 mg	60 mg
Vitamin D	5 mg	5 mg
Vitamin E	10 mg aTE	8 mg aTE
Folate	200 mg	180 mg
Calcium	800 mg	800 mg
Chromium	50 to 200 mg	50 to 200 mg
Copper	1.5 to 3.0 mg	1.5 to 3.0 mg
Iron	10 mg	15 mg
Magnesium	350 mg	280 mg
Manganese	2.0 to 5.0 mg	2.0 to 5.0 mg
Potassium	3,500 mg	3,500 mg
Selenium	70 mg	55 mg
Zinc	15 mg	12 mg

RE stands for retinol equivalents. Since 1974, the National Academy of Sciences has been using retinol equivalents (RE) instead of international units (I.U.) to measure vitamin A in food for vitamin A requirements. aTE stands for alpha-tocopherol equivalents. Alpha-tocopherol is the most easily absorbed form of vitamin E.

Weight Loss

If you are overweight, losing weight is one of the best things you can do for your health. Losing weight will lower your blood pressure, lower your risk of heart disease and blood vessel damage, and improve your blood glucose control.

In fact, your blood glucose control may improve so much that you can cut down on your insulin or diabetes pills. Sometimes, losing just 5–7% of your body weight is enough to improve diabetes control. For someone who is 200 pounds, this is a weight loss of just 10–15 pounds.

Your health care team can work with you to determine a healthy weight-loss goal. They can also assist you in developing a weight-loss plan, which will help you reach your weight-loss goal. You will likely have a long-range goal, but this should be broken down into small, short-term goals with specific action steps.

When you meet a smaller goal, reward yourself with a book, a CD, an outing, or a piece of clothing, for example. Once you have set your goals, you are ready to start your weight-loss program.

The only way to lose weight is to eat less and exercise more. And the only way to keep the weight off is to keep up these two new habits for the rest of your healthy life.

Ways to Eat Less

"Eat less" actually means "eat fewer calories." You may need to eat smaller portions. Or, you may be able to eat the same amount of food, if you eat foods that are lower in calories.

Fat has more than twice as many calories as carbohydrate or protein, so cutting back on high-fat foods is one way to reduce calories.

EAT LESS FOOD TIPS

- Serve food from the stove. Leave the food there instead of putting it on the table. Going for seconds won't be as easy.
- Eat slowly and stop when you just begin to feel full. That way, you won't get too full.
- Don't watch TV, read, or listen to the radio while you eat. These activities may draw your attention away from how much you are eating and whether you are full.
- Ask another family member to put leftovers away. That way, you won't be tempted to eat the remaining food.
- Brush your teeth right after you eat. This gets the taste of food out of your mouth.
- Don't go grocery shopping when you are hungry. You may buy too much. Or you may buy things that aren't on your meal plan.
- Write out a grocery list before you go shopping. Buy just what is on the list.
- Store food out of sight.
- Eat something before you go to a social function. That way, you'll be less tempted by high-calorie foods.
- Don't skip a meal. You may overeat at your next one.
- Don't forbid yourself to eat certain foods. You'll only want them more. Try to cut down on your serving size or the number of times you eat that food in a week.

Ways to Exercise More

Physical activity helps with weight loss and with maintaining a stable weight over time. When you exercise, you burn more calories than you do when you are inactive. And, as you become more fit, you give your metabolism a boost so that you burn more calories even when you're at

rest. The number of calories you burn when you exercise depends on the type of activity you do, how hard you exercise, and for how long. Good exercises for weight loss include aerobic activities like cross-country skiing, walking, jogging, swimming, bicycling, and low-impact aerobics. Strengthening exercises are good to do too.

It's best to exercise at a moderate to brisk, but comfortable, pace so you can keep going for a long time. The longer you exercise, the more calories you burn.

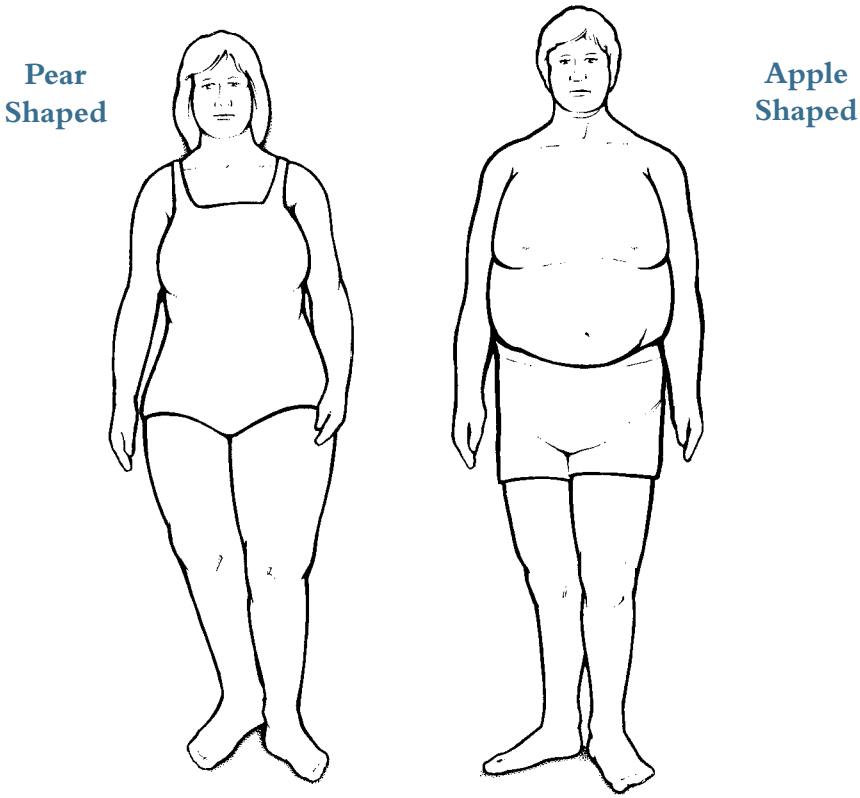
You might start with a 5-minute walk each day. Then, as you get stronger, add a minute to your walk. If you are able to add a minute every day or two, by the end of a week, you will be able to walk 10 minutes or more without stopping. Continue to build up until you are able to walk for 45 to 60 minutes at least 5 times a week. A physical activity goal for losing weight and keeping pounds off is to do a total of 5 to 7 hours of activity each week. To burn even more calories, make an effort to do more lifestyle activities throughout the day. Walk instead of driving. Take the stairs instead of the escalator or elevator. Spend an evening bowling or dancing instead of watching a movie. For more ideas on increasing your physical activity, see Activity, page 3.

MOTIVATING TIPS

- Choose physical activities that you enjoy.
- Pick a convenient time and place for your exercise or activity.
- Have several exercise options to choose from, including indoor and outdoor options and activities you can easily do from home.
- Select an exercise or activity that fits your budget.
- Don't focus only on your weight. When you exercise you lose body fat and build lean muscle. Muscle weighs more than fat.
- Check your measurements with a tape measure. You'll be able to see that you're getting leaner.

How to Keep The Weight Off

When you have reached your body weight goal, it will be important for you to keep up your new eating and exercise habits in order to stay at your new, healthy weight. Keeping weight off is sometimes more challenging than losing it. Many people regain lost weight because they return to their old eating and exercise habits. If you notice yourself returning to your old ways, focus on all the strategies you used to lose weight, and practice them once again. By stopping weight re-gain early, you can continue to look and feel your best.



People who carry weight on their hips and thighs are pear-shaped. People who carry more weight around the waist and abdomen are apple-shaped. Apple-shaped people are more likely to have blood vessel damage, heart disease, high blood pressure, high blood fat levels, insulin resistance, and poor blood glucose control.

Yoga

Staying active is a big part of controlling your blood glucose levels with diabetes, especially type 2 diabetes. In recent years, more and more research has shown that exercise and activity can go a long way toward helping your body use insulin more efficiently. In fact, some believe that exercise might be one of the most important factors in keeping blood glucose levels near normal.

There are many forms of exercise and countless ways to stay active. These range from weeding the garden to taking a walk to riding cross-country on a bicycle. There are also different ways to focus your activity to get different results. You can concentrate on building strength with resistance activities, such as lifting weights. You can focus on elevating your heart rate for a period of time with aerobic exercises, such as jogging. You can also focus on increasing your flexibility with stretching exercises, such as yoga.

Yoga and Flexibility

Flexibility is a part of exercise that is often overlooked. Many people tend to focus on building muscles or improving their aerobic capacity. Stretching and flexibility is usually seen as something you do before you exercise, not as exercise in its own right. However, improving your flexibility through activities such as yoga can reap a lot of rewards. Flexibility is generally thought of as how far you can comfortably move your muscles around your joints, or your range of motion.

Yoga is an excellent way to improve flexibility because it works stretching exercises into a complete, low-impact, full-body program. It involves holding your body in various positions or doing a series of slow movements while you concentrate on your breathing patterns. Yoga is an excellent choice if you haven't been active for a while, you're recovering

HEALTH BENEFITS OF YOGA

- Decreases tension on your muscles
- Helps prevent injury
- Eases muscle and joint discomfort
- Increases strength
- Increases energy
- Relieves physical and mental stress

from an injury, or you have limited mobility. It's also a good addition to any cross-training routine, since it works muscles you don't normally use.

There are many different types of yoga (some more active, others more meditative), so be sure to look into the various choices to find the type that is best for you. Generally, it's also better to take a yoga class, as opposed to following a book or tape. Having a yoga instructor there to make sure you are in the correct position and doing the exercises correctly can be a big help.

Yoga may not be right for everyone. If you have high blood pressure or retinopathy, you may need to avoid placing your head below your waist. Before you begin any new exercise program, discuss the activity with your doctor or a member of your health care team. Not only will they be able to assess your ability to take part in an activity such as yoga, but they will also be able to provide you with information on local groups, classes, and other resources.

Zzzs (Sleep)

Americans are a severely sleep-deprived people. Adults in this country, on average, sleep only 6 1/2 hours a night, with a third of us sleeping even less than that. Fifty years ago, people averaged an hour more sleep than we do today. Eighty years ago, people got about 2 hours more. So why can't we sleep? Nobody can pinpoint one single reason, but some suspect it is too much work, too much stress, too much TV and Internet, or a combination of all three. Whatever the reason, there seems to be something keeping us from getting a good night's rest.

The effects of not having enough sleep can be very harmful. Besides just making us less alert in our daily lives (some studies suggest that 10% of all auto accidents and most job-related accidents are caused by fatigue), being sleep deprived can disrupt the way your body works to regulate itself. Lack of sleep has been linked to high blood pressure, heart attack, and stroke. Recent research suggests that not getting enough sleep can even cause diabetes, or for those who already have diabetes, cause complications from diabetes to worsen.

Sleep and Diabetes

How can lack of sleep cause diabetes? While the cause is still not known, it appears that sleep helps regulate certain hormones that work together to determine how sensitive you are to insulin. When you do not get enough sleep, your body becomes less sensitive to insulin. In one study of sleep-deprived young males, insulin levels in the blood were up to 50% higher when they did not get enough sleep. It may not always be this striking, but not getting enough sleep appears to be directly linked to high levels of insulin in the bloodstream. Over time, these high levels of insulin can cause your body to become more and more insulin resistant, and possibly lead to diabetes.

If you already have diabetes, the effects of too little sleep can be even more dramatic. The insulin resistance that comes with not enough sleep can intensify your preexisting diabetes, making it much harder to control your blood glucose levels and putting you at a much higher risk of developing complications. If you have diabetes or are at risk for diabetes, getting enough sleep is not just a matter of being better rested, it's a matter of good health. It you cannot wake up without the help of an alarm clock you are probably not getting enough sleep.

Sleep Apnea

Getting a good night's sleep is easier said than done, however. In addition to the many lifestyle obstacles that often keep us from getting enough sleep—stress, entertainment, and insomnia—people with diabetes often suffer from a sleeping disorder call *sleep apnea*. Sleep apnea prevents people from getting enough oxygen while they sleep, which can interrupt deep sleep and make it harder to get good rest. Most people with sleep apnea aren't aware that they suffer from the disorder, and it has been suggested that 9 out of 10 people with sleep apnea go undiagnosed. If you have sleep apnea, you may often feel very tired, even after many hours of sleep, and have trouble getting out of bed in the morning. Although a link has not been clearly established, sleep apnea, diabetes, and obesity often go hand in hand.

Besides keeping you from feeling rested, sleep apnea can produce the same insulin-resistant effects that come from not getting enough sleep. It has been suggested that just like lack of sleep in general, there's a link between sleep apnea and an increased rate of heart disease, heart attack, and stroke, though this may not be caused by sleep apnea; the two conditions may just be caused by a common source.

Fortunately, there are treatments for sleep apnea that can be very effective. If you feel you suffer from this condition, talk with a member of your diabetes care team about what treatments might be right for you.

TIPS FOR GOOD SLEEP

- Reserve the bed for sleep (and intimacy) only. Doing other activities in bed, such as watching TV, discussing emotional issues, or working on a laptop, can cause you to associate the bed with things other than sleep.
- Avoid naps in the afternoon or early evening. Some people find one or two 10-minute naps each day very helpful even though they get enough sleep.
- Avoid caffeine, nicotine (don't smoke!), and alcohol in the evening. Alcohol may seem as if it helps put you to sleep, but as it is processed by your body, it can cause you to wake early and may cause nightmares and sweats.
- Try to establish a calming, pre-bed ritual. It can often be hard to "turn off" the stresses of daily life and simply fall asleep. Performing a calming activity before you go to sleep, such as taking a hot bath, meditating, or listening to calming music, will help clear your mind of the stress of daily life.
- Minimize bright lights, noise, and other aggravating factors in your sleep area.
- A light snack before bed can be relaxing (and, if you take insulin, help avoid nighttime lows), but a full meal right before you go to bed can make it hard to sleep.
- Try to go to sleep and wake at the same time every day, even on weekends. Getting your body into a sleeping rhythm is very important.
- If you feel you have a sleeping disorder, such as sleep apnea, insomnia, or narcolepsy, talk with your health care team about options for treatment.

Index

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

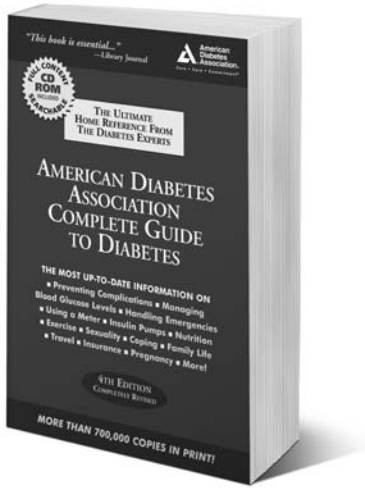
V

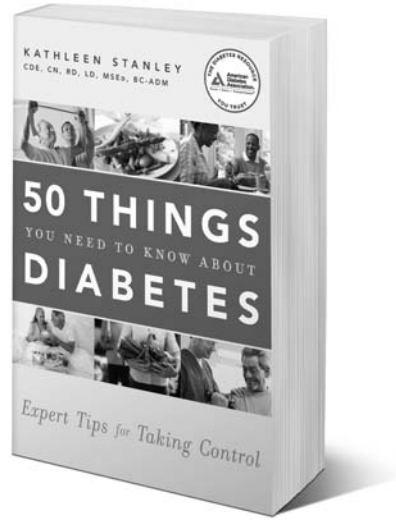
W

Y

Z

Other Titles from the American Diabetes Association





Complete Guide to Diabetes, 4th Edition

by American Diabetes Association

Have all the tips and information on diabetes that you need close at hand. The world's largest collection of diabetes self-care tips, techniques, and tricks for solving diabetes-related problems is back in its fourth edition, and it's bigger and better than ever before.

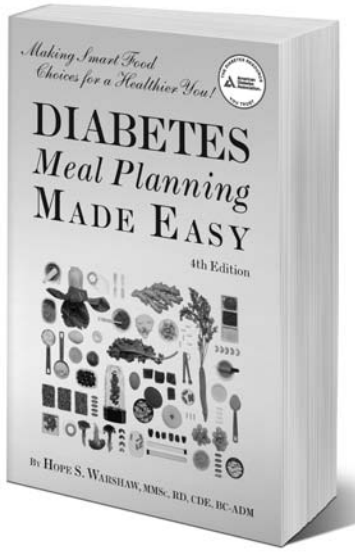
Order no. 4809-04; New low price $19.95

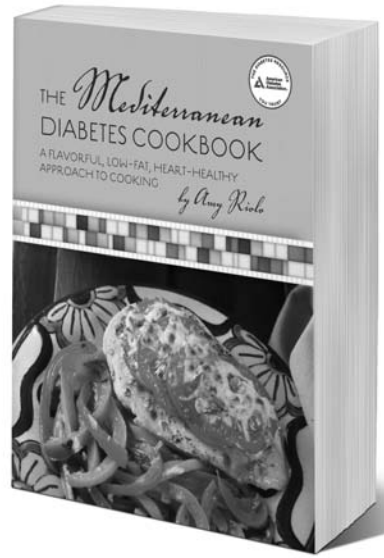
50 Things You Need to Know About Diabetes

by Kathleen Stanley, CDE, CN, RD, LD, MSEd, BC-ADM

Cut through the confusion, jargon, and conflicting information about diabetes care and get the simple advice you need about eating right, exercising, and staying healthy. Learn how to interpret A1C and eAG numbers, keep your love life happy, and avoid depression and burnout. Make your life easier—and a lot healthier!

Order no. 4884-01; Price $17.95





Diabetes Meal Planning Made Easy, 4th Edition

by Hope S. Warshaw, MMSc, RD, CDE, BC-ADM

This new edition of the meal-planning bestseller uncovers the secrets to healthy eating with diabetes—from the basics of what to eat to the practical skills of shopping, planning nutritious meals, and even eating healthy restaurant meals. You don't have to change your life to eat healthy, but you might be surprised to learn how eating healthy can change your life!

Order no. 4706-04; Price $16.95

The Mediterranean Diabetes Cookbook

by Amy Riolo

Imagine cooking without sacrificing flavor. Mediterranean cuisine uses healthful, fresh ingredients, and when it is paired with the moderate Mediterranean lifestyle, you can enjoy delicious, traditional, and naturally diabetes-friendly dishes. Regain the joys of eating with *The Mediterranean Diabetes Cookbook*.

Order no. 4674-01; Price $19.95

To order these and other great American Diabetes Association titles, call 1-800-232-6733 or visit http://store.diabetes.org. American Diabetes Association titles are also available in bookstores nationwide.