

Prevent diabetes problems

Keep your diabetes under control



National Institute of
Diabetes and Digestive
and Kidney Diseases

National Diabetes Information
Clearinghouse

Prevent diabetes problems:
Keep your diabetes
under control

Contents

| | |
|---|----|
| What are diabetes problems?..... | 1 |
| Who can help me with my diabetes care?..... | 3 |
| What should my blood glucose numbers be? | 4 |
| How can I check my blood glucose numbers?..... | 6 |
| What should I do if my blood glucose numbers are too high or too low? | 8 |
| What is the A1C test? | 12 |
| What should my blood pressure be? | 15 |
| What should my cholesterol and triglycerides be?..... | 17 |
| Eating, Diet, and Nutrition | 20 |
| Will I need to take diabetes medicines? | 21 |
| What does smoking have to do with diabetes problems? | 22 |
| What steps can I take to prevent diabetes problems? | 23 |
| What should I discuss with my health care team at each checkup? | 26 |
| What tests, exams, and vaccines do I need if I have diabetes? | 28 |
| How to Use the Daily Diabetes Record | 30 |
| My Health Care Team Members..... | 34 |

Pronunciation Guide 35
For More Information 36
More in the Series 37
Acknowledgments 39

What are diabetes problems?

Diabetes problems are health problems that can happen when you have diabetes. If your diabetes is not under control, you will have too much **glucose**,* also called sugar, in your blood. Having too much glucose in your blood for a long time can affect many important parts of your body, such as your

- blood vessels and heart
- nerves
- kidneys
- mouth
- eyes
- feet

You can do a lot to prevent or slow down these health problems if you keep your diabetes under control.

*See the Pronunciation Guide for tips on how to say the words in **bold** type.

This chart shows the body parts that can be affected by diabetes and the resulting health problems you may have.

| Affected Body Part | Resulting Health Problems You May Have |
|-------------------------|--|
| Blood vessels and heart | <ul style="list-style-type: none"> • Heart disease • Heart attack • Stroke • High blood pressure • Poor blood circulation, or flow, throughout your body |
| Nerves | <ul style="list-style-type: none"> • Pain, tingling, weakness, or numbness in your hands, arms, feet, or legs • Problems with your bladder, digestion, having sex, and keeping your heartbeats and blood pressure steady |
| Kidneys | <ul style="list-style-type: none"> • Protein loss through your urine • Buildup of wastes and fluid in your blood |
| Mouth | <ul style="list-style-type: none"> • Gum disease and loss of teeth • Dry mouth • Thrush, or the growth of too much fungus in the mouth |
| Eyes | <ul style="list-style-type: none"> • Loss of vision and blindness |
| Feet | <ul style="list-style-type: none"> • Sores • Infections • Amputation |

Who can help me with my diabetes care?

Taking care of diabetes is a group effort among you, your family, and your health care team. A diabetes health care team may include these health care providers:

- a doctor
- an **endocrinologist**—a doctor with special training in diabetes
- diabetes educators, such as a nurse and **dietitian**
- a counselor
- a pharmacist
- a dentist
- an eye doctor
- a foot doctor

You are the most important member of the team.

What should my blood glucose numbers be?

Your blood glucose numbers should meet the targets in this chart unless your doctor helps you set different targets. Targets are numbers you aim for. The chart shows the target blood glucose numbers—measured in milligrams per deciliter (mg/dL)—for most people with diabetes.

| Target Blood Glucose Numbers (mg/dL) for Most People with Diabetes | |
|---|----------------|
| Time of Day | Targets |
| Before meals and when you wake up | 70 to 130 |
| 1 to 2 hours after eating | 180 or below |

This chart shows target blood glucose numbers for women with diabetes who become pregnant.

| Target Blood Glucose Numbers (mg/dL) for Women with Diabetes Who Become Pregnant | |
|---|----------------|
| Time of Day | Targets |
| Before meals and when you wake up | 60 to 99 |
| 1 to 2 hours after eating | 129 or below |

This chart shows target blood glucose numbers for women who develop diabetes during pregnancy, called **gestational** diabetes.

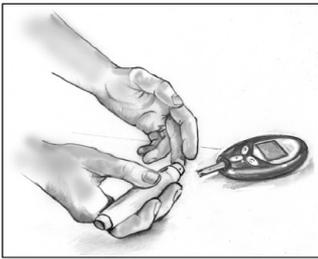
| Target Blood Glucose Numbers (mg/dL) for Women with Gestational Diabetes | |
|---|--------------|
| Time of Day | Targets |
| Before meals and when you wake up | 95 or below |
| 1 hour after eating | 140 or below |
| 2 hours after eating | 120 or below |



How can I check my blood glucose numbers?

You can check your blood glucose numbers at home using a blood glucose meter. Your health care team can teach you how to

- prick your finger to get a drop of blood for testing
- use your meter to find out the glucose level in the drop of blood



The results of your blood glucose checks can help you make decisions about your diabetes medicines, daily meals and snacks, and physical activity.

Ask your health care team when and how often you need to check your blood glucose. Self-tests are usually done before meals, after meals, and at bedtime.

Your blood glucose test results will help you and your health care team make a plan for keeping your blood glucose under control.

Keep track of your blood glucose test results by using a record page.

- Make copies of the record page at the end of this booklet or ask your health care team for a blood glucose record book.
- Always bring your record book to your checkups so you can talk with your health care team about reaching your target blood glucose levels.

Or you may be able to use an electronic blood glucose tracking system on the Internet or on your cell phone.



What should I do if my blood glucose numbers are too high or too low?

If your blood glucose numbers are often higher or lower than your targets, tell your health care team. You may need to make changes in how you take care of your diabetes.

High blood glucose, called **hyperglycemia**, can make you

- thirsty
- weak or tired
- have headaches
- urinate more often
- have trouble paying attention
- have blurred vision
- have yeast infections

Talk with your health care team if you notice any of these symptoms. Ask what you should do when your blood glucose is too high.

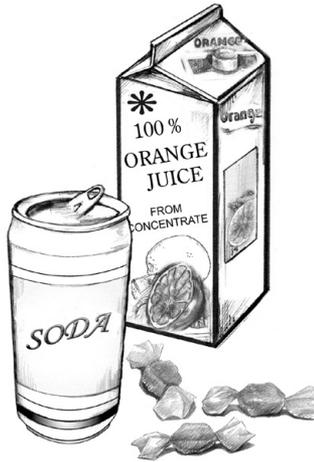
Low blood glucose, called **hypoglycemia**, can make you

- hungry
- dizzy or shaky
- confused
- pale
- sweat more
- weak
- anxious or cranky
- have headaches
- have a fast heartbeat

Severe hypoglycemia can cause you to pass out. If that happens, you'll need help bringing your blood glucose level back to normal. Your health care team can teach your family members and friends how to give you an injection of **glucagon**, a medicine that raises blood glucose levels quickly. If glucagon is not available, someone should call 911 to get you to the nearest emergency room for treatment.

If you have any of these symptoms, check your blood glucose. If your number is too low, have one of these quick sources of glucose:

- three or four glucose tablets
- one serving of glucose gel—the amount equal to 15 grams of carbohydrates
- 1/2 cup, or 4 ounces, of any fruit juice
- 1/2 cup, or 4 ounces, of a regular—not diet—soft drink
- 1 cup, or 8 ounces, of milk
- five or six pieces of hard candy
- 1 tablespoon of sugar or honey





Check your blood glucose again in 15 minutes to make sure it is at your pre-meal target number. If your number is still too low, have another serving of a quick glucose food or drink. Repeat these steps until your blood glucose is at your pre-meal target number or higher.

After you feel better and your blood glucose returns to your target number, eat your regular meals and snacks as planned.

What is the A1C test?

The **A1C** test, also called the **hemoglobin A1C** test, **HbA1C**, or **glycohemoglobin** test, is a blood test that reflects the average level of glucose in your blood during the past 3 months. Your A1C test result is given in percents. Your doctor might use the A1C test to help diagnose your diabetes. Your doctor will draw a sample of your blood in the office or send you to a lab to have a sample of your blood drawn for the test. After being diagnosed with diabetes, you should have the A1C test at least twice a year.

Your A1C result plus your record of blood glucose numbers show whether your blood glucose is under control.

- **If your A1C result is too high, you may need to change your diabetes care plan.** Your health care team can help you decide what part of your plan to change. For instance, you might need to change your meal plan, your diabetes medicines, or your physical activity plan.
- **If your A1C result is on target, then your diabetes treatment plan is working.** The lower your A1C is, the lower your chance of having diabetes problems.

This chart shows the A1C goals for different types of people with diabetes.

| Types of People | A1C Goals |
|--|-----------|
| Most people with diabetes | below 7% |
| Women with diabetes who want to get pregnant or who are pregnant | below 6% |

A1C goals can also depend on

- how long you have had diabetes
- whether or not you have other health problems

Ask your doctor what goal is right for you.



This chart shows how your A1C result may match up to your average blood glucose number.

| What Your A1C Result Means | |
|-----------------------------------|--|
| My A1C Result | My Average Blood Glucose Number |
| 6% | 135 |
| 7% | 170 |
| 8% | 205 |
| 9% | 240 |
| 10% | 275 |
| 11% | 310 |
| 12% | 345 |

What should my blood pressure be?

Your blood pressure should be below 140/80 unless your doctor helps you set a different goal.

Blood pressure is the force of blood flow inside your blood vessels. Blood pressure is written with two numbers separated by a slash and is said as “140 over 80.” The top number is the pressure as your heart beats and pushes blood through your blood vessels. The bottom number is the pressure as your blood vessels relax between heartbeats.

High blood pressure forces your heart to work harder to pump blood. High blood pressure can strain your heart, damage blood vessels, and increase your risk of heart attack, stroke, eye problems, and kidney problems.



Many people with diabetes also have high blood pressure. But keeping your blood pressure at your goal will help prevent damage to your heart, blood vessels, and other parts of your body. Healthy meal planning, medicines, and physical activity can help you reach your blood pressure goal.

Have your blood pressure checked at every medical visit. Ask your doctor whether you need medicine to control your blood pressure.



What should my cholesterol and triglycerides be?

Your **cholesterol** and **triglyceride** numbers should meet the targets in this chart unless your doctor helps you set different targets.

| Target Blood Cholesterol Numbers for People with Diabetes | |
|---|---|
| Total cholesterol | below 200 |
| LDL, or bad, cholesterol | below 100 or below 70 if you have cardiovascular disease or other health problems |
| HDL, or good, cholesterol | above 40 in men and above 50 in women |
| Triglycerides | below 150 |

Cholesterol is a type of fat found in your body's cells, in blood, and in many foods. High cholesterol can lead to heart and blood vessel disease, also called **cardiovascular** disease. Cardiovascular disease is the biggest health problem for people with diabetes.

LDL cholesterol. LDL cholesterol is known as the bad cholesterol because it builds up in the artery walls that supply blood to your heart. Extra cholesterol in your blood can build up in artery walls if

- you often eat foods that are high in LDL cholesterol
- high cholesterol runs in your family

HDL cholesterol. HDL cholesterol, or good cholesterol, carries cholesterol from other parts of your body back to your liver, which removes the cholesterol from your body.

Triglycerides. Triglycerides are another form of fat found in your blood and in food. Although triglycerides do not build up in artery walls, they can be a sign that your risk for cardiovascular disease is high.

Total cholesterol. Your total cholesterol number reflects all the cholesterol in the blood, but is mostly due to the amount of your LDL cholesterol.

Meeting your target numbers for cholesterol levels will help prevent heart disease, stroke, and damage to your blood vessels. Keeping cholesterol levels under control can also help with blood flow. Healthy meal planning, medicines, and physical activity can help you reach your target blood cholesterol numbers.

Have your cholesterol checked at least once a year. Your doctor will send you to a lab to have a small sample of your blood drawn for the cholesterol test. Ask your doctor whether you need medicine called a statin to control your cholesterol.



Eating, Diet, and Nutrition

Following a healthy eating plan is a key step in living with diabetes and preventing diabetes problems. Your health care team will help you make a healthy eating plan.

Read more in *What I need to know about Eating and Diabetes* at www.diabetes.niddk.nih.gov or call 1-800-860-8747.



Will I need to take diabetes medicines?

If you cannot reach your target blood glucose levels with a healthy eating plan and physical activity, you may need diabetes medicines. The kind of medicines you'll take will depend on your type of diabetes, your schedule, and your other health problems. Diabetes medicines help keep your blood glucose in the target range.

Your doctor will prescribe any medicines you need, including **insulin**. Insulin helps your blood glucose levels stay on target by moving glucose from your blood to your body's cells. You will need to take insulin if your body no longer makes enough.

Be sure to take your medicines as directed by your doctor.

What does smoking have to do with diabetes problems?

Smoking and diabetes are a dangerous mix. Smoking raises your risk for many diabetes problems. If you quit smoking,

- you will lower your risk for heart attack, stroke, nerve disease, kidney disease, and amputation
- your cholesterol and blood pressure levels might improve
- your blood circulation will improve

If you smoke, stop smoking. Ask for help so that you don't have to do it alone. You can start by calling 1-800-QUITNOW or 1-800-784-8669.



What steps can I take to prevent diabetes problems?

You can take steps each day to prevent diabetes problems.

| Steps | |
|--|---|
| Healthy Eating | |
|  | <ul style="list-style-type: none">• Follow the healthy eating plan that you and your doctor or dietitian have made.• Learn what to eat to keep your blood glucose levels under control.• Make wise food choices to help you feel good every day and to lose weight if needed. |
| Blood Glucose | |
|  | <ul style="list-style-type: none">• Check your blood glucose every day.• Each time you check your blood glucose, write the number in a record book to share with your health care team.• Treat low blood glucose quickly. |

(continued)

Steps

Physical Activity



- Even small amounts of physical activity help manage diabetes. Aim for 30 to 60 minutes of physical activity most days of the week. Children and adolescents with type 2 diabetes who are 10 to 17 years old should aim for 60 minutes of activity every day.
- Not all physical activity has to take place at the same time.
- Do **aerobic** activities, such as brisk walking, which use your large muscles to make your heart beat faster. The large muscles are those of the upper and lower arms and legs and those that control head, shoulder, and hip movements.
- Do activities to strengthen muscles and bone, such as lifting weights or sit-ups. Aim for two times a week.
- Stretch to increase your flexibility, lower stress, and help prevent muscle soreness after physical activity.
- Increase daily activity by decreasing time spent watching TV or at the computer. Children and adolescents should limit screen time not related to school to less than 2 hours per day. Limiting screen time can help you meet your physical activity goal.
- Always talk with your doctor before you start a new physical activity program.

(continued)

Steps

Medicines



- Take your medicines as directed, including insulin if ordered by your doctor.

Feet



- Check your feet every day for cuts, blisters, sores, swelling, redness, or sore toenails.

Mouth



- Brush and floss your teeth every day.

Blood Pressure



- Control your blood pressure and cholesterol.

Smoking



- Don't smoke.

What should I discuss with my health care team at each checkup?

This chart lists important things that you should discuss with your health care team at each checkup.

| Things to Discuss with Your Health Care Team at Each Checkup | Make Sure to... |
|---|--|
| Blood glucose records and how you check your blood glucose | <ul style="list-style-type: none"> • Share your blood glucose records. Your health care team will ask to see how you are checking your blood glucose to make sure you are doing it right. • Mention if you often have low or high blood glucose. |
| Weight | <ul style="list-style-type: none"> • Talk about how much you should weigh. • Talk about ways to reach your weight goal that will work for you. |
| Blood pressure | <ul style="list-style-type: none"> • Talk about your blood pressure numbers. |
| Cholesterol | <ul style="list-style-type: none"> • Talk about your cholesterol numbers. |

(continued)

| Things to Discuss with Your Health Care Team at Each Checkup | Make Sure to... |
|---|---|
| Medicines | <ul style="list-style-type: none"> • Talk about the medicines you are taking. Mention if you are having any problems. • Ask if you should take a low-dose aspirin every day to lower your risk for heart disease. |
| Feet | <ul style="list-style-type: none"> • Ask to have your feet checked for problems. |
| Physical activity plan | <ul style="list-style-type: none"> • Talk about what you do to stay active. |
| Meal plan | <ul style="list-style-type: none"> • Talk about what you eat, how much you eat, and when you eat. |
| Feelings | <ul style="list-style-type: none"> • Ask about ways to handle stress. • If you are feeling sad or unable to cope with problems, ask for help. |
| Smoking | <ul style="list-style-type: none"> • If you smoke, ask for help with quitting. |
| Mouth | <ul style="list-style-type: none"> • If you see signs of problems from diabetes in your mouth, tell your doctor and see your dentist. |

What tests, exams, and vaccines do I need if I have diabetes?

This chart lists important tests, exams, and vaccines to get at least once or twice a year.

| Tests, Exams, and Vaccines to Get at Least Once or Twice a Year | Make Sure to... |
|---|--|
| A1C test | <ul style="list-style-type: none">• Have this blood test at least twice a year. Your result will tell you what your average blood glucose level was for the past 3 months. |
| Cholesterol test | <ul style="list-style-type: none">• Get a blood test to check your<ul style="list-style-type: none">• total cholesterol• LDL• HDL• triglycerides |
| Kidney tests | <ul style="list-style-type: none">• Once a year, get a urine test to check for protein.• At least once a year, get a blood test to check for creatinine, a waste product healthy kidneys remove from the body. |

(continued)

| Tests, Exams, and Vaccines to Get at Least Once or Twice a Year | Make Sure to... |
|--|--|
| Eye exam | <ul style="list-style-type: none"> • See an eye doctor once a year for a complete eye exam that includes using drops in your eyes to dilate your pupils. • If you are pregnant, have a complete eye exam in your first 3 months of pregnancy. Have another complete eye exam 1 year after your baby is born. |
| Dental exam | <ul style="list-style-type: none"> • See your dentist twice a year for a cleaning and checkup. |
| Flu vaccine | <ul style="list-style-type: none"> • Get a flu vaccine each year. |
| Pneumonia vaccine | <ul style="list-style-type: none"> • Get this vaccine if you are younger than 64. • If you're older than 64 and your vaccine was more than 5 years ago, get another one. |
| Hepatitis B vaccine | <ul style="list-style-type: none"> • Get this vaccine if you're younger than 60 and you have not already had the vaccine. • Prevent exposure to Hepatitis B by not sharing blood glucose monitors or other diabetes equipment. |

How to Use the Daily Diabetes Record

The next page is a blank record where you can keep track of your blood glucose test results, medicines, and notes about things that affect your blood glucose. Make one copy of the record page for each week. This record will help you see whether your diabetes plan is working. Review your record with your health care team at each checkup.

Follow this checklist when completing the daily diabetes record.

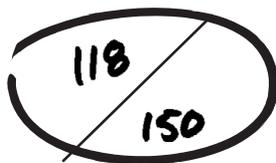
Blood Glucose Checks

- Talk with your health care team about the best times to check your blood glucose—before meals, after meals, or at bedtime. Write when to check your blood glucose at the top of the chart.
- Write down your target blood glucose numbers. If needed, record test results taken before and after a meal on either side of the line in the meal boxes. For instance,



118
/ 150

- Circle the blood glucose result each time you're above or below your target. For instance,



Medicines

- Under the heading marked “Medicines,” write the names of your diabetes medicines and the amounts taken.

Notes

- Write down things that may affect your blood glucose numbers. Some examples are
 - eating more or less than usual
 - forgetting to take your diabetes medicines
 - physical activity—write down what kind and for how long
 - being sick
 - feeling upset about something—being under stress

Daily Diabetes Record*

My Target Blood Glucose Numbers

Before meal target _____ to _____

1 to 2 hours after the start of a meal target _____ or below

My A1C target _____

When to check my blood glucose _____

Call my health care team if my blood glucose is higher than _____

| | Breakfast blood glucose | Medicines | Lunch blood glucose | Medicines | Dinner blood glucose | Medicines | Bedtime blood glucose | Medicines | Other blood glucose check | Notes: (Special events, sick days, physical activity) |
|-----------|-------------------------------|-----------|---------------------------|-----------|----------------------------|-----------|-----------------------------|-----------|------------------------------------|--|
| Monday | | | | | | | | | | |
| Tuesday | | | | | | | | | | |
| Wednesday | | | | | | | | | | |
| Thursday | | | | | | | | | | |
| Friday | | | | | | | | | | |
| Saturday | | | | | | | | | | |
| Sunday | | | | | | | | | | |

*Keep this copy clean. Make photocopies and write on those.

My Health Care Team Members

Use this chart to keep track of the contact information for your health care team members.

| | Name and Address | Phone |
|-------------------|------------------|-------|
| Doctor | | |
| Endocrinologist | | |
| Diabetes educator | | |
| Counselor | | |
| Pharmacist | | |
| Dentist | | |
| Eye doctor | | |
| Foot doctor | | |

Pronunciation Guide

A1C (AY-WUHN-SEE)

aerobic (air-OH-bik)

amputation (AM-pyoo-TAY-shuhn)

cardiovascular (KAR-dee-oh-VASS-kyoo-lur)

cholesterol (koh-LESS-tur-ol)

circulation (SUR-kyoo-LAY-shuhn)

creatinine (kree-AT-ih-noon)

dietitian (DY-uh-TISH-uhn)

endocrinologist (EN-doh-krih-NOL-uh-jist)

gestational (jess-TAY-shuhn-uhl)

glucagon (GLOO-kuh-gon)

glucose (GLOO-kohss)

glycohemoglobin (GLY-koh-HEE-moh-GLOH-bin)

hemoglobin (HEE-moh-GLOH-bin)

hyperglycemia (HY-pur-gly-SEE-mee-uh)

hypoglycemia (HY-poh-gly-SEE-mee-uh)

insulin (IN-suh-lin)

triglyceride (try-GLISS-ur-eyed)

For More Information

To find diabetes educators (nurses, dietitians, pharmacists, and other health care providers), contact

American Association of Diabetes Educators

200 West Madison Street, Suite 800

Chicago, IL 60606

Phone: 1-800-338-3633

Internet: www.diabeteseducator.org

To find dietitians, contact

Academy of Nutrition and Dietetics

Internet: www.eatright.org

Click on “Find a Registered Dietitian.”

To get more information about taking care of diabetes, contact

National Diabetes Information Clearinghouse

1 Information Way

Bethesda, MD 20892-3560

Phone: 1-800-860-8747

TTY: 1-866-569-1162

Fax: 703-738-4929

Email: ndic@info.niddk.nih.gov

Internet: www.diabetes.niddk.nih.gov

American Diabetes Association

1701 North Beauregard Street

Alexandria, VA 22311

Phone: 1-800-DIABETES (1-800-342-2383)

Email: askADA@diabetes.org

Internet: www.diabetes.org

JDRF

26 Broadway, 14th Floor

New York, NY 10004

Phone: 1-800-533-CURE (1-800-533-2873)

Fax: 212-785-9595

Email: info@jdrf.org

Internet: www.jdrf.org

More in the Series

The Prevent Diabetes Problems Series includes seven booklets that can help you learn more about how to prevent diabetes problems.

- *Prevent diabetes problems: Keep your diabetes under control*
- *Prevent diabetes problems: Keep your eyes healthy*
- *Prevent diabetes problems: Keep your feet healthy*
- *Prevent diabetes problems: Keep your heart and blood vessels healthy*
- *Prevent diabetes problems: Keep your kidneys healthy*

- *Prevent diabetes problems: Keep your mouth healthy*
- *Prevent diabetes problems: Keep your nervous system healthy*

For free single copies of these booklets, write, call, fax, or email the

National Diabetes Information Clearinghouse

1 Information Way

Bethesda, MD 20892-3560

Phone: 1-800-860-8747

TTY: 1-866-569-1162

Fax: 703-738-4929

Email: ndic@info.niddk.nih.gov

These booklets are also available at
www.diabetes.niddk.nih.gov.



Acknowledgments

Publications produced by the Clearinghouse are carefully reviewed by both NIDDK scientists and outside experts. The National Diabetes Information Clearinghouse thanks the following people who helped review or field-test the original version of this publication:

For the American Association of Diabetes Educators

Lynn Grieger, R.D.,
C.D.E.
Arlington, VT
Celia Levesque, R.N.,
C.D.E.
Montgomery, AL
Teresa McMahon,
Pharm.D., C.D.E.
Seattle, WA
Barbara Schreiner, R.N.,
M.N., C.D.E.
Galveston, TX

For the American Diabetes Association

Phyllis Barrier, M.S.,
R.D., C.D.E.
Alexandria, VA
Linda Haas, Ph.C., R.N.,
C.D.E.
Seattle, WA
Kathleen Mahoney,
M.S.N., R.N., C.D.E.
Drexel Hill, PA
Randi Kington, M.S.,
R.N., C.S., C.D.E.
Hartford, CT

For the Centers for Medicare & Medicaid Services

Baltimore, MD
Jan Drass, R.N., C.D.E.

For the Diabetes Research and Training Centers

Albert Einstein School
of Medicine
Norwalk Hospital
Norwalk, CT
Jill Ely, R.N., C.D.E.
Sam Engel, M.D.
Pam Howard, A.P.R.N.,
C.D.E.

Indiana University
School of Medicine
Indianapolis, IN
Madelyn Wheeler, M.S.,
R.D., F.A.D.A., C.D.E.

VA/JDF Diabetes
Research Center
Vanderbilt School of
Medicine
Nashville, TN
Ok Chon Allison,
M.S.N., R.N.C.S.,
A.N.P., C.D.E.
Barbara Backer, B.S.
James W. Pichert, Ph.D.
Alvin Powers, M.D.
Melissa E. Schweikhart
Michael B. Smith
Kathleen Wolffe, R.N.

For the Grady Health System Diabetes Clinic

Atlanta, GA
Ernestine Baker, R.N.,
F.N.P., C.D.E.
Kris Ernst, R.N., C.D.E.
Margaret Fowke, R.D.,
L.D.
Kay Mann, R.N., C.D.E.

For the Indian Health Service

Albuquerque, NM
Ruth Bear, R.D., C.D.E.
Dorinda Bradley, R.N.,
C.D.E.
Terry Fisher, R.N.
Lorraine Valdez, R.N.,
C.D.E.

Red Lake, MN
Charmaine Branchaud,
B.S.N., R.N., C.D.E.

For the Medlantic Research Center

Washington, D.C.
Resa Levetan, M.D.

For the Texas Diabetes Council

Texas Department of
Health
Austin, TX
Luby Garza-Abijaoude,
M.S., R.D., L.D.

National Diabetes Education Program

1 Diabetes Way

Bethesda, MD 20814-9692

Phone: 1-888-693-NDEP (1-888-693-6337)

TTY: 1-866-569-1162

Fax: 703-738-4929

Email: ndep@mail.nih.gov

Internet: www.ndep.nih.gov

www.yourdiabetesinfo.org

The National Diabetes Education Program is a federally funded program sponsored by the U.S. Department of Health and Human Services' National Institutes of Health and the Centers for Disease Control and Prevention and includes over 200 partners at the federal, state, and local levels, working together to reduce the morbidity and mortality associated with diabetes.

National Diabetes Information Clearinghouse

1 Information Way
Bethesda, MD 20892-3560
Phone: 1-800-860-8747
TTY: 1-866-569-1162
Fax: 703-738-4929
Email: ndic@info.niddk.nih.gov
Internet: www.diabetes.niddk.nih.gov

The National Diabetes Information Clearinghouse (NDIC) is a service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). The NIDDK is part of the National Institutes of Health of the U.S. Department of Health and Human Services. Established in 1978, the Clearinghouse provides information about diabetes to people with diabetes and to their families, health care professionals, and the public. The NDIC answers inquiries, develops and distributes publications, and works closely with professional and patient organizations and Government agencies to coordinate resources about diabetes.

This publication is not copyrighted. The Clearinghouse encourages users of this publication to duplicate and distribute as many copies as desired.

This publication is available at www.diabetes.niddk.nih.gov.

This publication may contain information about medications and, when taken as prescribed, the conditions they treat. When prepared, this publication included the most current information available. For updates or for questions about any medications, contact the U.S. Food and Drug Administration toll-free at 1-888-INFO-FDA (1-888-463-6332) or visit www.fda.gov. Consult your health care provider for more information.



National Institute of
Diabetes and Digestive
and Kidney Diseases

NIH Publication No. 14-4349
February 2014

 The NIDDK prints on recycled paper with bio-based ink.