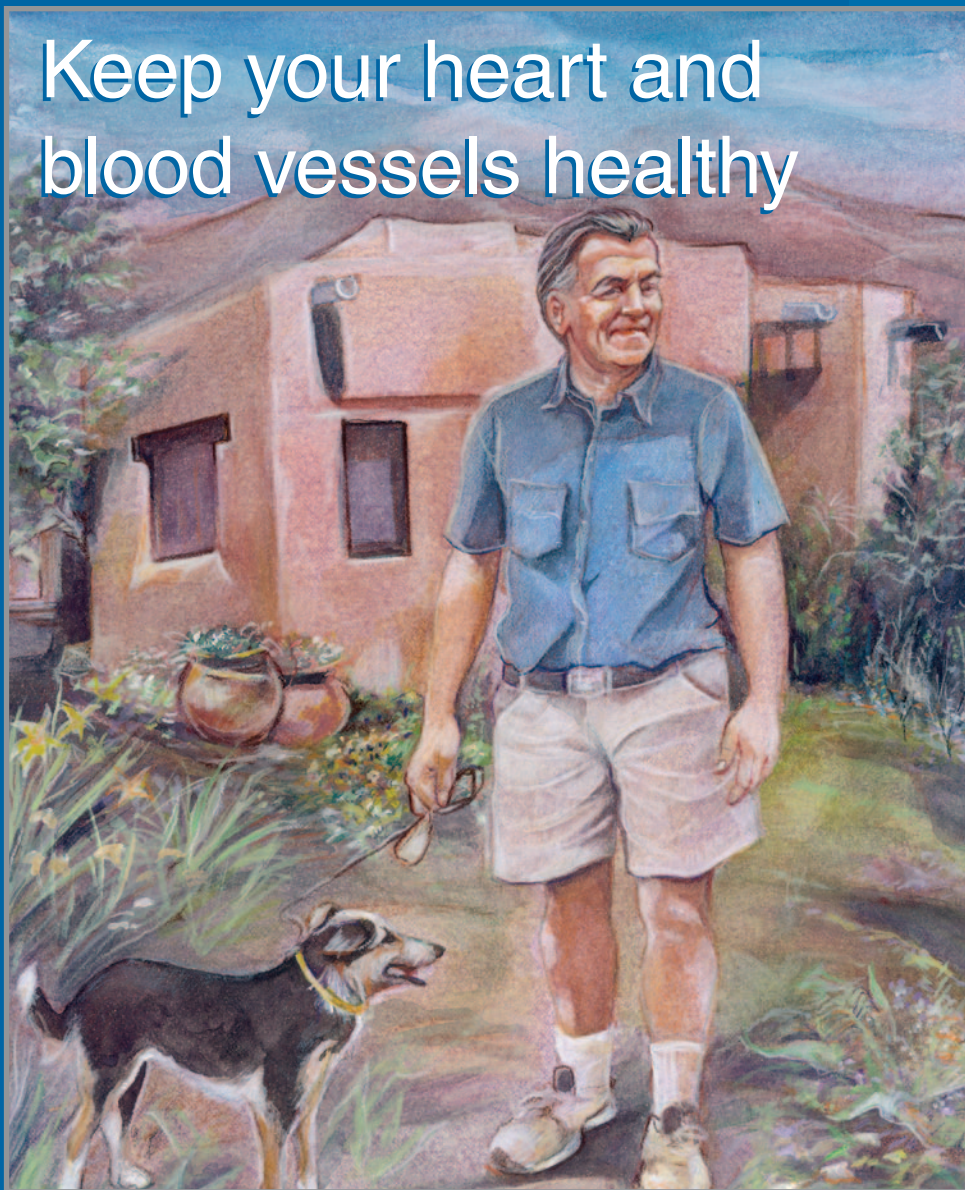


Prevent diabetes problems

Keep your heart and blood vessels healthy



U.S. Department
of Health and
Human Services

NATIONAL INSTITUTES OF HEALTH
NIH... *Turning Discovery Into Health*[®]



NATIONAL INSTITUTE OF
DIABETES AND DIGESTIVE
AND KIDNEY DISEASES

National Diabetes Information Clearinghouse

Prevent diabetes problems: Keep your heart and blood vessels healthy



U.S. Department
of Health and
Human Services

NATIONAL INSTITUTES OF HEALTH



National Diabetes Information Clearinghouse

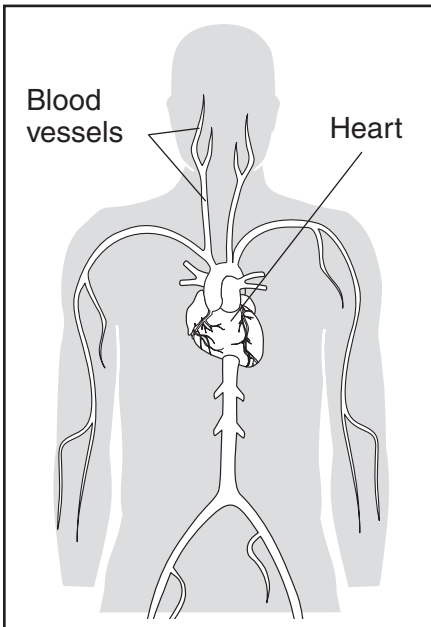
Contents

What are diabetes problems?.....	1
What should I do each day to stay healthy with diabetes?	2
What do my heart and blood vessels do?	3
What can I do to prevent heart disease and stroke?.....	4
How do my blood vessels get clogged?	6
What can happen when blood vessels are clogged?	7
What are the warning signs of a heart attack?	8
How do narrowed blood vessels cause high blood pressure?	9
What are the warning signs of a stroke?	11
How can clogged blood vessels hurt my legs and feet?	12
What can I do to prevent or control PAD?.....	12
Pronunciation Guide.....	13
For More Information	14
More in the Series	17
Acknowledgments	18

What are diabetes problems?

Too much glucose in the blood for a long time can cause diabetes problems. This high blood glucose, also called blood sugar, can damage many parts of the body, such as the heart, blood vessels, eyes, and kidneys. Heart and blood vessel disease can lead to heart attacks and strokes, the leading causes of death for people with diabetes. You can do a lot to prevent or slow down diabetes problems.

This booklet is about heart and blood vessel problems caused by diabetes. You will learn the things you can do each day and during each year to stay healthy and prevent diabetes problems.



High blood glucose can cause heart and blood vessel problems.

What should I do each day to stay healthy with diabetes?



Follow the healthy eating plan that you and your doctor or dietitian have worked out.



Be active a total of 30 minutes most days. Ask your doctor what activities are best for you.



Take your medicines as directed.



Check your blood glucose every day. Each time you check your blood glucose, write the number in your record book.



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



Brush and floss your teeth every day.



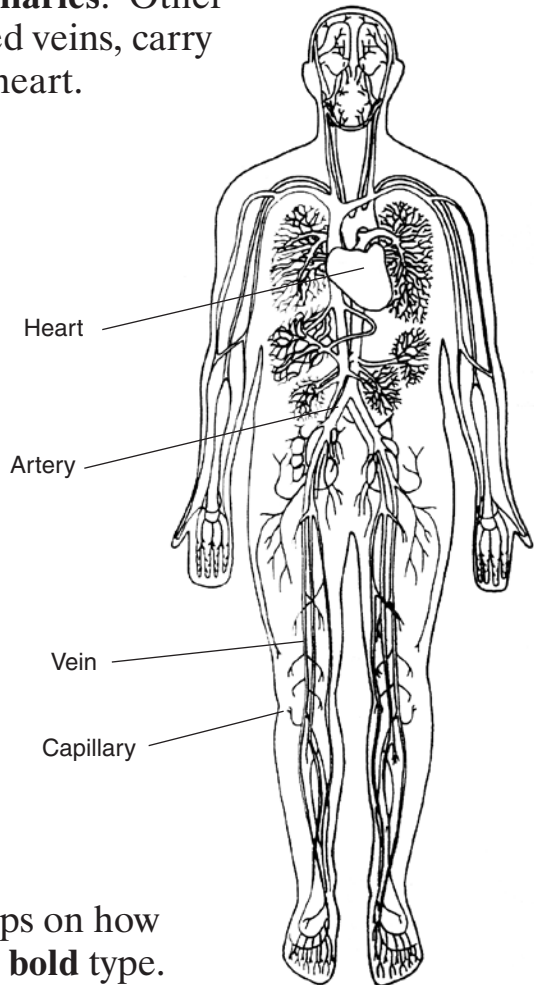
Control your blood pressure and cholesterol.



Don't smoke.

What do my heart and blood vessels do?

Your heart and blood vessels make up your **circulatory*** system. Your heart is a muscle that pumps blood through your body. Your heart pumps blood carrying oxygen to large blood vessels, called **arteries**, and small blood vessels, called **capillaries**. Other blood vessels, called veins, carry blood back to the heart.



*See page 13 for tips on how to say the words in **bold** type.

What can I do to prevent heart disease and stroke?

You can do a lot to prevent heart disease and stroke.

- **Keep your blood glucose under control.** You can see if your blood glucose is under control by having an A1C test at least twice a year. The A1C test tells you your average blood glucose for the past 2 to 3 months. The target for most people with diabetes is below 7. In some people with heart disease or other special circumstances, their doctor may recommend slightly higher levels of A1C.
- **Keep your blood pressure under control.** Have it checked at every doctor visit. The target for most people with diabetes is below 130/80.
- **Keep your cholesterol under control.** Have it checked at least once a year. The targets for most people with diabetes are
 - LDL—bad—cholesterol: below 100
 - HDL—good—cholesterol: above 40 in men and above 50 in women
 - triglycerides—another type of fat in the blood: below 150

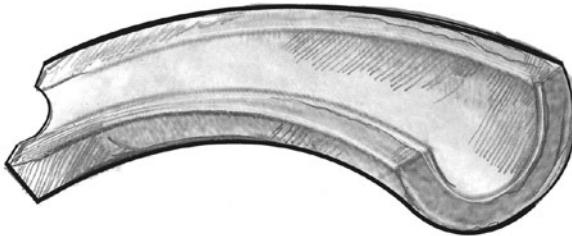
- **Make sure the foods you eat are “heart-healthy.”** Include foods high in fiber, such as oat bran, oatmeal, whole-grain breads and cereals, fruits, and vegetables. Cut back on foods high in saturated fat or cholesterol, such as meats, butter, dairy products with fat, eggs, shortening, lard, and foods with palm oil or coconut oil. Limit foods with trans fat, such as snack foods and commercial baked goods.
- **If you smoke, quit.** Your doctor can tell you about ways to help you quit smoking.
- **Ask your doctor whether you should take an aspirin every day.** Studies have shown that taking a low dose of aspirin every day can help reduce your risk of heart disease and stroke.
- **Take your medicines as directed.**

How do my blood vessels get clogged?

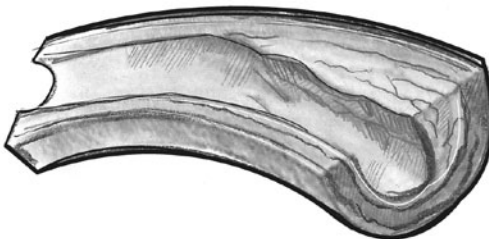
Several things, including having diabetes, can make your blood cholesterol level too high. Cholesterol is a substance that is made by the body and used for many important functions. Cholesterol is also found in some food derived from animals. When cholesterol is too high, the insides of large blood vessels become narrowed or clogged. This problem is called **atherosclerosis**.

Narrowed and clogged blood vessels make it harder for enough blood to get to all parts of your body. This condition can cause problems.

Cross section of a healthy blood vessel



Cross section of a narrowed blood vessel



What can happen when blood vessels are clogged?

When blood vessels become narrowed and clogged, you can have serious health problems:

- **Chest pain, also called **angina**.** When you have angina, you feel pain in your chest, arms, shoulders, or back. You may feel the pain more when your heart beats faster, such as when you exercise. The pain may go away when you rest. You also may sweat a lot and feel very weak. If you do not get treatment, chest pain may happen more often. If diabetes has damaged your heart nerves, you may not feel the chest pain. If you have chest pain with activity, contact your doctor.
- **Heart attack.** A heart attack happens when a blood vessel in or near your heart becomes blocked. Then your heart muscle can't get enough blood. When an area of your heart muscle stops working, your heart becomes weaker. During a heart attack, you may have chest pain along with nausea, indigestion, extreme weakness, and sweating. Or you may have no symptoms at all. If you have chest pain that persists, call 911. Delay in getting treatment may make a heart attack worse.
- **Stroke.** A stroke can happen when the blood supply to your brain is blocked. Then your brain can be damaged. See page 11 for more information about strokes.

What are the warning signs of a heart attack?

You may have one or more of the following warning signs:

- chest pain or discomfort
- pain or discomfort in your arms, back, jaw, or neck
- indigestion or stomach pain
- shortness of breath
- sweating
- nausea
- light-headedness

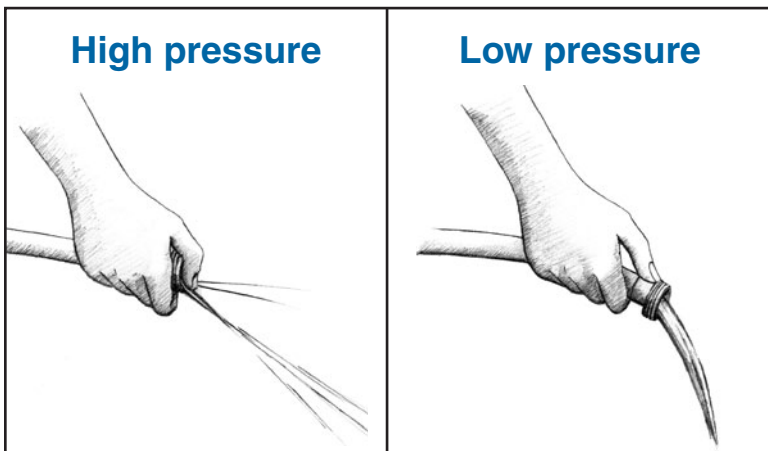
Or, you may have no warning signs at all. Warning signs may come and go. If you have any of these warning signs, call 911 right away. Getting prompt treatment can reduce damage to the heart.

How do narrowed blood vessels cause high blood pressure?

Narrowed blood vessels leave a smaller opening for blood to flow through. Having narrowed blood vessels is like turning on a garden hose and holding your thumb over the opening. The smaller opening makes the water shoot out with more pressure.

In the same way, narrowed blood vessels lead to high blood pressure. Other factors, such as kidney problems and being overweight, also can lead to high blood pressure.

Many people with diabetes also have high blood pressure. If you have heart, eye, or kidney problems from diabetes, high blood pressure can make them worse.



A smaller opening in a garden hose makes the water pressure higher. In the same way, clogged blood vessels lead to high blood pressure.

You will see your blood pressure written with two numbers separated by a slash. For example, your reading might be 120/70, said as “120 over 70.” For people with diabetes, the target is to keep the first number below 130 and the second number below 80.

If you have high blood pressure, ask your doctor how to lower it. Your doctor may ask you to take blood pressure medicine every day. Some types of blood pressure medicine can also help keep your kidneys healthy.

You may also be able to control your blood pressure by

- eating more fruits and vegetables
- eating less salt and high-sodium foods
- losing weight if you need to
- being physically active
- not smoking
- limiting alcoholic drinks



To lower blood pressure, get to a healthy weight.

What are the warning signs of a stroke?

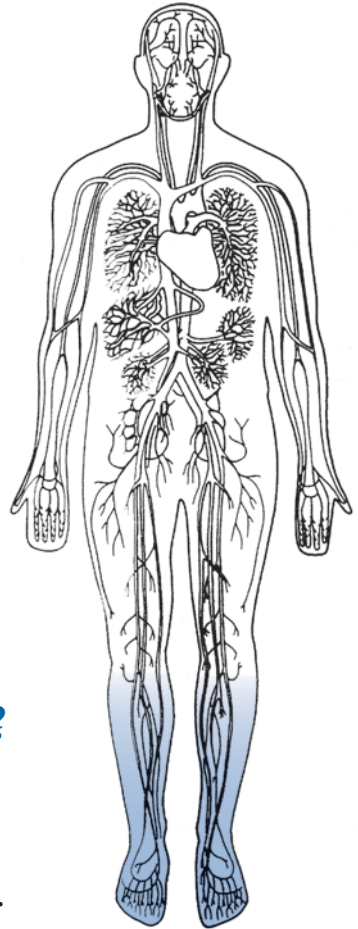
A stroke happens when part of your brain is not getting enough blood and stops working. Depending on the part of the brain that is damaged, a stroke can cause

- sudden weakness or numbness of your face, arm, or leg on one side of your body
- sudden confusion, trouble talking, or trouble understanding
- sudden dizziness, loss of balance, or trouble walking
- sudden trouble seeing in one or both eyes or sudden double vision
- sudden severe headache

Sometimes, one or more of these warning signs may happen and then disappear. You might be having a “mini-stroke,” also called a TIA or a **transient ischemic attack**. If you have any of these warning signs, call 911 right away. Getting care for a TIA may reduce or prevent a stroke. Getting prompt treatment for a stroke can reduce the damage to the brain and improve chances for recovery.

How can clogged blood vessels hurt my legs and feet?

Peripheral arterial disease, also called PAD, can happen when the openings in your blood vessels become narrow and your legs and feet don't get enough blood. You may feel pain in your legs when you walk or exercise. Some people also have numbness or tingling in their feet or legs or have sores that heal slowly.



What can I do to prevent or control PAD?

- Don't smoke.
- Keep your blood glucose and blood pressure under control.
- Keep your blood fat levels close to normal.
- Be physically active.
- Ask your doctor if you should take aspirin every day.

You also may need surgery to treat PAD.

Pronunciation Guide

angina (an-JY-nuh)

arteries (AR-tur-eez)

atherosclerosis (ATH-ur-oh-sklur-OH-siss)

capillaries (KAP-ih-lair-eez)

circulatory (SUR-kyoo-luh-TOR-ee)

peripheral arterial disease (puh-RIF-ur-uhl)
(ar-TEE-ree-uhl) (dih-ZEEZ)

transient ischemic attack (TRANZ-see-uhnt)
(iss-KEE-mik) (uh-TAK)

For More Information

Diabetes Teachers (nurses, dietitians, pharmacists, and other health professionals)

To find a diabetes teacher near you, call the American Association of Diabetes Educators toll-free at 1-800-TEAMUP4 (1-800-832-6874), or look on the Internet at www.diabeteseducator.org and click on “Find a Diabetes Educator.”



Dietitians

To find a dietitian near you, contact the Academy of Nutrition and Dietetics at www.eatright.org and click on “Find a Registered Dietitian.”

Government

The National Heart, Lung, and Blood Institute (NHLBI) is part of the National Institutes of Health. To learn more about heart and blood vessel problems, write or call the NHLBI Health Information Center, P.O. Box 30105, Bethesda, MD 20824-0105, 301-592-8573; or see www.nhlbi.nih.gov on the Internet.

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

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

American Diabetes Association

1701 North Beauregard Street

Alexandria, VA 22311

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

Fax: 703-549-6995

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 has seven booklets that can help you learn more about how to prevent diabetes problems.



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 on the Internet.

Acknowledgments

The National Diabetes Information Clearinghouse thanks the people who helped review or field-test this booklet.

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, DC
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 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.

Publications produced by the Clearinghouse are carefully reviewed by both NIDDK scientists and outside experts.

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

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

This publication may contain information about medications. 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.



U.S. DEPARTMENT OF HEALTH
AND HUMAN SERVICES

National Institutes of Health
NIH... *Turning Discovery Into Health*[®]



NIH Publication 13-4283
November 2012



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