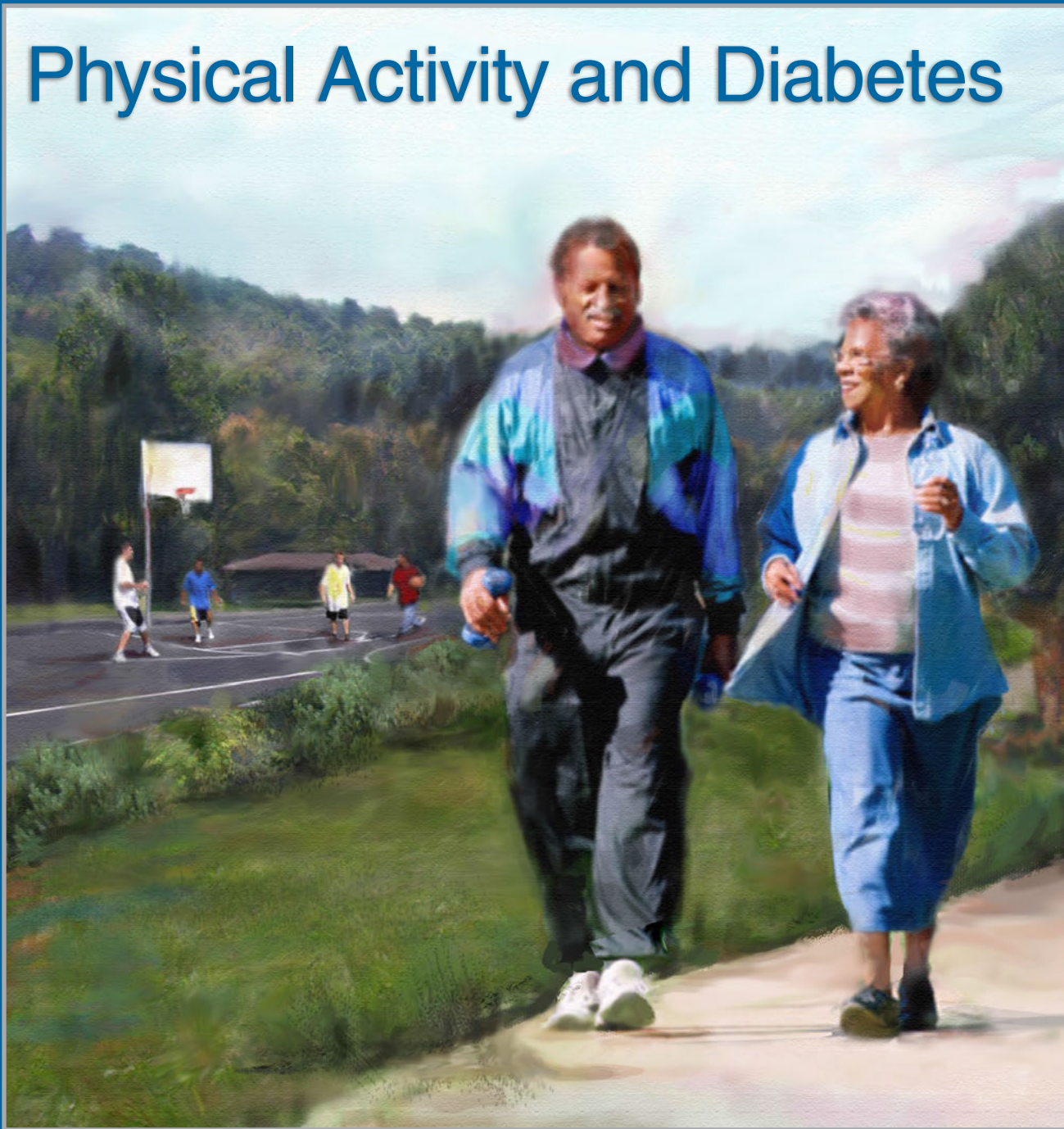


What I need to know about Physical Activity and Diabetes



National Institute of
Diabetes and Digestive
and Kidney Diseases

National Diabetes Information
Clearinghouse

What I need to know about Physical Activity and Diabetes

Contents

How can physical activity help me take care of my diabetes?	1
What should I do before I start a physical activity program?	2
What kinds of physical activity can help me?	6
When is the best time of day for me to do physical activity?	14
My Physical Activity Planning Tools	15
Points to Remember	19
Hope through Research	21
Pronunciation Guide	22
For More Information	23
Acknowledgments	24

How can physical activity help me take care of my diabetes?

Physical activity and keeping a healthy weight can help you take care of your diabetes and prevent diabetes problems. Physical activity helps your blood **glucose**,* also called blood sugar, stay in your target range.

Physical activity also helps the hormone **insulin** absorb glucose into all your body's cells, including your muscles, for energy. Muscles use glucose better than fat does. Building and using muscle through physical activity can help prevent high blood glucose. If your body doesn't make enough insulin, or if the insulin doesn't work the way it should, the body's cells don't use glucose. Your blood glucose levels then get too high, causing diabetes.

Starting a physical activity program can help you lose weight or keep a healthy weight and keep your blood glucose levels on target. Even without reaching a healthy weight, just a 10 or 15 pound weight loss makes a difference in reducing the risk of diabetes problems. Read more about how to prevent diabetes problems in the Prevent Diabetes Problems Series at www.diabetes.niddk.nih.gov.

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

What should I do before I start a physical activity program?

Before you start a physical activity program, you should

- talk with your health care team
- plan ahead
- find an exercise buddy
- decide how you'll track your physical activity
- decide how you'll reward yourself

Talk with your health care team. Your health care team may include a doctor, nurse, dietitian, diabetes educator, and others. Always talk with your health care team before you start a new physical activity program. Your health care team will tell you a target range for your blood glucose levels.

People with diabetes who take insulin or certain diabetes medicines are more likely to have low blood glucose, also called **hypoglycemia**. If your blood glucose levels drop too low, you could pass out, have a **seizure**, or go into a coma. Physical activity can make hypoglycemia more likely or worse in people who take insulin or certain diabetes medicines, so planning ahead is key. It's important to stay active. Ask your health care team how to stay active safely. Read more in *Hypoglycemia* at www.diabetes.niddk.nih.gov.

Physical activity works together with healthy eating and diabetes medicines to prevent diabetes problems. Studies show that people with type 2 diabetes who lose weight with physical activity and make healthy changes to their eating plan are less likely to need diabetes and heart medicines. Ask your health care team about your healthy eating plan and all your medicines. Ask if you need to change the amount of medicine you take or the food you eat before any physical activity.

Read more in the following publications at www.diabetes.niddk.nih.gov:

- *What I need to know about Eating and Diabetes*
- *What I need to know about Diabetes Medicines*

Talk with your health care team about what types of physical activity are safe for you, such as walking, weightlifting, or housework. Certain activities may be unsafe for people who have low vision or have nerve damage to their feet.

Make copies of the table of questions and topics in the “My Physical Activity Planning Tools” section to take with you when you visit your health care team. Write down the answers on the table of questions and topics.

Plan ahead. Decide in advance what type of physical activity you'll do. Before you start, also choose

- the days and times you'll be physically active
- the length of each physical activity session
- your plan for warming up, stretching, and cooling down for each physical activity session
- a backup plan, such as where you'll walk if the weather is bad
- how you will measure your progress

To make sure you stay active, find activities you like to do. If you keep finding excuses not to be physically active, think about why:

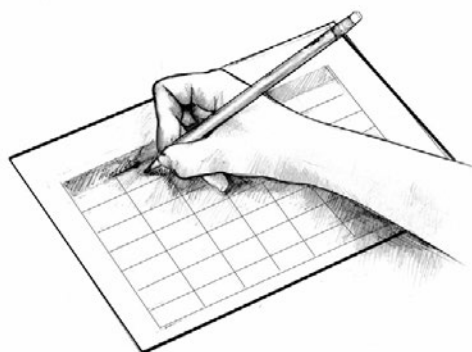
- Are your goals realistic?
- Do you need a change in activity?
- Would another time be more convenient?

Find an exercise buddy. Many people find they are more likely to be physically active if someone joins them. Ask a friend or family member to be your exercise buddy. When you do physical activities with a buddy you may find that you

- enjoy the company
- stick to the physical activity plan
- are more eager to do physical activities

Being active with your family may help everyone stay at a healthy weight. Keeping a healthy weight may prevent them from developing diabetes or **prediabetes**. Prediabetes is when the amount of glucose in your blood is above normal yet not high enough to be called diabetes.

Decide how you'll track your physical activity. Write down your blood glucose levels and when and how long you are physically active in a record book. You'll be able to track your progress and see how physical activity affects your blood glucose. You can find tools to help track your daily activities at www.ndep.nih.gov.



You can find tools to help track your daily activities at www.ndep.nih.gov.

Decide how you'll reward yourself. Reward yourself with a nonfood item or activity when you reach your goals. For example, treat yourself to a movie or buy a new plant for the garden.

What kinds of physical activity can help me?

Many kinds of physical activity can help you take care of your diabetes. Even small amounts of physical activity can help. You can measure your physical activity level by how much effort you use.

Doctors suggest that you aim for 30 to 60 minutes of moderate to vigorous 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 moderate to vigorous activity every day.

Your health care team can tell you more about what kind of physical activity is best for you. They can also tell you when and how much you can increase your physical activity level.

Light physical activity. Light activity is easy. Your physical activity level is light if you

- are breathing normally
- are not sweating
- can talk normally or even sing

Moderate physical activity. Moderate activity feels somewhat hard. Your physical activity level is moderate if you

- are breathing quickly, yet you're not out of breath
- are lightly sweating after about 10 minutes of activity
- can talk normally, yet you can't sing

Vigorous physical activity. Vigorous, or intense, activity feels hard. Your physical activity level is vigorous if you

- are breathing deeply and quickly
- are sweating after a few minutes of activity
- can't talk normally without stopping for a breath

Not all physical activity has to take place at the same time. You might take a walk for 20 minutes, lift hand weights for 10 minutes, and walk up and down the stairs for 5 minutes.

Breaking the physical activity into different groups can help. You can

- do **aerobic** exercise
- do strength training to build muscle
- do stretching exercises
- add extra activity to your daily routine

Do Aerobic Exercise

Aerobic exercise is activity that uses large muscles, makes your heart beat faster, and makes you breathe harder. Doing moderate to vigorous aerobic exercise for 30 to 60 minutes a day most days of the week provides many benefits. You can even split up these minutes into several parts.



Doing moderate to vigorous aerobic exercise for 30 to 60 minutes a day most days of the week provides many benefits.

Talk with your health care team about how to warm up and cool down before and after you exercise. Start slowly, with 5 to 10 minutes a day, and add a little more time each week. Try

- walking briskly
- hiking
- climbing stairs
- swimming or taking a water-aerobics class
- dancing
- riding a bicycle outdoors or a stationary bicycle indoors
- taking an exercise class
- playing basketball, tennis, or other sports
- in-line skating, ice skating, or skateboarding
- other things I can do: _____

Read more about physical activity for older adults in *Exercise & Physical Activity: Your Everyday Guide from the National Institute on Aging* at www.nia.nih.gov.

Do Strength Training to Build Muscle

Strength training is a light to moderate physical activity that builds muscle and keeps your bones healthy. When you have more muscle and less fat, you'll burn more calories because muscle burns more calories than fat, even between exercise sessions. Burning more calories can help you lose and keep off weight.

Whether you're a man or a woman, you can do strength training with hand weights, elastic bands, or weight machines two to three times a week. You can do strength training at home, at a fitness center, or in a class. Start with a light weight and slowly increase the size of your weights as your muscles become stronger.



You can do strength training with hand weights, elastic bands, or weight machines two to three times a week to build muscle.

Do Stretching Exercises

Stretching exercises are a light to moderate physical activity that both men and women can do. For example, yoga is a type of stretching that focuses on your breathing and helps you relax. Your health care team can suggest whether yoga is right for you.

Even if you have problems moving or balancing, certain types of yoga can help. For example, chair yoga has stretches you can do when sitting in a chair. When you stretch, you increase your flexibility, lower your stress, and help prevent sore muscles.



Chair yoga has stretches you can do when sitting in a chair.

Add Extra Activity to Your Daily Routine

Increase daily activity by spending less time watching TV or at the computer. Try these simple ways to add light, moderate, or vigorous physical activities in your life every day:

- Walk around while you talk on the phone.
- If you have kids or grandkids, visit a zoo or a park with them.
- Take a walk through your neighborhood.
- When you watch TV, get up and walk around the room during commercials.
- Do chores, such as work in the garden or rake leaves, clean the house, or wash the car.
- Stretch out your chores. For example, make two trips to take the laundry downstairs instead of one.
- Park at the far end of the shopping center parking lot and walk to the store.

- Take the stairs instead of the elevator.
- Stretch or walk around instead of taking a coffee break and eating.
- Other things I can do: _____

Read more about physical activity in these booklets at www.win.niddk.nih.gov:

- *Active at Any Size!*
- *Energize Yourself and Your Family!*
- *Walking...A Step in the Right Direction*



Take the stairs instead of the elevator.

When is the best time of day for me to do physical activity?

Your health care team can help you decide the best time of day for you to do physical activity based on your daily schedule, healthy eating plan, and diabetes medicines.

If you have type 1 diabetes, try not to do vigorous physical activity when you have **ketones** in your blood or urine. Ketones are chemicals your body might make when your blood glucose levels are too high and your insulin level is too low. If you are physically active when you have ketones in your blood or urine, your blood glucose levels may go even higher.

Light or moderate physical activity can help lower blood glucose if you have type 2 diabetes and you don't have ketones. Ketones are rare in people with type 2 diabetes. Ask your health care team whether you should be physically active when your blood glucose levels are high.

My Physical Activity Planning Tools

These tables of questions and topics list important things you should discuss with your health care team at each checkup.

What to Ask Your Health Care Team
Date: _____
Name of the health care team member you are visiting: _____
Should I change my medicine?
Should I change what and when I eat?
When should I take my prescription medicine?
How much should I take before physical activity?
When should I take my over-the-counter medicine?
Should I eat before physical activity? Or after?
What should I do if I have low blood sugar during physical activity?

Which activities are safe for me?
Daily activities:
Aerobic exercise:
Strength training:
Stretching:

My Physical Activity Plan (Sample Starter Plan)

This table shows you some ideas for getting started on your plan. Ask your health care team for help with your plan.

My Daily Activities
Every day I will: <i>play catch with the dog; walk up the stairs at work; park at the far end of the parking lot</i>
My Aerobic Exercise
Most days I will: <i>walk around my block</i>
When: <i>Tuesday through Sunday, after dinner</i>
Length of time: <i>10 minutes</i>
My buddy: <i>my daughter</i>
Backup plan: <i>walk at the mall if it rains</i>
My Strength Training
Three times a week I will: <i>lift hand weights</i>
When: <i>T-TH-Sat, 8 a.m.</i>
Number of repetitions: <i>15</i>
My Daily Stretches
Every day I will: <i>do chair yoga</i>
When: <i>before bed</i>
Length of time: <i>10 minutes</i>

My Physical Activity Plan **Date:** _____

My Daily Activities
Every day I will:
My Aerobic Exercise
Most days I will:
When:
Length of time:
My buddy:
Backup plan:
My Strength Training
Three times a week I will:
When:
Number of repetitions:
My Daily Stretches
Every day I will:
When:
Length of time:

Points to Remember

- Starting a physical activity program can help you lose weight or keep a healthy weight and keep your blood glucose levels on target.
- Always talk with your health care team before you start a new physical activity program.
- Ask your health care team if you need to change the amount of medicine you take or the food you eat before any physical activity.
- Talk with your health care team about what types of physical activity are safe for you, such as walking, weightlifting, or housework.
- To make sure you stay active, find activities you like to do. Ask a friend or family member to be your exercise buddy.
- Write down your blood glucose levels and when and how long you are physically active in a record book.
- Doctors suggest that you aim for 30 to 60 minutes of moderate to vigorous 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 moderate to vigorous activity every day.
- Not all physical activity has to take place at the same time. For example, you might take a walk for 20 minutes, lift hand weights for 10 minutes, and walk up and down the stairs for 5 minutes.

- Doing moderate to vigorous aerobic exercise for 30 to 60 minutes a day most days of the week provides many benefits. You can even split up these minutes into several parts.
- Start exercising slowly, with 5 to 10 minutes a day, and add a little more time each week. Try walking briskly, hiking, or climbing stairs.
- Whether you're a man or a woman, you can do strength training with hand weights, elastic bands, or weight machines two to three times a week.
- Stretching exercises are a light to moderate physical activity that both men and women can do. When you stretch, you increase your flexibility, lower your stress, and help prevent sore muscles.
- Increase daily activity by spending less time watching TV or at the computer.
- Try these simple ways to add light, moderate, or vigorous physical activities in your life every day:
 - Walk around while you talk on the phone.
 - Take a walk through your neighborhood.
 - Do chores, such as work in the garden or rake leaves, clean the house, or wash the car.
- If you have type 1 diabetes, try not to do vigorous physical activity when you have ketones in your blood or urine.

Hope through Research

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), through its Division of Diabetes, Endocrinology, and Metabolic Diseases, supports research in the areas of type 1 and type 2 diabetes and other metabolic disorders.

The Mechanisms by Which Strength Training Ameliorates the Metabolic Syndrome study, funded under National Institutes of Health (NIH) clinical trial number NCT00727779, is investigating prevention and treatment strategies for diabetes by using physical activity. Researchers have expanded the pilot studies to find ways resistance exercise and strength training benefit people with metabolic syndrome.

Clinical trials are research studies involving people. Clinical trials look at safe and effective new ways to prevent, detect, or treat disease. Researchers also use clinical trials to look at other aspects of care, such as improving the quality of life for people with chronic illnesses. To learn more about clinical trials, why they matter, and how to participate, visit the NIH Clinical Research Trials and You website at www.nih.gov/health/clinicaltrials. For information about current studies, visit www.ClinicalTrials.gov.

Read more about the NIDDK's research on diabetes and related topics at www.diabetes.niddk.nih.gov/diabetesresearch/dm_research.aspx.

Pronunciation Guide

aerobic (AIR-oh-bic)

glucose (GLOO-kohss)

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

insulin (IN-suh-lin)

ketones (KEE-tohnz)

prediabetes (PREE-dy-uh-BEE-teez)

seizure (SEE-zhur)

For More Information

To find diabetes educators—nurses, dietitians, and other health professionals—near you, call the American Association of Diabetes Educators toll-free at 1-800-338-3633 or visit *www.diabeteseducator.org* and click on “Find a Diabetes Educator.”

For additional information about diabetes, contact

American Association of Diabetes Educators

200 West Madison Street, Suite 800

Chicago, IL 60606

Phone: 1-800-338-3633

Internet: www.diabeteseducator.org

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

Acknowledgments

Publications produced by the Clearinghouse are carefully reviewed by both NIDDK scientists and outside experts. The National Diabetes Information Clearinghouse would like to thank the following individuals for assisting with the scientific and editorial review of the original version of this publication:

Andrea Kriska, Ph.D.

University of Pittsburgh, Department of Epidemiology

David G. Marrero, Ph.D.

Indiana University School of Medicine, Division of Endocrinology

Susan Yanovski, M.D.

NIDDK, Division of Digestive Diseases and Nutrition, Obesity and Eating Disorders Program

Thank you also to Sally A. Stacey, R.N., C.D.E., at the Regional Diabetes Center, Home Hospital, Lafayette, IN, for facilitating field-testing of the original version of this publication.

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 directed, 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. 14-5180
May 2014

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