

# Physical Activity and Exercise

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## Purpose

This section is intended to provide information on the effect of exercise on diabetes. Guidelines are provided on how to start and maintain an activity plan.

## Objectives

At the end of this section you will be able to:

- Identify your level of physical activity.
- Plan an exercise program – warm-up, type and duration of exercise, and cool down period.
- List several alternative exercise options.
- Describe actions taken when you have low blood glucose with exercise.
- List possible snacks you should eat before light, moderate, and strenuous exercise.

## Outline

Benefits of exercise.....	C-2
Staying active.....	C-3
Small changes to start now.....	C-4
How to get started.....	C-6
Planning your exercise program.....	C-6
Exercising safely.....	C-8
Rating your effort.....	C-10



\*The American Diabetes Association Recognizes this education service as meeting the National Standards for Diabetes Self-Management Education and Support.

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## Benefits of exercise

Exercise is good for everyone. It is an essential part of controlling your diabetes.

### Exercise benefits related to diabetes:

- Controls (lowers) blood glucose levels
- Increases muscle sensitivity to the action of insulin
- Decreases body fat; increases muscle tone
- Lowers total and LDL (bad) cholesterol
- Increases HDL (good) cholesterol
- Lowers blood pressure
- Increases metabolism
- Promotes and sustains weight loss
- Improves circulation

### Overall health benefits

- Improves sleep
- Reduces stress, anxiety and depression
- Boosts energy level
- Helps maintain bone density
- Increases muscle strength, endurance, and flexibility
- Slows the aging process
- Decreases the risk of colon and endometrial cancers
- Improves self esteem
- Strengthens heart and lungs
- Improves mood



## Types of physical activity

- Stretching (flexibility)
  - Exercise bands
  - Exercise balls
- Strengthening (build and tone muscles)
  - Push, pull, and lift activities
  - Weight lifting
  - Push ups
- Aerobic (cardiovascular)
  - Walking
  - Running
  - Biking
  - Water or chair aerobics
  - Swimming



## Staying active

Mark how active you are on the arrow below.

Not Active	Somewhat Active	Moderately Active	Extremely Active
Example: Sit most of the day	On feet most of the day	On feet most of the day, does daily exercise	Involved in physical labor or has intense recreational activity

- When we think of exercise we tend to think of vigorous activities such as long workouts at the gym or training to become a marathon runner.
- Exercise does not have to be grueling to be beneficial; activity of short duration, repeated often, can be very beneficial.
- Anything you do to become more active will advance you up the activity arrow and help improve your health and your diabetes control.

## Small changes to start now

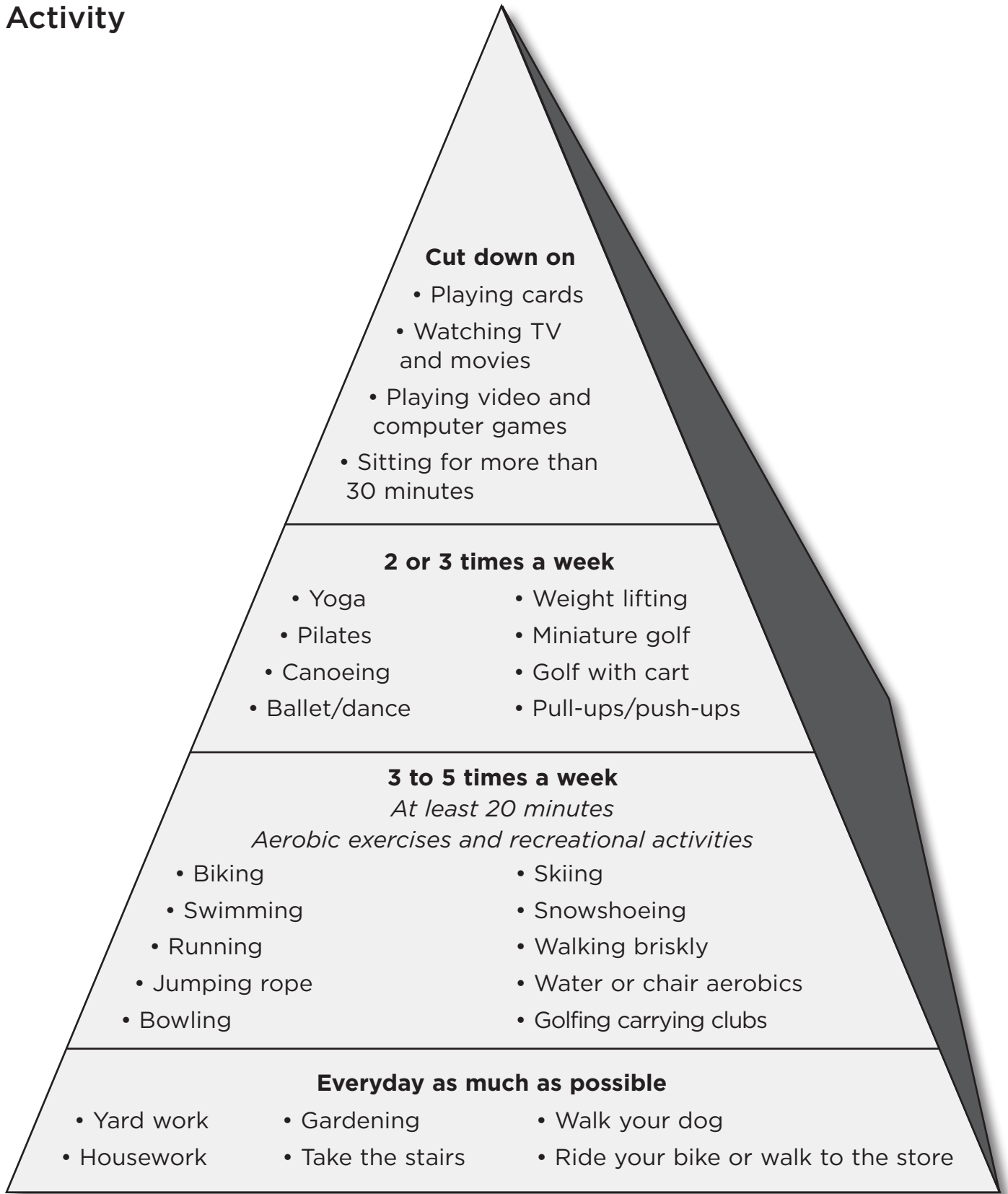
Remember, anything that you do to increase your activity level will help improve your diabetes control.

- Park your car further away from the store, so that you have to walk farther.
- Take the stairs instead of the elevator.
- Instead of just letting the dog outside in the yard, take him for a walk around the block.
- Walk in place during commercials.
- Walk up and down the hallway in your home or apartment building.
- Use a push mower instead of riding mower.
- Sweep your floors instead of vacuuming them.
- Instead of meeting your friend for lunch, meet for a walk in the park.
- Do some upper body exercise.
- Try arm chair fitness exercises.
- Get up and change the TV channel, do not use the remote control.



**Before starting an exercise program, talk with your health care provider regarding risks and your exercise plan.**

# Activity



## How to get started

- See yourself as a person who feels good, looks good, and has energy.
- Make a list of why you want to be more active.
- Make a list of reasons why you do not do more activity.
- Work through excuses; look for ways to overcome your usual excuse for not being active.
- Choose an exercise that you enjoy doing.
- Start slowly; start with 5 minutes at a time, and build from there.
- Find several activities that you enjoy doing; boredom can set in quickly if you do the same exercise all the time.
- If possible, exercise with a spouse or a friend.
- Set aside the same time each day for your exercise, eventually it becomes a habit.
- Choose activities that do not depend on good weather, or plan activities for good and bad weather.
- Be sure you have the right clothing, shoes, and equipment for your activities.
- Call the Parks and Recreation Department, YMCA, or other community programs to see what classes, lessons, or clubs are available in which you may be interested.

**Reward yourself when you have met your exercise goal and above all Have Fun!**

## Planning your exercise program

### Write down the answers to the following questions

- What exercise programs or activities are safe and practical to do regularly?
- How often will you exercise?
- How long will you exercise each time?
- What will you do to reduce your risk for hypoglycemia?
- What stretching, strengthening and physical activities will you do?
- What is your goal for how often you will exercise once your exercise program is established?
- How will you keep track of your exercise?
- How will you reward yourself for doing your exercise program?

## Warming up and cooling down

Always warm up 5 to 10 minutes before starting to exercise. Warming up helps your body get ready for the activity. It can decrease your risk of injury. For example, if you are going for a walk, walk at an easy pace for 5 to 10 minutes. Then stop and do some very gentle stretching exercises. Resume walking. Gradually increase your speed until you reach the aerobic level.

At the aerobic level, your heart is beating faster. Your lungs are breathing deeper. When you first get started, you may tire or get winded within a few minutes. Try slowing down and keep moving. Once you regain your breath, pick up your speed again. Listen to your body and slow down when needed.

Cooling down allows your heart and breathing to slow down gradually. To cool down, slowly reduce your exercise speed. Do some gentle stretching after exercise to prevent sore muscles.



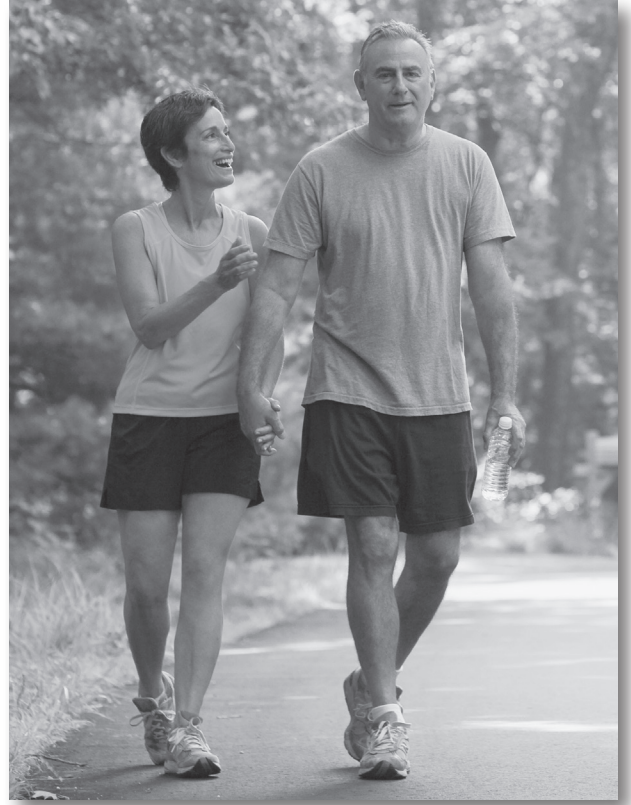
## Exercising safely

- Know your blood glucose levels before, during, and after exercising if you use diabetes-related medicines that can cause low blood sugar (hypoglycemia).
- If you plan to exercise for over an hour, or have problems with low blood glucose levels during exercise, check your glucose levels during exercise.
- If your blood glucose is less than 100 mg/dl and you are taking diabetes medicines or insulin, eat an appropriate snack see C-9.
- Carry a fast-acting source of carbohydrate such as glucose gel or tables for low blood glucose treatment.
- Carry your meter and strips, medical identification, water and phone. A small backpack or fanny pack works great for carrying these supplies.
- Remember to warm up and cool down.
- Drink plenty of water before, during, and after your workout.
- Exercise with a friend - let someone know where you are going and when you plan on returning.
- Wear well-fitting shoes appropriate for your choice of exercise; check your feet after exercise for redness, infected cuts, or open sores. Notify your health care provider if this occurs (see foot care guidelines in Section K-"Reducing Your Risk of Diabetes-Related Complications").
- Exercise with caution if you have Type 1 diabetes and urine ketones are negative, but the post-meal glucose level is greater than 300 mg/dl.
- Stop exercising if pain, light-headedness, or shortness of breath occurs.

Do not exercise when:

- You are sick.
- You have Type 1 diabetes and have ketones in your urine and a fasting glucose level greater than 250 mg/dl.
- Your insulin is at it's peak (working the most in your body) as this increases your chances of having a low blood glucose level (hypoglycemia).

If you have eye disease (retinopathy), nerve damage (neuropathy), kidney disease (nephropathy), or heart and blood vessel disease (cardiovascular disease), you will need to ask your health care provider for guidance on exercise choices.





**For use by those on insulin or diabetes medicines that can cause hypoglycemia.**

<b>Activity</b>	<b>If Blood Glucose Is</b>	<b>Then Eat</b>	<b>Suggestions</b>
<b>Light intensity</b> <ul style="list-style-type: none"> <li>• Walking a half mile</li> <li>• Leisurely biking for less than 30 minutes</li> </ul>	Less than 100 mg/dl	<b>1 carb choice</b> (10 to 15 gm carbohydrate) per hour	<b>1 fruit or 1 starch choice</b> (½ cup orange juice or ¾ ounce pretzels)
	100 mg/dl or above*	No food needed	No food needed
<b>Moderate intensity</b> <ul style="list-style-type: none"> <li>• Tennis</li> <li>• Running</li> <li>• Swimming</li> <li>• Leisurely biking</li> <li>• Gardening</li> <li>• Golfing</li> <li>• Vacuuming for 1 hour</li> </ul>	Less than 100 mg/dl	<b>2 carb choices</b> (25 to 35 gm carbohydrate before exercise; then 10 to 15 gm per 30 minutes of exercise)	<b>1 milk and 1 fruit choice or 1 milk and 1 starch</b> (1 cup plain yogurt and ¾ cup blueberries or ¾ cup cereal and 1 cup milk)
	100 to 180 mg/dl	<b>1 carb choice</b> (10 to 15 gm carbohydrate) per 30 minutes of exercise	<b>1 fruit or 1 starch choice</b> (1 small banana or 6 saltine crackers)
	180 to 300* mg/dl	No food needed	No food needed
<b>Strenuous intensity</b> <ul style="list-style-type: none"> <li>• Football</li> <li>• Hockey</li> <li>• Racquetball</li> <li>• Basketball</li> <li>• Strenuous biking</li> <li>• Swimming</li> <li>• Shoveling heavy snow</li> <li>• Raking leaves</li> </ul>	Less than 100 mg/dl	<b>3 carb choices</b> (50 gm carbohydrate) protein or fat may be needed; test blood glucose often; 10 to 15 gm of carbohydrate per 30 minutes of exercise	<b>2 starch choices with either 1 milk or 1 fruit choice</b> (2 slices toast with 1 cup milk, or 1 small orange)
	100 to 180 mg/dl	<b>2 to 3 carb choices</b> (25 to 50 gm carbohydrate) depending on intensity and duration	<b>1 milk and 1 starch choice</b> (1 slice bread and 1 cup milk), or <b>1 fruit and 1 starch</b> (8 animal crackers and ½ cup apple juice)
	180 to 300* mg/dl	No food needed	No food needed

**\*If you have Type 1 diabetes, test for ketones if blood glucose is over 250 mg/dl before or after exercise.**

If you use diabetes medicines that can cause hypoglycemia: Be sure to monitor and record your blood glucose before and after exercise (and every 30 minutes during exercise). Each person responds to exercise and food differently – activity snacks need to be planned for each person with the help of a dietitian.

## Rating your effort

If you have not been exercising routinely, almost any type of activity seems like very hard work. Two self-assessment tests can be done to check your progress.

### The “talk test”

The talk test is a self-assessment of the intensity of your physical activity. Several times during your activity say a few sentences (or sing out loud). If you can easily speak or sing and are not the least bit out of breath, your activity is at a low intensity. You may wish to increase the pace of your activity. If you cannot say a few sentences, you are exercising at high intensity (probably too high). You may need to decrease the pace of your activity. You can use the talk test to adjust the intensity of your activity to your target level.

### Scale of perceived exertion (Borg Scale)

This scale is based on how hard you feel you are working

1	Very, very easy	
2	Very easy	
3	Fairly easy	Walking slowly at your own pace for several minutes
4	Somewhat easy	
5	Somewhat hard	Harder exercise but still OK to keep going
6	Moderately hard	
7	Hard	
8	Very hard	You can still keep going but you must push yourself
9	Very, very hard	
10	Extremely hard	Most strenuous exercise you have ever done

### How to use the scale of perceived exertion

- While doing physical activity, rate how hard you feel you are working.
- The rating should reflect how strenuous the exercise feels to you.
- Look at the scale and select the rating that best describes your feeling of exertion.
- Record your rating selection and the date, perhaps on your activity plan.
- Repeat this rating process every few weeks to check your progress.

In general if you are working at a level of 5, you are receiving a good exercise level. If you're rating is a 3 or less increase your exercise pace.

If your rating is 7 or more you need to slow down. As you exercise more consistently you will find that you will be able to exercise more at the same level of exertion.

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## Calories used for physical activity

The exact number of calories (fuel) used to do an activity will vary depending on factors such as body weight, muscle tone, and level of exertion.

Activity	Estimated Calories Burned Per 30 Minutes			
	150 lbs	200 lbs	250 lbs	300 lbs
Aerobics, high impact	250	330	420	500
Aerobics, low impact	180	240	300	360
Baseball, playing catch	180	240	300	360
Bicycling, leisure	105	145	180	215
Bicycling, light effort	200	265	330	395
Bowling	105	145	180	215
Dancing (fast-paced such as polka, disco, swing)	160	215	270	320
Football, playing catch	90	120	150	180
Football, touch or flag	285	380	475	575
Frisbee playing	105	145	180	215
Golf, carrying clubs	160	215	270	320
Hockey	285	380	475	575
Logging	245	302	358	414
Mowing lawn, push mower	165	200	235	270
Raking lawn	149	178	207	226
Rope jumping	372	444	516	588
Running, 10 mph (6 min mile)	360	475	595	715
Running, 5 mph (12 min mile)	285	380	475	575
Scrubbing floors	193	237	281	325
Shoveling snow	223	266	309	352
Skateboarding	186	222	260	295
Skating	246	302	358	415
Skiing, cross-country	250	335	420	500
Skiing, downhill	211	259	307	355
Sledding, tobogganing	246	302	358	415
Snowblowing, walk behind	165	200	235	270
Soccer	250	335	420	500
Stacking/carrying wood	186	222	258	294

Activity	Estimated Calories Burned Per 30 Minutes			
	150 lbs	200 lbs	250 lbs	300 lbs
Stair climber, treadmill	211	259	308	366
Stretching, yoga	118	140	172	204
Sweeping floor, sidewalk	140	172	204	236
Swimming laps, leisure	215	285	360	430
Swimming laps, moderate pace	285	380	475	570
Tennis (singles)	285	380	475	575
Walking, 2 mph, slow pace	90	120	150	180
Walking, 3 mph, moderate pace, walking the dog	120	160	195	235
Walking, 3.5 mph, 17 minute mile	135	180	225	270
Walking, upstairs (6 cal/minute)	180	240	300	360
Weight lifting, light or moderate effort	105	145	180	215
Zumba	215	288	358	430