

Fitness and Exercise

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NATIONAL INSTITUTES OF HEALTH
National Heart, Lung, and Blood Institute

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Do we get enough exercise from our daily activities?

Most Americans get little vigorous exercise at work or during leisure hours. Today, only a few jobs require vigorous physical activity. People usually ride in cars or buses and watch TV during their free time rather than be physically active. Activities like golfing and bowling provide people with some benefit. But they do not provide the same benefits as regular, more vigorous exercise.

Evidence suggests that even low- to moderate-intensity activities can have both short- and long-term benefits. If done daily, they help lower your risk of heart disease. Such activities include pleasure walking, stair climbing, gardening, yard work, moderate to heavy housework, dancing and home exercise. More vigorous exercise can help improve fitness of the heart and lungs, which can provide even more consistent benefits for lowering heart disease risk.

Today, many people are rediscovering the benefits of regular, vigorous exercise - activities like swimming, brisk walking, running, or jumping rope. These kinds of activities are sometimes called "aerobic" - meaning the body uses oxygen to produce the energy needed for the activity. Aerobic exercises can condition your heart and lungs if performed at the proper intensity for at least 30 minutes, 3-4 times a week.

But you don't have to train like a marathon runner to become more physically fit! Any activity that gets you moving around, even if it's done for just a few minutes each day, is better than none at all. For inactive people, the trick is to get started. One great way is to take a walk for 10-15 minutes during your lunch break. Other ideas in this pamphlet will help you get moving and living a more active life.

What are the benefits of regular physical activity?

These are the benefits often experienced by people who get regular physical activity.

Feeling better

Regular physical activity -

- gives you more energy
- helps in coping with stress
- improves your self-image
- increases resistance to fatigue
- helps counter anxiety and depression
- helps you to relax and feel less tense
- improves the ability to fall asleep quickly and sleep well
- provides an easy way to share an activity with friends or family and an opportunity to meet new friends

Looking better

Regular physical activity

- tones your muscles
- burns off calories to help lose extra pounds or helps you stay at your desirable weight
- helps control your appetite

You need to burn off 3,500 calories more than you take in to lose 1 pound. If you want to lose weight, regular physical activity can help you in either of two ways.

First, you can eat your usual amount of calories, but be more active. For example: A 200-pound person who keeps on eating the same amount of calories, but decides to walk briskly each day for 1 1/2 miles will lose about 14 pounds in 1 year. Or second, you can eat fewer calories and be more active. This is an even better way to lose weight.

About three-fourths of the energy you burn every day comes from what your body uses for its basic needs, such as sleeping, breathing, digesting food and reclining. A person burns up only a small amount of calories with daily activities such as sitting. Any physical activity in addition to what you normally do will burn up extra calories.

The average calories spent per hour by a 150-pound person are listed below. (A lighter person burns fewer calories; a heavier person burns more.) Since exact calorie figures are not available for most activities, the figures below are averaged from several sources and show the relative vigor of the activities.

Activity	Calories burned
Bicycling 6 mph	240 cal./hr.
Bicycling 12 mph	410 cal./hr.
Cross-country skiing	700 cal./hr.
Jogging 5 ^{1/2} mph	740 cal./hr.
Jogging 7 mph	920 cal./hr.
Jumping rope	750 cal./hr.
Running in place	650 cal./hr.
Running 10 mph	1280 cal./hr.
Swimming 25 yds/min.	275 cal./hr.
Swimming 50 yds/min.	500 cal./hr.

Tennis-singles	400 cal./hr.
Walking 2 mph	240 cal./hr.
Walking 3 mph	320 cal./hr.
Walking 4 ^{1/2} mph	440 cal./hr.

The calories spent in a particular activity vary in proportion to one's body weight. For example, a 100-pound person burns 1/3 fewer calories, so you would multiply the number of calories by 0.7. For a 200-pound person, multiply by 1.3.

Working harder or faster for a given activity will only slightly increase the calories spent. A better way to burn up more calories is to increase the time spent on your activity.

Working better

Regular physical activity -

- helps you to be more productive at work
- increases your capacity for physical work
- builds stamina for other physical activities
- increases muscle strength
- helps your heart and lungs work more efficiently

Consider the benefits of a well-conditioned heart:

In 1 minute with 45 to 50 beats, the heart of a well-conditioned person pumps the same amount of blood as an inactive person's heart pumps in 70 to 75 beats. Compared to the well-conditioned heart, the average heart pumps up to 36,000 more times per day, 13 million more times per year.

Feeling, looking, and working better - all these benefits from regular physical activity can help you enjoy your life more fully.

Comparing the benefits and the risks

Should you begin a regular exercise program? Consider the ways physical activity can benefit you and weigh them against the possible risks.

Potential benefits

- more energy and capacity for work and leisure activities
- greater resistance to stress, anxiety and fatigue, and a better outlook on life
- increased stamina, strength and flexibility
- improved efficiency of the heart and lungs
- loss of extra pounds or body fat
- help in staying at desirable weight
- reduced risk of heart attack

Potential risks

- muscle or joint injuries
- heat exhaustion or heat stroke on hot days (rare) aggravation of existing or hidden heart problems

Should I consult a doctor before I start an exercise program?

Most people do not need to see a doctor before they start since a gradual, sensible exercise program will have minimal health risks. However, some people should seek medical advice.

Use the following checklist to find out if you should consult a doctor before you start or significantly increase your physical activity.*

Mark those items that apply to you:

-
- Your doctor said you have a heart condition and recommended only medically supervised physical activity.
 - During or right after you exercise, you frequently have pains or pressure in the left or mid-chest area, left neck, shoulder or arm.
 - You have developed chest pain within the last month.
 - You tend to lose consciousness or fall over due to dizziness.
 - You feel extremely breathless after mild exertion.
 - Your doctor recommended you take medicine for your blood pressure or a heart condition.
 - Your doctor said you have bone or joint problems that could be made worse by the proposed physical activity.
 - You have a medical condition or other physical reason not mentioned here which might need special attention in an exercise program. (For example, insulin-dependent diabetes.)
 - You are middle-aged or older, have not been physically active, and plan a relatively vigorous exercise program.

If you've checked one or more items, see your doctor before you start. If you've checked no items, you can start on a gradual, sensible program of increased activity tailored to your needs. If you feel any of the physical symptoms listed above when you start your exercise program, contact your doctor right away.

*This checklist has been developed from several sources, particularly the Physical Activity Readiness Questionnaire, British Columbia Ministry of Health, Department of National Health and Welfare, Canada

(revised 1992).

What if I've had a heart attack?

Regular, brisk physical activity can help reduce your risk of having another heart attack. People who include regular physical activity in their lives after a heart attack improve their chances of survival. Regular exercise can also improve the quality of your life - how you feel and look. It can help you do more than before without pain (angina) or shortness of breath.

If you've had a heart attack, consult your doctor to be sure you are following a safe and effective exercise program. Your doctor's guidance is very important because it could help prevent heart pain and for further damage from overexertion.

Five common myths about exercise

Myth 1. Exercising makes you tired.

As they become more physically fit, most people feel physical activity gives them even more energy than before. Regular, moderate-to-brisk exercise can also help you reduce fatigue and manage stress.

Myth 2. Exercising takes too much time.

It only takes a few minutes a day to become more physically active. To condition your heart and lungs, regular exercise does not have to take more than about 30 to 60 minutes, three or four times a week. If you don't have 30 minutes in your schedule for an exercise break, try to find two 15-minute periods or even three 10-minute periods. Once you discover how much you enjoy these exercise breaks, you may want to make them a habit! Then physical activity becomes a natural part of your life.

Myth 3. All exercises give you the same benefits.

All physical activities can give you enjoyment. Low-intensity activities - if performed daily - also can have some long-term health benefits and lower your risk of heart disease. But only regular, brisk and sustained exercises such as brisk walking, jogging or swimming improve the efficiency of your heart and lungs and burn off substantial extra calories. Other activities may give you other benefits such as increased flexibility or muscle strength, depending on the type of activity.

Myth 4. The older you are, the less exercise you need.

We tend to become less active with age, and therefore need to make sure we are

getting enough physical activity. In general, middle-aged and older people benefit from regular physical activity just as young people do. Age need not be a limitation. In fact, regular physical activity in older persons increases their capacity to perform activities of daily living. What is important, no matter what your age, is tailoring the activity program to your own fitness level.

Myth 5. You have to be athletic to exercise.

Most physical activities do not require any special athletic skills. In fact, many people who found school sports difficult have discovered that these other activities are easy to do and enjoy. A perfect example is walking - an activity that requires no special talent, athletic ability or equipment.

How do different activities help my heart and lungs?

Some types of activity will improve the condition of your heart and lungs if they are *brisk, sustained and regular*. Low-intensity activities do not condition the heart and lungs much. But they can have other long-term health benefits.

The columns below describe three types of activities and how they affect your heart.

Column A - These vigorous exercises are especially helpful when done regularly. To condition your heart and lungs, the AHA recommends that you do them for at least 30 minutes, three or four times a week, at more than 50 percent of your exercise capacity. (See target heart rate zones.) Other health experts suggest a shorter period for higher-intensity activities. These exercises can also burn up more calories than those that are not so vigorous.

Column B - These activities are moderately vigorous but still excellent choices. When done briskly for 30 minutes or longer, three or four times a week, they can also condition your heart and lungs.

Column C - These activities are not vigorous or sustained. They still have benefits - they can be enjoyable, improve coordination and muscle tone, relieve tension, and also help burn up some calories.

These and other low-intensity activities - like gardening, yard- work, housework, dancing and home exercise - can help lower your risk of heart disease if done daily.

A
Do condition

B
Can condition

C
Do not

heart and lungs	heart and lungs	condition much
Aerobic Dancing	Downhill Skiing	Badminton
Bicycling	Basketball	Baseball
Cross-Country Skiing	Field Hockey	Bowling
Hiking (uphill)	Calisthenics	Croquet
Ice Hockey	Handball	Football
Jogging	Racquetball	Gardening
Jumping Rope	Soccer	Golf (on foot or by cart)
Rowing	Squash	Housework
Running in Place	Tennis (singles)	Ping-pong
Stair-climbing	Volleyball	Shuffleboard
Stationary Cycling	Walking Moderately	Social Dancing
Swimming		Softball
Walking Briskly		Walking Leisurely

The key to success

How do I begin?

The key to a successful program is choosing an activity (or activities) that you will enjoy. Even moderate levels of activity have important health benefits. Here are some questions that can help you choose the right kind of activity for you:

1. How physically fit are you?

If you've been inactive for a while, you may want to start with walking or swimming at a comfortable pace. Beginning with less strenuous activities will allow you to become more fit without straining your body. Once you are in better shape, you can gradually change to a more vigorous activity if you wish.

2. How old are you?

If you are over 40 and have not been active, avoid very strenuous programs such as jogging when you're first starting out. For the first few months, build up the length and intensity of your activity gradually. Walking and swimming are especially good forms of exercise for all ages.

3. What benefits do you want from exercising?

If you want the benefits of exercise that condition your heart and lungs, check the activities in columns A and B. These activities - as well as those listed in column C - also give you other benefits as described in this booklet.

4. Do you like to exercise alone or with other people?

Do you like individual activities such as swimming, team sports such as soccer, or two-person activities such as racquetball? How about an aerobics class or ballroom dancing? Companionship can help you get started and keep going. If you would like to exercise with someone else, can you find a partner easily and quickly? If not, choose another activity until you can find a partner.

5. Do you prefer to exercise outdoors or in your home?

Outdoor activities offer variety in scenery and weather. Indoor activities offer shelter from the weather and can offer the convenience of exercising at home as with stationary cycling. Some activities such as bench stepping, running in place or jumping rope can be done indoors or outdoors. If your activity can be seriously affected by weather, consider choosing a second, alternate activity. Then you can switch activities and still stay on your regular schedule.

6. How much money are you willing to spend for sports equipment or facilities?

Many activities require little or no equipment. For example, brisk walking only requires a comfortable pair of walking shoes. Also, many communities offer free or inexpensive recreation facilities and physical activity classes.

7. When can you best fit the activity into your schedule?

Do you feel more like being active in the morning, afternoon, or evening? Consider moving other activities around. Schedule your activity as a regular part of your routine. Remember that exercise sessions are spread out over the week and needn't take more than about 10 to 15 minutes at a time.

By choosing activities you like, you will be more likely to keep doing them regularly and enjoying the many benefits of physical activity.

How do I pace myself?

Build up slowly If you've been inactive for a long while, remember it will take time to get into shape. Start with low- to moderate-level activities for at least several minutes each day. See the sample walking program, for example. You can slowly increase your time or pace as you become more fit. And you will feel more fit after a few weeks than when you first started.

How hard should I exercise?

It's important to exercise at a comfortable pace. For example, when jogging or walking briskly you should be able to keep up a conversation comfortably. If you do not feel normal again within 10 minutes of stopping exercise, you are pushing yourself too much.

Also, if you have difficulty breathing, experience faintness or prolonged weakness during or after exercising, you are exercising too hard. Simply cut back.

If your goal is to improve the fitness of your heart and lungs, you can find out how hard to exercise by keeping track of your heart rate. Your maximum heart rate is the fastest your heart can beat. Exercise above 75 percent of your maximum heart rate may be too strenuous unless you are in excellent physical condition. Exercise below 50 percent gives your heart and lungs little conditioning.

Therefore, the best activity level is 50 to 75 percent of this maximum rate. This 50-75 percent range is called your target heart rate zone.

When you begin your exercise program, aim for the lower part of your target zone (50 percent) during the first few months. As you get into better shape, gradually build up to the higher part of your target zone (75 percent). After 6 months or more of regular exercise, you can exercise at up to 85 percent of your maximum heart rate - if you wish. However, you do not have to exercise that hard to stay in good condition.

To find your target zone, look for the age category closest to your age in the table below and read the line across. For example, if you are 30, your target zone is 95 to 142 beats per minute. If you are 43, the closest age on the chart is 45; the target zone is 88 to 131 beats per minute.

Age	Target HR Zone 50-75%	Average Maximum Heart Rate 100%
20 years	100-150 beats per min.	200
25 years	98-146 beats per min.	195
30 years	95-142 beats per min.	190
35 years	93-138 beats per min.	185
40 years	90-135 beats per min.	180
45 years	88-131 beats per min.	175
50 years	85-127 beats per min.	170
55 years	83-123 beats per min.	165
60 years	80-120 beats per min.	160
65 years	78-116 beats per min.	155

70 years 75-113 beats per min. 150

Your maximum heart rate is approximately 220 minus your age. However, the above figures are averages and should be used as general guidelines.

Note: A few high blood pressure medicines lower the maximum heart rate and thus the target zone rate. If you are taking high blood pressure medications, call your physician to find out if your exercise program needs to be adjusted.

To see if you are within your target heart rate zone, take your pulse immediately after you stop exercising.

1. When you stop exercising, quickly place the tips of your first two fingers lightly over one of the blood vessels on your neck (carotid arteries) located to the left or right of your Adam's apple. Another convenient pulse spot is the inside of your wrist just below the base of your thumb.
2. Count your pulse for 10 seconds and multiply by six.
3. If your pulse falls within your target zone, you're doing fine. If it is below your target zone, exercise a little harder next time. And if you're above your target zone, exercise a little easier. Don't try to exercise at your maximum heart rate - that's working too hard.
4. Once you're exercising within your target zone, you should check your pulse at least once each week during the first 3 months and periodically after that.

A special tip:

Some people find that exercising within their target zone seems too strenuous. If you start out lower, that's okay, too. You will find that with time you'll become more comfortable exercising and can increase to your target zone at your own rate.

How long should I exercise?

That depends on your age, your level of physical fitness, and the level of intensity of your exercise. If you are inactive now, you might begin slowly with a 10-15 minute walk or other short session, three times a week. As you become more fit, you can do longer sessions or short sessions more often.

If you're active already and your goal is to condition your heart and lungs, try for a minimum of 30 minutes at your target heart rate zone. Each exercise session should include:

Warm up 5 minutes

Begin exercising slowly to give your body a chance to limber up and get ready for more vigorous exercise. Start at a medium pace and gradually increase it by the end of the 5-minute warm-up period.

Note: With especially vigorous activities such as jumping rope, jogging or stationary

cycling, warm up for 5-10 minutes by jumping rope or jogging slowly, warming up to your target zone. It is often a good idea to do stretching exercises after your warm-up period and after your exercise period. Many of these stretching exercises can be found in books on sports medicine and running. Below are three stretches you can use in your warm-up period and after your cool down period. Each of these exercises help stretch different parts of your body. Do stretching exercises slowly and steadily, and don't bounce when you stretch.

Wall push: Stand about 1 1/2 feet away from the wall. Then lean forward pushing against the wall, keeping heels flat. Count to 10 (or 20 for a longer stretch), then rest. Repeat one to two times. **Palm touch:** Stand with your knees slightly bent. Then bend from the waist and try to touch your palms to the floor. Count to 10 or 20, then rest. Repeat one to two times. If you have lower back problems, do this exercise with your legs crossed.

Toe touch: Place your right leg level on a stair, chair, or other object. With your other leg slightly bent, lean forward and slowly try to touch your right toe with right hand. Hold and count to 10 or 20, then repeat with left hand. Do not bounce. Then switch legs and repeat with each hand. Repeat entire exercise one to two times.

Exercising within your target zone 30-60 minutes

Build up your exercising time gradually over the weeks ahead until you reach your goal of 30-60 minutes. Once you get in shape, your exercising will last from 30 to 60 minutes depending on the type of exercise you are doing and how briskly you do it. For example - for a given amount of time, jogging requires more energy than a brisk walk. Jogging will thus take less time than walking to achieve the same conditioning effect. For two examples of how to build up to the goal of 30-60 minutes, see "Two Sample Exercise Programs".

Cool down 5 minutes

After exercising within your target zone, slow down gradually. For example, swim more slowly or change to a more leisurely stroke. You can also cool down by changing to a less vigorous exercise, such as changing from running to walking. This allows your body to relax gradually. Abrupt stopping can cause dizziness. If you have been running, walking briskly, or jumping rope, repeat your stretching and limbering exercises to loosen up your muscles.

How often should I exercise?

If you are exercising in your target zone, exercise at least three or four times per week (every other day). If you are starting with less intense exercise, you should try to do at least something every day.

Exercising regularly is one of the most important aspects of your exercise program. If you don't exercise at least three times a week, you won't experience as many of the benefits of regular physical activity as you could or make as much progress. Try to spread your exercise sessions throughout the week to maximize the benefits. An every-other-day schedule is recommended and may work well for you.

What if I miss a few sessions?

Whenever you miss a few sessions (more than a week), you may need to resume exercising at a lower level than before. If you miss a few sessions because of a temporary, minor illness such as a cold, wait until you feel normal before you resume exercising.

If you have a minor injury, wait until the pain disappears. When you resume exercising, start at one-half to two-thirds your normal level, depending on the number of days you missed and how you feel while exercising.

Whatever the reasons for missing sessions, don't worry about the missed days. Just get back into your routine and think about the progress you will be making toward your exercise goal.

Is there a top limit to exercising?

That depends on the benefits you are seeking.

Anything beyond 60 minutes daily of a vigorous or moderately vigorous activity, such as those in columns A and B, will result in little added conditioning of your heart and lungs. And it may increase your risk of injury.

If you want to lose extra pounds or control your present weight, there is no upper limit in that the longer you exercise, the more calories you burn off. But remember that the most effective weight loss program includes cutting down on calories in addition to exercise.

Remember: How you exercise is just as important as the kind of activity you do. Your activity should be brisk, sustained and regular - but you can do it in gradual steps. Common sense and your body will tell you when you are exercising too long or too hard. Don't push yourself to the point where exercise stops being enjoyable.

How do I keep going?

Here are some tips to help you stay physically active:

1. Set your sights on short-term as well as long-term goals. For example, if your long-term goal is to walk 1 mile, then your short-term goal can be to walk the first quarter mile. Or if your long-term goal is to lose 10 pounds, then focus on the immediate goal of losing the first two or three pounds. With short-term goals you will be less likely to push yourself too hard or too long. Also, think back to where you started. When you compare it to where you are now, you will see the progress you've made.
2. Discuss your program and goals with your family or friends. Their encouragement and understanding are important sources of support that can help you keep going. Your friends and family might even join in.
3. If you're having trouble sticking to your regular activity program, use the questions on pages 20 and 21 to think through the kinds of things that can affect your exercise enjoyment.

4. What were your original reasons for starting an activity program? Do these reasons still apply or are others more important? If you are feeling bored or aren't enjoying a particular activity, consider trying another one.

By continuing to be active regularly, you'll be building a good health habit with benefits you can enjoy throughout your life.

How can I become more active throughout my day?

To become more physically active throughout your day, take advantage of any opportunity to get up and move around. Here are some examples:

- Use the stairs - up and down - instead of the elevator. Start with one flight of stairs and gradually build up to more.
- Park a few blocks from the office or store and walk the rest of the way. Or if you ride on public transportation, get off a stop or two before and walk a few blocks.
- Take an activity break - get up and stretch, walk around and give your muscles and mind a chance to relax.
- Instead of eating that extra snack, take a brisk stroll around the neighborhood.
- Do housework, such as vacuuming, at a more brisk pace.
- Mow your own lawn.
- Carry your own groceries.
- Go dancing instead of seeing a movie.
- Take a walk after dinner instead of watching TV.

If you have a family, encourage them to take part in an exercise program and recreational activities they can either share with you or do on their own. It is best to build healthy habits when children are young. When parents are active, children are more likely to be active and stay active after they become adults.

Whatever your age, moderate physical activity can become a good health habit with lifelong benefits.

Are there any risks in exercising?

Muscles and joints

The most common risk in exercising is injury to the muscles and joints. This usually happens from exercising too hard or for too long - particularly if a person has been inactive for some time. However, most of these injuries can be prevented or easily treated as explained in "Effective ways to avoid injuries".

Heat exhaustion and heat stroke

If precautions are not taken during hot, humid days, heat exhaustion or heat stroke can occur - although they are fairly rare. Heat stroke is the more serious of the two. Their symptoms are similar:

Heat exhaustion

dizziness
headache
nausea
confusion
body temperature below normal

Heat stroke

dizziness
headache
nausea
thirst
muscle cramps
sweating stops
high body temperature

The last two symptoms of heat stroke are important to know. If the body temperature becomes dangerously high, it can be a serious problem.

Both heat exhaustion and heat stroke can be avoided if you drink enough liquids to replace those lost during exercise.

Heart problems

In some cases, people have died while exercising. Most of these deaths are caused by overexertion in people who already had heart conditions. In people under age 30, these heart conditions are usually congenital heart defects (heart defects present at birth). In people over age 40, the heart condition is usually coronary artery disease (the buildup of deposits of fats in the heart's blood vessels). Many of these deaths have been preceded by warning signs such as chest pain, lightheadedness, fainting and extreme breathlessness. These are symptoms that should not be ignored and should be brought to the attention of a doctor immediately.

Some of the deaths that occur during exercise are not caused by the physical effort itself. Death can occur at any time and during any kind of activity - eating, sleeping, sitting. This does not necessarily mean that a particular activity caused the death - only that the two events happened at the same time.

No research studies have shown that physically active people are more likely to have sudden, fatal heart attacks than inactive people. In fact, a number of studies have shown a reduced risk of sudden death for people who are physically active.

Exercising too hard is not beneficial for anyone, however, and is especially strenuous for out-of-shape, middle-aged and older persons. It is very important for these people to follow a gradual and sound exercise program.

If you consider the time your body may have been out of shape, it is only natural that it will take time to get it back into good condition. A gradual approach will help you maximize your benefits and minimize your risks.