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# Endurance Exercise:

## The REAL Fountain of Youth

### Gay Rekerdres's goal

**last January was fairly common.** “I was about to turn 50 and wanted to lose weight. I’d tried before, without much commitment. But now I faced high blood pressure. I write life and health insurance and see those tables and numbers. I want to care for myself in old age,” said Rekerdres, who works at the insurance company she owns with her husband. “My friend and I agreed: We **must** do this.”

Rekerdres and her friend began attending weekly classes at the Cooper Institute in Dallas. “My idea of an exercising goal was 30 minutes a day. I resisted shopping, because it forced me to walk the mall. I always wanted the closest parking space. But my friend spurred me on. We realized we needed to exercise consistently. By early June we’d made a pact to walk five days a week for an hour — and make it our number-one priority.” When school started, the mother of school-aged children faced added scheduling challenges. But her resolve remained strong. “My family’s shocked that I actually get up at 5:30 in the morning, put on my shoes and head out the door,” she said. “But I’ve taken care of my family for years, and now it’s time

Many people don’t realize that physical inactivity, like high blood pressure or elevated cholesterol, is a risk factor for heart disease.





## Weight loss and aerobic exercise

Fat weighs less than muscle does. Aerobic exercise can help reduce body fat and replace it with muscle. You'll look better, although you may not weigh less. To lose weight, adjust your caloric intake.

One 12-week study compared the effects of aerobic and resistance training in individuals who had recently lost weight. Those in the resistance exercise group had stable weights but increased fat-free mass. Those in the aerobic exercise group lost an additional five pounds of weight (predominantly body fat) while maintaining fat-free mass.

But exercise had the greatest impact on maintaining weight loss. Participants could avoid regaining weight with an average of about 210 minutes of endurance exercise per week — a brisk half-hour walk every day.

to also take care of myself. If I'm going to stay healthy, exercise must be a part of my life."

Making exercise a way of life is a key message of the Cooper Institute, according to exercise psychologist Andrea Dunn, Ph.D., associate director for the division of epidemiology and clinical applications. "Many people don't realize that physical inactivity, like high blood pressure or elevated cholesterol, is a risk factor for heart disease." Clearly, our bodies were designed to be physically active, and the biggest roadblock is the chair, say Dunn and the other authors of *Active Living Every Day: 20 Weeks to Lifelong Vitality* (Human Kinetics, 2001), a self-help book that helps readers adopt an active lifestyle.

Heart disease is now the number-one cause of death and disability in the United States for both men and women. Jobs seldom require vigorous physical activity — just hours commuting — and free time is spent watching TV or in front of a computer. Only about 20 percent of American adults maintain an activity level needed for good health. The U.S. Surgeon General, the National Institutes of Health and the Centers for Disease Control and Prevention, among others, consider sedentary lifestyle a major modifiable coronary risk factor — along with cigarette smoking, high blood pressure, elevated LDL cholesterol and triglycerides, reduced HDL cholesterol and obesity. It's a key contributor to about 12 percent — or 250,000 — deaths in the United States each year.

Heart disease kills sedentary adults

at about twice the rate of more active adults, says cardiologist Gerald F. Fletcher, M.D., professor of medicine, Mayo Medical School, Mayo Clinic, Jacksonville, Florida, and lead author of the American Heart Association's recent scientific statement on exercise. The least fit Americans are more than five times as likely as the most fit to die of heart disease.

## Endurance exercise: the key to health

A good conditioning program includes endurance, strength and stretching exercises.

**Endurance exercise** includes brisk walking or jogging, stair stepping, cycling, swimming, cross-country skiing, or a combination of several (see "What if I'm not walking?"). Experts recommend that most people get at least 30 minutes of endurance exercise most days of the week.

**Flexibility exercise** focuses on improving range of motion in your joints and should be done when your muscles are warm.

**Resistance or strength training** increases muscle mass and improves older adults' ability to perform activities of daily living (see *Special Bulletin: Strength Training*, September/October 2001).

Now that endurance exercise and healthful eating are part of her lifestyle, Rekerdres has lost weight and feels better. Stiffness in her hip is disappearing, and she notices healthier hair and skin. Her blood pressure has gone down, along with the need for some medications. But these changes aren't surprising.

# AEROBIC EXERCISE

BY LYNN MADSEN



Although strength and stretching exercises are important to good overall health, experts say aerobic exercise, also called endurance exercise, is the real fountain of youth. It prompts your heart to pump at an elevated rate for an extended period of time, removing oxygen from the air and delivering it to working muscles.

Incorporating regular aerobic exercise into your routine can reduce your risk for cardiovascular diseases by:

- increasing the amount of blood ejected from your heart with each contraction
- slashing your risk for high blood pressure by 30 to 50 percent
- lowering your risk of ischemic stroke (caused by narrow or blocked blood vessels) by 30 percent and hemorrhagic stroke (caused by bleeding into or around the brain) by 20 percent
- reducing your risk of developing diabetes, and helping insulin work more efficiently if you have diabetes

- reducing body fat 1 to 4 percent, especially in the upper body and abdomen
- reducing elevated triglyceride and LDL cholesterol levels
- increasing HDL cholesterol levels
- relaxing your blood vessels to maximize blood flow and improve heart and lung function
- relieving stress and improving your mental health with the release of endorphins, your body's natural painkillers

If you're well conditioned, your heart pumps fewer beats per minute than if you're not. Walking briskly burns about one-third as many calories as jogging (but with less impact and injury) and can — in as little as three hours a week — reduce your risk of coronary disease by as much as 65 percent. Even if you have heart disease, aerobic exercise can reduce by 25 percent your risk of dying of it.

Building an endurance exercise program into your daily lifestyle also offers you:

- improved respiratory function
- strengthened leg muscles, increased joint stability and reduced likelihood of falls
- osteoporosis prevention (with weight-bearing exercise such as walking, jogging, running, cycling)
- lowered risk of colon, lung, prostate and breast cancer (possibly through improved immune system function)
- improved psychological and emotional well-being
- increased life span
- increased stamina and reduced fatigue
- improved sleep

## Calculating target heart rate

Generally, target heart rate during exercise is about 50 to 75 percent of your maximum heart rate.

To find your heart rate, or pulse, lightly place the tips of your first two fingers inside your wrist, just below the base of your thumb, over a blood vessel. Count the number of beats in 15 seconds and multiply by four.

Your maximum heart rate is approximately 220 minus your age. To calculate a target range, multiply your maximum heart rate by .7 for the low end and then by .85 for the upper end.

To determine your rate, take your pulse immediately after you stop exercising.

Learn how weight affects heart rate by taking your pulse after you walk a fixed distance, first without and then with an extra 15 pounds of weight in hand.

**Note:** If you have a heart condition or take a prescribed beta-blocker medication, these rates do not apply. Your doctor should help determine your target heart rate.



Exercise may even help you avoid declining mental abilities. In a five-year study of people 65 and older, the most active were only about half as likely as their less active counterparts to develop Alzheimer's disease.

So why hasn't everyone signed on?

Many are overwhelmed to think of adding anything to their day that would gobble up more time. Convinced they could never meet these goals, they do nothing. Others are uncertain about what constitutes aerobic exercise. They understand a word like "endurance," but they're not too sure about "aerobic."

### **What is aerobic?**

Aerobic means "living in air" and, when linked with exercise, refers to activity that increases oxygen intake and heart rate. Aerobic conditioning increases your car-

diovascular system's capacity to deliver oxygen and your muscles' ability to use oxygen. In fact, under a microscope, muscles that are exercised aerobically can resemble those of a younger person.

One scientific measure of cardiovascular fitness and exercise capacity is maximal oxygen consumption ( $VO_{2max}$ ), the maximum rate at which your heart, lungs and muscles burn oxygen to make energy. This rate generally declines 8 to 10 percent per decade after age 30. Thus, by age 60,  $VO_{2max}$  in men is about two-thirds what it was at age 20. Physical activity plays an important role in  $VO_{2max}$ . Regardless of your age, simply staying in bed for three weeks can reduce your  $VO_{2max}$  by about 25 percent.

But exercise can reduce loss of  $VO_{2max}$ . One study followed an American medal-winning Olympic rowing



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team for more than 20 years. As most of the teammates focused on their careers, fitness levels declined steadily. But one team member who continued training faithfully retained 90 percent of his aerobic capacity, although he lost some muscle power.

Since most people don't have equipment to measure  $VO_{2max}$ , other indicators are helpful. You can detect changes in your heart's activity level by measuring your pulse rate — the number of heartbeats per minute — before, during and after exercise. More intense activity generates a greater pulse rate. The pulse of a well-conditioned heart returns to normal more quickly after exercise in the so-called target zone (see "Calculating target heart rate"). Another measurement of exertion uses metabolic equivalents (METs), which measure energy your body uses for activity above and beyond the basic functions of breathing. METs are weight-dependent (it takes more energy to move 200 pounds than 140 pounds).

It's simpler to measure exertion with the Borg scale of perceived exertion, which is based on how strenuously you feel you're exercising. It's generally a sound indicator of relative fatigue. This system has you rate your level of exercise from 6 (resting) to 20 (maximum exertion possible):

Number	Perceived exertion level
9	Very light
13	Somewhat hard
15	Hard
17	Very hard
19	Very, very hard

Generally, aerobic conditioning starts when the perceived level of exertion is from 12 to 14.

## Should you consult a doctor before starting a conditioning program?

Check with your doctor if you are middle-aged or older, inactive and plan to undertake a vigorous exercise program — or, if you:

- have a heart condition that limits your activity
- feel pain or pressure in your chest or in the left side of your neck or shoulder when exercising
- have had chest pain — without activity — in the past month
- commonly become dizzy and lose your balance or lose consciousness
- are extremely short-winded after mild exertion
- take medication for high blood pressure or a heart condition
- have insulin-dependent diabetes
- have a bone or joint problem that's likely to worsen with physical activity
- smoke
- are overweight
- are sedentary
- have a chronic health condition

Generally, these conditions don't mean you can't exercise, just that your program should be carefully tailored to your needs.

## Getting started

Time is the reason most people give for lack of physical activity. Yet, everyone has the same number of hours in a week — or a year. Visualize yourself as an active person. Start where you are. Remember, walking doesn't require athletic skill.

Develop specific short- and long-term goals — and write them down.

## What if I'm not walking?

You can exercise in a variety of ways. Just for comparison, here's a partial list, taken from *Active Living Every Day: 20 Weeks to Lifelong Vitality*, of about how many calories a 160-pound person spends per minute during various activities (adjust proportionately more or less, according to your weight):

### Light activities:

Mowing with a riding mower	3.2
Shopping	2.9
Sleeping	1.1
Standing	2.3
Walking, 30 minutes per mile	3.2
Watching TV while sitting or lying	1.3

### Moderate activities:

Low-impact aerobic dance	6.4
Bicycling, 10 mph	5.1
Canoeing	5.1
Dancing: polka, line or country	5.7
Dancing: waltz, foxtrot, samba	3.8
Mopping, vacuuming	4.5
Mowing with a power mower	5.7
Playing golf, no cart	5.7
Playing shuffleboard	3.8
Raking lawn	5.1
Snowmobiling	4.5
Sweeping the sidewalk	5.1
Swimming, treading water	5.1
Table tennis	5.1
Walking, 15 minutes per mile	6.4
Walking, 20 minutes per mile	4.2
Water aerobics	5.1
Weeding, digging in garden	5.7

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**Hard activities:**

- High-impact aerobic dance . . . . . 8.9
- Chopping wood . . . . . 7.7
- Horseback riding at a trot . . . . . 8.3
- Moving furniture . . . . . 7.7
- Playing tennis, doubles 7.7
- Playing racquetball, casual . . . . . 8.9
- Rowing, moderate effort .. 8.9
- Shoveling, light to moderate . 8.3
- Roller or ice skating .. 8.9
- Ski machine . . . . . 8.9
- Lap swimming, light, moderate effort .. 8.9
- Swimming, leisure .... 7.7

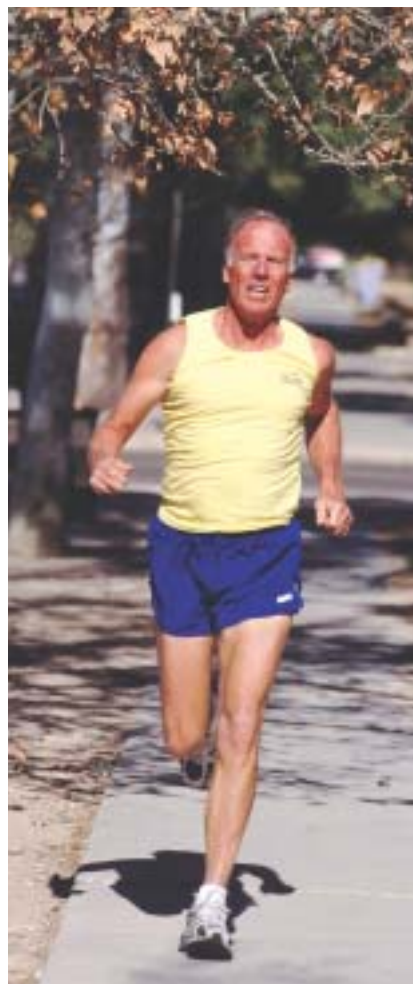
**Very hard activities:**

- Bicycling, 12-14 mph . . . . . 10.2
- 16-19 mph . . . . . 15.3
- Cross-country skiing .. 11.5
- In-line skating . . . . . 16.0
- Playing basketball .... 10.2
- Playing racquetball, competitive . . . . . 12.8
- Playing tennis, singles . 10.2
- Running, 10 minutes per mile` 12.8
- Skipping rope . . . . . 10.2
- Stair climber machine . 11.5
- Step aerobics, 6-8 inch step .... 10.9
- Swimming, vigorous effort ... 14.1

Solicit support from your family and friends and encourage them to join you. Choose something you enjoy, start slowly and develop a lifelong habit of being an active person. List your sedentary activities. Now select one to do less often. Convert light into moderate activity by walking like you're rushing to make an appointment or come in from the cold. Being active makes you feel more energetic.

Squeeze in a two-minute walk — during a coffee break perhaps. Use a bathroom on a different floor and take the stairs — or get off the elevator one floor early and walk up the last flight. Do housework more briskly. Consider where you can convert sedentary time to active time — perhaps by bringing a bag lunch and walking briskly for part of your lunch hour. Park farther from the store or bank or get off the bus one stop early and walk. Substitute a talking walk with your partner for one TV show. Schedule a walking meeting with a coworker. Walk around the field during your kids' games. Enlist your kids' help with household tasks, perhaps dishes after supper, freeing time for a walk. (A bump in allowance may help here.) Use the stairs at work or when you stay in a motel. Substitute an evening of dancing for a movie. Use your treadmill in front of the TV during the news or your favorite program or buy a bookstand for the stationary bike. Rather than sharing coffee with a friend, take a walk together or do something else active.

Find an activity about which you can be passionate. Then decide whether you prefer doing it alone or with others. Do you enjoy the out-of-doors? If you



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choose outdoor activities, plan alternatives for days when the weather doesn't cooperate. Besides activities already mentioned, heart conditioning may include aerobic dancing or classes, hiking, jumping rope and rowing — or a variety of sports, if done continuously (singles tennis, for example). If you enjoy groups, find one for your chosen activity — a hiking or biking club, perhaps.

Until recently, exercise gurus focused on intensity of exercise, a focus that discouraged some beginners from trying even brief exercise sessions. Although 30 minutes at a time is desirable for endurance exercise, you can even benefit aerobically from a 10-minute brisk walk. Get a step counter

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and try to increase the number of steps you take each day. Develop an activity pattern and add to it gradually (see “Using a step counter”).

## Avoiding injuries — and how much is too much

The biggest mistake people make is doing too much too quickly, which can produce injuries or sore muscles. While temporary soreness and mild weariness are tolerable, your workout should not hurt or leave you feeling exhausted. Warm up with 5 minutes of moderate activity to gradually increase your heart and breathing rates and prepare your body for more vigorous activity. When finished, don’t stand still, but cool down gradually, giving your body time to adjust. Stretch at the end of your exercise session to avoid sore muscles. Wait two hours after a big meal before exercising vigorously. If you miss a day, don’t double your workout the next day. If illness causes you to miss several days, resume activity gradually.

Listen to your body’s warning signs — especially pain. If something you’re doing hurts, stop doing it. Be especially concerned about:

- discomfort in your upper body when you exercise, including your chest, neck, arm or jaw area
- shortness of breath or wheezing during exercise
- painful bones or joints

The Centers for Disease Control and Prevention and the American College of Sports Medicine recommend 20 to 30 minutes of endurance activity, three to five days a week, at 50 to 80 percent of maximum exercise capacity. While more than 60 minutes of vigorous activity a

day is fine for controlling weight, it adds little additional heart or lung conditioning — and may increase your risk of injury. While Fletcher notes that data support a 15-minute mile being more beneficial than a 20-minute mile (and a 12- to 13-minute mile even better), you’re doing too much if you’re unable to converse while exercising or find yourself fatigued for the rest of the day. If you feel faint or nauseated afterwards, you’re probably exercising too intensely or you stopped too suddenly. If you experience more than slight muscle discomfort, check your stretching and warm-up procedures. Incidentally, jogging increases risk of impact injury much more than walking briskly does.

Walking,  
12 minutes per mile  
10.2

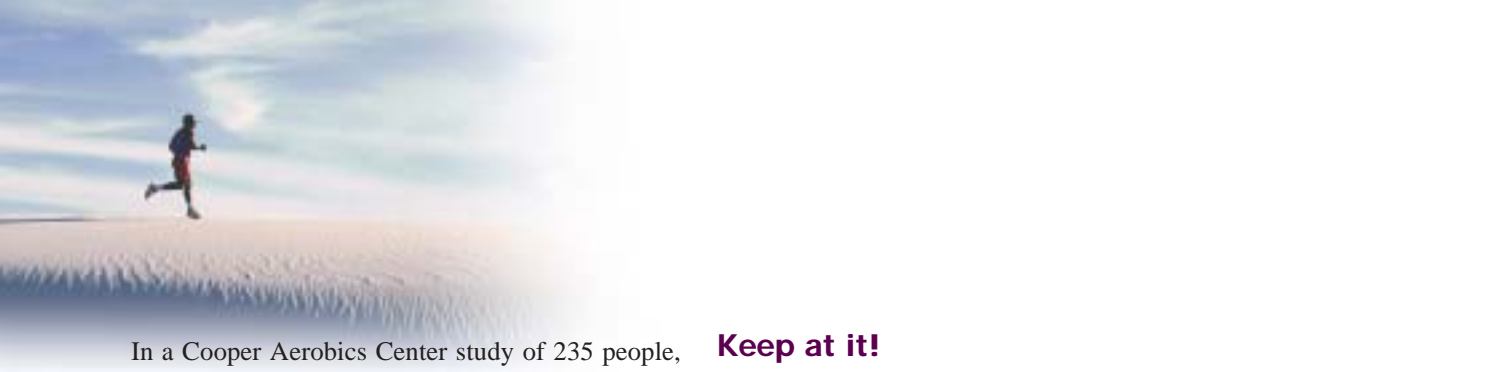
Based on selected MET values created by B.E. Ainsworth et al., 2000, “Compendium of physical activities: An update of activity codes and MET intensities.” *Medicine and Science in Sports and Exercise* 32 (9): S498-504. Adapted, by permission, from S.N. Blair et al., 2001, *Active Living Every Day*, (Champaign, IL: Human Kinetics), 179-182.

## Using a step counter

Keeping track of how many steps you take each day is a simple way to start your program. Put the step counter on the waist of your garment (or undergarment) first thing in the morning. Learn how many steps you take in an average day, and set a goal for improvement. A good ultimate goal is 10,000 steps a day. A brisk, half-hour walk usually amounts to 2,500 to 3,500 steps.

Purchase a step counter for about \$30 (don’t bother with a fancy one) from a local sporting goods shop or contact New Lifestyles Digiwalker (1-888-748-5377, [www.digiwalker.com](http://www.digiwalker.com)) or Accusplit (1-800-935-1996, [www.accusplit.com](http://www.accusplit.com)).





In a Cooper Aerobics Center study of 235 people, amount of exercise was more important than intensity, and gains were most notable as people moved from sedentary to moderately active lifestyles. “What really seems to matter, in terms of health and fitness, is the amount of exercise people do, not the intensity,” says Steven N. Blair, director of research at the Cooper Institute and senior scientific editor of the Surgeon General’s Report on Physical Activity and Health in 1996.

Dress and exercise appropriately for the weather. On hot days or when you travel to a warm place, exercise early in the morning, late in the day, or in a climate-controlled mall. Drink ample fluids, especially water. Wear sweatsuits only for warmth, and avoid rubberized ones. When you exercise outside at dawn, dusk or in the dark, consider whether you’re visible to oncoming traffic and wear light-colored clothes and reflective bands. Wear shoes designed for your activity. Dress in layers when it’s cold, and remove clothes as you warm up. Wear appropriate protective gear for your activity and use the proper equipment. Try to find a soft, even surface for jogging.

## Keep at it!

As exercise becomes part of your lifestyle, add more gradually. Pack walking shoes for a business trip. Reward yourself for reaching short- and long-term goals. These suggestions are from *Active Living Every Day*:

- Buy theater or concert tickets
- Take dance lessons
- Treat yourself to a facial or a manicure
- Give yourself flowers or a favorite magazine subscription
- Buy a portable CD or audio tape player
- Take an active vacation — a biking, hiking or cross-country skiing trip

Rekerdres is convincing. “Once I started feeling much better, I couldn’t imagine going back to my old ways,” she says enthusiastically. She takes the stairs at work, added weekend morning walks and hopes to begin jogging soon, now that the weight is disappearing. She uses a step counter and regularly meets her goal of 15,000 steps a day. And cycling may not be far off. “Exercise was a chore. Now it’s something I want to do, because I reap the rewards.” She and her husband plan

to add a lap swimming pool when they remodel a portion of their house. And Gay shares a secret fantasy. “Feeling better is inspiring me to try other things. I have a hidden side. I tap danced in and right after college. I’m planning to start again as a reward for getting back into shape — it’s something I love to do. Although I’ve come a long way, I still have a way to go. But the difference is amazing.” ✎

*Lynn Madsen is a medical writer who has authored articles, book chapters and Internet pieces for consumers. She is also an exercise junkie who enjoys walking, swimming and biking nearly every day.*



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