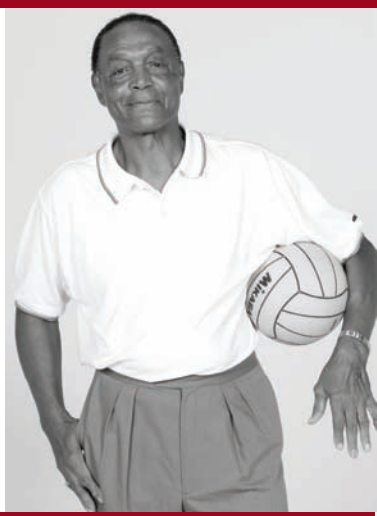
Stay Active and Be Fit!



A Guide to Fitness and Activity Fundamentals

You're it. Get fit!

The President's Challenge Physical Activity & Fitness Awards Program

A Program of the President's Council on Physical Fitness and Sports, U.S. Department of Health and Human Services

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Stay Active and Be Fit! A Guide to Fitness and Activity Fundamentals

The President's Challenge is a program of the President's Council on Physical Fitness and Sports, U.S. Department of Health and Human Services. This booklet can be downloaded from the President's Challenge Web site at www.presidentschallenge.org/pdf/getfit.pdf.
For ordering multiple copies of this booklet please contact the President's Challenge office at 1-800-258-8146 or visit the Web site at www.presidentschallenge.org.

A Message from the President's Council

You use it or lose it. It's a fact. Maintain your vigor and the quality of your life by keeping active. Just follow the tips in this guidebook to get fit.

The number one mission of the President's Council on Physical Fitness and Sports (PCPFS) is to motivate all Americans to become—and stay—active. Regular physical activity enhances the quality of your life by improving both your physical and mental health. An active lifestyle can also prevent the development of a myriad of health problems including heart disease, obesity, diabetes, osteoporosis, and certain cancers.

It's not easy being active in today's world. But studies show that you're most likely to get and stay fit if you pick a convenient activity that you enjoy, set realistic goals, record your progress, and seek out recognition when you meet your goals. That's why the President's Council on Physical Fitness and Sports initiated the President's Challenge—to help Americans of all ages, with and without disabilities, set and reach their health and fitness goals.

Use the President's Challenge to keep a log of your physical activities and you'll qualify for a Presidential Active Lifestyle Award. The award is a wonderful goal to achieve, and something you can do with your family, or with friends and co-workers. Get healthy together. Having that support network makes it easier to get fit!

www.fitness.gov

Acknowledgments

The President's Council on Physical Fitness and Sports is grateful to the many respected experts and staff who helped create this valuable resource for all Americans, with and without disabilities. Of special note are B. Don Franks, Ph.D., Susan Kalish, Russ Pate, and Brendon Hale. Editorial comments were provided by Dennis Hill and Mary Spohn. We sincerely thank all of the others, too many to mention individually, who graciously provided their time and energy to comment.

The President's Council on Physical Fitness and Sports (PCPFS) hopes that this booklet will help you to start and stay on a path towards lifetime physical activity and FUN!

Of special note, the PCPFS is pleased to announce that in 2003 a Science Board was created. Information on these eminent professionals can be viewed at www.fitness.gov. Members to date include the following:

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You Can Make a Difference

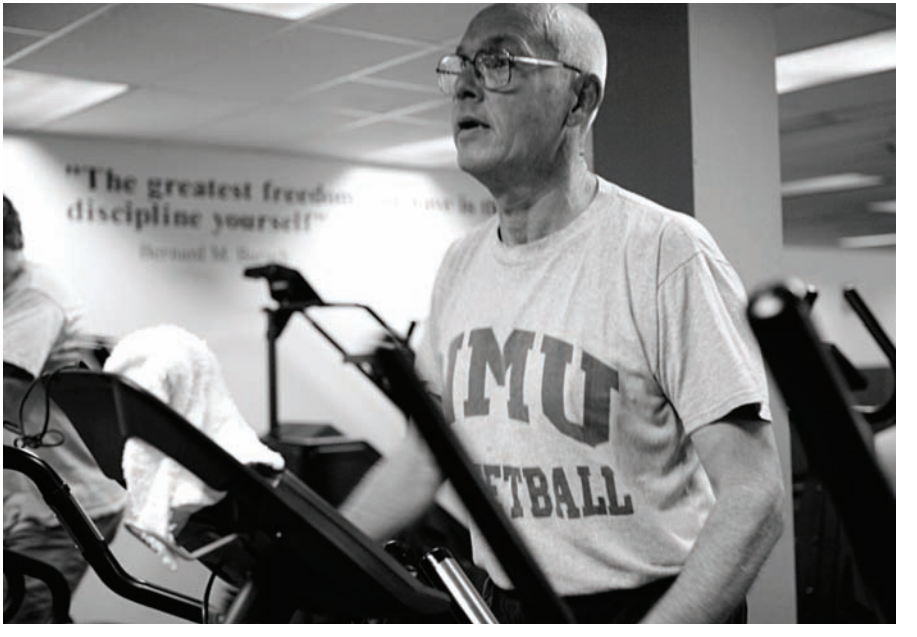
There are a lot of things that you can't control, but you can improve your health and fitness. One of the most important things that scientists have learned in the last century is that what you eat and what you do can be the foundation for a healthy life.

Study after study has conclusively shown that keeping active—whether through sports, exercise, or everyday chores—will help you to live longer and enjoy each day more. Active people have a reduced risk of heart disease, obesity, diabetes, and some forms of cancer. They generally have a more positive outlook on life and the energy to get things done and make things happen. Sounds like a pretty good return on an investment of just 30 minutes a day.

How Healthy Is Your Lifestyle?

Have you been thinking about changing some aspects of your life? Here's a quick self-assessment to help you think about which aspects of your life you want to improve: Are you physically active for 30 minutes every day? Do you exercise vigorously at least three times a week, for a minimum of 20 minutes? Do you regularly exercise to increase your strength and flexibility? Do you smoke? Do you have more than a couple of drinks of alcohol a week? Do you take other drugs or medicine on a regular basis? Is your weight what it should be? Do you eat a well-balanced diet? Are you able to cope with day-to-day stress? Can you deal with big emotional problems—or do you eat, drink, or take drugs to relieve stress when troubles arise?

The answers to these questions indicate that the lifestyle of many of us isn't up to par. If you see your lifestyle lacking in any of these areas, reading this booklet can get you on the right track. There are a number of things you can do to improve your health. If you're ready to make some positive changes in your life, we're here to help you.



What is Fitness?

An active lifestyle improves your health and decreases your risk of premature health problems. Total fitness includes mental, social, and physical components; however, this book will focus on physical fitness. Contrary to what many people believe, physical fitness isn't just about being muscular or maintaining a low body weight. It's also about aerobic fitness, flexibility, muscular strength and endurance, and proper body composition.

- **Aerobic fitness** (also called cardiovascular or cardiorespiratory fitness) refers to your body's ability to utilize oxygen efficiently for a variety of tasks.
- **Flexibility** and **muscular strength and endurance** are essential to being able to carry out the daily tasks of everyday living, such as carrying in the groceries or reaching for a book.
- **Body composition** refers to your body's muscle-to-fat ratio. Your total weight isn't as important as how much fat you are carrying around.

Set Your Goals and Make Them Happen

For most of us, it takes a specific sequence of events to change eating patterns and develop fitness habits that will last a lifetime.

Here's how you can make it happen:

1. Decide to improve your health.
2. Find out your physical status; get advice from health and fitness professionals. If you have health concerns, get your doctor's OK before you increase your activity level.
3. Select a fitness program that's right for you, taking into account your age, physical condition, and lifestyle.
4. Take a fitness test to find out how fit you are now.
5. Participate in physical activities that you enjoy.
6. Undergo periodic fitness testing to gauge your progress.
7. Modify your activities often so that your workout remains challenging.

Choose the Right Activities

The American College of Sports Medicine (ACSM) suggests you take the following factors into account to zero in on a fitness plan you'll stick with:

- **Convenience:** Can you do it? Some activities require expensive equipment, are seasonal, or are not readily available in certain locations. Choose an activity that you can afford to do year-round, and that you can do near your home or office.

- **Skill:** Is it too hard? Workouts that require a high level of skill may discourage you if they're too challenging. Focus on activities that fit with your skill base (for example, inline skating might be difficult for you if you don't have good balance, but traditional roller skating may work). Allow yourself time to develop the skills you need for an activity to become enjoyable.

- **Social Factors:** Are you having fun yet? For many individuals, working out with others makes exercise sessions more fun and increases the likelihood of continuing a fitness program over the long term. If you prefer social activities, you might choose to walk or run with a friend or neighbor, or take exercise classes at a local gym or recreation center. Some people, however, prefer working out alone, away from phones, beepers, and other people. The key is to find what suits your personality.

Fitness Facts

If you want to lose weight… Did you know that higher intensity workouts may decrease fat more than lower intensity workouts? At lower intensities, your body burns more fat calories than carbohydrates. But you may burn more calories overall at higher intensities, provided you work out long enough. Studies also suggest that even if your total caloric expenditure is slightly lower, high-intensity workouts can create a modest "after-burn" effect, so you'll lose more fat.

If you want to build muscle… Do men really build muscle more easily than women? In most cases, yes. Our genetic makeup determines what types of muscle fibers we have, where they are distributed, and how we respond to exercise. When you build muscle, you boost your resting metabolic rate and increase lean body mass. Whether you're male or female, you can develop strong muscles. In one study, women who lifted weights for 25 minutes just two to three times a week gained an average of two pounds of muscle (and lost about four pounds of fat) over an eight-week period.

If you want to tone up… Strength training is a great way to sculpt muscle, but if you want to be sleek and strong, why not give Pilates a try? Many fitness experts believe that this workout can help you develop long, strong muscles, a flat stomach, a strong back, and improved posture. And like working out with weights, Pilates strengthens connective tissue (tendons and ligaments) and may help reduce your risk of osteoporosis. Check out your local gym or recreation center to find a Pilates class near you.

Pick a Sport that Meets Your Needs

Use this chart to help you find an activity that suits your style. Categories are rated on a scale of 1 to 5, (5 is the highest). For example, biking is a good muscle builder, but cost varies, depending on the type of bike you purchase or whether you bike indoors or out. It's an aerobic, heart-healthy sport, but the intensity of the workout varies, from easy to vigorous. You don't need a lot of training to bike, but it generally isn't conducive to conversation or social interaction. It's pretty convenient, if you bike near home, but longer tours take special planning.

Activity	Builds Muscles	Cost	Availability	Heart Healthy	Intensity	Skill Factor	Social Factor	Time/ Convenience
Basketball	3	1	5	4	5	2	5	1
Biking	4	3–5	3	5	2–5	2	2	1–3
Climbing	5	1–3	2	3	3	3	3	4-5
Exercise Class/Video	4	1–3	4	2–5	1–5	2	1–4	1
Fitness Equipment	3	1–3	3	2–5	2–5	2	1–4	2
Free Weights	5	3	5	2	2	2	1–4	1
Golf	2	5	3	2	2	4	4	4–5
Hockey	3	5	2	5	5	4	5	4
Resistance Machines	5	2–4	3	2	2	2	1–3	1
Rowing	4	2–4	3	5	3–5	2	3	3
Running	3	1	5	5	3–5	1	1	1
Skating	3	3	3	3	3	3	2	3
Skiing	3	3–5	2	3	3	3	2	4–5
Soccer	3	3	3	4	3–5	3	5	4
Swimming	3	3	3–4	5	3–5	2	1–4	3
Tennis	2	3	4	3	3	3	4	3
Walking	2	1	5	5	3	1	1–4	1

Getting Started

Regular physical activity is important throughout your life. Healthy habits are more influential than genetic factors in avoiding the kinds of health problems traditionally associated with aging. Here's the President's Council on Physical Fitness and Sports Four-Phase Plan to help you go from couch potato to fit and firm.

Phase 1

Begin Doing Something Every Day

The first step is to increase your physical activity as part of your daily life. You can do this easily by walking or biking to visit friends or to run errands that are not far from home. When you go to the mall or movie theater, park farther away and walk across the parking lot. Take the stairs instead of the elevator. Work in your yard or garden, or take a walk with family or friends after dinner and on the weekends. Even housework, such as vacuuming and washing windows, is good for you. Be active with your kids, and do things they enjoy. One reason Americans aren't as fit as previous generations is that we have so many labor-saving devices. So cut your grass with a push mower, rake your leaves, sweep the walk . . . simply putting everyday activity back into your life will keep you fit and trim.

Phase 2

Start Walking (or Another Low-Impact Activity) to Build Your Endurance

In addition to becoming more active in your daily life, incorporate some moderately intense activities as well (for example, brisk walking). If you haven't been very active lately, here's how to ease your way into an active lifestyle that will allow you to build up gradually toward the recommended amount of daily exercise. Start out slowly and listen to your body, and you'll be more likely to

have a successful fitness plan. Pain, dizziness, or shortness of breath are signs that you should stop exercising and assess whether you need to visit a doctor before continuing with your program.

Step 1. Go for a walk. It's that easy to reap the benefits of moderate endurance exercise. Each time you exercise, simply walk a little farther. As the weeks pass, gradually increase the pace, or speed, of your walks.

Step 2. Every two weeks, increase the duration of your workout by five minutes. Also, add five minutes of total-body stretches to the beginning and end of your workouts (for a total of 10 minutes of stretching). Improving your flexibility makes your workouts easier over time.

Step 3. After exercising moderately for a month, add a five-minute vigorous-intensity workout three days a week. For example, if you're walking, speed up to a fast walk or slow jog for a total of five minutes, on three of the days you work out. After two weeks, increase the higher intensity portion of the workout to 10 minutes. Two weeks later, increase it to 15 minutes of vigorous exercise, and then two weeks later do 20 minutes of vigorous activity, three to four days a week. This is a healthy amount of activity that will help you reduce your chance of illness and find more pleasure and vigor in your life.

Phase 3

Exercise at the Right Intensity and Duration for Your Age and Health

Once you get into the habit of stretching and doing at least 30 minutes of aerobic activity most days of the week, you can utilize these basic fitness recommendations:

- Do vigorous-intensity aerobic activity for 20 minutes, three or four days a week.
- Do strength training (1–2 sets with 8–15 repetitions) using all major muscle groups, two days a week.

Phase 4

Enjoy a Variety of Sports

If you haven't already experienced the pleasure of participating in a sport or performance activity (such as tennis, inline skating, soccer, or dancing), by Phase 4 you'll be fit enough to enjoy new activities and succeed. Play a sport each week for a fully active lifestyle.

Why You Should Vary Your Activities

We've all heard the term "cross-training," but what does it really mean and why is it important? Cross-training is simply a way of adding variety to your exercise program and reducing your risk of injury. Cross-training makes sure that the same muscles, bones, and joints are not continuously subjected to the stresses of the same activity. Cross-training also makes your fitness routine more interesting and easier to maintain. It improves your overall fitness and, over time, may lead to improved performance.

Even if you don't belong to a gym or play sports, there are lots of fitness activities you can mix and match for a great cross-training program. You can vary your routine from workout to workout, or try adding a new activity to your routine. One of the easiest ways to start is to alternate activities—walk one day, swim or cycle the next. Or, you can alternate these activities within a single workout. For instance, spend five minutes on a treadmill, five minutes on a stationary cycle, and so on for a total of 20 minutes. If you want to increase your endurance level, try alternating a low-intensity aerobic activity with a high-intensity activity—such as easy stationary cycling for 10 minutes, followed by 10 minutes of stair-stepping or jumping rope. Gradually increase the amount of time you spend on the more intense activity.

Should You Exercise When You're Under the Weather?

If you have a stuffy nose or sore throat, it's okay to work out, but it's a good idea to avoid the gym (out of consideration for others). During the first two or three days of a cold, you can easily infect others by sneezing. During this period, you might want to do yoga, stretching, or a low-intensity aerobic workout at home, or exercise outdoors, weather permitting.

Skip your workout if you have a fever, lung congestion, body aches, or general weakness; your workout won't enhance your fitness and the activity is likely to make you feel worse. Use this rule of thumb: If your cold affects you above the neck, you've got the green light to exercise. If you feel it from the neck down, take some time off and give your body a chance to rest and heal.

If you have asthma or a dry cough, avoid exercising in cold, dry air, which can exacerbate inflammation in your lungs. (You might feel all right during the workout, but your cough may worsen afterwards.) Swimming indoors often works well.

A Typical Workout

Workouts should always start off easy, become more intense, and then taper to cool down.

Get with the Program

Stretching and light endurance activities before your workout (warm-up) and after it (cool-down) help you get the most from your exercise program and improve low-back function. Muscle and joint discomfort can occur when you don't adequately warm up and stretch before working out, or cool down and stretch after working out. Here's why you need to do each:

Why warm up? Muscles need time to adjust to the new demands that activity places on them.

Why stretch *before* exercising? It fosters better flexibility and improved posture, and reduces risk of injury during your workout.

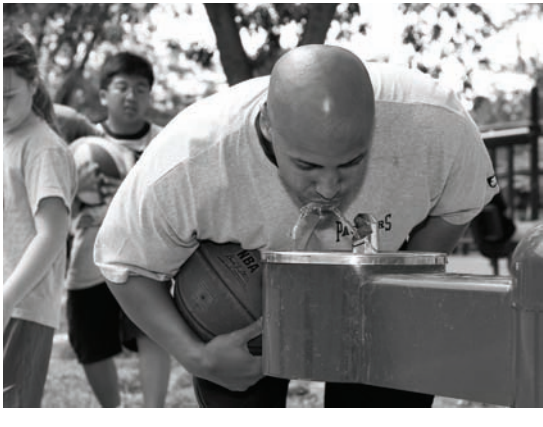
Why cool down? Keep moving at a slower pace for several minutes once you've completed the high intensity part of your workout, to lower your heart rate gradually.

Why stretch *after* exercising? Stretch immediately following an aerobic activity while your muscles are warm and pliable. This increases physical and mental relaxation, releases muscle tension, and reduces your chance of developing muscle soreness.

Choose Your Activity

There are a variety of ways you can warm up or cool down. Try doing parts of your regular workout, but at a lower intensity. For example, if you run during your workout, then walk to warm up; if you walk during your workout, do gentle calisthenics and movements that mimic walking. Do stretching exercises for the muscles involved in the activity, as well as those in the mid-trunk area. Your cool-down phase is a convenient time to do muscular endurance exercises, such as curl-ups or crunches.

Don't cut corners on your warm-up and cool-down. If your workout needs to be shorter than usual, reduce the main body of the workout, and be sure to allow 5–10 minutes for the warm-up and cool-down portions.



Making Your Workout Fit Your Special Needs

Older adults, children, women who are pregnant, and people with certain health problems all benefit from physical activity, but they all need a fitness plan with special modifications. Here's a quick look at the American College of Sports Medicine's recommendations for special populations.

Older Adults

It's especially important for older adults to ensure a safe workout by choosing well-made fitness equipment and apparel (for example, walking shoes that offer good stability). Older adults should begin with five minutes of easy exercise to warm up, and monitor their exercise intensity and duration to make sure their workout is challenging, but safe. Endurance exercises 3–5 days a week are recommended, with strength exercises on alternate days. Use a heart rate monitor while exercising, so you can get an accurate and consistent reading of how hard you are working. An adequate cool-down is imperative for an older athlete. For more information, go to www.aarp.org.

Exercising with Children

When it comes to kids and exercise, the emphasis should always be on fun! When you monitor a child's workout, remember that kids can overheat more easily than adults, and they may have so much fun that they exercise to exhaustion. Keep kids cool and remind them to take breaks when necessary. Adolescents can use the same recommendations for physical activity as adults (with a minimum of 60 minutes daily).

Encourage children to participate in strength-training activities if they are mature enough to accept and follow directions, and if they are supervised at all times during their workouts. Generally speaking, children who are able to participate in organized sports such as baseball, soccer, or gymnastics, are ready to do some elementary strength training. For younger children, push-ups, sit-ups, and other exercises that use a child's own bodyweight as resistance will yield the best strength results with the lowest risk of injury. For more information, go to www.presidentschallenge.org.

Pregnant Women

Both mother and child benefit from exercise during pregnancy. It's fine for healthy, fit pregnant women to perform moderate-intensity, short duration exercise or light-intensity exercise for prolonged periods. Pregnant women should focus on the intensity of their workouts (how hard it feels), and not their performance (how fast they go). Proper warm-ups and cool-downs are essential during pregnancy. It's easier to get overheated when working out while pregnant, so wear appropriate clothing, drink plenty of fluids, and select the proper environment. Women also need to be vigilant about getting proper nutrition to prevent post-exercise increases in blood glucose levels, which can cause dizziness and nausea. For more information, go to www.melpomene.org.

People with Health Problems

If you have **asthma,** you can—and should—exercise, but you should do so with caution. Studies show that people who have asthma and perform regular exercise tend to experience asthma attacks less frequently, can improve their lung function, and may lose weight and feel better overall. Work with your doctor to be sure you're using the appropriate medication to control your condition during activities. It's always important for people to choose activities that they enjoy, but it's worth noting that certain types of endurance sports (such as long-distance running) might be more likely to aggravate an asthmatic condition, while moderate activities such as swimming, walking, and jogging shorter distances are less likely to lead to breathing problems. For more information, go to www.lung.ca/asthma/exercise.

If you have **elevated blood pressure,** increased physical activity may actually help decrease your blood pressure within three to four weeks, says the ACSM. But you shouldn't exercise with high blood pressure unless the condition is under control, and only with the guidance of your physician. Medications help you control elevated blood pressure, but some also affect your workouts—another good reason to talk with your doctor about your exercise program. Exercise also helps with weight control and reduction of cholesterol and glucose

levels, both of which reduce your risk of having a heart attack or stroke, even if your blood pressure doesn't drop to normal levels. For more information, go to www.americanheart.org.

If you have **diabetes,** both moderate-intensity aerobic activity and strength training are highly recommended. It's important to wear well-made athletic shoes that fit properly and wear cotton socks, because there may be some loss of sensitivity in the feet. Check your feet for blisters and other signs of injury from time to time. For more information, go to www.diabetes-exercise.org/index.asp.

For those with **arthritis,** exercise is considered the most effective non-drug treatment for reducing pain, increasing range of motion, and improving movement. Speak with your doctor to find out which fitness activities are best suited to your condition. Generally speaking, the best activities for those with arthritis are those that don't expose the joints to the stress of repeated impact. Walking, biking, tai chi, swimming, and water-based aerobics are all good options. Consider developing an exercise program with the help of a physical therapist or personal trainer skilled in working with people who have arthritis. For more information, go to www.niams.nih.gov.

The Basic Aerobic Workout

The emphasis in any fitness program, such as the aerobic (cardio fitness) workout, should be to start slowly and, when in doubt, do too little rather than too much. Begin with easy workouts, and gradually increase the amount of exercise you do during a session.

For example, if running is your goal, begin your training program by walking a distance that you can complete without feeling fatigued or sore. With time, you will be able to walk a greater distance at a faster pace without discomfort. After you can walk 30 minutes briskly without stopping, you can try a walk/run workout.

As you adapt to the interval workouts, you will be able to gradually increase the amount of jogging while decreasing the distance you walk. Gradually work up to jogging 30 minutes continuously.

The National Institutes of Health have developed two training schedules to get you active. Go to www.pueblo.gsa.gov/cic_text/health/exercise heart/page8.htm for a sample walking or jogging program.

Minimum Recommendations

It is recommended that all adults be active at least 30 minutes a day, 5–7 days per week; stretch daily (see p. 19); and do muscular strength and endurance exercises 2–3 times per week (see p. 25). After achieving these basic levels of activity, you'll want to add more aerobic activities to provide added health and fitness benefits. The following sections describe the nature of these cardio workouts.

How Long Should You Work Out?

If you're just beginning vigorous activities, start with less than 20 minutes and gradually increase the duration of your workout. For most people, 20 to 60 minutes of aerobic activity in your target heart rate range is recommended. After training for several weeks, adjust your duration and intensity for variety. For example, sometimes work out at a higher intensity for a shorter duration, other days work out easily, but for a longer time.

How Often Should You Exercise?

Your heart gets stronger the more you exercise, but benefits begin to level off when you work out at high intensity more than four days a week. Every-other-day workouts are often recommended, because they give muscles and joints a chance to rest, allow improvements in heart function, are associated with a low incidence of injuries, and help you achieve your weight-loss goals. Although exercising for fewer than three days a week is good for heart health, you will have to exercise at a higher intensity to achieve your weight loss goals.

How Hard is Right for You?

Exercise intensity is a measure of the effort you experience in a workout, usually expressed as a percentage of maximal heart rate or oxygen consumption. How hard do you have to work to provide sufficient overload for the cardiovascular and respiratory systems to increase their functional capacities? Gains in cardiorespiratory fitness have been shown to occur in exercise programs in which the training intensity is 75 to 90 percent of maximal heart rate (use 50 to 70 percent if you have been sedentary or are de-conditioned). This range is called your Target Heart Rate range.

Target Heart Rate Training is Efficient

Working out within your target heart rate range will give you the best results if you're trying to burn fat and lose weight. Working out below your range won't raise your intensity to fat-burning levels, and exercising above your range means your body is no longer working aerobically (but anaerobically instead, which will help you build endurance, but not burn fat).

Once you determine your target heart rate (see How to Calculate Your Target Heart Rate, p. 17), you can use subjective judgment to determine whether the intensity of your workout should be higher or lower. Researchers call this your Rating of Perceived Exertion (RPE), and studies have found that using your RPE can be almost as accurate (and a lot less expensive) than buying a heart rate monitor.

If you're just starting an exercise program, use the lower part of the target heart rate range. If you are more active and in good health, use the upper part of the range. Whatever your fitness level, if your workout is so easy that you're able to do the work without effort, you should increase the intensity. On the other hand, be sure your workout isn't so taxing that you're short of breath, feeling pain, or can't go the duration you planned. If it is, decrease your intensity.

Measuring Your Pulse

To see if you are exercising within your target heart rate range, count the number of times your heart beats during 10 seconds of exercise. Multiply this number by six to see whether you are exercising within your target range.

A digital watch or watch with a second hand can be helpful. Check your pulse at your wrist or neck. The radial artery can be found on the thumb side of either wrist, just below the base of the thumb. Apply gentle pressure with your fingers until you feel the pulse. Begin your count with "zero" on the starting time mark; then count the pulses for the desired time length.

Your carotid pulse is taken on your neck just below the jaw beside the windpipe. Use the fingertips of the index and middle fingers to press gently. Do not move your fingers around in a massaging motion while trying to find your carotid pulse. This can lower your blood pressure and cause dizziness. The same counting system used for the radial pulse check can be used for the carotid pulse check.

How to Calculate Your Target Heart Rate

Here's how you would calculate your target heart rate if you were a 45-year-old:

Estimate your maximal heart rate (220–your age = 220–45 = 175).

Take 70 percent and 90 percent of that value: 70 percent of 175 beats per minute = 122 beats per minute; 90 percent of 175 beats per minute = 158 beats per minute.

So for 45-year-olds, the target heart rate range is between 122 and 158 beats per minute.

Since your actual maximum heart rate may be higher or lower than 220 minus your age (this formula is just a good estimate for beginners), the target heart rate range should be used as a guideline. If it seems too hard, use a lower intensity. If it seems too easy, then go to a higher intensity.

For older adults and those who haven't been very active, shoot for 50 to 70 percent of your maximum heart rate. For most others, exercising at 70 to 90 percent of your maximum is optimal. The key is to go at an intensity that allows you to exercise for the duration needed. Exercise intensity and duration must be balanced so that you can exercise long enough to expend 150 to 400 kilocalories per day, in order to achieve good heart and lung function and body composition goals.

Perceived Exertion (RPE) Measures Success

If you're not using a heart rate monitor during your exercise session, you can adjust the intensity of your activity based on your Rating of Perceived Exertion (Borg, 1998). It's normal to sense effort, and maybe even discomfort, but you should never be in pain during a workout. Your fitness goals and the state of your health should determine your appropriate rate of exertion.

Plan your workout intensity based on your Rating of Perceived Exertion.

- Warm-ups and cool downs should be from very easy (you can converse with no effort) to easy (you can converse with almost no effort).
- Three to four times a week you should exercise moderately so a conversation requires a bit of effort.
- Two or three times a week do short workouts that are so vigorous that conversation requires a lot of effort.

Perceived Exertion Scale

6	
7	Very, Very Light
8	
9	Very Light
10	
11	Fairly Light
12	
13	Somewhat Hard
14	
15	Hard
16	
17	Very Hard
18	
19	Very, Very Hard
20	

Adapted from Borg (1998).

The Basic Flexibility Workout

Flexible people can easily reach or bend for things they need, and sudden movements don't result in pulled muscles. Stretching all your joints is important to maintain a full range of motion.

Maintaining a full range of motion means your muscles should be able to pass through a complete range of movement easily and with no pain. In addition, stretching in the abdominal, back, and upper leg areas can help you develop and maintain a healthy low back. Low-back pain is one of the most common complaints, and one of the most frequent causes of activity limitation, among adults in the U.S. Good flexibility and range of motion can decrease the probability of a low-back problem. If you do have a backache, good range of motion can be a factor in reducing the severity of the problem. Maintaining good physical fitness and strengthening your trunk muscles with appropriate exercises are keys to decreasing the chances of having low-back pain.

Stretching Tips

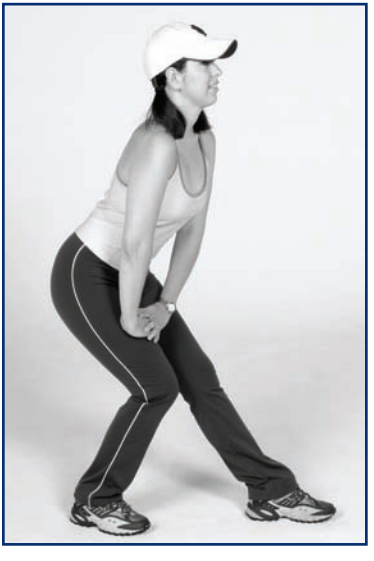
- All warm-up programs should consist of pulse-raising activities, along with mobility and stretching activities.
- Only stretch after the muscles have warmed up.
- Only stretch to the point of mild tension. Stretching should never be painful.
- Don't bounce or use jerky movements when you are stretching.
- Do not hold your breath. Breathing normally will help you relax.

What to Do

Try the following exercises. Repeat each one, holding it for 20 seconds; gradually build to 30 seconds if you still feel tight. For more options go to www.nia.nih.gov/exercisebook/chapter4_stretching.htm.

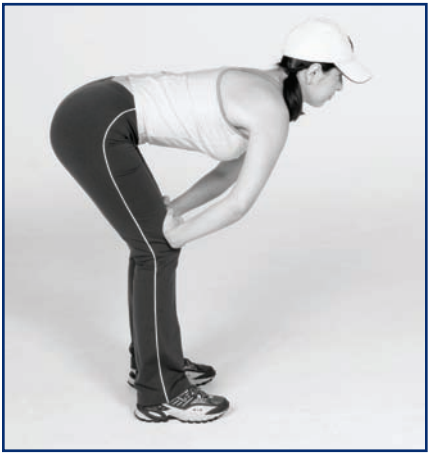
To **stretch your calf (back of lower leg),** stand with feet hip-width apart, back straight, and stomach tight. Keep the knees slightly bent. In a straight line from head to the left heel, lean forward, keeping the left heel on the floor. Place both hands on right thigh. Repeat on other side. The front leg should be kept over the ankle.

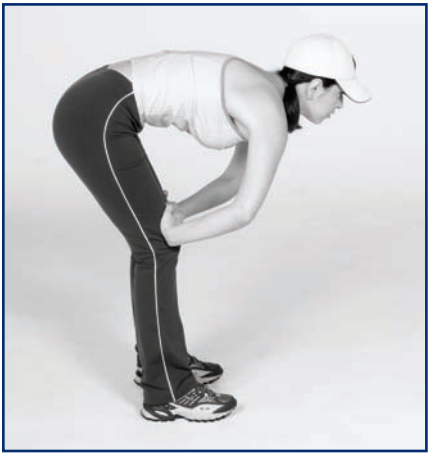
For a **hamstring stretch (back of thigh),** stand up straight, with your right foot slightly behind hips. Slowly bend the rear leg as if sitting backwards. Keep the front leg straight with a very slight bend at the knee. Place hands on right thigh. Push buttocks backwards, slowly, until you a feel a slight tension in your hamstring. Keep your neck in line with your spine. Never place your hands on the front leg. Make sure your feet are correctly positioned for balance before stretching.



To **strengthen the front of your thigh (quadriceps),** stand with feet together, bend your left knee and with your left hand lift the left foot towards your buttocks. Bend slightly on the supporting leg. Keep the knees close together. Tilt the pelvis forward and keep the back straight. Always keep the support leg bent. Use a wall or other object for balance. Keep your back straight and stomach tight.

For **chest and shoulders (pectoralis and deltoid)** stretch, stand with feet shoulder-width apart and knees slightly bent. Place both hands on the buttocks and gently ease the shoulders backwards. This should give a feeling of the chest "opening." Hold.





The **lower back** stretch starts when you stand with feet shoulder-width apart, knees bent, with your hands on thighs. Shoulders should be slightly apart. Slowly pull stomach in and curl upwards (similar to a cat). Hold. Be sure your weight is supported by placing your hands on your thighs. Be careful to slowly uncurl to original position. Keep chin up and eyes focused in front of you.

To stretch your **upper back,** stand with feet shoulder-width apart and knees slightly bent. Clasp your hands in front of you at shoulder height with the palms away from the body. Gently push the palms outward, without locking the elbows. Keep your back straight and the tummy tight, knees slightly bent.

Another way to stretch your **shoulder** is to take the right arm across the body at shoulder height, keeping the shoulder relaxed. Place the left hand or forearm on the right arm slightly above the elbow and gently bring the right arm towards the chest. Keep the back straight and stomach tight. Make sure the knees are slightly bent at all times. Keep head facing forward.

To **stretch over-all,** stand with feet shoulder-width apart and knees slightly bent. Raise your arms overhead and bring your hands together. Slowly begin to stretch upward.

To stretch your **hips,** sit on a mat with your right leg straight in front of you. Bend your left leg and cross it over your right leg so that your left foot is alongside your right knee. Bring your right elbow across your body and place it on the outside of your left thigh near the knee. Slowly twist your body as you look over your left shoulder. Your right elbow should be exerting pressure against your left thigh. Repeat in the other direction.

The Basic Strength-Training Workout

For many years, strength training was primarily used by adult athletes to enhance sports performance and increase muscle size. However, strength training is now recognized as an important method of enhancing health and fitness for people of all ages and abilities.

You can expect a wide variety of health and fitness benefits from regular, moderate-intensity strength training.

Strength training (also known as resistance training) is a method of conditioning designed to increase one's ability to exert or resist force. A wide range of loads and a variety of training tools are used in strength training, including free weights (barbells and dumbbells), weight machines, elastic tubing, medicine balls, stability balls, and a person's own body weight. Strength training is not the same as the competitive sports of weightlifting, power lifting, or bodybuilding.

Strength training can improve your ability to perform daily tasks like carrying in the groceries or lifting a child up for a hug. And the more muscle you have (as opposed to fat), the more calories you burn—even at rest. The only drawback with strength training is that it often requires equipment, so you'll need to purchase some or do your workouts at a recreation center or gym.

Below are some good exercises that will help you increase your strength and don't require equipment. You will benefit from these workouts but you will be able to affect more muscles using free weights, weight machines, or stretchy bands. Choose from a variety of strength training options. For more information, go to www.nia.nih.gov/exercisebook/chapter4_strength.htm.

Comparing Different Tools for Strength Training

Will you get a better workout if you use hand weights or a weight machine? A medicine ball or stretchy resistance bands? The truth is, each mode of training has its own pros and cons. Here's how they stack up against one another:

	Weight Machines	Free Weights	Weighted Balls	Stretchy Bands	Body Weight
Cost	High	Low	Relatively low	Very low	No cost
Portability	Limited	Variable	Excellent	Excellent	Excellent
Ease of Use	Excellent	Variable	Variable	Variable	Variable
Muscle Isolation	Excellent	Variable	Variable	Variable	Variable
Functionality	Limited	Excellent	Excellent	Excellent	Limited
Exercise Variety	Limited	Excellent	Excellent	Excellent	Limited
Space Requirements	High	Variable	Low	Low	Low

Adapted from Faigenbaum & McInnis (2003).

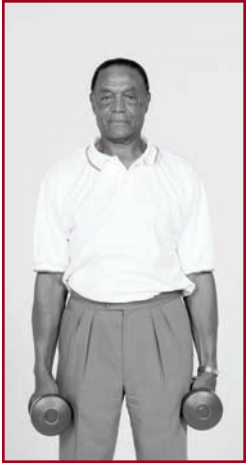
Strength Training 101

In order for the body to adapt to any training program, the exercise stimulus must be greater than the body is accustomed to (overload). For example, if you can easily complete 20 repetitions with 25 pounds while performing a barbell curl, then increase the weight or the number of sets to improve your arm strength or endurance.

The principle of progressive resistance refers to continually and progressively placing demands on the body that are greater than it is accustomed to. A reasonable guideline is to increase the training weight about 5 percent, and decrease the repetitions by two to four when a given load can be performed for the desired number of repetitions with proper exercise technique. For example, if you can easily do 16 repetitions while performing the chest press exercise using 100 lbs., increase the weight to 105 lbs. and decrease the repetitions to 12 to make gains in muscle strength and endurance.

What to Do

Strength and conditioning specialist Doug Lentz developed the following program to help people build strength. It's so effective that it was provided to the military during the Gulf War to keep our troops fit when they didn't have access to strength training equipment. You can divide the exercises in half and work your upper body one day and your lower body the next. Or do them all, but every other day. Start by doing 10 repetitions of each exercise, and each week increase your repetitions by two until you can do 16. Then break the workout into two sets of eight repetitions and increase your reps again until you do two sets of 10 to 15 reps.



▪ You can work on your shoulder and neck muscles with **shrugs.**

With your arms at your sides, shrug your shoulders to an "I don't know" posture, then relax and let your shoulders drop. This is more effective with resistance, but you don't need to buy anything. Begin by holding cans of food in your hands with your arms hanging by your sides; then progress to buckets of sand, or anything you have handy that weighs a few pounds.

▪ **Push-ups** are great for your chest muscles. Here are several ways to do them:

The military-style push-up is performed with your body horizontal and nothing touching the ground except your hands and toes. An easier version of the push-up can be done with knees bent so that hands and knees touch the ground throughout the exercise.

For variety, try incline push-ups, which emphasize upper chest. Perform these with hands elevated on a couple of thick books or a box.

For lower chest emphasis, perform decline push-ups, with feet elevated instead of hands.

■ Work your trunk with a **rotational movement**. Stand with your hands on your hips, elbows pointed outward.

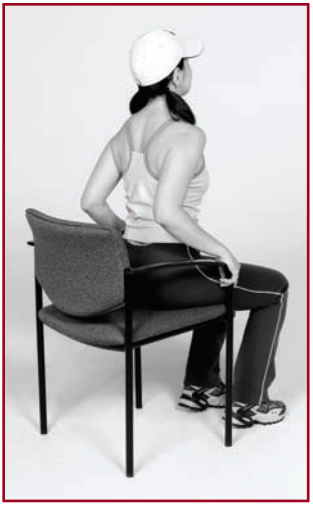
From the waist lean your body one way as far as you can, then rotate so that your head swings forward at about waist level, across to the other side, and then back up.

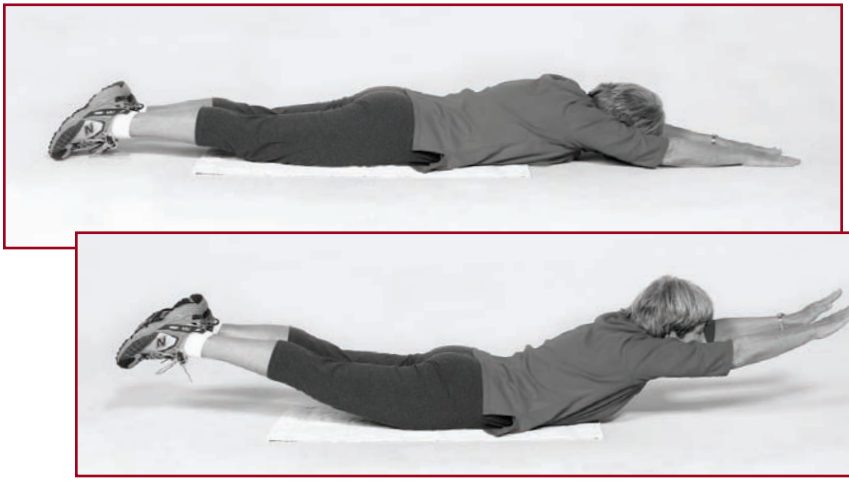
■ You can get a great **abdominal workout** with bent leg sit-ups or crunches.

Bend your knees so that your feet are comfortably flat on the floor, fold your arms across your chest, and raise your shoulders about a foot off the ground.

- Work your upper back with **scapular retractions.**

Sit upright and pull your shoulders back to squeeze your shoulder blades together, trying to make them touch in the middle of your back. Hold a few seconds, then relax.





- For your lower back, try prone **lumbar extensions.**

Lie on your stomach with your arms and legs stretched straight out. Raise your arms and legs off the ground a few inches, hold a few seconds, and then lower them.

As you repeat this move, try to get your arms and legs higher off the ground.

▪ Don't neglect your forearm muscles—they control wrist movement. These wrist exercises will help to keep your forearms strong:

In **wrist extension,** raise one hand as far as you can bend your wrist, and push your fingers back on the palm side, using the other hand. Now push the fingers of the first hand against this resistance until you feel the muscle tension in your lower forearm muscles.

For **wrist flexion,** bend your hand downward so that your wrist is fully bent in the opposite direction, and push on the backs of your fingers with the other hand. Push the fingers of the first hand against this resistance until you feel muscle tension in your upper forearm muscles.

Alternate extension and flexion exercises for each forearm, holding each position for several seconds.

▪ You can work out your biceps with **arm curls** using either cans of food for dumbbells, or pushing with the other hand for resistance.

Rest your upper arm down the front of your body and pull your lower arm up until the clenched palm is close to your shoulder.

■ **Dip exercises** are good for the triceps at the back of your upper arms.

Begin by sitting on the ground in front of a chair or stool. Reach your arms out behind you and grasp the edge of the chair, palms down. Raise your hips off the ground and straighten your body. Now lower and raise your body by bending your elbows. This is a kind of upside down push-up.

■ For your front thigh try **wall squats**.

Stand with your back straight against a wall with your feet a thigh's width in front of your body. Slide your back down the wall until you are in a parallel squat position, thighs horizontal. Hold until your thigh muscles begin to burn, and then push up to the starting position. Repeat a few times until your quads are tired.

■ **Lunges** are good for your legs and front hips, favoring the hamstrings and gluteal muscles.

Stand upright and take a big stride forward. Your trunk should go down close to the floor, and your planted leg should trail straight and almost horizontal behind your body, raised on the toes. You can take several short steps to bring your front leg back to the starting position.

Repeat for the other leg.

■ You can work your calves with **toe raises** on a stair or block.

Stand on both feet, with one hand on a rail for balance and your weight on the balls of your feet at the edge of the step. Lower your heels until they are as far below the stair as you can manage. Now slowly raise your heels until they are as high above the stair as you can reach. Lower and raise your heels through the full range of motion of your ankles. A dozen of these will give your calves and Achilles tendons a good workout, and they are good for your ankles, too.

Tools for Basic Training

Once you've decided to get in shape, you may decide to join a fitness program at a local recreation center, health club, workplace, or place of worship. Whatever you choose, you'll want to invest in a few basic pieces of equipment.

Proper Footwear

Choose a pair of athletic shoes designed for the activities you plan to participate in. Running and walking shoes are made for people to move forward and backward, and provide stability for this type of movement. They are also more cushioned for impact while running and walking. Tennis, basketball, and cross training shoes, on the other hand, are made for both front-to-back and side-to-side movements. What does this mean? Get running shoes for running or walking. Use walking shoes or cross trainers for walking. Try cross trainers or tennis or basketball shoes for strength training and other activities.

Fitness Apparel

Depending on the temperature and humidity, you'll need shorts or full-length pants, plus sleeveless, short-sleeve, or long-sleeve tops, all made of lightweight acrylic fabrics that wick sweat away from your skin.

Water Bottle

You can find basic bottles with tops to squirt water into your mouth at your grocery store. Others that can be strapped to you for long workouts can be found at sporting goods stores.

Pedometer

A pedometer should be comfortable to wear all day and be held securely by its clip. An extra safety leash can help. The display should be easy to read without removing the unit from your waistband. The simplest pedometers count your steps and display steps or distance; others estimate calories burned and provide times.

Hand Weights

Get two sets—one light, one heavy. Beginners should try two- or three-pound weights and five-pound weights. If you have a good base of upper-body strength, try five- and eight-pound weights, or eight- and 10-pound weights.

Stretchy Resistance Bands

These inexpensive latex bands often come in sets of three—light, medium, and heavy resistance—along with directions for using them instead of hand or ankle weights. They can be purchased at many sporting goods stores, and they provide resistance during both upper and lower body strength exercises.

Modifying Your Workout

If you're planning to stay active for the rest of your life (and you should be), you need to work out in a way that's safe and prevents injury.

Modify your fitness activities according to the weather or other environmental conditions where you are working out, or if you have specific health problems. And, when injuries occur, learn to treat the minor ones, and know when to seek professional care.

Your heart rate is one indication of the proper exercise intensity. Environmental factors such as heat, humidity, pollution, and altitude cause your heart rate and your perception of effort to increase during an exercise session. This could shorten your exercise session and reduce the chance of your expending sufficient calories to experience a training effect. By monitoring your heart rate or perceived exertion and slowing down your workout to train within your target range, you will be able to keep on exercising in a variety of conditions.

It's Cold Out There!

Exercising in the cold isn't a problem if you plan ahead and dress appropriately. But problems develop quickly if you don't take the necessary precautions. Hypothermia is a decrease in body temperature that occurs when your body's heat loss exceeds its heat production. Your body temperature is affected by environmental factors, such as air temperature, water vapor pressure, wind, and whether air or water are involved; insulating factors, such as clothing and subcutaneous fat; and the capacity for sustained energy production. Surprisingly, the environmental temperature does not have to be below freezing to cause hypothermia. Wind and water can be bigger factors than temperature.

The rate of heat loss at any given temperature is directly influenced by wind speed. Wind increases the number of cold air molecules coming into contact with the skin, increasing the rate of heat loss. The wind chill index indicates what the "effective" temperature is for any combination of temperature and wind speed, and allows you to properly gauge a variety of conditions. Keep in mind that if you are running, cycling, or cross-country skiing into the wind, you must add your speed to the wind speed to evaluate the full impact of the wind chill.

What you wear during exercise can make a big difference in how your body handles cold temperatures. The key is to dress in layers. Not only will mixing and matching layers help you stay dry and wind resistant, you can also take off layers as your body warms up. Your inner layer should be something that wicks (or pulls) sweat away from your body. Cotton doesn't do the trick, but acrylics and wool do. The middle layer should keep you warm, and the outer layer should keep you dry and protected from the wind.

Symptoms of cold stress include numbness, tingling, fatigue, and pain. If hypothermia occurs, get out of the cold, wet, and wind; remove wet clothing; drink something warm and get into a warm environment, such as in a sleeping bag or bed.

Too Hot to Trot?

Overheating is one of the few things that can kill an otherwise healthy person. Recognize the stages of heat illness: from heat cramps to heat stress to heat stroke. Although treatment of these problems is important, prevention is a better approach.

By monitoring your intensity level (either by heart rate or rate of perceived exertion), you can greatly reduce your risk of heat illness. On a hot day, if you see your heart rate climbing or if your regular workout seems harder than normal, slow down. Heart rate is a sensitive indicator of dehydration, environmental heat load, and acclimatization.

Symptoms of heat illness include excessive sweating (or no sweat), fatigue, dizziness, racing heart, and confusion. If you feel the effects of the heat, get to a cooler place, drink cool fluids, fan yourself to enhance sweat evaporation, and if necessary, place ice on your body or get into a cool pool.

Prevent Heat Issues

- **Get Fit:** Fit people have a lower risk of heat injury, can tolerate more work in the heat, and acclimatize to heat faster.
- **Get Acclimated:** Seven to 10 days of exercise in the heat increases your capacity to sweat, initiates sweating at a lower body temperature, and reduces salt loss. Body temperature and heart rate responses are lower during exercise, and the chance of salt depletion is reduced.

- **Drink Up:** Inadequate hydration reduces sweat rate and increases the chance of heat injury. Generally, during exercise the focus should be on replacing fluids. Drink water regularly throughout the day, as well as before, during, and after your workouts.

- **Watch the Thermostat:** Exercising in temperatures greater than skin temperatures (98.6˚ F or 37˚ C) results in a heat gain. While evaporating sweat cools the body, you still may not be able to keep up with the heat gain.

- **Dress for Success:** As much skin surface as possible should be exposed to encourage evaporation (but use a sun block to reduce exposure to dangerous UV rays). Wear light-colored clothing made from fabrics that wick sweat to the surface for evaporation; materials impermeable to water will increase the risk of heat injury and should be avoided.

Cold Weather Safety

- Do wear appropriate clothing in layers that provide insulation.
- Do remove layers of clothing as you warm up.
- Do stay as dry as possible.
- Don't exercise in extreme cold. Either take your workout indoors, or skip the workout.

Hot Weather Safety

- Do learn how to deal with heat illness symptoms (cramps and lightheadedness, for example).
- Do exercise during the cooler parts of the day to avoid heat gain from the sun, or from building or road surfaces heated by the sun.
- Do gradually increase exposure to heat and humidity to safely acclimatize over a period of 7–10 days.
- Do drink water before, during, and after exercise. Weigh in each day to monitor hydration.
- Do wear only shorts and a tank top to expose as much skin as modestly possible (and use sun block for protection from UV rays).
- Don't wait until you feel thirsty to start drinking fluids; if you're thirsty, dehydration has already begun.

- **Hot *and* Humid:** Heat is one thing, but high humidity is another. High humidity can impede the body's ability to cool itself because your sweat won't evaporate quickly.

- **Watch Your Intensity:** During times of high heat and humidity, your heart rate increases as your body tries to combat the heat. A typical workout may not seem typical. Monitor your intensity and avoid racing or demanding workouts in the heat.

- **Wind:** Although wind increases your risks during cold weather exercise, it can decrease them in hot weather—as long as you are well hydrated. Wind increases the rate of evaporation, which in turn can help keep you cooler. But don't be misled by the wind; sun block, water, and monitoring your heart rate are still important.

Exercise and Poor Air Quality

Air pollution includes a variety of gases and particles that are products of the combustion of fossil fuels (for example, ozone, sulfur dioxide, and carbon monoxide). The smog that results when these pollutants are in high concentration can have detrimental effects on your health and performance. The gases affect performance by decreasing your body's capacity to transport oxygen, increasing airway resistance and altering the perception of effort required. Physiological responses to these pollutants are related to the amount, or "dose," received. The major factors determining the dose are the concentration of the pollutant, duration of your exposure to the pollutant, and volume of air you inhale. Clearly, you inhale a large volume of air during exercise, and this is one reason why you need to curtail your outdoor physical activity during times when pollution is at peak levels.

Environmental Safety

- Do reduce your exposure to pollutants prior to exercise, because the physiological effects are time- and dose-dependent.

- Do avoid areas where you might receive a large dose of carbon monoxide, such as smoking areas, high traffic areas, and urban environments.

- Don't schedule activities during the times when pollutants are at their highest levels, such as during morning or evening rush hour.

Get Fit, Not Injured

It's a fact of life that when you exercise, you run the risk of injuring yourself.

That risk is increased in activities that combine intensity greater than 85 percent of maximal heart rate, duration longer than 40 minutes at a time, and frequency of more than four times a week. In addition, running and aerobic dance or step workouts are more likely to cause muscle and skeletal trauma than walking, cycling, and swimming. Games—especially competitive ones such as football and soccer—are associated with more injuries than controlled, moderate-intensity activities such as cycling. Older individuals and those who exercise in extreme environmental conditions are at greater risk for problems related to exercise.

Does that mean exercise isn't safe? Not at all. By exercising wisely, you will improve your health. If you aren't used to regular exercise, talk with your doctor about getting a thorough health screening prior to vigorous exercise. Remember to start your program slowly and progress deliberately to higher intensities, duration, and frequency. Always listen to your body; if you experience unusual soreness or fatigue, take a break, and return to your workout at a lower intensity or duration once the discomfort is gone.

Does It Hurt?

When you begin a new activity, it's normal to experience some muscle soreness 24 to 72 hours afterwards. If you continue to do the activity at low intensities, you should be able to do it without soreness. That said, you may have an injury if you experience any of the following:

- Extreme tenderness when a body part is touched.
- Pain while at rest, pain that does not disappear after warming up, joint pain, or increased pain when moving the body part.
- Swelling or discoloration.
- Changes in normal body function.

At the first sign of any of these symptoms, try some self-treatment. Remember, the **PRICE** is right for self-treatment:

- **Protect** the body part from further damage. Stop exercising or reduce the intensity with which you exercise.
- **Rest** the body part: do not try to "walk off" the injury.
- **Ice** the injured area to reduce the blood flow to the injured site (several minutes at a time periodically, for 24 to 72 hours).
- **Compress** the area firmly while holding the ice in place. After the ice is removed, you may want to wrap the injured area.
- **Elevate** the injured body part whenever possible to reduce swelling and blood flow to the injured area.

These methods can be used for minor acute injuries. However, a medical professional should check extreme tenderness, pain, swelling, or discoloration. Or if you have a minor ache or pain that doesn't go away after a week or so of treatment, check with your doctor. For more information on sports injuries, go to www.americanrunning.org, and click on fitness articles, injuries, and sports medicine.

Too Much, Too Soon

Many sports injuries occur because you try to do too much too fast. They occur when you have excessive frequency, volume, or intensity of training combined with inadequate rest and recovery. How do competitive athletes train so hard and not get hurt? They increase their workouts gradually. You'd be amazed how much you will be able to do if you gradually increase your training load over time. Just monitor your progress and if you notice your heart rate or exertion level going up when it shouldn't, or if you notice pain when you exercise, slow down or rest for a bit.

Measuring Your Improvement

You may want to ask an exercise specialist at your local gym or recreation center to test your cardiovascular function, body composition, muscular strength, endurance, and flexibility.

The results of these tests will help you develop a fitness program that meets your unique needs and abilities. If you don't have access to a club or recreation center, there are some tests you can do at home to monitor your progress.

Aerobic Fitness

The less aerobically fit you are, the quicker you tire out when you exercise. You can tell your aerobic fitness is improving when you can work out longer or harder than before. As your aerobic fitness improves, you will be able to do the same workout with less effort and at a lower heart rate, because your heart and circulation are working at a more efficient level. Exercise scientists measure aerobic fitness by "maximal oxygen uptake." You can have this measured or estimated by an exercise physiologist or exercise specialist at a health club. Or, you can measure it on your own with a one-mile walk test.

Steps to Follow to Take the One-Mile Walk Test

- Select and mark off one mile on a level area (you might find this already done if you go to a local track).
- Have paper and pencil, and a watch that indicates seconds.
- Walk slowly and stretch to warm up.
- Start your walk and note the time on your watch. Walk as fast as you can to complete the mile. Record your time for the mile walk, in minutes and seconds.
- If you have a heart monitor, check your heart rate at the end of the walk, or take your heart rate for 10 seconds immediately following the end of the mile walk. Multiply the 10-second count by six to get your heart rate in beats per minute. Either way you do it, record your heart rate. Compare your time and heart rate with the following table to get your estimated maximal oxygen uptake.

To help you assess the results of your one-mile walk test, use Table 1. First, find the part of the table for your gender and age, then go across the top until you find the time (to the nearest minute) it took you to walk a mile; then go down that column until it intersects with your post-exercise heart rate (HR) listed on the left side. The number at which the mile time and post-exercise heart rate meet is the cardiorespiratory function (CRF) in ml/kg/min. For example, a 25-year-old man who walked the mile in 20 minutes and had a post-exercise HR of 140 would have an estimated maximal oxygen uptake of 29.2 ml/ kg/min.

Table 1

VO_2 Chart

Min · mile $^{-1}$

	HR	10	11	12	13	14	15	16	17	18	19	20
Men (20–29)	120	65.0	61.7	58.4	55.2	51.9	48.6	45.4	42.1	38.9	35.6	32.3
	130	63.4	60.1	56.9	53.6	50.3	47.1	43.8	40.6	37.3	34.0	30.8
	140	61.8	58.6	55.3	52.0	48.8	45.5	42.2	39.0	35.7	32.5	29.2
	150	60.3	57.0	53.7	50.5	47.2	43.9	40.7	37.4	34.2	30.9	27.6
	160	58.7	55.4	52.2	48.9	45.6	42.4	39.1	35.9	32.6	29.3	26.1
	170	57.1	53.9	50.6	47.3	44.1	40.8	37.6	34.3	31.0	27.8	24.5
	180	55.6	52.3	49.0	45.8	42.5	39.3	36.0	32.7	29.5	26.2	22.9
	190	54.0	50.7	47.5	44.2	41.0	37.7	34.4	31.2	27.9	24.6	21.4
	200	52.4	49.2	45.9	42.7	39.4	36.1	32.9	29.6	26.3	23.1	19.8
Women (20–29)	120	62.1	58.9	55.6	52.3	49.1	45.8	42.5	39.3	36.0	32.7	29.5
	130	60.6	57.3	54.0	50.8	47.5	44.2	41.0	37.7	34.4	31.2	27.9
	140	59.0	55.7	52.5	49.2	45.9	42.7	39.4	36.1	32.9	29.6	26.3
	150	57.4	54.2	50.9	47.6	44.4	41.1	37.8	34.6	31.3	28.0	24.8
	160	55.9	52.6	49.3	46.7	42.8	39.5	36.3	33.0	29.7	26.5	23.2
	170	54.3	51.0	47.8	44.5	41.2	38.0	34.7	31.4	28.2	24.9	21.6
	180	52.7	49.5	46.2	42.9	39.7	36.4	33.1	29.9	26.6	23.3	20.1
	190	51.2	47.9	44.6	41.4	38.1	34.8	31.6	28.3	25.0	21.8	18.5
	200	49.6	46.3	43.1	29.8	36.5	33.3	30.0	26.7	23.5	20.2	16.9
Men (30–39)	120	61.1	57.8	54.6	51.3	48.0	44.8	41.5	38.2	35.0	31.7	28.4
	130	59.5	56.3	53.0	49.7	46.5	43.2	39.9	36.7	33.4	30.1	26.9
	140	58.0	54.7	51.4	48.2	44.9	41.6	38.4	35.1	31.8	28.6	25.3
	150	56.4	53.1	49.9	46.6	43.3	40.1	36.8	33.5	30.3	27.0	23.8
	160	54.8	51.6	48.3	45.0	41.8	38.5	35.2	32.0	28.7	25.5	22.2
	170	53.3	50.0	46.7	43.5	40.2	36.9	33.7	30.4	27.1	23.9	20.6
	180	51.7	48.4	45.2	41.9	38.6	35.4	32.1	28.8	25.6	22.3	19.1
	190	50.1	46.9	43.6	40.3	37.1	33.8	30.5	27.3	24.0	20.8	17.5
Women (30–39)	120	58.2	55.0	51.7	48.4	45.2	41.9	38.7	35.4	32.1	28.9	25.6
	130	56.7	53.4	50.1	46.9	43.6	40.4	37.1	33.8	30.6	27.3	24.0
	140	55.1	51.8	48.6	45.3	42.1	38.8	35.5	32.3	29.0	24.7	22.5
	150	53.5	50.3	47.0	43.8	40.5	37.2	34.0	30.7	27.4	24.2	20.9
	160	52.0	48.7	45.4	42.2	38.9	35.7	32.4	29.1	25.9	22.6	19.3
	170	50.4	47.1	43.9	40.6	37.4	34.1	30.8	27.6	24.3	21.0	17.8
	180	48.8	45.6	42.3	39.1	35.8	32.5	29.3	26.0	22.7	19.5	16.2
	190	47.3	44.0	40.8	37.5	34.2	31.0	27.7	24.4	21.2	17.9	14.6
Men (40–49)	120	57.2	54.0	50.7	47.4	44.2	40.9	37.6	34.4	31.1	27.8	24.6
	130	55.7	52.4	49.1	45.9	42.6	39.3	36.1	32.8	29.5	26.3	23.0
	140	54.1	50.8	47.6	44.3	41.0	37.8	34.5	31.2	28.0	24.7	21.4
	150	52.5	49.3	46.0	42.7	39.5	36.2	32.9	29.7	26.4	23.1	19.9
	160	51.0	47.7	44.4	41.2	37.9	34.6	31.4	28.1	24.8	21.6	18.3
	170	49.4	46.1	42.9	39.6	36.3	33.1	29.8	26.5	23.3	20.0	16.7
	180	47.8	44.6	41.3	38.0	34.8	31.5	28.2	25.0	21.7	18.4	15.2

Continued on next page.

Continued from previous page.

	HR	10	11	12	13	14	15	16	17	18	19	20
Women (40–49)	120	54.4	51.1	47.8	44.6	41.3	38.0	34.8	31.5	28.2	25.0	21.7
	130	52.8	49.5	46.3	43.0	39.7	36.5	33.2	29.9	26.7	23.4	20.1
	140	51.2	48.0	44.7	41.4	38.2	34.9	31.6	28.4	25.1	21.8	18.6
	150	49.7	46.4	43.1	39.9	36.6	33.3	30.1	26.8	23.5	20.3	17.0
	160	48.1	44.8	41.6	38.3	35.0	31.8	28.5	25.2	22.0	18.7	15.5
	170	46.5	43.3	40.0	36.7	33.5	30.2	26.9	23.7	20.4	17.2	13.9
Men (50–59)	120	53.3	50.0	46.8	43.5	40.3	37.0	33.7	30.5	27.2	23.9	20.7
	130	51.7	48.5	45.2	42.0	38.7	35.4	32.2	28.9	25.6	22.4	19.1
	140	50.2	46.9	43.7	40.4	37.1	33.9	30.6	27.3	24.1	20.8	17.5
	150	48.6	45.4	42.1	38.8	35.6	32.3	29.0	25.8	22.5	19.2	16.0
	160	47.1	43.8	40.5	37.3	34.0	30.7	27.5	24.2	20.9	17.7	14.4
	170	45.5	42.2	39.0	35.7	32.4	29.2	25.9	22.6	19.4	16.1	12.8
Women (50–59)	120	50.5	47.2	43.9	40.7	37.4	34.1	30.9	27.6	24.3	21.1	17.8
	130	48.9	45.6	42.4	39.1	35.8	32.6	29.3	26.0	22.8	19.5	16.2
	140	47.3	44.1	40.8	37.5	34.3	31.0	27.7	24.5	21.2	17.9	14.7
	150	45.8	42.5	39.2	36.0	32.7	29.4	26.2	22.9	19.6	16.4	13.1
	160	44.2	40.9	37.7	34.4	31.1	27.9	24.6	21.3	18.1	14.8	11.5
	170	42.6	39.4	36.1	32.8	29.6	26.3	23.0	19.0	16.5	13.2	10.0
Men (60–69)	120	49.4	46.2	42.9	39.6	36.4	33.1	29.8	26.6	23.3	20.0	16.8
	130	47.9	44.6	41.3	38.1	34.8	31.5	28.3	25.0	21.7	18.5	15.2
	140	46.3	43.0	39.8	36.5	33.2	30.0	26.7	23.4	20.2	16.9	13.6
	150	44.7	41.5	38.2	34.9	31.7	28.4	25.1	21.9	18.6	15.3	12.1
	160	43.2	39.9	36.6	33.4	30.1	26.8	23.6	20.3	17.0	13.8	10.5
Women (60–69)	120	46.6	43.3	40.0	36.8	33.5	30.2	27.0	23.7	20.5	17.2	13.9
	130	45.0	41.7	38.5	35.2	31.9	28.7	25.4	22.2	18.9	15.6	12.4
	140	43.4	40.2	36.9	33.6	30.4	27.1	23.8	20.6	17.3	14.1	10.8
	150	41.9	38.6	35.3	32.1	28.8	25.5	22.3	19.0	15.8	12.5	9.2
	160	40.3	37.0	33.8	30.5	27.2	24.0	20.7	17.5	14.2	10.9	7.7

Adapted from Kline et. al. (1987).

Table 2

VO_2 Guidelines

Age	VO_2 max (ml_kg-1_min-1) Female	Male	1.5-mile runs (min:s) Female	Male	12-min run (miles) Female	Male
			Good			
15–30	>40	>45	<12	<10	>1.5	>1.7
35–50	>35	>40	<13:30	<11:30	>1.4	>1.5
55–70	>30	>35	<16	<14	>1.2	>1.3
			Adequate for most activities			
15–30	35	40	13:30	11:50	1.4	1.5
35–50	30	35	15	13	1.3	1.4
55–70	25	30	17:30	15:30	1.1	1.3
			Borderline			
15–30	30	35	15	13	1.3	1.4
35–50	25	30	16:30	14:30	1.2	1.3
55–70	20	25	19	17	1	1.2
			Needs extra work on CRF			
15–30	<25	<30	>17	>15	<1.2	<1.3
35–50	<20	<25	>18:30	>16:30	<1.1	<1.2
55–70	<15	<20	>21	>19	<0.9	<1.0

Adapted from Howley & Franks (2003).

What the Numbers Mean

You can evaluate your cardiorespiratory fitness by comparing the number you measured in Table 1 with the guidelines presented in Table 2. In the example of the 25-year-old man, his maximal oxygen uptake is less than 30, indicating a need for improvement. The standards in Table 2 represent the recommended levels of oxygen uptake for men and women. For better performance, you should strive for higher values.

After you have been doing vigorous-intensity activities at least three days a week for several weeks without any problems, try doing an endurance run (for example, one mile for time) to get an indicator of your aerobic fitness (see Table 3 on p. 46).

Table 3

Fitness Testing Standards

Test item	6–9	10–12	13–15	16–30	31–50	51–70
Mi run (min)						
Males						
Good	14	12	11	10	10	10
Borderline	16	14	13	12	12	12
Needs Work	≥18	≥16	≥15	≥14	≥14	≥14
Females						
Good	14	12	13	12	12	12
Borderline	16	14	15	14	14	14
Needs Work	≥18	≥16	≥17	≥16	≥16	≥16
Percent body fat (%)						
Males						
Good	7–18	7–18	7–18	7–18	7–18	7–18
Borderline	22	22	22	22	22	22
Needs Work	<5	<5	<5	<5	<5	<5
	>25	>25	>25	>25	>25	>25
Females						
Good	7–18	7–18	16–25	16–25	16–25	16–25
Borderline	22	22	27	27	27	27
Needs Work	<5	<5	<14	<14	<14	<14
	>25	>25	>30	>30	>30	>30
Curl-ups (#)						
Good	≥20	≥25	≥30	≥35	≥35	≥35
Borderline	12	15	22	25	25	25
Needs Work	≤5	≤10	≤13	≤15	≤15	≤15
Sit-and-reach (in)						
Good	12	12	12	12	12	12
Borderline	8	8	8	8	8	8
Needs Work	≤6	≤6	≤6	≤6	≤6	≤6
Modified pull-ups (#)						
Good	≥10	≥12	≥15	≥15	≥15	≥15
Borderline	6	8	10	10	10	10
Needs Work	≤2	≤4	≤5	≤5	≤5	≤5

Adapted from Franks & Howley (1998).

Muscular Strength and Endurance

Fitness experts measure muscular strength and endurance by the force a person exerts on a certain movement, or the number of repetitions he or she can do against a certain level of resistance. In simple terms, you can see your own progress while doing strength-training exercises, as lifting the same amount of weight or using the same level of resistance becomes easier for you. Another test, below, involves doing partial abdominal curls slowly, and 90-degree push-ups to determine strength/endurance of your abdominal muscles and your arms and shoulders.

Abdominal Strength

Lie on a flat surface with knees flexed and feet about 12 inches from your buttocks. Your feet should not be held or anchored. Extend your arms forward with fingers pointing toward your knees. Move your fingers toward your knees slowly (about three seconds for each curl-up) and then lie back down. Continue until you can't do any more while maintaining good form, or until you have reached the appropriate number in Table 2.

Strong Arms and Shoulders

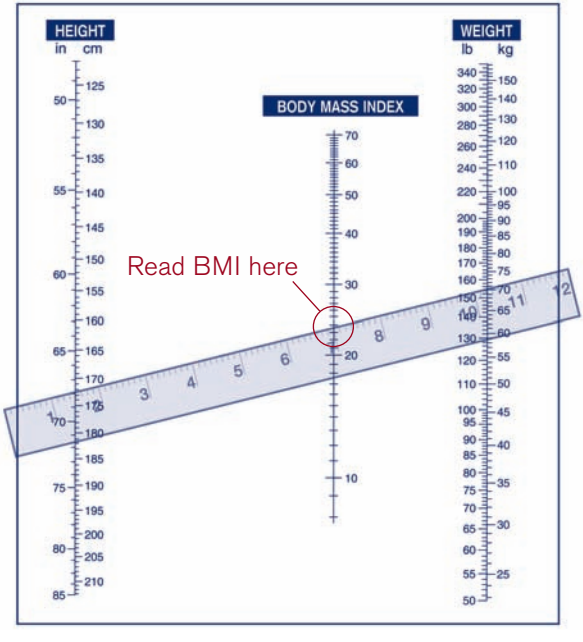
Lie facedown in a push-up position, with hands under shoulders, fingers pointing away from you, and legs parallel and slightly apart, with the toes supporting your body weight. Straighten your arms, keeping your back and knees straight, then lower the body until your elbows are bent at 90-degree angles.

Body Composition

An exercise physiologist can measure your body composition in the lab to determine your muscle-to-fat ratio, also known as "relative leanness." Body composition is accurately measured by underwater weighing or x-ray; percentage of body fat can be estimated by skin fold calipers. It's important to note that the total amount of fat as well as its distribution on your frame are both important measurements of the state of your body's health.

Body Mass Index (BMI) is a widely used clinical assessment of a person's weight as it's related to his or her height. This value is calculated by dividing your weight in kilograms by your height in meters squared. Body Mass Index provides a quick and easy guide to determining if you're at the appropriate weight for your height. As is the case with girth measurements, BMI does not differentiate between fat and nonfat (muscle, bone, etc.) body weight. For most adults, however, there is a clear correlation between elevated BMI and poor health. You can go to presidentschallenge.org/tools_to_help/bmi.aspx to have your body mass calculated or calculate your BMI by using Table 4 (your BMI is where a line between your height and weight intercept the Body Mass Index values). You can compare your BMI with the values in Table 3.

Table 4



Modified with permission from David C. Nieman, *Fitness and Sports Medicine: A Health-Related Approach,* (3rd edition), Bull Publishing Co., Palo Alto, CA (1995).

Are You Active Enough?

One of the greatest rewards for an active lifestyle is seeing improvement. How can you monitor and evaluate your progress?

Measure Your Physical Activity

The first goal for your physical activity is to accumulate at least 30 minutes of moderate-intensity physical activity (or take at least 8,500 steps) daily. Keeping a log or wearing a pedometer for the Presidential Active Lifestyle Award (PALA) is a good way to determine if you have accomplished this basic health goal. Keeping track of your activity at www.presidentschallenge.org is a great way to monitor these levels of activity. After you have earned your PALA you can use the same Web site to record your activities as part of the Presidential Champions program that can lead to a bronze, silver, or gold medal.

Feeling Fit!

Another way to evaluate your physical activity program is to actually see and feel the difference an active lifestyle makes. You will be able to feel your aerobic improvements when you do a typical activity (like going up stairs) and it seems easier. In addition, you will experience more energy in your daily routine. You'll have more vitality to enjoy your family and more vigor to get a task accomplished. Just retake the one-mile walk test, or a graded exercise test in a fitness center, to see your improvements.

You won't see changes in body composition on your bathroom scale. Muscle weighs more than fat. What you will notice is your clothes are more comfortable, they "hang" well, and you have more energy. You can also measure your waist girth and determine your new BMI. In addition, you can get your percent of body fat estimated in a fitness center.

Changes in flexibility will be obvious as you find it easier to do routine tasks (such as reaching for items) and you will find that you have a larger range of motion. You can be more spontaneous in your movements and not so stiff in the morning.

As you improve your muscular strength and endurance, everyday tasks become easier. It won't be an issue to carry the groceries or run to catch the phone. Your ability to continue to use your muscles with less fatigue shows improvement in this area. You'll be able to keep up with your kids. You will also see that you can use more resistance in your strength training and still do the same number of reps.

Perhaps most important, you should "feel good" after you exercise, sleep better, and have extra strength and energy to do those things that enrich your life. You may also be less depressed and find it easier to cope with some stressors as a result of your active life. Many people who are fit and maintain a healthy weight have reduced risk of disease and get sick less often.

Stay Active for Your Lifespan

The many benefits of an active lifestyle can be lost with a return to sedentary living. Thus, it is important to find activities that are enjoyable at all ages. What you enjoy at age 10, you may not enjoy at 20. And again, in midlife you may like to play tennis, while as you get older walking may make you feel good. It doesn't matter what you do, it matters that you do it. Be a role model for children, youth, and older adults, as you help them see how important regular activity is to you, and plan activities to keep you active.

Here's to increased activity, improved fitness, and enhanced health!

Resources

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Web Sites

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