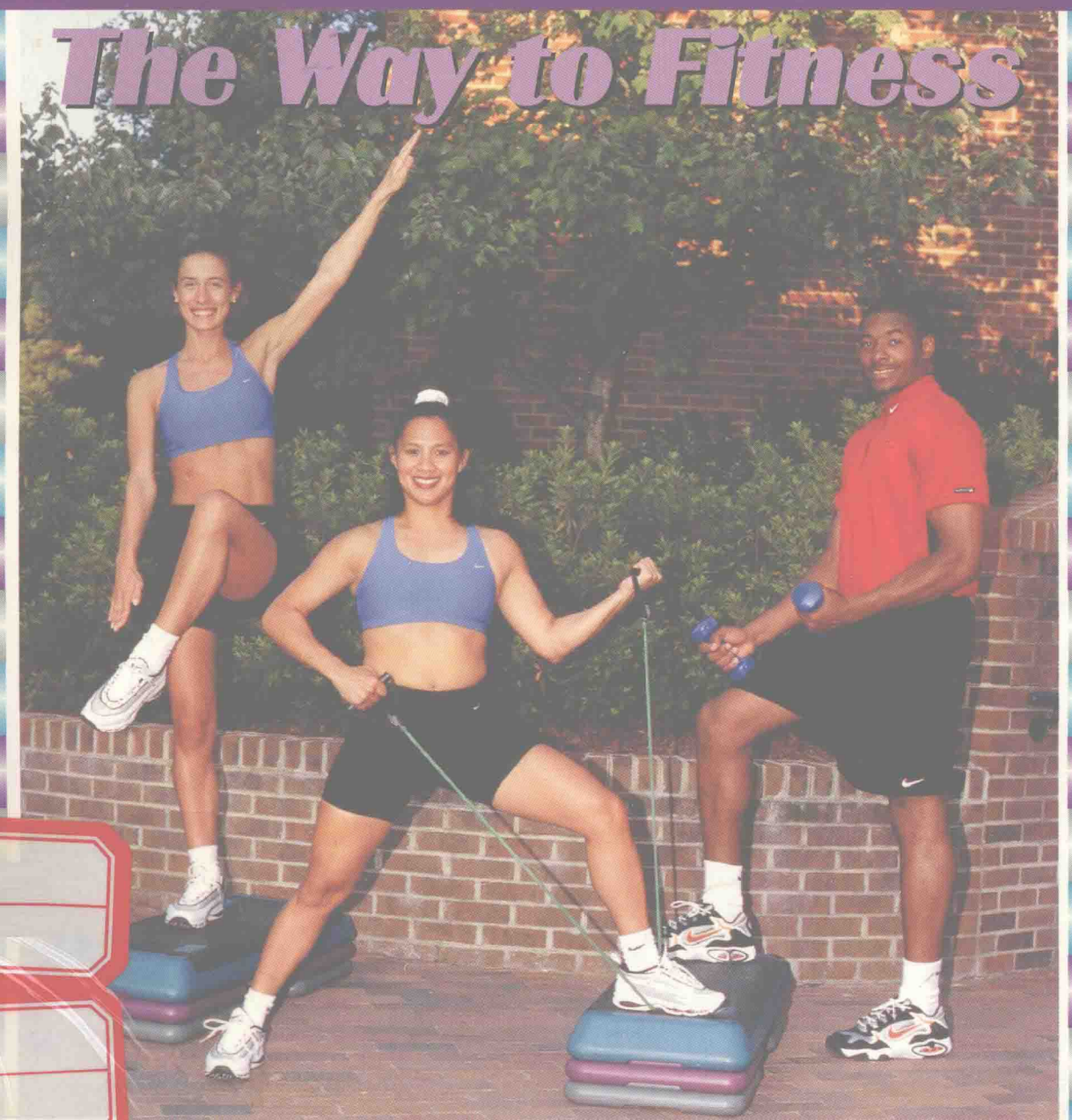
# STEP training PLUS

SECOND 2nd EDITION

Lauren M. Mangili

Karen S. Mazzeo



# STEP TRAINING PLUS
## THE WAY TO FITNESS
### SECOND EDITION

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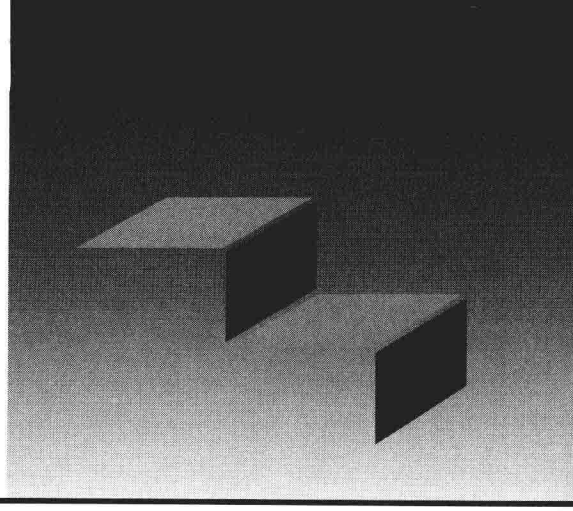

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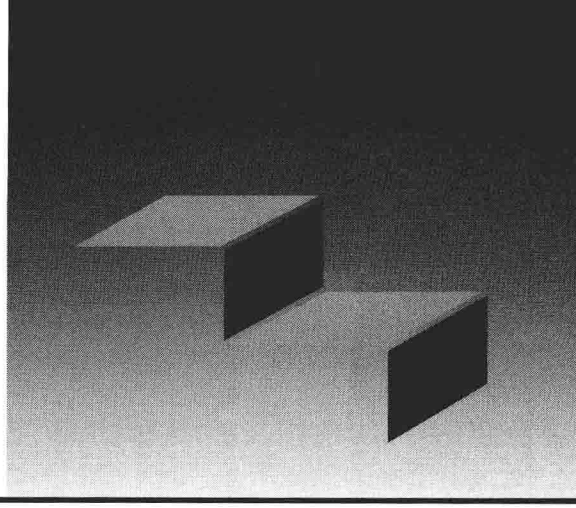
# INTRODUCTION



Bench/step training, or step training, is continuing its immense popularity with fitness professionals and enthusiasts into the 21st century. Step training, which uses a 4" to 12" step bench, is a safe and efficient method for achieving and maintaining physical fitness. Many participants consider it their top choice of modality for working out, and *the* way to fitness for a lifetime!

*Step Training Plus: The Way to Fitness,* Second Edition, updates the latest fitness research available. It assists individuals like yourself, who are taking physical fitness courses, to understand the basic principles and techniques involved in step training. The "Plus" tells how to structure a total physical fitness and mental training workout that will motivate you to make healthy choices for a lifetime.

*Step Training Plus* is designed for the novice requiring the basics and for the instructor-to-be to understand the methods behind the basics. Its brief, easy-to-follow, sequential learning order can be the map and compass for one's journey toward personal fitness excellence.

The three-hole punched book format allows for greater ease and flexibility of use by the student enrolled in a fitness course, as well as the instructor who may choose to provide additional handout pages of researched information and techniques to be taught. Students are encouraged to use this text as a personalized workbook, continually assessing their starting points, monitoring their progress and change, and setting goals to work toward. Pages can easily be removed and submitted to the instructor for review and evaluation, and then returned to their original locations within the text for continual reference during the course and for years to come.

This second edition is divided into two sections, I and II. Section I begins with two forms entitled, *Student Information Profile* and *Student Physical Activity Readiness.* The information gathered serves as part of the prescreening for both fitness testing and exercise participation. Section I continues by addressing all of the principles, techniques, and options for the exciting step training program in Chapters 1 through 8.

Chapter 1 initiates *A Step In The Right Direction* by presenting total fitness principles and definitions. These lay a broad foundation for understanding the specific fitness techniques you will be using.

Chapter 2 encourages you to take *The First Step*. Using the information obtained in the prescreening forms, this chapter helps you describe your starting point — where you are today — through testing procedures that are easily conducted in a class setting. From there, you'll be able to establish program goals, monitor your progress, and see your results.

Chapter 3 invites you to take *The Next Step* in understanding the specific fitness activity called step training. It covers the benefits, latest research, how to choose your bench height and music tempo, proper alignment and technique, positions to avoid, shoe selection, and general safety precautions.

Chapter 4 presents the *Segments of a Step Class* and specific information to consider while participating in each. The four segments are: warm-up, step aerobics, strength/muscle conditioning, and the cool-down, flexibility, and relaxation segment. The types of movements, music tempo, and length of each segment are recommended.

Chapter 5 takes you *Step By Step* through the basic techniques of step training. The techniques are described with photographs using the "mirrored" method for all *front* views. A movement described and visualized as using the left foot/arm/or side of the body shown is actually the right foot/arm/side of the model (see Figure I.1). Therefore, you do not have to reverse the direction of what is pictured and described and what you are to perform. You simply perform the

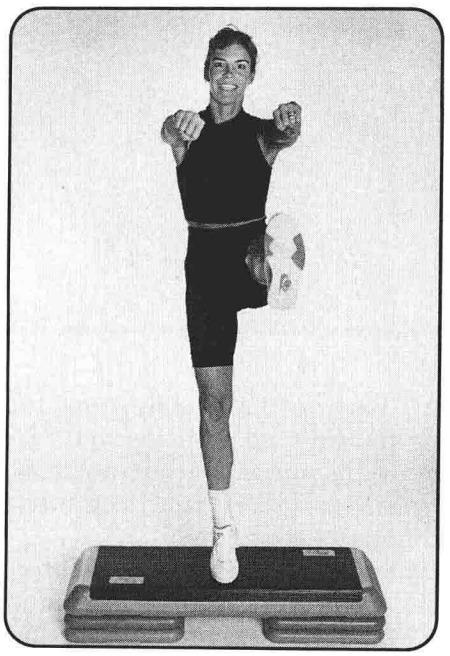


**Figure I.1.** Stepping up onto the bench, taking weight on your **left** foot, kick your **right** leg forward, waist-high.

movement on the same side of the body as you see it photographed and described. (Movement photographed from the model's *side* view or *rear* view are natural and not "mirrored"; right and left steps are the same as the model's right and left.)

Creativity is fostered in Chapter 6 by giving you a chance to *Step to the Beat* — providing you the framework for putting moves together. Principles of balance, selecting and sequencing movements, transitions, and adding variety are presented. This chapter offers ideas on how to safely progress through a step program (beginner to advanced stepper and simple to complex movements). By varying the intensity, you are sufficiently and continually challenged according to your own fitness level, skill level, current health status, and goals you've set. The advanced options in this chapter can provide a goal for the beginner to aspire to, and that occasional needed change for continually challenging the trained stepper. Ways to build unlimited possibilities are also provided, along with a worksheet to apply what you've learned.

Chapter 7 presents *A Step Ahead,* adding variety to your program once you've learned the basics. It includes format options, methods for combination training using other fitness modalities such as slide, jump rope and sports conditioning, and efficient training techniques you can use to enhance your step training program. Having progressed to being an intermediate-to-advanced stepper, variety in the workout format becomes a *plus* to stay motivated and to continue to adhere to this or any other training modality.

Chapter 8 features *A Stronger Step,* emphasizing strength and endurance training of the skeletal muscles using the bench in level, incline, and decline positions, in conjunction with a variety of resistance equipment.

Section II details the *Plus* in the title, including numerous additional areas of awareness, education, assessment, and monitoring one needs to consider when taking a course that emphasizes the development of a *total* fitness lifestyle. This section emphasizes making the mind-body-spirit connection necessary for one's total well-being.

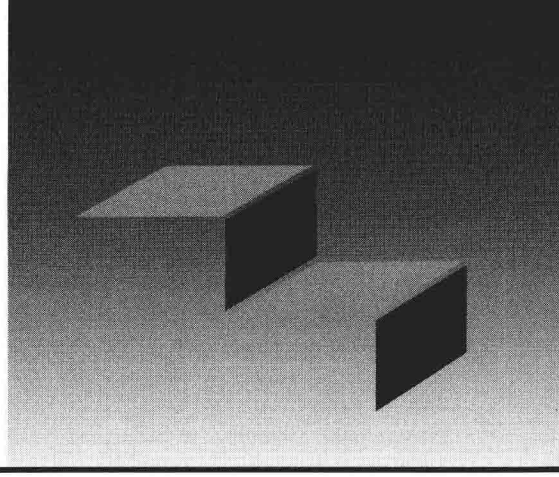
If you personally have difficulty starting a physical fitness program, you may want to begin the course in Section II, reading Chapter 9 first. This chapter will provide the principles and techniques needed immediately for understanding how internal *Motivation and Goal Setting* can work successfully for you now. For participants eager to get right into the physical step training principles and techniques, this mental training chapter will likely be presented later in your course, to solidify lifetime compliance to your program.

*Nutrition* is one of the hottest interest topics today and, therefore, is greatly expanded in Chapter 10. Variety and quantity of foods to eat and drink, nutrient density, vegetarian eating, and thirst replenishment are only a few of the many concepts presented.

Chapter 11 takes a look at the *Weight Management* issues of fat loss, lean gain, and weight maintenance. It explains assessment of body composition and offers several positive ideas to consider if changes are needed.

The steps toward lifetime fitness are taken one at a time beginning now, in the present moment. All steps become easier, quicker, and automatic if they are considered *fun.* Enjoy your fitness journey!

# CONTENTS



# SECTION 1

**LEVEL 4** Limit...
- sitting
- watching TV

**LEVEL 3** 2–3 days/week

Flexibility

Muscular strength/ endurance

**LEVEL 2**

3–5 days/week moderate intensity

Aerobic activities
- aerobic dance
- jogging
- biking

Recreational activities
- racquetball
- basketball
- tennis

**LEVEL 1** Choose to be active every day!
- use the stairs
- park further from destination
- walk the dog

The four levels of the fitness pyramid may be used as a guide for developing a well balanced fitness program. The bottom layer of the pyramid encourages you to be active by doing things for yourself rather than relying on modern conveniences. For example, when given a choice between taking the elevator or using the stairs, or walking instead of driving, choose to be active.

The second layer from the bottom promotes aerobic activities (aerobic dance, jogging, biking, step training) and recreational activities (basketball, tennis, racquetball, as examples) to strengthen the cardiovascular system.

The third level of the pyramid includes a flexibility and strength component, as well as leisure activities such as golf, bowling and yard work (that often are not as strenuous as aerobic exercise and vigorous recreational activities). These should be done a minimum of 2 or 3 days a week.

Finally, when constructing your fitness program, the top of the pyramid indicates an individual who lives a fit lifestyle and limits the amount of sitting and watching TV.

### ACSM Guidelines:

To achieve *cardiovascular benefits,* the American College of Sports Medicine (ACSM) recommends exercising 3 to 5 days a week at moderate to vigorous intensity, for 20 minutes or more. To improve *muscular strength and endurance,* ACSM recommends strength training 2 days per week, performing eight to ten exercises at approximately 70% to 85% of your one-repetition maximum.

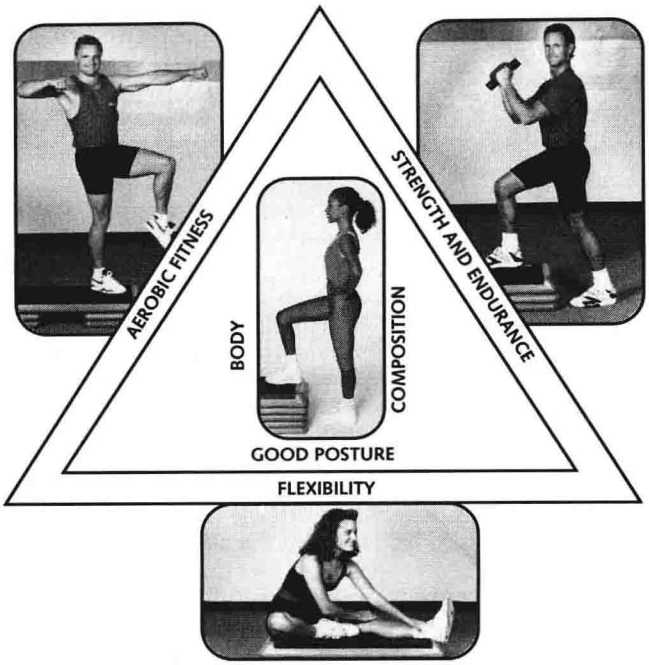
# Personal Fitness Program

Name:_____ Date:_____

1. Do you currently exercise? _____ No _____ Yes
   If yes, how many days per week? _____
2. If yes, what type of exercises are you performing? _____
3. If you are not currently exercising, how long has it been since you have exercised? _____
   _____
4. List in numerical order the top three to five reasons you wish to become involved in a regular exercise program:
   _____Improve cardiovascular fitness _____Reduce stress
   _____Lose fat weight _____Gain lean weight
   _____Increase flexibility _____Sleep better
   _____Improve muscular endurance _____Increase energy
   _____Improve posture and appearance _____Specific sport training:
   _____Increase muscular strength List sport _____
5. Check the aerobic exercise machines you are familiar with:
   _____Climbmax _____Cybex Bike _____Nordic Track
   _____Concept II Rower _____Freeclimber _____Treadmill
   _____Crossrobics _____Lifecycle
6. Check the weight machines you are familiar with:
   _____Cybex _____Free Weights _____Hammer
7. Check the aerobic exercises you enjoy:
   _____Aerobic dance _____Jogging _____Stair Stepping _____Walking
   _____Cross-country Skiing _____Jump Rope _____Step Training
   _____Cycling _____Rowing _____Swimming Laps
8. What days of the week do you prefer to exercise?
   _____M _____T _____W _____Th _____F _____Sat _____Sun
9. What time of day do you plan to exercise?
   _____Early morning (6 a.m.–9 a.m.) _____Evening (6 p.m.–9 p.m.)
   _____Mid morning (9 a.m.–noon) _____Late night (9 p.m.–midnight)
   _____Early afternoon (noon–3 p.m.)
   _____Late afternoon (3 p.m.–6 p.m.)
10. How do you prefer to exercise?
    _____Alone _____With a partner _____In a group setting.

# 1

# A Step in the Right Direction




By engaging in a physical fitness activity such as *aerobic* step training, you've taken the first step of your journey toward a meaningful, active lifestyle. Physical conditioning through step aerobics offers you a happier, more vivacious and abundant life. The physically fit active lifestyle actually prolongs life.[1] Furthermore,

> some predictions are that by the end of this century, the average American woman will live to age ninety, and the average American man to the mid-eighties.[2]

With these impressive findings and a projected long life ahead of us, let's make sure it will be a *quality* long life we're living (not just doing time), by making good choices.

Most simply stated, the term *aerobic means promoting the supply and use of oxygen.* The body's demand for oxygen increases when you engage in vigorous activity that produces specific beneficial changes in the body. *Aerobic, therefore, can refer to any type of exercise mode as long as it meets certain basic criteria.*

*Step training or step aerobics is an exercise mode that fulfills all of the criteria for aerobic exercise established by the American College of Sports Medicine.*

## A Total Physical Fitness Conditioning Program

Total physical fitness is the positive state of well-being allowing you enough strength and energy to participate in a full, active

lifestyle of your choice. According to the American Medical Association, it is

> the general capacity to adapt favorably to physical effort. Individuals are physically fit when they are able to meet both the usual and unusual demands of daily life, safely and effectively without undue stress or exhaustion.

A total physical fitness conditioning program consists of five basic components. This can be visualized by the fitness triangle, depicting the three action components, plus the two structural components.

1. *Aerobic fitness* (cardiovascular and respiratory)
2. *Flexibility* (ability to bend and stretch)
3. *Muscular strength and muscular endurance* (thickening muscle fiber mass to enable individuals to endure a heavier workload)
4. *Good posture* (holding body in proper position for safety and efficiency)
5. *Body composition* (maintaining the proper fat weight-to-lean weight ratio).

A total, well-rounded weekly fitness conditioning program should consist of regular participation in all five components.

## Aerobic Fitness

Because the sign of genuine fitness is the condition of the heart, blood vessels, and lungs, aerobic fitness is the most important component. *Aerobic* exercise is exercise that requires oxygen for extended periods and demands an uninterrupted work output from your muscles. Aerobic exercise trains the heart, lungs, and cardiovascular system to deliver oxygen quickly and efficiently to every part of the body. The higher your fitness level, the better able your cardiovascular system is to deliver adequate oxygen. Endurance activities that are rhythmic, dynamic, continuous, and use large muscle groups characterize aerobic exercise.

If you are exercising at a pace that is too intense, your body will utilize the *anaerobic* energy system. This type of exercise quickly uses up more oxygen than the body can take in while engaging in the exercise, causing an oxygen debt. This, in turn, causes lactic acids (waste products) to accumulate in the muscles, which leads to exhaustion.

Anaerobic activity is basically stop and start, in which the heart is *not* kept at a constant, steady pace for 20 to 60 minutes. Thus, anaerobic describes an activity that requires all-out effort of short duration and does not utilize oxygen to produce energy.

By engaging in step training or any other aerobic activity, the heart gradually strengthens and develops a greater capacity to pump more oxygenated blood to the body with fewer contractions. Exercised hearts are stronger and slower.

> Highly trained and conditioned endurance athletes have resting heart rates as low as 30 to 32 beats per minute, an unbelievably low rate! What happens is that, with regular, stimulating exercise, the heart becomes a more efficient pump. It pumps more blood with each stroke, and with a more efficient stroke volume, your heart can function with less effort.
>
> By getting your heart into condition, you may be practicing preventive medicine. You may be lessening the danger of a coronary heart attack, 5, 10, 15, 20 years from now. And if you do have a heart attack, your chances of surviving are far greater with a heart, lungs, and blood vessels that are in good condition.[3]

A person can exist without big, bulging muscles, or without the perfect figure, or with a head cold, but not very long without a good heart and lungs. Unfortunately, more than 40% of all people who have a first heart attack do not have a second chance to change their habits or develop an aerobic program. They die. And more than half of all deaths in the United States each year are attributable to heart-related diseases.[4] If only we could establish a priority early in life to counteract this overwhelming statistic!

## Flexibility

Flexibility is defined as *the functional range of motion of a certain joint and its corresponding muscle groups.* The greater the range of movement, the more the muscles, tendons, and ligaments can flex or bend.

Muscles are arranged in pairs. One muscle's ability to shorten or contract is directly related to the opposing muscle's length or stretch. Flexibility is maintained or increased by movement patterns that slowly and progressively stretch the muscle beyond its relaxed length. The stretch is performed to a point at which the exerciser feels tension developing in the muscle, but not to a point of pain.

## Muscular Strength and Endurance

Muscular strength is the *ability of a muscle to exert a force against a resistance.* Strength activities increase the amount of force muscles can exert, or the amount of work muscles can perform. Activities such as weight training can develop strength in the skeletal muscles.

Muscular endurance is the *ability of muscles to work strenuously for relatively long periods without fatigue.* It is the capacity of a muscle to exert a force repeatedly, or to hold a static (still) contraction over time.

Muscular strength and endurance activities do not provide increased oxygen to condition the heart to function more efficiently.[5] Their primary target is skeletal muscle.

### Good Posture/Good Positioning

Proper positioning of the body when performing any type of physical exertion promotes a safe and efficient workout. Once the basic mechanics are known and practiced, this underlying fitness component becomes an integral part of every move, not a separate program.

### Body Composition

An individual's total body weight is composed of fat weight and lean weight (fat-free weight). Keeping an appropriate percentage ratio between these two weights is important for the entire body's best functioning and helps prevent obesity and its many related health risks. This fitness component is managed by establishing a proper diet and exercise plan that provides for maintaining ideal weight.

If you aren't beginning your program at an ideal weight, specific guidelines will be given within both the physical exercise programs and the dietary eating plans you'll establish for how to achieve an ideal percentage ratio.

## Aerobic Fitness Training

The remainder of Chapter 1 is devoted to a detailed look at aerobic fitness research and the general principles recommended for you to follow, including modes of activity to choose in addition to step training. The other four physical fitness components are explained more fully in later chapters.

Aerobic means promoting the supply and use of oxygen, and training refers to muscle stimulation. Therefore, aerobic training is any exercise that requires a steady supply of oxygen for an extended time and demands an uninterrupted work output from the muscles.

An activity such as step training significantly increases the oxygen supply to all body parts, including the heart and lungs, through continuous, rhythmic movement of large muscles and connective tissue. This type of movement conditions the body's oxygen transport system (heart, lungs, blood, and blood vessels) to process oxygen more efficiently. This *efficiency in processing oxygen*, called *aerobic capacity*, is dependent on your ability to:

- Rapidly breathe large amounts of air.
- Forcefully deliver large volumes of blood.
- Effectively deliver oxygen to all parts of the body.

In short, one's aerobic capacity depends upon efficient lungs, a powerful heart, and a good vascular system. Because it reflects the conditions of these vital organs, *aerobic capacity is the best index (single measure) of overall physical fitness.*[6]

Aerobic capacity is what is measured, quantified, and labeled in a physical fitness stress test, performed either in a laboratory (called a laboratory stress test) or on a premeasured distance such as a track (called a field stress test). Chapter 2 describes these and other ways by which you can test your aerobic capacity.

### The Progressive Overload Principle

Step training, or any aerobic activity, conditions the heart muscle by strengthening it through a principle called *progressive overload.* Not only will the heart pump more blood with each beat, but it will also rest longer between each beat, thereby lowering the pulse rate.

Aerobic exercise overloads the heart by causing it to beat faster during the specific timeframe of the workout session, producing a temporary high demand on the cardiorespiratory system. Over time, as you become more fit, the heart eventually will adjust to this temporary high demand, and soon it will be able to do the same amount of work with less effort.

By overloading the heart with any vigorous aerobic exercise, your aerobic capacity will increase and you can achieve a desirable training effect. The *training effect,* or total beneficial changes that usually occur, consists of the following:

- Stronger heart, sending more oxygenated blood to all tissues of the body.
- More blood cells produced.
- Slower resting heart rate.

- Expansion of blood vessels.
- Improvement in muscle tone.
- Lower blood pressure through improved circulation.
- Stronger respiratory muscles.
- Regulation of the release of adrenalin.
- Greater lung capacity.
- More regular elimination of solid wastes.
- Lower levels of fat in blood.[7]
- Strengthening of muscles and skeleton to protect them from injury later in life.
- Increased bone density, deterring osteoporosis.[8]
- Increased sensitivity to insulin and lowered blood sugar levels in mild, adult-onset diabetes.[9]
- Improvement in the way the body handles cholesterol, by increasing the proportion of blood cholesterol attached to high-density lipoprotein — a carrier molecule that keeps cholesterol from damaging artery walls.[10]

## Alternative Aerobic Exercise

In addition to bench/step training, aerobic exercise options include all of the following activities:

- Aerobic dance-exercise (aerobics)
- Cross-country skiing
- Cycling (including stationary cycling)
- Jogging/running
- Jumping rope
- Rowing
- Skating (ice/roller/in-line)
- Stair climbing
- Swimming
- Walking/hiking (moderate to fast pace-walk).

## Aerobic Criteria

These exercise alternatives, collectively, must have several essential criteria for the exercise to be labeled *aerobic* (see Figure 1.1). Because aerobic means *with oxygen:*

1. *The movement you do must use the large muscles of the body,*[11] (arms and legs). The gesture and step patterns in bench/step movements are excellent choices.
2. *The movement must be rhythmic.*[12] One-two-one-two, using a steady beat of music, with either a fast or slow tempo, is suggested.
3. *You must practice a minimum of three sessions per week.*[13]
   - 4 days a week or every other day is good.
   - Some key researchers recommend 5 days as a maximum for fitness goals. Beyond this, injuries to the musculoskeletal system from

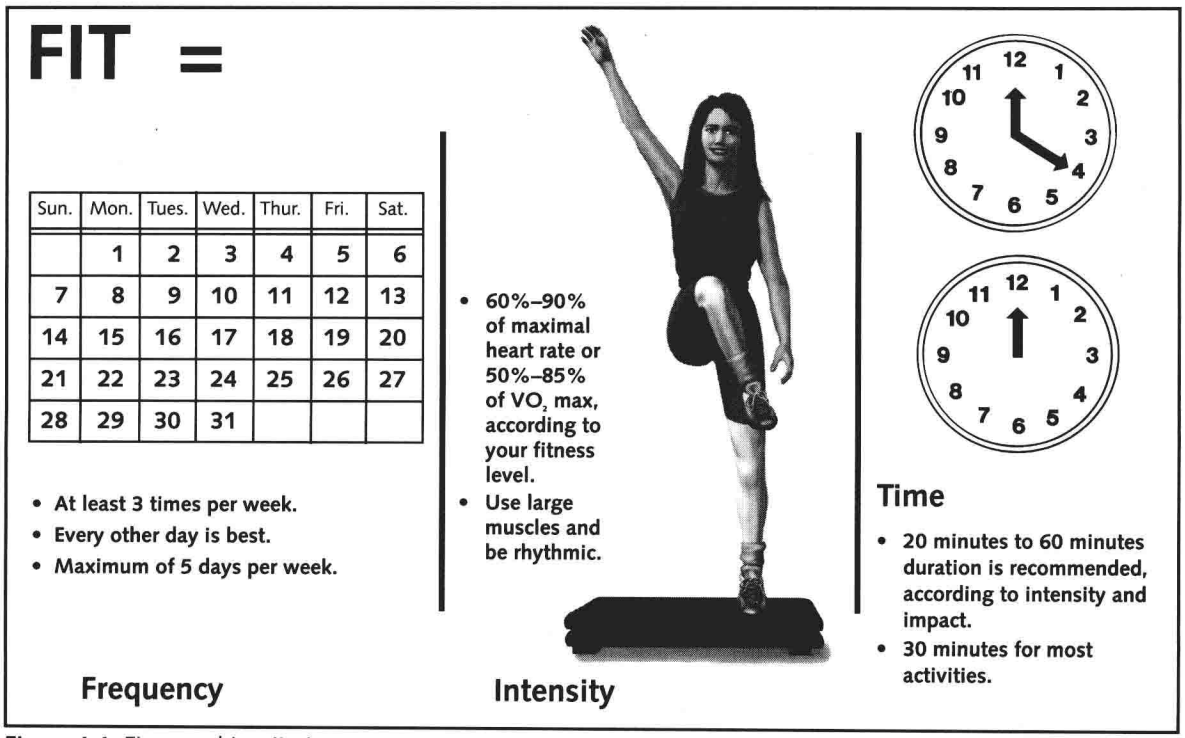



**Figure 1.1.** Five aerobic criteria.

overuse are 10 times more likely to occur. Give your body at least 2 days off per week, especially if you are a novice to physical fitness conditioning.

- If your goals are related to more than just aerobic fitness — if, perhaps, your profession (such as a fitness instructor) or your athletic sport status requires more workouts or days per week — allow your body to tell you your maximum frequency. A sudden elevated resting heart rate in the morning signifies the day(s) not to work out. This is your built-in body signal, and it can be readily seen/heard/felt simply by daily monitoring your resting heart rate. Upon arising in the morning, check this heart rate for 1 full minute.

4. *You must exercise continuously for 20–60 minutes.*[14]
   - Duration depends upon the intensity used, and the impact of the activity.
   - Lower intensity activity, such as walking, should be done over a longer period (40–60 minutes).
   - Because high-impact types of activity, such as running and jumping, generally cause significantly more debilitating injuries to exercisers, shorter workouts (20 minutes) are recommended.
5. To receive the cardiorespiratory fitness benefits (called the training effect), *the heart rate must be maintained in a specific target heart rate training zone*, which is the individualized safe pace at which to aerobically work or exercise. This reflects your intensity and is explained scientifically as one of the following:
   - 60% to 90% of your maximum heart rate, *or*
   - 50% to 85% of your maximum oxygen uptake, or heart rate reserve.[15]

## Intensity

Frequency and time duration of your workouts are easy to determine. Determining the amount of exertion during the workout to keep it safe while continually making fitness gains can be more of a challenge, especially for the novice. Intensity is measured (monitored) in one of three ways:

- Finding your *target heart rate (THR)* training zone using the Karvonen formula. This is suggested for the novice.
- Using the psychophysical scale for *ratings of perceived exertion (RPE)*, which shows a high correlation with heart rate and other metabolic parameters, according to American College of Sports Medicine (ACSM) guidelines. Rate of perceived exertion monitoring is suggested for the individual who already has become well-accustomed to taking a heart rate pulse.
- Using the *talk test.* This easy and practical method is best used in conjunction with the THR and RPE for monitoring exercise intensity.

### TARGET HEART RATE

**Taking Your Pulse.** To calculate appropriate exercise intensity by finding your THR training zone, you first must know how to accurately take your pulse. The pulse equals heartbeats per minute and can be felt and counted at one of six pulsation points. Select which area you can best obtain a pulse using your index and second fingers. The two places most often used to count pulse are the neck near the carotid artery and the wrist near the radial artery. Both are shown in Figure 1.2.

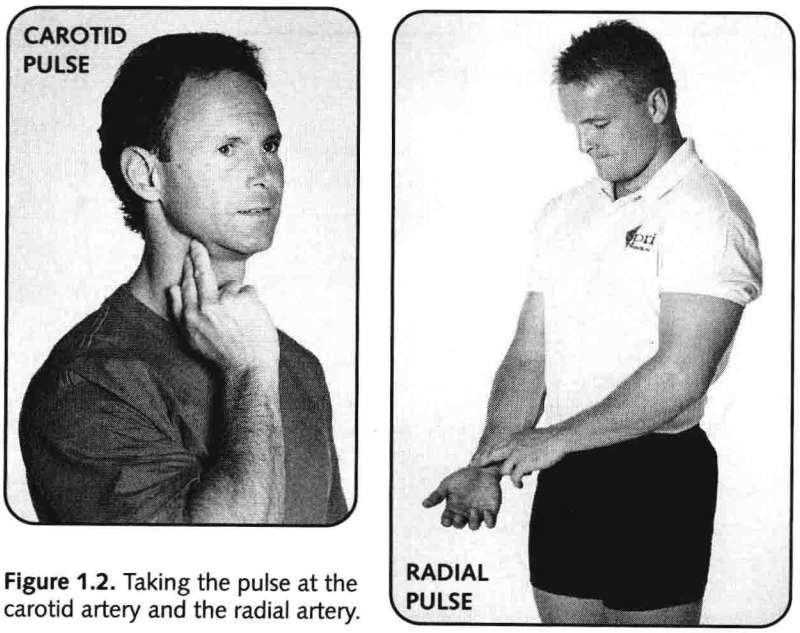



**Figure 1.2.** Taking the pulse at the carotid artery and the radial artery.

1. The *carotid artery,* located in the neck, is usually easy to find. Place your index and middle fingers below the point of your jawbone and slide downward an inch or so, pressing lightly. When you use the carotid artery method, make sure to apply light pressure, as excessive pressure may cause the heart rate to slow down by a reflex action.
2. The *radial artery* extends up the wrist on the thumb side. Place your index and middle fingers just below the base of your thumb. Press lightly. Count the number of pulsations, or beats, for 60 seconds. The total is the number of heartbeats per minute. To count correctly, make sure you count each beat you feel.

Having gained the skill of pulse taking, it is now time to establish your *resting heart rate.* This number is to be placed in the formula for establishing your target heart rate training zone.

**Establishing Resting Heart Rate (RHR).** A true *resting* heart rate (RHR) is not taken in a class but, instead, when the individual has been at complete rest, preferably after sleeping for several hours and upon awakening. Keep a clock or watch with a second hand next to your bed. When you awaken (without an alarm clock ring), take your pulse for 1 full minute and record that number as your RHR. Do this for five consecutive mornings, then determine an average (add all RHR's and divide by 5). This is a rather accurate way to determine your resting heart rate.

**WEEK 1:**

Day 1: _____

Day 2: _____

Day 3: _____

Day 4: _____

Day 5: _____

Sum total: _____

÷ 5: _____ RHR

***Unusual stress and illness (illness is a type of stress) sharply elevate the resting heart rate from previous readings.***

Normally healthy individuals should find a positive outlet for stress. Stress affects you even as you sleep. The heart continues to beat rapidly at a time when the heart ideally should take a break and slow down for 6 to 8 hours.

One of the two visible signs of improvement in heart and lung fitness is a lower resting heart rate. Because the RHR is the basic thermometer of fitness, after a 10-to-15-week step aerobics course, you and your classmates may experience:

- A decline in your resting heart rate beats per minute.
- A significant decline in resting heart rate beats per minute by smokers who quit, or cut down their intake, during the course.

Continue to monitor and record your RHR at least two times per week in a Fitness Journal you keep for the course.

**Determining THR Training Zone.** You can now place your average RHR figure in the formula for determining your target heart rate training zone, in Table 1.1. The other variables figured into the formula are your current *age* and *lifestyle,* represented as a percentage of your maximum heart rate.

In Table 1.1, record your current age and the percentage range you select from the list below that describes your current lifestyle.

| If you are: | Use: |
|---|---|
| ▮ a nonathletic adult | 50% to begin |
| ▮ sedentary | 60%-69% |
| ▮ moderately active | 70%-75% |
| ▮ very active and well-trained | 80%-85% |

Now figure the Karvonen equation. The result is your target heart rate training zone, the safe exercise training zone for you.

**Taking a Count After a Step Aerobics Interval.** As you are beginning a step aerobics program, you will want to monitor your pace several times during the workout hour so you can learn constant endurance pacing. Mentally remember your