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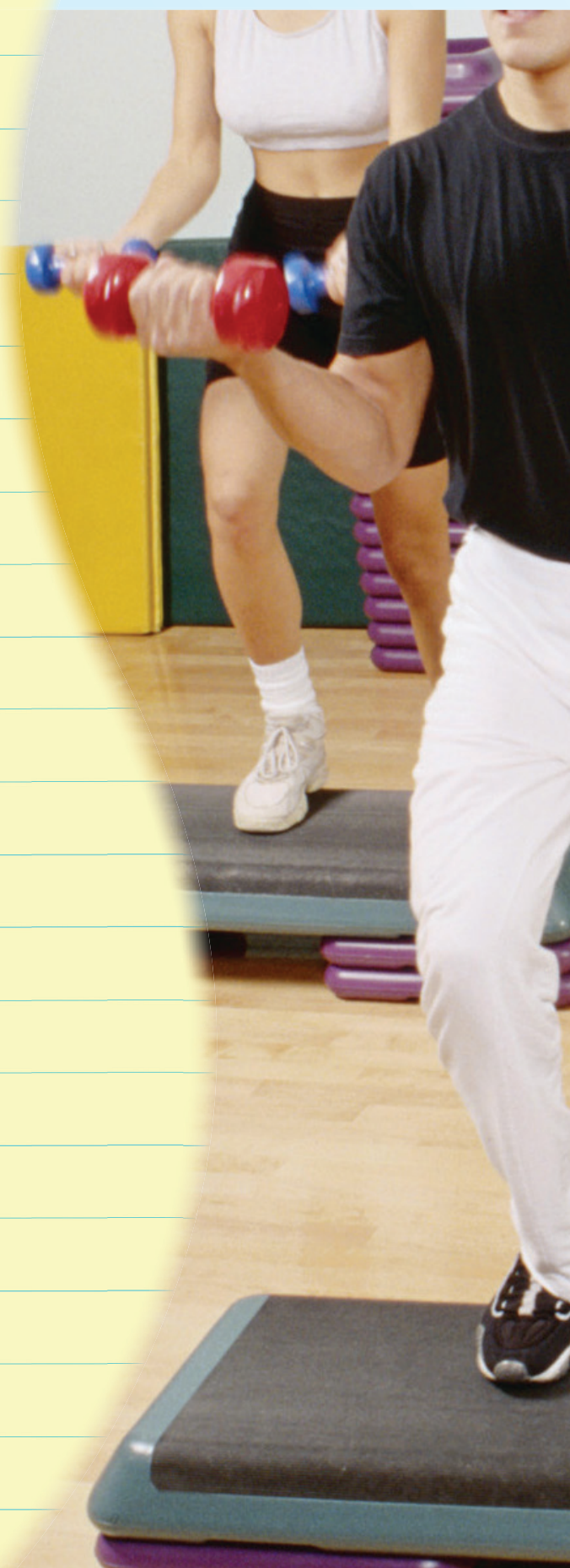
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CHAPTER II

Developing Physical Fitness

In this chapter, you will learn about the following:

- ❶ The characteristics of fitness training principles
- ❷ The components of physical fitness and motor ability
- ❸ The benefits of different types of fitness training activities
- ❹ Designing a training program to meet specific fitness goals





“You may never know what results come of your actions, but if you do nothing there will be no result.”

Mahatma Gandhi

The health, joie de vivre, and creativity of a well-developed personality depend to a large degree on total fitness levels. **Total fitness** is the functional readiness and level of effectiveness required for everything a person does. It involves the ability to adapt to the demands and stresses of daily life and is directly related to the amount and intensity of **physical activity**. The term *total fitness* is used in many ways and has many dimensions, including physical, emotional, social, spiritual, and intellectual. The focus of this chapter is physical fitness.

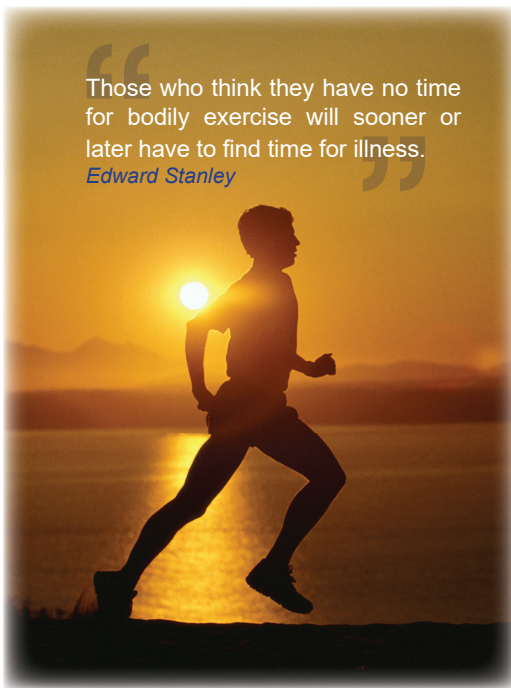
Physical fitness is more than just a concept – it is a way of life. It incorporates many components important for health, such as muscular strength, muscular endurance, cardiorespiratory endurance, flexibility, and body composition. Each of these components offers unique benefits and advantages that affect your client’s health in a positive way. Engaging in **physical exercise** provides numerous benefits that help control weight, manage stress, and boost the immune system, as well as protect against disease. Exercise not only helps a person look and feel good but also provides enjoyment while developing a state of health and vitality.

To best advise someone whose goal is to improve physical fitness, you must understand how to exercise properly and most effectively. In this chapter you will learn about the principles involved in planning training programs, the importance of the various components of physical fitness and how to develop them, and activities that can be used in fitness training. Attaining physical fitness need not be boring and monotonous or restricted to running and cycling; there are many options available, and all you need to do is discover what activities interest your client most.

In the previous two chapters we have focused our discussion on people who want to improve their health status. Many of your clients will want to take the next step. They will want to set goals for specific improvements in aspects of physical fitness such as strength, flexibility, and endurance. They may want to improve their ability to handle the physical requirements of their jobs. They may want to achieve a certain muscle mass (18-inch biceps) or a “six-pack” abdomen. They may want to improve their sports performance by improving their speed, agility, and balance. These are valid and relevant goals for many people and are dealt with in this chapter.

Those who think they have no time for bodily exercise will sooner or later have to find time for illness.

Edward Stanley





Fitness Training Principles

Before we discuss the components of fitness and the types of training activities, it is important to know something about the principles that govern training. Programs that adhere to these well-established principles are more likely to generate the greatest improvements in your client's fitness levels.

Does the training program FITT?

FITT Principle

The **FITT principle** is a simple method of recalling the four important design elements of any training program: Frequency, Intensity, training Time, and Type of activity. Each of these components is described in more detail here.

Training Frequency

Training frequency refers to the number of times a person exercises each week. This can depend on an individual's goals, abilities, fitness level, and sport. If the goal is to maintain an achieved level of fitness, two or three sessions per week are sufficient; however, if the goal is to improve physical fitness, four to six sessions are recommended.

Training Intensity

Training intensity describes how hard a person needs to work in order to achieve a fitness benefit or see an improvement. It is measured differently for each physical fitness component. For instance, intensity in cardiorespiratory endurance training is monitored by measuring the pulse, or heart rate, with the goal of keeping the heart rate between 50 and 85 percent of the client's predicted maximum. Other measures of intensity include resistance to be overcome, number of repetitions, speed of movement, and percentage of maximum performance effort.

Another intensity consideration is the **work-to-rest ratio** (e.g., 1:2 – the rest phase is two times the length of the work phase). The rest phase allows for recovery from muscle fatigue. Generally, the lower the intensity of exercise, the shorter the rest periods required.

Training Time

Training time refers to the total time devoted to developing fitness. It is based on the duration of each training session. **Training volume**, another element of exercise time, is measured in various units depending on the type of activity. For instance, in cyclic movements (e.g., walking, running, swimming, kayaking, rowing), the total distance in one workout or several workouts over the course of one week represents the volume



The work-to-rest ratio indicates how long the rest phase should be relative to the length of the work phase. Generally, the lower the intensity of exercise, the shorter the rest periods have to be.





Do you understand the difference between **formal** and **informal** fitness activities? As a fitness leader, you must be aware of the client's specific goals in order to maximize his or her training experience.

of training. For strength training, the volume may refer to (a) the total number of all repetitions of each exercise, (b) the total of all repetitions during a workout, (c) the total resistance moved, or (d) the number of times a circuit was completed.

Type of Activity

Choosing a type of exercise is also important. Physical activity can include **formal fitness activities**, where the development of fitness is the participant's main goal (e.g., circuit training, group fitness classes, jogging, weight training), or **informal fitness activities**, which emphasize the social aspect of exercising – such as camaraderie, cooperation, and fun – as the main goal, with fitness being a by-product (e.g., pickup street hockey, social dancing, three-on-three basketball, mall walking).

Often the participant will determine whether an activity falls into the formal or informal category. One person may engage in pickup soccer or mall walking to improve fitness, while another may participate in these activities to meet people and make new friends.

FITT Principle

The mnemonic FITT can be used as a simple method of recalling the four important design elements of any training program:

Frequency – How often should I train this component?

Intensity – How hard do I need to work to achieve a benefit?

Time – How long should I train for?

Type – What activities should I do?



Overload Principle

The **overload principle** states that for improvement to occur, training demands must be higher than normal performance requirements in order to stress the capacity of the targeted muscle or body system. The additional overload can be achieved by increasing the frequency, intensity, or time of the exercise program.

Progression Principle

After a period of training, the load that previously created a level of stress will no longer provide an adequate overload stimulus. This stimulus is now a



“normal” load, and to ensure that the muscles or systems continue to improve, the stimulus must be periodically increased (see the box *From Greek Mythology*). This is called the **progression principle**.



From Greek Mythology

In his youth, Milon of Croton (disciple of Pythagoras, scholar, and multiple Olympic wrestling champion in ancient Greece) decided to become the strongest man on earth. To achieve this he lifted and carried a calf every day. As the calf grew and became heavier Milon's body adapted to the growing weight of the animal and became increasingly stronger. When the calf had grown into a bull and Milon a man, he had become the strongest man of his time.

There are various ways to increase load, depending on one's fitness level and the particular method of training used. Gradually increasing the training load, in small steps from one training cycle to another, is recommended for beginners and recreational trainees. An example is shown in the box *How to Overload*.

How to Overload

One way to determine whether to increase the load is by judging the number of times a given weight can be lifted before causing fatigue. For example, if you start lifting 50 pounds 10 times and, after training for a length of time (two to five sessions), you can lift the same weight 15 times, then to increase muscle strength, the load should be increased to what can be lifted maximally (until exhaustion) 10 times. This new weight will most likely be 60 pounds. This ensures that the muscles are working in the overload zone and the “signals” that stimulate adaptation are being sent to the muscles.

Reversibility Principle

Illness, injury, or even a vacation can cause an unavoidable break in your training routine. According to the **reversibility principle**, training interruptions have a negative effect on personal fitness, resulting in stagnation or a temporary decline in performance. Fitness instructors or mentors need to be ready to encourage clients who have lost ground during the interruption and are discouraged as a result.

Generally, cardiorespiratory and muscular endurance performance declines faster than maximal strength and power performance. Motor ability performance factors such as coordination and muscle integration



Use it or lose it!
Endurance athletes can lose up to 10 percent of their performance VO_2max following a one-week layoff from cardiorespiratory training.





also decline with training interruptions because these factors are all interrelated. Remember the saying “Use it or lose it!”

Specificity Principle

The **specificity principle** states that exercises cause specific physiological responses or changes. This means that if you wish to improve a particular fitness or skill component, you must select a training modality that is as close in action as it can be to the end result.

When You Exercise for Performance, Be Specific!

- If you train arm strength by pushing with bent arms against immovable walls, you will become strong at pushing walls but not at doing push-ups, which require dynamic contractions.
- It makes little sense for basketball players to practice shooting at an 8-foot basket if they shoot at a 10-foot one in a game or for hockey players to practice shooting drills without a goalie in the net.
- If a person has to lift 60-pound boxes at work, it makes little sense to use a 20-pound resistance while training to improve work efficiency.
- Performing bench presses will not help you improve the endurance of your leg muscles.
- Sprinters will do themselves little good if they train by running long distances.

Components of Physical Fitness

Physical fitness incorporates components important for general health (Figure 11.1), such as muscular strength, muscular endurance, cardiorespiratory endurance, and flexibility. Each of these components is essential for people of all ages and abilities. Body composition, which was discussed in the previous chapter, is another component of health-related fitness.

Muscular Strength



Muscular strength is defined as the ability of a muscle or muscle group to exert force against a resistance. The greater the muscle diameter, the greater the force it should be able to generate. Before puberty, girls and boys have equivalent strength. Because of the influence of testosterone during and after puberty, however, males have the capacity to develop larger muscles and thus can generally develop greater strength.

In sports, the force generated by a muscular contraction may be applied against a movable object, as in weightlifting,



or against a fixed object, such as the starting blocks in sprinting. If you think of sports that require great strength, the athletes that participate in these sports have large muscles. However in daily life, the average person needs only enough strength to manipulate his own body weight; lift and carry items such as a backpack, groceries, or children; or carry work-related items such as tools.

We can differentiate between absolute and relative strength. **Absolute strength** is the total force a person can apply in a single effort against a resistance: how much weight or mass she can move regardless of her weight or mass. **Relative strength** takes the mass of the body into account and is calculated by taking the person's maximum (absolute) strength and dividing it by the mass of her body. For example, a fourteen-year-old girl who can do a chin-up can lift her own body weight. A year later, after gaining 12 pounds, her upper body may be just as strong, but she may no longer be able to do a chin-up. She has maintained her absolute strength, but her relative strength has decreased.



Figure 11.1
The components of physical fitness.



The amount of strength required in our daily lives depends to a large extent on our age, occupation, and specific life circumstances.

