CHAPTER

1

The Scientific Rationale for Integrated Training

OBJECTIVES

After studying this chapter, you should be able to:

- Explain the history of the profession of personal training.
- Identify common characteristics of personal training clients.
- Demonstrate an understanding of the principles of integrated exercise program design.
- Describe the Optimum Performance Training (OPT™) model.

Overview of the Personal Training Industry

There has never been a better time than the present to consider a career in personal training. According to the US Department of Labor, the demand for personal trainers is expected to increase faster than the average for all occupations (1). The increasing demand for personal trainers is due in part to the escalation of obesity, diabetes, and various chronic diseases, and to the advancing age of Americans. Another factor related to the rise in demand for personal trainers is that health clubs rely on them for their largest source of non-dues revenue (2). In addition to traditional health club markets, some of the fastest growing areas of growth for personal trainers are in corporate, medical, and wellness settings.

A BRIEF HISTORY OF FITNESS AND PERSONAL TRAINING IN AMERICA

1950 to 1960—Health clubs, or "gyms," as they were called back in the 1950s, were a male-dominated environment in which men trained with free weights to increase size (body builders), strength (power lifters), explosive strength (Olympic lifters), or

a combination of all of these goals (athletes). In 1951 Jack LaLanne began hosting America's first television fitness show called The Jack LaLanne Show, which aired until 1984. Jack's workouts consisted mainly of calisthenics intermixed with tips on counting calories, weight training, and nutrition. What most people don't know about Jack LaLanne is that, in addition to his pioneering TV show, in 1936 at the age of 21 he opened up his first health club in Oakland, California, and was the inventor of the cable pulley weight training system and the Smith weight lifting machine, both of which are still used in virtually every gym around the world.

1960 to 1970—In the 1960s women's fitness centers or "figure salons" became a popular trend. Unlike male-oriented gyms where the focus was on developing muscle size and strength, women's fitness centers typically focused on weight loss and spot reduction. And instead of barbells and dumbbells, most of the exercise machines in women's fitness centers were passive; for example, a rolling machine was used to roll away fat, and an electronic vibrating belt supposedly helped jiggle the fat from the thighs. In the early 1960s President John F. Kennedy changed the name of the President's Council on Youth Fitness to the President's Council on Physical Fitness to address not only children but adults as well. President Kennedy's public support of fitness and exercise had a significant impact on generating greater awareness of health and spawned a tremendous interest in jogging, or running as it was called back then. In 1966 Bill Bowerman, the head track coach for the University of Oregon, published a book titled *Jogging*, which helped launch the jogging/running boom in the United States.

In 1965 Joe Gold opened the first Gold's Gym in Venice Beach, California. The original Gold's Gym was the backdrop for the movie *Pumping Iron* starring Arnold Schwarzenegger and remains a shrine for serious bodybuilders and weightlifters. In 1970 Joe sold the chain, but the Gold's Gym Empire went on to become one of the largest chains of coed gyms in the world with more than 650 to date worldwide.

1970 to 1980—By the 1970s joining a health club or exercising outdoors was becoming more socially acceptable, and soon men and women of all ages were exercising side by side. Joining a health club provided a way of achieving social interaction and health simultaneously. Health clubs began offering an alternative to participating in team sports or activities, which often involve some, and in some cases high, levels of skill and endurance before the activity can be enjoyed. Health clubs became an outlet for men and women of all ages, regardless of physical ability, that could be used year-round day or night. The growth in popularity of health clubs was a sign that members of society at the time were becoming conscious of their appearance and that physical appearance could be improved by changing physical characteristics through exercise.

As the popularity and growth in new health clubs steadily increased throughout the 1970s, they became the desired location for people seeking information on ways to improve their health and ways to get started on an exercise program. By default, the expert of the 1970s was the person working in a health club who had been training the longest, looked the most fit, or was the strongest. Unfortunately, physical appearance does not always have anything to do with knowledge of exercise science or training principles. Despite the lack of qualified staff during the early days of the health club industry, the majority of new members would often seek out advice from a perceived expert and offer that person money in exchange for their training knowledge and guidance. Thus, the personal training profession was born.

■ **Muscle Imbalance:** *Alteration of muscle length surrounding a joint.*

Although anyone with some basic experience and knowledge of training could potentially provide adequate information on training principles such as loads, sets, reps, etc., their understanding and application of human movement science (functional anatomy, functional biomechanics, and motor behavior) is something very different. In the early days of fitness training it was not common practice to assess a new client for past medical conditions, training risk factors, **muscle imbalances**, and goals. This resulted in training programs that simply mimicked those of the current fitness professional or instructor. Programs were rarely designed to meet an individual client's goals, needs, and abilities.

THE PRESENT: THE RISE OF CHRONIC DISEASE

Chronic diseases, such as asthma, cancer, diabetes, and heart disease, are widespread and rising dramatically in the United States. Largely preventable factors such as poor lifestyle choices and lack of access or emphasis on preventive care have led to dramatic increases in chronic disease rates within the past three decades. Not surprisingly, chronic diseases have become the leading cause of death and disability in the United States, accounting for 70% of deaths in the United States. The impact of chronic disease affects nearly every American, directly or indirectly, to some degree. Chronic disease is associated with worsening health and quality of life, eventual permanent disability with time, and a reduced life span. Indirectly, chronic disease takes a toll on the nation's economy by lowering productivity and slowing economic growth as a result of escalating corporate health-care costs and the fact that 75 cents of every dollar spent on health care, or about $1.7 trillion annually, goes toward treating chronic illness.

Chronic disease is defined as an incurable illness or health condition that persists for a year or more, resulting in functional limitations and the need for ongoing medical care. Despite widespread knowledge that most chronic diseases are preventable and manageable through early detection, treatment, and healthy living, chronic disease usually leads to some degree of permanent physical or mental impairment that significantly limits one or more activities of daily living (ADL) in at least 25% of those diagnosed with a chronic health condition.

The US Centers for Disease Control and Prevention reported that chronic diseases were responsible for five of the six leading causes of death in the United States in 2006 (2). Of the leading causes of death in the United States, 57% were caused by cardiovascular disease and cancer, and nearly 80% of these deaths could have been prevented if a healthy lifestyle was followed (3). The estimated direct and indirect costs for cardiovascular disease for 2010 alone are estimated at $503.2 billion (4).

■ **Obesity:** *The condition of being considerably overweight, and refers to a person with a body mass index of 30 or greater, or who is at least 30 pounds over the recommended weight for their height.*

■ **Overweight:** *Refers to a person with a body mass index of 25 to 29.9, or who is between 25 to 30 pounds over the recommended weight for their height.*

Another chronic condition often associated with cardiovascular disease is obesity, which is currently a worldwide problem. **Obesity** is the condition of being considerably overweight, and refers to a person with a body mass index (BMI) of 30 or greater, or who is at least 30 pounds over the recommended weight for their height (5). A desirable BMI for adults 20 years and older is between 18.5 and 24.9. The calculations for determining BMI are noted in Figure 1.1. At present 66% of Americans older than age 20 are overweight, and of these, 34%, which equates to approximately 72 million Americans, are obese (6). The same trend is occurring among youth (ages 2–19) as more than nine million young people are overweight or obese (7). Experts predict nearly one in four kids will be overweight by the year 2015 (8). **Overweight** is defined as a person with a BMI of 25 to 29.9, or who is between 25 to 30 pounds over the recommended weight for their height (5). Excessive body weight is associated with a myriad of health risks including cardiovascular disease, type 2 diabetes, high cholesterol, osteoarthritis, some types of cancer, pregnancy complications, shortened life expectancy, and decreased quality of life.

■ **Blood Lipids:** *Also known as cholesterol and triglycerides, blood lipids are carried in the bloodstream by protein molecules known as high-density lipoproteins (HDL) and low-density lipoproteins (LDL).*

Cholesterol has received much attention because of its direct relationship with cardiovascular disease and obesity. **Blood lipids**, also known as cholesterol and triglycerides, are carried in the bloodstream by protein molecules known as high-density lipoproteins, or "good cholesterol," and low-density lipoproteins, or "bad cholesterol." A healthy total cholesterol level is less than 200 mg/dL. A borderline high cholesterol level is between 200 and 239 mg/dL, and a high-risk level is more than 240 mg/dL.

$$\text{BMI} = 703 \times \frac{\text{weight (lb)}}{\text{height}^2\ (\text{in}^2)}$$

$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height}^2\ (\text{m}^2)}$$

Figure 1.1 Equations used to calculate body mass index.

Alarmingly, more than 50% of adults have total cholesterol values of 200 mg/dL or higher (9).

■ **Diabetes Mellitus:** *Chronic metabolic disorder caused by insulin deficiency, which impairs carbohydrate usage and enhances usage of fats and proteins.*

Another condition affecting nearly 23 million Americans is diabetes (10). **Diabetes mellitus** is a condition in which blood glucose or "blood sugar" is unable to enter cells either because the pancreas is unable to produce insulin or the cells have become insulin resistant. Type 1 diabetes, often referred to as juvenile diabetes because symptoms of the disease typically first appear in childhood, is the result of the pancreas not producing insulin. As a result, blood sugar is not optimally delivered into the cells, resulting in "hyperglycemia" or high blood sugar.

Type 2 diabetes is associated with obesity, particularly abdominal obesity, and accounts for 90 to 95% of all diabetes (10). Patients with type 2 diabetes usually produce adequate amounts of insulin; however, their cells are resistant and do not allow insulin to bring adequate amounts of blood sugar (glucose) into the cell. Not surprisingly, more than 80% of all patients with type 2 diabetes are overweight or have a history of excessive weight. If diabetes is not properly managed, high blood sugar can lead to a host of problems including nerve damage, vision loss, kidney damage, sexual dysfunction, and decreased immune function. Once limited to overweight adults, type 2 diabetes now accounts for almost half of the new cases diagnosed in children (11).

Americans are living longer. The US Census Bureau reported that the proportion of the population older than 65 is projected to increase from 12.4% in 2000 to 19.6% in 2030. The number of individuals older than 80 is expected to increase from 9.3 million in 2000 to 19.5 million in 2030. This leads to the number of individuals developing chronic diseases and disability. In the United States, approximately 80% of all persons older than 65 have at least one chronic condition, and 50% have at least two. One in five adults report having doctor-diagnosed arthritis, and this is a leading cause of disability (12).

In 2002, the World Health Organization recognized lack of physical activity as a significant contributor to the risk factors for several chronic diseases, but unfortunately, few adults achieve the minimum recommended 30 or more minutes of moderate physical activity on 5 or more days per week (13). Physical activity has been proven to reduce the risk of chronic diseases and disorders that are related to lifestyle, such as increased triglycerides and cholesterol levels, obesity, glucose tolerance, high blood pressure, coronary heart disease, and strokes (14). More importantly, some research indicates that discontinuing (or significantly decreasing) physical activity can actually lead to a higher risk of chronic diseases that are related to lifestyle (15).

Meanwhile, daily activity levels continue to decline (16). People are less active and are no longer spending as much of their free time engaged in physical activity. This is related in part to lack of physical activity in leisure time, but is even more likely the result of people spending increasing amounts of time in sedentary behaviors such as watching television and using computers, and excessive use of passive modes of transportation (cars, buses, and motorcycles). Physical education and after-school sports programs are also being cut from school budgets, further decreasing the amount of physical activity in children's lives. This new environment is producing more inactive, unhealthy, and nonfunctional people (17).

In 2008, the federal government issued its most comprehensive set of guidelines on physical activity to date. The guidelines are designed to provide information and guidance on the types and amounts of physical activity that provide substantial health benefits (to those who are apparently healthy as well as those with one or more chronic health conditions). These were the first set of physical activity guidelines that addressed the quality and quantity of exercise needed to improve health and prevent disease for not only adults but also children, seniors, and those individuals living with chronic disease.

Evidence of Muscular Dysfunction and Increased Injury

Research suggests that musculoskeletal pain is more common now than it was 40 years ago (18). One of the primary causes of muscular dysfunction is attributable to physical inactivity.

Low-Back Pain

Low-back pain is a primary cause of musculoskeletal degeneration seen in the adult population, affecting nearly 80% of all adults (19,20). Research has shown low-back pain to be predominant among workers in enclosed workspaces (such as offices) (21,22), as well as people engaged in manual labor (farming) (23). Low-back pain is also seen in people who sit for periods of time greater than 3 hours (22) and in individuals who have altered lumbar lordosis (curve in the lumbar spine) (24).

Knee Injuries

An estimated 80,000 to 100,000 anterior cruciate ligament (ACL) injuries occur annually in the general US population. Approximately 70% of these are noncontact injuries (25). In addition, ACL injuries have a strong correlation to acquiring arthritis in the affected knee (26). Most ACL injuries occur between 15 and 25 years of age (25). This comes as no surprise when considering the lack of activity and increased obesity occurring in this age group. US teenagers have an abundance of automation and technology, combined with a lack of mandatory physical education in schools (17). Fortunately, research suggests that enhancing neuromuscular stabilization (or body control) may alleviate the high incidence of noncontact injuries (27).

Musculoskeletal Injuries

In 2003, musculoskeletal symptoms were the number two reason for physician visits. Approximately 31 million visits were made to physicians' offices because of back problems in 2003, including more than 10 million visits for low-back problems. Approximately 19 million visits in 2003 were made because of knee problems, 14 million for shoulder problems, and 11 million for foot and ankle problems (28).

Unnatural posture, caused by improper sitting, results in increased neck, mid- and lower back, shoulder, and leg pain. Of work-related injuries, more than 40% are sprains (injured ligaments) and strains (injured tendons or muscles). More than one third of all work-related injuries involve the trunk, and of these, more than 60% involve the low back. These work-related injuries cost workers approximately 9 days per back episode or, combined, more than 39 million days of restricted activity. The monetary value of lost work time as a result of these musculoskeletal injuries was estimated to be approximately $120 billion (29).

Exercise training programs need to address all of the components of health-related physical fitness using safe and effective training principles. Unfortunately, many training programs and fitness equipment used to condition the musculoskeletal system are often based on unsound training principles and guidelines. Vital to safe and effective exercise training programs is to train essential areas of the body, such as the stabilizing muscles of the hips, upper and lower back, and neck, and to use a proper progression of acute variables (i.e., sets, repetitions, and rest periods). The extent to which exercise training programs develop the musculoskeletal system is directly influenced by the potential risk of injury. The less conditioned our musculoskeletal systems are, the higher the risk of injury (30).

Current Training Programs

For the majority of sedentary adults, low- to moderate-intensity exercise is extremely safe and can be very effective. However, if the training intensity is too high initially, then the individual will experience excessive overload, which may lead to injury (31). In the first 6 weeks of one study that focused on training sedentary adults, there was a 50 to 90% injury rate (32). Overtraining injuries can occur even though exercise training programs are specifically designed to minimize the risk of injury.

It is important to note that **deconditioned** does not simply mean a person is out of breath when climbing a flight of stairs or that they are overweight. It is a state in which a person may have muscle imbalances, decreased flexibility, or a lack of core and joint stability. All of these conditions can greatly affect the ability of the human body to produce proper movement and can eventually lead to injury.

■ **Deconditioned:** *A state of lost physical fitness, which may include muscle imbalances, decreased flexibility, and a lack of core and joint stability.*

■ **Proprioception:** *The cumulative sensory input to the central nervous system from all mechanoreceptors that sense body position and limb movement.*

■ **Proprioceptively Enriched Environment:** *An unstable (yet controllable) physical situation in which exercises are performed that causes the body to use its internal balance and stabilization mechanisms.*

Most training programs do not emphasize multiplanar movements (or movements in all directions) through the full muscle action spectrum (concentric acceleration, eccentric deceleration, and isometric stabilization) in an environment that enriches **proprioception**. A **proprioceptively enriched environment** is one that challenges the internal balance and stabilization mechanisms of the body. Examples of this include performing a Stability Ball Dumbbell Chest Press or Single-leg Squat versus the traditional Bench Press and Barbell Squat exercises. It is important to note, the National Academy of Sports Medicine (NASM) only recommends training in a proprioceptive environment that can be *safely* controlled based on the client's movement capabilities and overall conditioning level. Exercises must be regressed if the client cannot perform an exercise with ideal posture and technique.

THE FUTURE

The personal training industry is growing dramatically, especially in regard to personal trainers' abilities to work with individuals with one or more chronic health conditions or musculoskeletal impairments. The majority of clients who seek out personal training services are physically inactive and have poor overall functional capacities. A decrease in everyday activity has contributed to many of the postural deficiencies seen in people (33). Today's client is not ready to begin physical activity at the same level that a typical client could 20 or 30 years ago. Therefore, today's training programs cannot stay the same as programs of the past.

The new mindset in fitness should cater to creating programs that address functional capacity, as part of a safe program designed especially for each individual person. In other words, training programs must consider an individual's goals, needs, and abilities in a safe and systematic fashion. This is best achieved by introducing an integrated approach to program design. It is on this premise that NASM presents the rationale for integrated training and the Optimum Performance Training™ (OPT™).

SUMMARY

The typical gym members of the 1950s were mainly athletes, and, in the 1970s, those involved in recreational sports. The first fitness professionals were physically fit individuals who did not necessarily have education in human movement science or exercise physiology. They did not design programs to meet the specific goals, needs, and abilities of their clients.

Today, more people work in offices, have longer work hours, use better technology and automation, and are required to move less on a daily basis. This new environment produces more sedentary people, and leads to dysfunction and increased incidents of injury including chronic disease, low-back pain, knee injuries, and other musculoskeletal injuries.

In working with today's typical client, who is likely to be deconditioned, the fitness professional must use special consideration when designing fitness programs. An integrated approach should be used to create safe programs that consider the functional capacity for each individual person. These programs must address factors such as appropriate forms of flexibility, increasing strength and endurance, and training in different types of environments. These factors are the basis for NASM's OPT model.

Integrated Training and the OPT Model

Integrated training is a concept that incorporates all forms of training in an integrated fashion as part of a progressive system. These forms of training include flexibility training; cardiorespiratory training; core training; balance training; plyometric (reactive) training; speed, agility, and quickness training; and resistance training.

WHAT IS THE OPT MODEL?

The OPT model was conceptualized as a training program for a society that has more structural imbalances and susceptibility to injury than ever before. It is a process of programming that systematically progresses any client to any goal. The OPT model (Figure 1.2) is built on a foundation of principles that progressively and systematically allows any client to achieve optimal levels of physiologic, physical, and performance adaptations, including:

Physiologic Benefits

- Improves cardiorespiratory efficiency
- Enhances beneficial endocrine (hormone) and serum lipid (cholesterol) adaptations
- Increases metabolic efficiency (metabolism)
- Increases tissue tensile strength (tendons, ligaments, muscles)
- Increases bone density

Physical Benefits

- Decreases body fat
- Increases lean body mass (muscle)

Performance Benefits

- Strength
- Power
- Endurance
- Flexibility
- Speed
- Agility
- Balance

The OPT model is based on the scientific rationale of human movement science. Each stage has a designated purpose that provides the client with a systematic approach for progressing toward his or her individual goals, as well as addressing his or her specific needs. Now, more than ever, it is imperative that health and fitness professionals fully understand all components of programming as well as the right order in which those components must be addressed to help their clients achieve success.

PHASES OF TRAINING

■ **Phases of Training:** *Smaller divisions of training progressions that fall within the three building blocks of training.*

The OPT model is divided into three different levels of training—stabilization, strength, and power (Figure 1.2). Each level contains specific **phases of training**. It is imperative that the health and fitness professional understands the scientific rationale behind each level and each individual phase of training to properly use the OPT model.

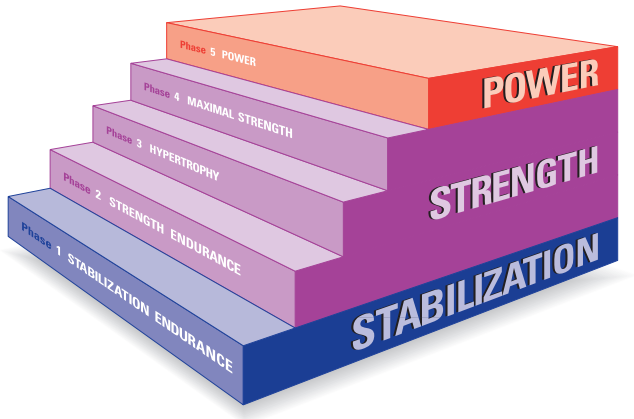

Figure 1.2 OPT Model.

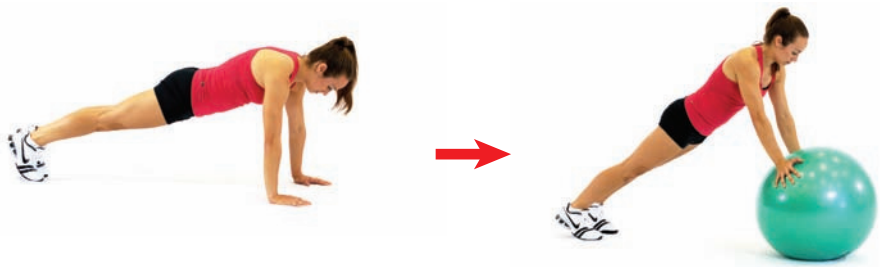

Figure 1.3 Proprioceptive push-up progression.

Stabilization Level

■ **Muscular Endurance:** *A muscle's ability to contract for an extended period.*

■ **Neuromuscular Efficiency:** *The ability of the neuromuscular system to enable all muscles to efficiently work together in all planes of motion.*

The Stabilization Level consists of one phase of training—Phase 1: Stabilization Endurance Training. The main focus of this form of training is to increase **muscular endurance** and stability while developing optimal **neuromuscular efficiency** (coordination).

The progression for this level of training is proprioceptively based. This means that difficulty is increased by introducing a greater challenge to the balance and stabilization systems of the body (versus simply increasing the load). For example, a client may begin by performing a push-up and then progress by performing the same exercise using a stability ball (Figure 1.3). This progression requires additional activation from the nervous system and the stabilizing muscles of the shoulders and trunk to maintain optimal posture while performing the exercise.

Stabilization and neuromuscular efficiency can only be obtained by having the appropriate combination of proper alignment (posture) of the human movement system (kinetic chain) and the stabilization strength necessary to maintain that alignment (34–36). Stabilization training provides the needed stimuli to acquire stabilization and neuromuscular efficiency through the use of proprioceptively enriched exercises and progressions. The goal is to increase the client's ability to stabilize the joints and maintain optimal posture.

It must be noted that stabilization training must be done before strength and power training. Research has shown that inefficient stabilization can negatively affect the way force is produced by the muscles, increase stress at the joints, overload the soft tissues, and, eventually, cause injury (30,37–39).

Stabilization Endurance Training not only addresses the existing structural deficiencies, it may also provide a superior way to alter body composition (reduce body fat) because all the exercises are typically performed in a circuit fashion (short rest periods) with a high number of repetitions (see Chapter 15 for more details) (40–42). By performing exercises in a proprioceptively enriched environment (controlled, unstable), the body is forced to recruit more muscles to stabilize itself. In doing so, more calories are potentially expended (40,41).

Goals and Strategies of Stabilization Level Training

PHASE 1: STABILIZATION ENDURANCE TRAINING

- Goals
  - Improve muscular endurance
  - Enhance joint stability
  - Increase flexibility
  - Enhance control of posture
  - Improve neuromuscular efficiency (balance, stabilization, muscular coordination)
- Training Strategies
  - Training in unstable, yet controllable environments (proprioceptively enriched)
  - Low loads, high repetitions

Strength Level

■ **Prime Mover:** *The muscle that acts as the initial and main source of motive power.*

The Strength Level of training follows the successful completion of stabilization training. The emphasis is to maintain stabilization endurance while increasing **prime mover** strength. This is also the level of training an individual will progress to if his or her goals are *hypertrophy* (increasing muscle size) or *maximal strength* (lifting heavy loads). The Strength Level in the OPT model consists of three phases.

TABLE 1.1

Phase 2 Example Supersets

Body Part	Strength Exercise	Stabilization Exercise
Chest	Barbell bench press	Stability ball push-up
Back	Seated cable row	Stability ball dumbbell row
Shoulders	Shoulder press machine	Single-leg dumbbell press
Legs	Leg press	Single-leg squat

■ **Superset:** *Set of two exercises that are performed back-to-back, without any rest time between them.*

In Phase 2: Strength Endurance Training, the goal is to enhance stabilization endurance while increasing prime mover strength. These two adaptations are accomplished by performing two exercises in a **superset** sequence (or back-to-back without rest) with similar joint dynamics (Table 1.1). The first exercise is a traditional strength exercise performed in a stable environment (such as a bench press), whereas the second exercise is a stabilization exercise performed in a less stable (yet controllable) environment (such as a stability ball push-up). The principle behind this method is to work the prime movers predominantly in the first exercise to elicit prime mover strength. Then, immediately follow with an exercise that challenges the stabilization muscles. This produces an increased ability to maintain postural stabilization and dynamic joint stabilization.

Phase 3: Hypertrophy Training is designed for individuals who have the goal of maximal muscle growth (such as bodybuilders). Phase 4: Maximal Strength Training works toward the goal of maximal prime mover strength by lifting heavy loads. These two phases of training can be used as special forms of training and as progressions within Strength Level Training.

Goals and Strategies of Strength Level Training

PHASE 2: STRENGTH ENDURANCE TRAINING

- Goals
  - Improve stabilization endurance and increase prime mover strength
  - Improve overall work capacity
  - Enhance joint stabilization
  - Increase lean body mass
- Training Strategies
  - Moderate loads and repetitions (8–12)
  - Superset: one traditional strength exercise and one stabilization exercise per body part in the resistance training portion of the program

PHASE 3: HYPERTROPHY TRAINING *(OPTIONAL PHASE, DEPENDING ON CLIENT'S GOALS)*

- Goal
  - Achieve optimal levels of muscular hypertrophy (increase muscle size)
- Training Strategies
  - High volume, moderate to high loads, moderate or low repetitions (6–12)

PHASE 4: MAXIMUM STRENGTH TRAINING *(OPTIONAL PHASE, DEPENDING ON CLIENT'S GOALS)*

- Goals
  - Increase motor unit recruitment
  - Increase frequency of motor unit recruitment
  - Improve peak force
- Training Strategies
  - High loads, low repetitions (1–5), longer rest periods

Power Level

The Power Level of training should only be entered after successful completion of the Stabilization and Strength Levels. This level of training emphasizes the development

TABLE 1.2

Phase 5 Example Supersets

Body Part	Strength Exercise	Stabilization Exercise
Chest	Incline dumbbell press	Medicine ball chest pass
Back	Lat pulldown machine	Soccer throw
Shoulders	Overhead dumbbell press	Front medicine ball oblique throw
Legs	Barbell squat	Squat jump

of speed and power. This is achieved through one phase of training simply named Phase 5: Power Training.

The premise behind this phase of training is the execution of a traditional strength exercise (with a heavy load) superset with a power exercise (with a light load performed as fast as possible) of similar joint dynamics. This is to enhance prime mover strength while also improving the **rate of force production** (Table 1.2).

■ **Rate of Force Production:** *Ability of muscles to exert maximal force output in a minimal amount of time.*

Goals and Strategies of Power Level Training

PHASE 5: POWER TRAINING

- Goals
  - Enhance neuromuscular efficiency
  - Enhance prime mover strength
  - Increase rate of force production
- Training Strategies
  - Superset: one strength and one power exercise per body part in the resistance training portion of the program
  - Perform all power exercises as fast as can be controlled

THE PROGRAM TEMPLATE

The uniqueness of the OPT model is that it packages scientific principles into an applicable form of programming. This is a direct result of research conducted at the NASM Research Institute in partnership with the University of North Carolina, Chapel Hill, and within NASM's clinical setting, used on actual clients. NASM has developed a template that provides health and fitness professionals with specific guidelines for creating an individualized program (Figure 1.4).

HOW TO USE THE OPT MODEL

Chapters later in this text will be specifically dedicated to explaining how to use the OPT model in the fitness environment and detail the necessary components of an integrated training program. They include:

- Fitness assessments
- Flexibility training
- Cardiorespiratory training
- Core training
- Balance training
- Plyometric (reactive) training
- Speed, agility, and quickness training
- Resistance training
- Program design
- Exercise modalities

Each of these chapters explains how each component specifically fits into the OPT model and how to realistically apply the information given. Because the OPT model is

Professional's Name:

CLIENT'S NAME: **DATE:**

GOAL: **PHASE:**

WARM-UP

Exercise:	Sets	Duration	Coaching Tip

CORE / BALANCE / PLYOMETRIC

Exercise:	Sets	Reps	Tempo	Rest	Coaching Tip

SPEED, AGILITY, QUICKNESS

Exercise:	Sets	Reps	Tempo	Rest	Coaching Tip

RESISTANCE

Exercise:	Sets	Reps	Tempo	Rest	Coaching Tip

COOL-DOWN

Exercise:	Sets	Duration	Coaching Tip

Coaching Tips:

National Academy of Sports Medicine

Figure 1.4 NASM program template.

based on the science of integrated training, all five phases within the OPT model often use all forms of exercise listed above. This is a far cry from traditional workouts that only incorporate generalized stretching, cardiovascular, and resistance exercise. Other chapters in this textbook review:

- Exercise science and physiology
- Nutrition
- Supplementation
- Chronic health conditions
- Lifestyle modification and behavioral coaching
- Professional development

All of this combined information should provide any individual with all of the tools necessary to become a skilled and well-rounded fitness professional.

SUMMARY

The OPT model provides a system for properly and safely progressing any client to his or her goals, by using integrated training methods. It consists of three levels—stabilization, strength, and power.

The Stabilization Level addresses muscular imbalances and attempts to improve the stabilization of joints and overall posture. This is a component that most training programs leave out even though it is arguably the most important to ensure proper neuromuscular functioning. This training level has one phase of training—Phase 1: Stabilization Endurance Training.

The Strength Level has three phases—Phase 2: Strength Endurance Training, Phase 3: Hypertrophy Training, and Phase 4: Maximum Strength Training. The Strength Level focuses on enhancing stabilization endurance and prime mover strength simultaneously (Phase 2), while also increasing muscle size (Phase 3) or maximal strength (Phase 4). Most traditional programs typically begin at this point and, as a result, often lead to injury. The Power Level is designed to target specific forms of training that are necessary for maximal force production. This level has one phase of training—Phase 5: Power Training.

All of these phases of training have been specifically designed to follow biomechanical, physiologic, and functional principles of the human movement system. They should provide an easy-to-follow systematic progression that minimizes injury and maximizes results. To help ensure proper organization and structure, NASM has developed a program template that guides health and fitness professionals through the process.

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