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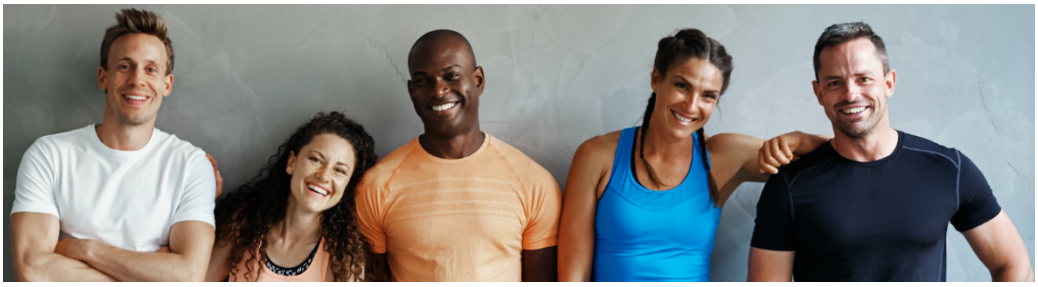

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We're here to help you succeed!

For any questions, reach out to 805-876-9924, and a real ISSA trainer will be in touch.

Foundations and Applications for a

CERTIFIED PERSONAL TRAINER

Tenth Edition

ISSA INTERNATIONAL SPORTS SCIENCES ASSOCIATION

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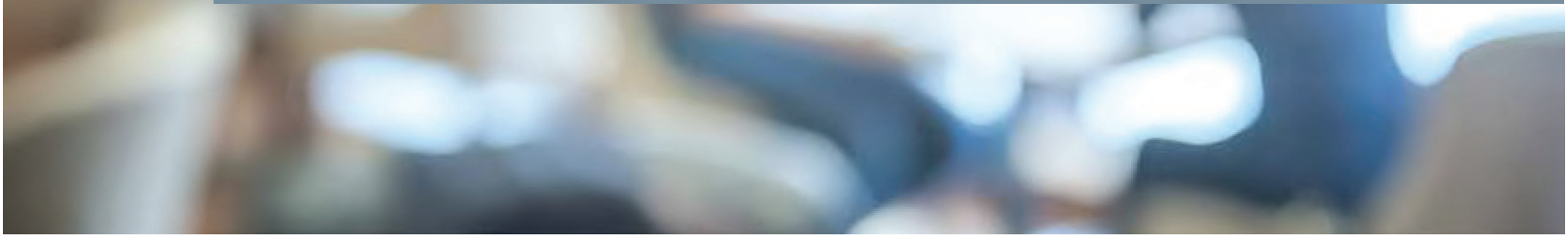
SUBJECTS COVERED

Foundations and Applications for a

CERTIFIED PERSONAL TRAINER

- Psychology of behavior change
- Human anatomy and physiology
- Energy systems
- Human metabolism
- Biomechanics and human movement
- Principles of program design
- Flexibility training
- Cardiovascular training
- Resistance training
- Exercise selection and technique
- Cueing clients
- Nutrition and supplementation
- Common chronic health conditions
- Lifespan considerations
- Growing and marketing a personal training business
- Emergency management in fitness



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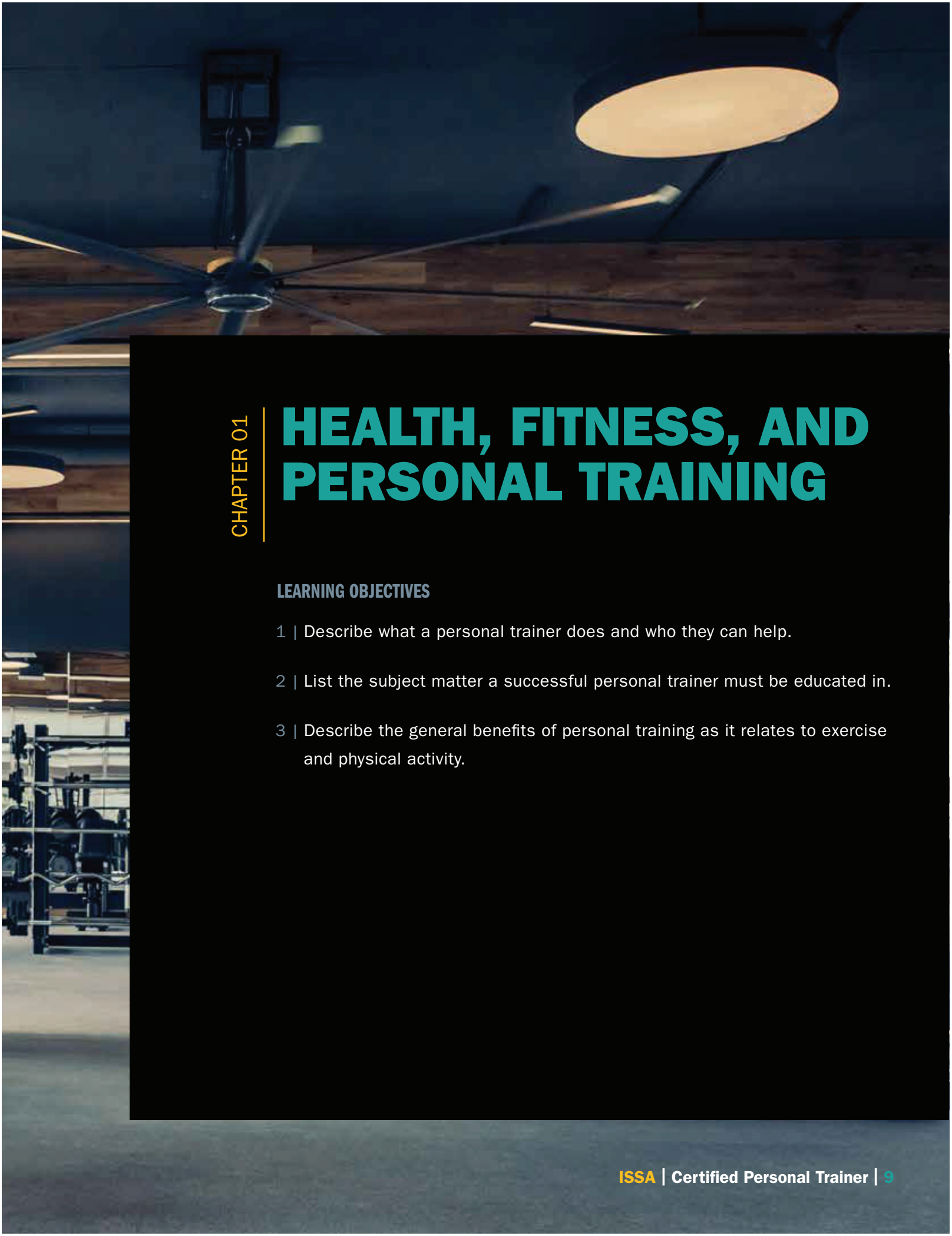

CHAPTER 01

HEALTH, FITNESS, AND PERSONAL TRAINING

LEARNING OBJECTIVES

1 | Describe what a personal trainer does and who they can help.

2 | List the subject matter a successful personal trainer must be educated in.

3 | Describe the general benefits of personal training as it relates to exercise and physical activity.

The fitness industry is a multibillion-dollar business bringing in more than $94 billion in 2019 according to the International Health, Racquet & Sportsclub Association (IHRSA). The industry includes fitness technology and wearables, wellness programs, large and small membership-based gyms, fitness studios, nutrition services, and physical recovery services. Within these aspects of fitness, personal training is one of the most prevalent.

THE HISTORY OF PERSONAL TRAINING

The roots of personal training are difficult to pinpoint. Some say personal training started in the 1950s, when personal trainers were first becoming actively certified, while others contend that personal training dates back to the beginning of recorded history. Dedicated health and fitness destination resorts dating back to the 1800s have been identified.

While the profession and terminology associated with personal training did not yet exist, the concept of optimal health (which is the motivation behind the profession) was already being touted by ancient philosophers. Around 400 BCE (Before Common Era), Hippocrates wrote:

Eating alone will not keep a man well; he must also take exercise. For food and exercise, while possessing opposite qualities, yet work together to produce health…and it is necessary, as it appears, to discern the power of various exercises, both natural exercises and artificial, to know which of them tends to increase flesh and which to lessen it; and not only this, but also to proportion exercise to bulk of food, to the constitution of the patient, to the age of the individual.

PERSONAL TRAINING DEFINED

The profession of personal training is a relatively new field that continues to expand its boundaries and redefine itself. Prior to the early 1980s, no minimal requirements existed to qualify or identify a person as a personal trainer. People engaging in training was fairly uncommon. Many learned about training solely through personal experiences in the gym. Recognizing the need for standardization and credibility, Dr. Sal Arria and Dr. Frederick Hatfield pioneered a program of personal fitness training that merged gym experience with practical and applied sciences.

Today, a personal fitness trainer can be defined as a person who educates and trains clients in the performance of safe and appropriate exercises to effectively lead them to optimal health. Personal trainers can be self-employed (in-home and private) or work in health clubs, physicians' offices, physical therapy clinics, wellness centers, schools, hospitals, rehabilitation facilities, and private studios.

What a Personal Trainer Knows

As the industry continues to expand its boundaries and the realm of scientific knowledge concerning the human response and adaptation to exercise continues to grow, it is essential for personal trainers to be competent in the following topics and subjects:

- Exercise programming
- Exercise physiology
- Functional anatomy and **biomechanics**
- Fitness assessments
- Nutrition and supplementation
- Common **chronic diseases**
- Basic emergency and safety procedures
- Psychological and physiological challenges throughout the stages of life
- Human behavior and motivation

BIOMECHANICS:
The study of the mechanical laws governing movement of living organisms.

CHRONIC DISEASES:
Conditions lasting a year or more that limit daily activities and/or requires ongoing medical attention.

Arguably, the science of motivation and changing behaviors are the most important aspects of a successful health and wellness program. However, many fitness professionals do not know enough about either to effectively help clients make lasting change.

A fitness professional's ability to educate and effectively draw clients into the fitness lifestyle and optimal health comes from a plan that is based in the aforementioned areas as well as the knowledge of muscular, cardiovascular, and metabolic adaptations. These adaptations

TRAINING EFFECT:
The body's adaptation to the learned and expected stress imposed by physical activity.

RESTING HEART RATE (RHR):
The measure of heart rate when completely at rest.

BLOOD PRESSURE:
The force of blood pushing against the walls of the arteries during the two phases of the cardiac cycle.

are known as the **training effect**. The training effect is the body's adaptation to the learned and expected stress imposed by physical activity. When the body experiences the training effect, it begins to change at the cellular level, allowing more energy to be released with less oxygen. The heart and capillaries become stronger and more dispersed to allow a more efficient flow of oxygen and nutrients. The muscles, tendons, and bones involved with this activity also strengthen to become more proficient. In time, the body releases unnecessary fat from its frame, and movements become more efficient. Additionally, **resting heart rate (RHR)** and **blood pressure** drop.

These adaptations can be achieved with the help of an educated trainer who can develop an appropriate fitness and health plan for most individuals. To be effective, this plan must account for the basic principles of fitness training: overload, specificity, individual differences, reversibility, periodization, rest, overtraining, and stimulus variability. The plan requires a thorough understanding of the major muscles of the body and how they work, as well as an understanding of metabolism—how the body converts food into other forms of energy. In addition, trainers must learn about the function and regulation of the lungs, heart, blood vessels, hormones, brain, and nerves at rest and during exercise. Once a fitness professional has the knowledge and support to develop comprehensive, individualized, and periodized plans that effectively produce the training effect, they can make a drastic impact on the lives and health of their clients.

THE CURRENT STATE OF HUMAN HEALTH

HYPERTENSION:
High blood pressure reading more than 140/90 mm Hg.

RISK FACTORS:
Variables associated with increased risk of disease or infection.

OBESITY:
An abnormal or excessive accumulation of bodyfat that may cause additional health risks.

The US surgeon general's Physical Activity and Health report supports the role of physical activity for good health and disease prevention. The National Institutes of Health released a consensus statement on the importance of physical activity for cardiovascular health. In addition, the Centers for Disease Control and Prevention (CDC) launched the Healthy People initiative, which lists physical activity, fitness, and nutrition at the top of 22 priority areas. Finally, the American Heart Association included physical inactivity and low fitness levels, along with smoking, **hypertension**, and high cholesterol, as primary **risk factors** for disease.

Unfortunately, although the resounding benefits of physical activity and fitness are touted and reported, the United States is currently undergoing an **obesity** epidemic. In the United States, 25 to 35 percent of people remain sedentary (inactive). To make matters worse, federal resources and funding for physical activity programs have lagged far behind other aspects of health. Health and physical education in schools are low priorities, and when school districts are looking to trim their budgets, health and physical education programs are among the first expenditures to be reduced or cut altogether.

Each year in the United States, people spend more than $2.5 trillion on health care. This enormous figure translates into an expenditure of almost $7,000 for each member of the US population. Regrettably, this financial commitment has neither shown signs of abating nor produced satisfactory results with regard to treating a wide variety of chronic health problems.

Attempts to identify the factors that have been major contributors to this virtual epidemic of medical problems have produced a litany of probable reasons why such a large number of individuals are so apparently unhealthy, including poor eating habits, sedentary lifestyle, stress, and poor health habits (e.g., smoking). At the same time, a number of studies have been undertaken to identify what, if anything, can be done to diminish either the number or the severity of medical problems affecting the public. These studies have provided considerable evidence that exercise and increasing physical activity has substantial medicinal benefits for people of all ages.

PERSONAL TRAINING CLIENTELE

According to IHRSA, as of 2019, health club memberships are projected to reach 230 million worldwide by the year 2030, and health club memberships among children under 18 years of age have increased by 187 percent since 1987. The number of people considering personal training services continues to grow. According to IHRSA's annual Health Club Consumer Report (2019), 52.9 million Americans aged 6 years and older are members of health clubs. Over 12 percent of these members pay for the services of a personal trainer, and over 6 million health club members alone paid for a personal trainer this past year. In-home sessions, park boot camp sessions, and other nontraditional training sessions were not included in the gym data.

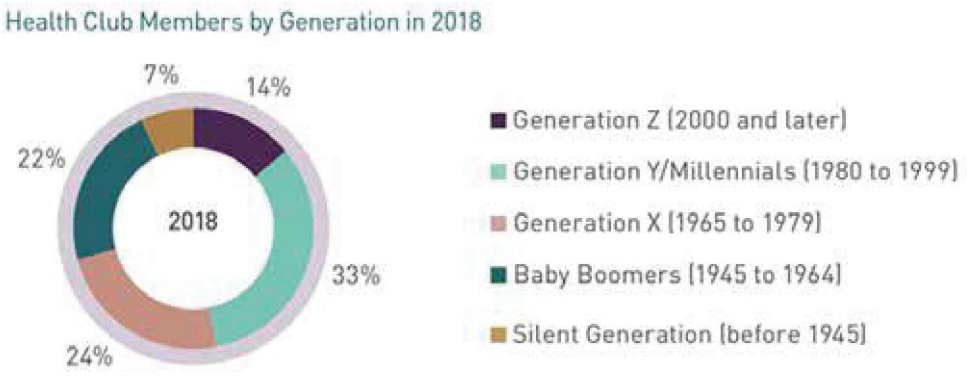

Figure 1.1 Health Club Members by Generation (IHRSA, 2019)

Here are some statistics from the report:

- Three out of five personal training clients are women.
- Clients report an average of 18 sessions with a trainer.
- The average personal trainer charges between $15 and $100 per hour—with the average being $50 per hour.
- The average number of training sessions used in 12 months breaks down as follows:

SESSIONS	PERCENTAGE
1-6 sessions	47 percent
7-11 sessions	12 percent
12-24 sessions	11 percent
25-49 sessions	8 percent
50+ sessions	11 percent
Not reported	11 percent

- The number of training sessions clients of different ages used break downs as follows:

AGE RANGE	SESSIONS
6-11 years old	22 sessions
12-17 years old	26 sessions
18-34 years old	15 sessions
35-54 years old	14 sessions
55+ years old	24 sessions

These statistics support the growing trend and need for personal training services. While those 6 million people who purchased personal training services are sold on the need for personal training, there are many millions more who do not know or understand the benefits of hiring a personal trainer regardless of their health and fitness goals. This population represents the greatest opportunity for growth and income for fitness professionals.

BENEFITS OF PERSONAL TRAINING

Two of the most widely publicized efforts to investigate the possible relationship between exercise and disease were longitudinal studies, each of which involved more than 10,000 subjects. In a renowned study of 17,000 Harvard graduates, Dr. Ralph Paffenbarger found that men who expended approximately 300 calories a day (the equivalent of walking briskly for 45 minutes) reduced their death rates from all causes by an extraordinary 28 percent and lived an average of more than two years longer than their sedentary classmates. Another study conducted by Dr. Steven Blair of the Cooper Institute for Aerobics Research in Dallas documented the fact that a relatively modest amount of exercise has a significant effect on the mortality rates of both men and women. The higher the fitness level, the lower the death rate (after the data was adjusted for age differences between the 13,344 subjects in this eight-year investigation). An analysis of the extensive data yielded by both studies suggests one inescapable conclusion: exercise is medicine!

Accepting the premise that regular exercise can play a key role in reducing the risk of medical problems and decreasing health care costs is critical. Despite the vast number of individuals who lead a sedentary lifestyle, the need for and the value of exercising on a regular basis is an irrefutable fact of life (and death). For example, after a detailed review of the results of his long-term investigation, Dr. Paffenbarger concluded that not exercising had the equivalent impact on a person's health as smoking one and a half packs of cigarettes a day. Fortunately, with few exceptions, most people are too sensible to ever consider ravaging their health by smoking excessively. Unfortunately, many of these same people fail to recognize the extraordinary benefits of exercise in the prevention of medical problems.

Any list of the medical problems and health-related conditions that can be at least partially treated and controlled by exercise would be extensive. Exploring the most significant of these health concerns, here are details on how exercise is thought to help alleviate each condition:

- **Allergies:** Exercise is one of the body's most efficient ways to control nasal congestion (and the accompanying discomfort of restricted nasal blood flow).
- **Angina:** Regular aerobic exercise dilates blood vessels, increasing blood flow and thereby improving the body's ability to extract oxygen from the bloodstream.
- **Anxiety:** Exercise triggers the release of mood-altering chemicals in the brain.
- **Arthritis:** By forcing a skeletal **joint** to move, exercise induces the manufacture of synovial fluid (fluid found in the cavities of synovial joints), helps to distribute it over the **cartilage**, and forces it to circulate throughout the joint space.
- **Back pain:** Exercise helps to strengthen the abdominal muscles, the lower back extensor muscles, and the hamstring muscles (muscles in the upper back of the leg).
- **Bursitis and tendinitis:** Exercise can strengthen the **tendons**, enabling them to handle greater loads without being injured.
- **Cancer:** Exercise helps maintain ideal body weight and helps keep body fat to a minimum.
- **Carpal tunnel syndrome:** Exercise helps build up the muscles in the wrists and forearms, thereby reducing the stress on arms, elbows, and hands.
- **Cholesterol:** Exercise helps to raise HDL (high-density lipoprotein, the "good" cholesterol) levels in the blood and lower LDL (low-density lipoprotein, the "bad" cholesterol) levels.
- **Depression:** Exercise helps speed **metabolism** and deliver more oxygen to the brain; the improved level of circulation in the brain tends to enhance mood.
- **Diabetes:** Exercise helps lower blood sugar levels, strengthen the skeletal muscles and heart, improve circulation, and reduce stress.
- **Fatigue:** Exercise can help alleviate the fatigue-causing effects of stress, poor circulation and blood oxygenation, bad posture, and poor breathing habits.
- **Glaucoma:** Exercise helps relieve intraocular hypertension (the pressure buildup on the eyeball that heralds the onset of glaucoma).
- **Headaches:** Exercise helps force the brain to secrete more of the body's opiate-like, pain-dampening chemicals (e.g., endorphins and enkephalins).

JOINT:
An articulation between two bones in the body.

CARTILAGE:
Firm, flexible connective tissue that pads and protects joints and structural components of the body.

TENDONS:
Strong, fibrous cords made of collagen that attach muscle to bone.

METABOLISM:
Chemical processes within the body that convert food into energy.

DIABETES:
A condition characterized by an elevated level of glucose in the blood.

- **Heart disease:** Exercise helps promote many changes—a decrease in body fat, a decrease in LDL cholesterol, an increase in the efficiency of the heart and lungs, a decrease in blood pressure, and a lowered heart rate—that collectively lower the risk of **heart disease**.
- **High blood pressure:** Exercise reduces the level of stress-related chemicals in the bloodstream that constrict arteries and veins, increases the release of endorphins, raises the level of HDL in the bloodstream, lowers resting heart rate (over time), improves the responsiveness of blood vessels (over time), and helps reduce blood pressure through maintenance of body weight.
- **Knee problems:** Exercise helps strengthen the structures attendant to the knee (muscles, tendons, and **ligaments**), thereby facilitating the ability of the knee to withstand stress.
- **Lung disease:** Exercise helps strengthen the muscles associated with breathing and helps boost the oxygen level in the blood.
- **Memory problems:** Exercise helps to improve cognitive ability by increasing the blood and oxygen flow to the brain.
- **Menstrual problems:** Exercise helps to control the hormonal imbalances often associated with premenstrual syndrome (PMS) by increasing the release of beta-endorphins.
- **Osteoporosis (fragile bones):** Exercise promotes bone density, thereby lowering an individual's risk of experiencing a bone fracture.

HEART DISEASE:
A term used to describe several different heart conditions.

LIGAMENTS:
Short bands of tough but flexible fibrous connective tissue connecting two bones or cartilages or holding together a joint.

THE FUTURE OF PERSONAL TRAINING AND FITNESS

The need for personal training services continues to grow. It is imperative that fitness professionals keep up with the evolving recommendations for health and physical fitness that have a direct application for fitness programs and exercise recommendations. With the emergence of the latest technologies, information regarding health and fitness is easily accessible. However, because of the plethora of confusing and conflicting health and fitness recommendations available, it is important that fitness professionals work to help clients, friends, and family members simplify the science, identify credible resources, and navigate the numerous fitness and nutrition myths.

As individuals who are committed to a long-term career in health and fitness, personal trainers will continue expanding their knowledge through additional courses in corrective exercise, corporate wellness, youth fitness, senior fitness, nutrition, and pre- and postnatal specializations to better serve their clients in achieving and living the fitness lifestyle. This lifelong commitment to learning is also reflected in the personal training recertification requirements that remain a standard in the industry. Individually and collectively, personal trainers have an inherent responsibility to positively influence and guide the health and fitness attitudes of those around them.

ISSA CERTIFIED PERSONAL TRAINER CODE OF ETHICS

Upon receipt of the ISSA certificate, members effectively become representatives of a leader in the fitness certification industry and thus are expected to conduct themselves according to the highest standards of honor, ethics, and professional behavior at all times. These principles are intended to aid ISSA members in their goal to provide the highest quality of service possible to their clients and the community.

Requirements for Certification

1. Certification will not be issued to any student/member/candidate who does not successfully complete or meet all pertinent qualifications or has not achieved passing scores on the relevant ISSA examinations.
2. Certification will not be issued to any student/member/candidate unless they have successfully completed a **cardiopulmonary resuscitation (CPR)** and **automated external defibrillator (AED)** certification as evidenced by a current and valid CPR/AED card.

Code of Ethics

1. The ISSA certified fitness professional shall maintain a professional client-trainer relationship at all times. Fitness professionals have the obligation to properly assess clients, program for their needs, and provide health care referrals as needed for the best interest of the client. They must respect the client's choices and decisions regarding their own health and provide accurate, factual information. They shall not misrepresent their education or credential(s) or work outside of their scope of practice.
2. The ISSA certified fitness professional shall not discriminate on the basis of sex, gender, race, religion, national origin, color, or any other basis deemed illegal.
3. The ISSA certified fitness professional shall maintain any and all primary and supplementary certifications (including CPR certification as required) that are necessary to execute their job. They will not misrepresent their status in regard to certification or qualification to ISSA, clients, or an employer.
4. The ISSA certified fitness professional shall uphold their social responsibility to promote inclusion and educate and inform within the scope of practice.
5. The ISSA certified fitness professional shall use their best judgment to maintain a safe training environment for clients. This includes the space being used and the movements being executed. At no time shall harm to others be intended.

CARDIOPULMONARY RESUSCITATION (CPR):
An emergency procedure involving chest compressions and, often, artificial ventilation to circulate blood and preserve brain function in an individual in cardiac arrest.

AUTOMATED EXTERNAL DEFIBRILLATOR (AED):
A portable electronic device that can identify and electrically correct heart arrythmias, ventricular fibrillation, and tachycardia.