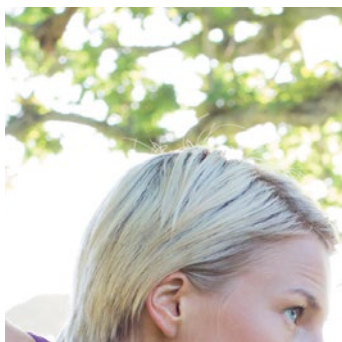


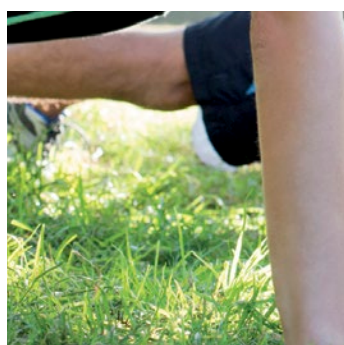
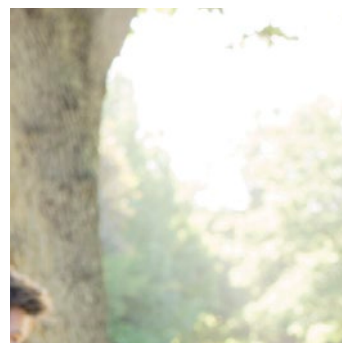
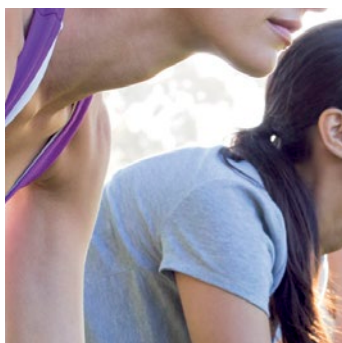
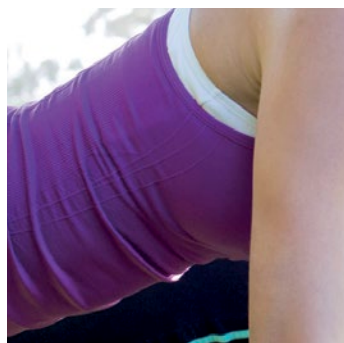


THE POWER OF PHYSICAL EXERCISE



A practical guide
to be healthy
and in shape

JULIÁN MELGOSA



Here you will find multiple references that will help you understand the benefits of physical exercise. Perform the activity that most adapts to your needs, obtaining thus the best results.

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LIFE IS MOVEMENT

Anything that does not move becomes atrophied.

Life is movement, and movement is life. Exercise is not something optional or merely advisable—it is intrinsic to the life of all animated beings in all of their stages. Physical activity is such a fundamental part of a human being's organic systems that leading a sedentary life carries with it multiple health risks.

PHYSICAL ACTIVITY AND PHYSICAL EXERCISE

Physical activity is any body movement that causes energy loss. For example, getting out of bed, grooming oneself, carrying out household chores, moving from one place to another, performing work, etc.

Meanwhile, physical exercise is the planned, structured, and repetitive type of physical activity that forms part of an objective aimed at improving locomotive ability.

If our lives were sufficiently active, deliberate and planned, physical exercise would not be necessary. However, the truth is that there is not sufficient movement in our lives; therefore, we need planned exercise in order to preserve physical and mental health.

A DESIGN FOR ACTION

The human being's anatomy and physiology implicitly carry the need for constant movement. Humans walk upright and are ready for action.



WHY EXERCISE?

Physical activity is part of a healthy lifestyle.

A VARIETY OF REASONS

Among all healthy behaviors, exercise is the one that perhaps has the most reasons to practice it (see table, 75 Reasons to Exercise). We've divided the reasons into five categories, which we explain below:

- **Physical health reasons:** For its direct effect on the circulatory system, physical exercise serves to prevent and improve all problems related to vascular health, including cardiovascular and cerebrovascular. However, the list continues with the beneficial effects that exercise has on the immune system (especially against cancer

and diabetes), and many other advantages, which we will review in chapter 2.

- **Mental health reasons:** Recently, the beneficial effects of exercise on mental health have been discovered in those who practice it. High-incidence problems such as depression and anxiety can be prevented and overcome through physical activity. The list of mental and emotional complications continues, as we see in chapter 3.
- **Wellness reasons:** Thanks to the practice of physical exercise, the biochemical processes that take place in the endocrine system have an analgesic and relaxant effect superior to many drugs and without side effects. The immediate sense of well-being signified by the release of endorphins is a good reason to stay active, to be in a good mood, to have a sufficient energy level to face the challenges in life.
- **Aesthetic reasons:** Many people who practice physical exercise programs to slightly improve their appearance, as basketball activity provides not only health benefits but also an added measure of physical attraction.
- **Longevity reasons:** Physical activity has been correlated to longer life. Various methodological avenues have been revealed that show that physically active people live longer and more healthily than those who follow a sedentary lifestyle.



We explain in detail the importance of physical exercise because we believe that before running we need to learn how to walk.

PHILOSOPHY OF IDEAL PHYSICAL EXERCISE

A practice that changes our attitude and makes us better people.

What is behind exercise or sport—a business, a lie, or an honest attempt to promote ideals and noble behavior in people? Anything is possible. And it is up to each one of us to make exercise what it should truly be: a tool to achieve health and well-being. Unfortunately, in recent decades certain factors have tainted the true intention of sports activities. Let's mention two: the first, professional sports; the second, the general practice of exercise:

- The payment of vast sums of money to elite athletes for obtaining good outcomes in championships or highly competitive games, which has driven many to doping and has caused an enormous disillusionment in the fans.
- The growth of the industry of sports equipment and accessories that has increased the cost of engaging in exercise, turning it into a means to extravagantly exhibit what some are able to spend and what others are not.

In this unit we suggest basic principles that should be the foundation of exercise and accompany its planning and practice.

PRINCIPLES OF PHYSICAL EXERCISE

- **Exercise is an inherent part of life.** Leading a life of constant movement is indispensable (never a luxury) for optimal organic function. A sedentary lifestyle does not promote health; it makes a deliberate effort to harm the body in daily life.
- **Exercise is a source of physical and mental health.** Balanced and regular exercise has a beneficial effect on all organs and systems, allowing them to perform their function. This should not be confused with a plan and carry out an active lifestyle that promotes their age and fitness. This goes beyond exercise for weight loss or for aesthetic purposes. (See research table.)



FROM SPECTATORS TO ATHLETES

A step that requires courage, determination, and perseverance but brings abundant benefits.



Watching the games is the most popular part of certain sports, which has advantages and drawbacks. However, playing a sport is different and requires a process of transition that results in many health benefits. This unit evaluates the role of a spectator and presents advice to make way for the transition.

and distract themselves from their work and daily life.

However, being a spectator carries risks. Some fans get carried away and engage in offensive and aggressive behavior toward opponents. They begin to use gestures and then resort to insults, pushing, and striking; in addition, they end up using weapons. At times, violence is exercised by destroying material in the facilities or by throwing objects. All of this provides a bad example to children and young people, who view it as something natural and, on occasions, even repeating this negative behavior. Television fans are not exposed to the same level of violence, but they become addicted to sports programs and dedicate too much time to related programs and commentary.

Exercise and Physical Health

A combination required in the prevention and treatment of various diseases.

The case of José Luis represents that of many people who experience a similar situation. Because of his lifestyle, he weighed, at the age of 38, 95 kilograms (209 pounds), with a height of 1.70 meters (five feet seven inches); yet he was not worried about it. He lived happily with his wife and their two children, he was healthy and did not see the need to diet or exercise, until a medical checkup pointed out his excess of glucose and an irregularity in his heartbeat. The doctor warned him that if he did not lose weight, it was very likely that he would suffer a heart attack. José Luis made a firm decision: to watch his diet and to exercise every day. His wife started to cook low-calorie and healthier food (less cheese, meat, sweets, and fried foods, and more vegetables and produce, fruits and whole-grain cereals). José Luis went to a gym, where he gradually increased his exercise time from 10 to 45 minutes daily. It took him a year to lose 12 kilograms (27 pounds), but he knows they will not come back, as his new habits are here to stay. He is determined to continue exercising after reaching his goal of 75 kilograms (165 pounds). As for the other indicators of poor health, they have completely disappeared with the weight loss.



Explore and learn about the influence of exercise on different aspects of health.

2.04

OVERWEIGHT AND OBESITY

The practice of any kind of physical exercise, together with a healthy diet, is one of the best weapons against obesity and its complications.



According to the WHO, the incidence of obesity has increased significantly since 1980 and 2008 when over 500 million were obese. The proportions of obesity are higher in high-income countries and tend to increase in emerging countries. This is a global health problem of this unit.

What is the difference between overweight and obesity? An overweight person has a BMI equal to or greater than 25, whereas an obese person has a BMI greater than 30 kg/m². The constitutional difference between a woman should be upon reaching 30 kg/m², self-help table for a

CAUSES OF OBESITY

There are a number of causes of obesity: heredity, hormones, medications, and lifestyle. These causes do not act alone, but millions of obese people are the result of obesity is

2.05

CEREBROVASCULAR ACCIDENT

Physical activity has proven to have a protective effect against cerebrovascular problems.

In the world, each year 15 million people suffer a stroke, or cerebrovascular accident (CVA). Of those, 5 million die, 5 million are permanently disabled, and the remaining 5 million survive with minimal aftereffects. Thanks to campaigns with minimal aftereffects (warning about the danger of a sedentary lifestyle and tobacco) in industrialized countries, the incidence has dropped; however, the problem still produces a high percentage of all deaths, being the second cause of mortality in the world.

WHAT IS A CEREBROVASCULAR ACCIDENT?

Also known as ictus, embolism, or stroke, it is caused by an embolus (blood clot or fat and cholesterol) that moves through the circulatory passages and reaches the obstruction of an artery producing a lack of oxygen in a part of the brain. Cerebral injuries that, depending on the affected section, are manifested as weakness, loss of sensation, or loss of motor function in half of the body.

HOW PHYSICAL EXERCISE CAN HELP?

Physical activity combats the number one risk factor for stroke: high blood pressure. It also increases concentration, promotes cholesterol (HDL), and helps with weight. All these benefits



RESEARCH

THE POWER OF PHYSICAL EXERCISE • 2 • Exercise and Physical Health

A Sedentary Lifestyle Is as Bad as Tobacco

The study by I. M. Lee¹ from Harvard Medical School and his team is a very clear example of the global extent of a sedentary lifestyle. Published in the prestigious medical magazine *Lancet*, this research shows that thousands of men and women each year could avoid an early death if physical inactivity were eliminated. The study takes into account the diseases that scientifically placed themselves at the top of the list because of their close link to physical exercise: coronary diseases, type 2 diabetes, breast cancer, colon cancer, hypertension, stroke, metabolic syndrome, depression, and general mortality (as well as falls, although these are a risk, not a disease). Population Attributable Risk (PAR) (which incorporates the percentage of inactive people, risk of disease, and other related factors) rates were estimated for each country in the world that has data available. That allowed an estimate of disease cases that could be prevented if the population's lifestyle were more active. As an example, we display the number of annual deaths that could be avoided if inactivity were eliminated in regard to certain places and conditions:

	Africa	America	Eastern Mediterranean	Europe	Southeast Asia
Coronary disease					
Breast cancer	15,000	60,000			
Colon cancer	3,000	11,000	44,000	121,000	59,000
	1,000	14,000	4,000	14,000	5,000
			2,000	24,000	4,000

In this study, the total number of premature deaths as a result of inactivity is estimated at 1.3 million annually. This could be prevented through a worldwide change geared toward an active lifestyle. According to the research data highlights that physical inactivity causes approximately the same number of annual deaths in the world as tobacco.

¹ I. M. Lee et al., "Effect of Physical Inactivity on Major Non-Communicable Diseases Worldwide: An Analysis of Burden of Disease and Life Expectancy," *Lancet*, 380: 219-229 (2012).

CANCER

A natural way of protection against various types of cancer.

The relation between a sedentary lifestyle and cancer has become increasingly more evident. It is presently known that exercise is a protective mechanism against cancer in general and certain types in particular. After analyzing hundreds of studies, the National Cancer Institute of the United States disseminated information regarding the types of cancer with a greater connection to physical exercise, in this order: colon, breast, prostate, lung, and uterine cancer.

HOW PHYSICAL EXERCISE WORKS AGAINST CANCER

Exercise provides protection against colon cancer by balancing the hormonal metabolism, regulating the secretion of insulin, reducing the time that the intestine is exposed to possible carcinogens, and boosting immune functions. Protection against

breast cancer is explained through hormonal reduction (especially in premenopausal women) the reduction of insulin secretion, the strengthening of the immune response, and the reduction of fatty tissue. Exercise protects from uterine cancer by regulating the changes of body mass and the metabolism of sex hormones, particularly that of estrogen. Regarding lung and prostate cancer, although the beneficial effect of exercise is clear, the process is somewhat obscure and the perception that it is associated with hormonal changes, its fluctuations, immune response, and antioxidant processes.



IMMUNOLOGY AND PHYSICAL EXERCISE

Moderate and regular physical exercise reduces the risk of suffering infections.

? RESOLVING DOUBTS

Is physical exercise beneficial when I have a cold? Will the activity help me to recover faster?
The majority of experts agree that when the symptoms include fever, physical exercise should not be engaged in. When there is no temperature, moderate physical activity, such as walking, ends up being beneficial.



The immunological (or immune) system of human beings is a complex system, with the capacity to identify, fight, and repel infectious agents that cause diseases. It is comprised of a complex network of cells and other protective agents of the human body. The presence and activity of these structures determine if they prevail or the pathogenic agents do, whether viruses, bacteria, fungi, or parasites.

It is presently known that activity and exercise impact the effectiveness of the immune system. The interest in the relationship between physical exercise and the immune system is such that, as of 1993, the International Society of Exercise and Immunology was created with the objective

of researching and disseminating data about the prevention of diseases and improvement of health through physical exercise. This society, with its headquarters in Copenhagen (Denmark), publishes a prestigious scientific journal, *Immunology Review*.

HOW PHYSICAL EXERCISE WORKS ON THE IMMUNE SYSTEM

Recreational (rather than competitive) activity is linked to a lower number of viruses and bacteria, through protection that will be met more rapidly with a more effective defense mechanism when there is exercise. This effect prolongs its effects for several hours after exercise to eventually return to its normal state. Physical activity produces an increase of macrophages, which are responsible for eliminating bacteria.

UPPER RESPIRATORY TRACT INFECTIONS

Perhaps because it is easy to measure, many studies that show a positive relationship between exercise and respiratory infections (colds). The relationship is not linear, rather, it is curvilinear. The

DIABETES

Regular physical exercise is considered an important element in the treatment of all types of diabetes.

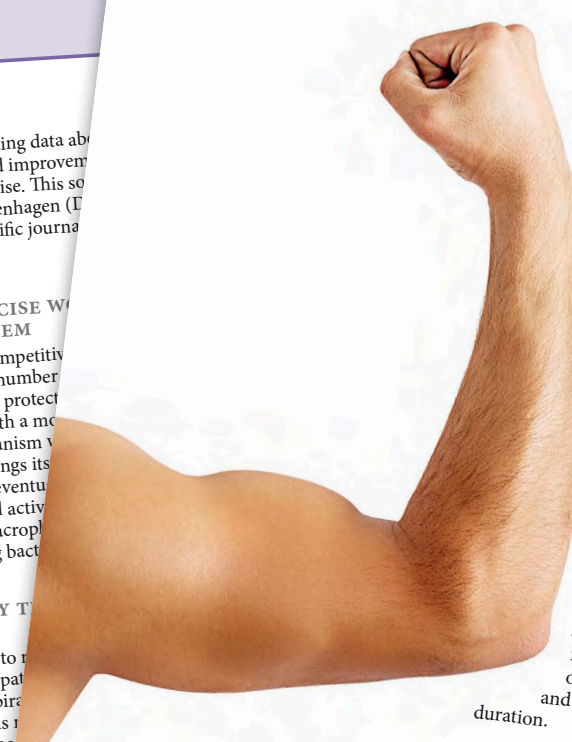
Diabetes is a growing illness, a by-product of the lifestyle in recent years, especially resulting from overweight and inactivity. This disease consists of an excessive amount of glucose that is retained in the blood as a result of a lack of insulin, either because the body does not produce it (type 1) or because, even if it produces it, blood cells do not absorb the energy (type 2). The first type of diabetes is frequent in children and adolescents and possesses a strong hereditary component. The second is diabetes in adults; it is not insulin-

dependent, and in the majority of cases is related to lifestyle. During the last 20 years, type 2 diabetes has notably increased and constitutes 85 percent of all cases. Diet and exercise are primary factors in the development of type 2 diabetes. About 80 percent of individuals who suffer from obesity and lead a sedentary life. For this reason, physical exercise is fundamental in the prevention and treatment of diabetes, particularly type 2.



GAINING STRENGTH AND ENDURANCE

Muscular strength is necessary for performing daily activities with less discomfort and risk of injuries.



Muscle strength and endurance are very important components of a person's physical condition. They are not areas to develop on a whim. They are truly a necessity, as they help carry out daily activities efficiently, reduce the risk of accidents, and promote a better mood and a healthy self-esteem.

Strength and endurance are distinct abilities. Strength refers to the **power** a muscle is able to exert in a precise manner. Endurance involves muscular **ability to repeat** a movement in a prolonged way. Both are connected, as endurance needs strength to maintain itself and strength needs endurance to repeat itself. Strength is centered on the use of much energy rapidly and endurance uses energy for long duration.

HOW TO GAIN STRENGTH

CHAPTER 3

Exercise and Mental Health

A sound mind in a sound body.

Stephanie is an example of overcoming depression through physical exercise. During her years as a student of medicine—coinciding with exams and a disappointing heartbreak—depression affected her so much that she lost hope of ever feeling happy again. She underwent a pharmacological and psychological treatment, and the symptoms were alleviated; yet it was not sufficient. True change came through the encouragement from her friend Laura, who insisted time and time again that she play volleyball with her team. Stephanie resisted every time; however, her friend's insistence was such that in the end she agreed to play with the team. Soon after, she noticed a spectacular change.

3.01

DEPRESSION

Regular practice of physical exercise contributes to improvement in mood and increases the sense of well-being.

Depression is the most common psychiatric disorder and the one that produces the greatest functional disability. The symptoms encompass depressive mood, lack of motivation, feeling of guilt, low self-esteem, sleep and appetite changes, minimal energy, lack of ability to concentrate, and suicidal thoughts. All of this overwhelms all those who suffer from it, and deprives them from carrying out their daily tasks in a normal manner.

It is presently known that the many devastating effects of depression can be avoided through regular physical exercise. It is interesting that the health problem that cuts down the most lives in the world, cardiovascular diseases, can also be prevented and fought through regular physical exercise. Therefore, if it were necessary to adopt a single global measure of maximum efficacy for public health, it would have to be that of physical exercise. In fact, the U.S. Department of Health and Human Services has issued a recommendation to its citizens: Practice 30 minutes of daily physical exercise. Likewise, the World Health Organization (WHO) recommends that adults who do not practice aerobic exercise begin with 75 minutes per week of intense physical activity and progressively increase until reaching 150 minutes per week. If the activity is moderate, WHO advises 300 minutes per week. Unfortunately, the recommendations are not followed¹ and the lack of activity continues to gravely affect the population.

HOW PHYSICAL EXERCISE ACTS AGAINST DEPRESSION

A person who exercises experiences euphoria, well-being, and analgesia, highly desirable effects to fight depression. This is explained by the secretion of endorphins: chemical substances produced by our bodies during physical exercise. Their structures are very similar to those of opiates, and for that reason, when

3.06

SEXUALITY

Best therapy to boost sexual life is the practice of physical exercise.

RELATIONSHIP BETWEEN EXERCISE AND SEXUALITY

Exercise benefits sexual function, directly; rather, through indirect effects that exercise reinforces and mental health that are related to it. Here are the most

Sexual function (unit 2.03), or strong sexuality, based on healthy heart

Sexual function (unit 2.04), contributing to a couple, which stimulates sexual

Fatigue (unit 2.12), that a tired body

Strength, and resistance (unit 2.12), mental elements to

practice the act of sex without discomfort or muscle pain.

- **Relieves symptoms of stress** (unit 3.04) and **depression** (unit 3.02), which benefits a mood that facilitates a satisfactory sexual manifestation.

- **Induces restorative sleep** (unit 3.05), acquiring higher levels of alertness and physical and emotional energy to initiate and maintain sexual relations.

- **Reinforces self-esteem** (unit 3.07) and **reduces shyness** (unit 3.12), facilitating more relaxed and natural sexual encounters.

- **Helps control rage and anger** (unit 3.08), promoting good interaction, dialogue, and communication between a couple; fundamentally essential ingredients for good sexuality.



3.05

SLEEP

Sleep deprivation deteriorates the quality of life, reduces productivity and concentration at work, and even increases the risk of suffering from physical and psychological issues.

Nowadays, people sleep less than they did 100 years ago, and the quality of sleep is worse. It is mainly because of the growing incidence of stress, anxiety, and depression (90 percent of those who suffer depression also suffer insomnia). Furthermore, this problem is understandable based on how easy it is to live without physical effort. At present, it is calculated that one out of three people are suffering, have suffered, or will suffer insomnia. Various observations and experiments show that physical exercise and sleep are closely related. After all, who doesn't sleep through the night after a full day of physical activity?

Sleep disorders affect nocturnal life: those who are sleep-deprived are not able to garner sleep; once asleep, they wake up intermittently; awakening occurs before the desired time, and in the end they are left with a sensation of not having rested. Daily life is also affected: fatigue, low state of mind, sleepiness, risk of accidents, lack of attention, memory, concentration, and lack of problem solving and motivation. This unit shows how the symptoms of insomnia and poor quality of sleep can notably improve through physical activity, as well as how to motivate yourself to exercise.



3.09

ADDICTIONS

Sports keep people away from addictions to harmful substances and accelerate recovery of those who have drug-related problems.

In recent years, it has repeatedly been proved that when physical exercise is included in the treatment of addictions, there is an increase in the quality of life in patients, a decrease in the consumption of substances, and a speeding up of recovery. Exercise has shown its effectiveness in prevention as well as rehabilitation. Moreover, when the habit of exercise has been acquired, it protects a former addict against such a dreaded relapse. It is not odd that specialized centers are increasingly incorporating some form of physical activity in drug dependency programs. Presently, it is common to observe plenty of gym equipment

in rehabilitation centers and a good portion of the time (about 20 percent) dedicated to motor activities and physical exercise.

HOW PHYSICAL EXERCISE HELPS

Physical activity stimulates the secretion of neurotransmitters that promote emotional stability and a sense of well-being. Endorphins are the most notable; also aiding are dopamine, serotonin, norepinephrine, endocannabinoids, and galanin. All of these substances are present in the circulatory system in quantities higher than the normal amounts when physical exercise is practiced. By way of this entire chemical alteration the following are obtained: a general state of well-being, a reduction of stress, and a reinforcement of will to avoid giving in to the anxiety of consumption.

As prevention, physical exercise counteracts tension and stress that lead many to start using psychoactive substances; and, as a rehabilitative factor, exercise makes the body secrete substances that are similar to certain drugs, in that manner reducing the craving to consume and the withdrawal syndrome typical of the lack of the addictive substance.

The same can be said of addictive behaviors unrelated to chemical substances, such as gambling, food, shopping, Internet, etc. Exercise provides the peacefulness that helps people to control their actions better. Exercise transmits a series of states of mind for those who are struggling to free themselves from an addiction:

- Develops the capacity of work



SELF-HELP

Depression and Personal Effort

Exercise represents an effective, harmless, and low cost remedy. However, depression involves a lack of motivation to carry it out. Thus, we offer advice that will help an individual in such a situation:

- **Gain confidence in yourself.** A huge step toward activity and exercise or sports is to believe that you are able to do it, whether running 3 kilometers, bicycle riding for 15 kilometers, or light walking for 45 minutes. Take a deep breath and repeat often: "Yes, I can; of course I can!"
- **Acquire skill.** Practice is essential. If you start any exercise or sports and you persist with regularity, you will gain skill, and it will become easier to carry out each time.
- **Perform it in the company of others.** The social environment is fundamental for obtaining greater performance and regularity. Practice physical exercise in a group or with a partner so that you may provide support and receive support.
- **Battle all obstacles you encounter one at a time:**
 - **Fatigue, low energy.** Force yourself into action; set small goals for yourself and use your imagination to reproduce the steps to be taken. Plan and choose the best time of day. Act! The task will become easier once you have begun it. Ask someone to remind you of your goals and to encourage you. Taking care of a pet may help you, as animals remind you of their needs; therefore, they will accustom you to regularity. A dog that needs two or three good walks a day can be the solution to lack of motivation to exercise.
 - **Feelings of inability.** Seek the company of those who offer you messages of affirmation, approval, and encouragement. Use internal dialogue in a positive way: "I have achieved things before, and I can do this, too!"
 - **Lack of hope.** Contemplate the future with a smile; anticipate things with enthusiasm. More important, religious hope. Pray, trust in God, and expect the best according to His will.

- **Depressed mood.** child does. Decid certainty that th company of peo
- **Low self-esteem.** discard shamefu on your virtues.
- **Fear of exercise.** people who ach or sports. Convi designed for co
- **Antidepressant m** they are not the so push to get you ou advice.

neurotransmitters that facilitate physical and psychological well-being. In fact, the majority of people are inclined to placate the internal

so-called stress depression prod lack of external inhibits the pro ing or redu

3.10

ANOREXIA AND BULIMIA

The practice of sports improves mood and favors a more realistic perception of the human body.

Anorexia and bulimia are eating disorders on which the media's praise of thinness based on current values: we are shown attractive figures from the world of fashion, movies, and music who display a standard of beauty associated with a highly slender body shape, something that is not natural in most sectors of the population. Consequently, young teens and adolescents aspire to possess the same figure but at the risk of suffering these disorders. Anorexia as well as bulimia affects young teens and adolescents more than any other age group. In addition, they are more common in females: 9 out of 10 cases are women. Many anorexic and bulimic patients use exercise (besides diet) as a compensatory measure to lose weight, and as a result, physical exercise has been traditionally rejected as part of any recovery plan. Nonetheless, in recent years physical activity has begun to be incorporated as an added tool in the treatment of eating disorders, specifically because of its ability to reduce stress and anxiety, thus producing well-being.

CHARACTERISTICS OF ANOREXIA AND BULIMIA

What are the distinctive characteristics of the two disorders? The diagnosis for each is based on three criteria:

- Reduction of intake until reaching levels: less than 18.5 body mass index.
- Intense fear of becoming fat despite low weight.
- Mistaken perception of own body image, unable to acknowledge the gravity of the extreme situation.

Bulimia consists of recurrent episodes of excessive intake in a relatively short period of time (less than two hours) and with apparent ability to stop. Binge eating is followed by inappropriate compensatory behavior, such as induced vomiting, using drugs such as laxatives or diuretics, prolonged fasting, or excessive physical exercise. Bulimia is more common than anorexia, with at least twice the number of cases in the young female population.



Let's get started! We explain the various types of exercise that exist so that you can discover the one that most suits your needs.

CHAPTER 4

Types of Physical Activity

A great variety of options for everyone.

Widowed and nearing the age of 75, Flora derives much satisfaction from physical activity. She tends to her small vegetable garden every day during summer and goes for a good half-hour walk every evening of the year, even in winter. Sometimes she goes alone; other times, she is accompanied by her sister who lives nearby. She frequently talks about the tranquillity and peacefulness found in the garden. Flora says that it is a spiritual experience wherein she stays in touch with nature and the plants, and feels close to God. As a reward for her perseverance, Flora reaps the fruit of her labor: a small crop of vegetables cultivated the old way that provides quality nourishment for herself and even to share with others. Since she took up gardening, she enjoys good moods, in addition to notable relief in the joints of her neck, fingers/toes, and knees—areas in which she suffers early osteoarthritis.

4.03

WORKING IN THE GARDEN OR YARD

An activity that implies cultivating physical and mental health

The growing urbanization and the increase in population density have forced millions of people to live in the city. As a result, active and rewarding traditions and habits such as working in small and at-home gardens have been abandoned. However, today many people acknowledge that returning to gardening and horticulture is an ideal way to increase enjoyment, relaxation, well-being, and overall health. For those reasons, we dedicate this unit to the task of working with nature, which has the ability to relieve many problems that are of a physical and mental nature.

HISTORY

The first written record in which we observe the activity of tending to a garden is found in the origins of human existence according to the biblical account. We are told that after having completed his work of creation, "the Lord God took the man and put him in the Garden of Eden to work it and

take care of it" (Gen. 2:15, NIV). The garden appears as the most important place for human beings in their connection with nature. Subsequent historical information leads us to observe multiple references to gardens and yards. In ancient Egypt, the shrub gardens were cultivated in the surroundings of palaces and recreational areas. The ancient civilizations: Babylon, Greece, and Rome. The Romans, for example, used diverse shapes, being the most common stone statues in gardens. Climbing plants, and in the Roman home, the garden was always room for a courtyard. Roman

¹ Bible texts credited to NIV. Version. Copyright © 1978 by Zondervan. All rights reserved.

SELF-HELP

Entire Body Isometric Exercises

To obtain a complete isometric workout, try to perform the following exercises that include the use of the body, as well as the entire body.

EXERCISES ABOVE THE WAIST

They are performed with 10 to 15 seconds of tension and a few more moments of relaxation; the amount of time can start out small and gradually increase.

- **Biceps and back.** Hook fingers by clasping one hand against the other. Pull with force as if trying to break the finger grip.
- **Triceps and chest.** With the palms of your hands together in front of your chest, maintaining elbows at a 90° angle, strongly press palms against each other.
- **Shoulders.** After the previous exercise, move the palms of your hands upward, sustaining the pressure, until placing them above your head. You can position yourself under a narrow door, extending your arms and, with them, applying pressure against the doorframe.
- **Abdomen.** In a seated position, inhale and tighten the stomach muscles. Strongly draw in your stomach. Hold the tension for five to six seconds. Slowly exhale.



Forward lunge

EXERCISES BELOW THE WAIST

These exercises require 10 to 15 seconds of tension and a few more moments of relaxation; the amount of time can start out small and gradually increase.

- **Squats.** Crouch down and hold position for 10 to 15 seconds.
- **Forward lunge.** With your right leg, take a step forward, positioning your left toes on the ground. Your knee bent approximately four to five centimeters from the ground. Repeat with other leg.
- **Side leg lift.** In a standing position, raise your right leg to the right and hold the position. Repeat with the left leg. You can use one hand on the backrest of a chair to help with balance.

EXERCISES FOR THE ENTIRE BODY

- **Plank (abdominal bridge).** Rest your toes and forearms on the ground and make a plank, keeping your body in a straight line.
- **Side plank.** Make a plank by supporting your right forearm and the outer side of your right foot on the ground, keeping your body in a straight line. Alternate sides.
- **Reverse plank.** With your back on the ground, bend your knees, keeping them together and your feet flat on the ground. Then raise your hips until making a straight line with your torso.



Side plank

4.04

GYMNASTICS WITHOUT APPARATUS

Excellent for improving coordination and flexibility, increasing strength, and osseous strength, besides gaining more movement space

Gymnastics is an activity with systematic exercises that puts into motion several groups of muscles and bones, ensuring agility and flexibility. There are four major types of gymnastics: **artistic**, which consists of a combination of acrobatics and gymnastics; **gymnastic**, which consists of a combination of acrobatics and gymnastics; **rhythmic**, which adds elements

of ballet and dance to gymnastics, which is performed in pairs, groups, or individually, and includes jumps, shapes, and pyramids, as well as choreography; and **trampoline**, which is very similar to that of gymnastics, but is performed on a trampoline. The purpose of gymnastics is of a competitive nature, to pursue perfection of movement.

There is also a general type of gymnastics for all ages and abilities: Swedish gymnastics, which consists of harmonious, slow, and light movements of the arms and legs, maintaining physical balance with multiple bends without risk of injury, tiredness, or

HISTORY

We found gymnastic activity in ancient centuries before the first Olympic Games (B.C.) that held gymnastic competitions. The Greeks also founded the gymnasium, an institution where men over the age of 18 were trained to compete in public festivals. Conferences and debates were held in the gymnasium, and literature, philosophy, and music. The Roman Empire, after conquering Greece, expanded gymnastic sport by including more formalized, and functionality. It was used for the physical training of their armies. There appears to have been a pause in gymnastics during the Middle Ages.



SWIMMING AND AQUATIC EXERCISE

Activities that allow the practice of exercise without impact, providing aerobic development and involving the main groups of muscles.

Swimming is very popular in certain countries. Throughout the United States, for example, it is the third most practiced sports activity after walking and equipment-assisted exercise. Furthermore, in many countries it has been promoted in recent decades with the construction of pools in sports pavilions, recreational centers, hotels, and private homes. Additionally, swimming makes up an integral part of high-level competitions, such as the triathlon or aquathlon, which requires intensive swimming training. In the medical field, swimming and aquatic exercises are being used for rehabilitation and post-operative procedures. Also, in geriatrics there is substantial use of aquatic exercise by retirees because of its effectiveness and safety against falls.

HISTORY

The practice of swimming dates back to prehistoric times, when man swam to cross rivers and lakes, as depicted in cave paintings. More formally, references appeared during the Middle Kingdom of ancient Egypt, 2050-1750 B.C., when scholastic programs included teaching children to swim. Centuries later, swimming appeared in Greece, Rome, and Phoenicia as a form of military training. However, the activity decreased by the Middle Ages because of a general belief that submerging oneself in water carried the risk of becoming ill.

Swimming as an organized sport officially began in Great Britain with the National Swimming Society founded in London in 1837. In 1844, a championship that marked a milestone was held in this same city. The swimmers were British and Native Americans. The Americans had no trouble winning, as they used the crawl method while the British swam using the breaststroke. Despite the defeat, the British considered the crawl method uncivilized because of its splashy nature, thus, they maintained



BASKETBALL

An excellent sport to develop balance, concentration, personality, confidence and speed of execution, among other things.

Basketball is one of the most popular sports in the world. It is widely practiced and the number of spectators is huge, as it sets the stage for a great source of exercise it is very comprehensive and especially appropriate for young people who require continuous activity, concentration, and endurance.

higher grades at the neighboring school in Buckingham (Cambridge, U.S.A.) were already playing the sport two weeks later. And one year thereafter, many of the country's educational centers knew about it. The first official game played by the YMCA team in 1892 against the 26th Company in the U.S. Army. In 1905, there were basketball teams in the country's institutes and colleges and the National Collegiate Athletic Association (NCAA), as known today, was founded. Nonetheless, the national championship tournament was not organized until 1939.

On an international



SOCCER

A very complete sport that provides health and social benefits to those who practice it.

Soccer is the most popular sport in the world. It moves the most people and it's known as the most popular Federation. Estimates of the practice of soccer as a part of sports do so for friends and family who do not have all its ins and outs number

HISTORY

The ball game in Mexico is a connotation of 1400 B.C. The game is mentioned in the Han Dynasty. It involved a ball that also known as soccer. However, it begins and at



AEROBICS

Ideal for practicing at home or at the gym.

All physical activity that significantly increases heart and respiratory rate is aerobic, as running, swimming, cycling or dancing. In recent years, a physical activity has emerged, consistent with rhythm and the large muscles to the beat of music. This type of exercise is also aerobic. The benefits of such activity. Women are encouraged to follow this sport; however, it is increasingly joined; thereby it is regarded as a feminine activity.

HISTORY

The book *Aerobics* published in 1966 by the American physiologist Kenneth Cooper was the beginning of aerobics. This was the Air Force lieutenant colonel who used to train astronauts, later followed by the endurance and performance. On the obesity and heart diseases. On the book's publication, Jackie Sorensen, another serviceman, created a dance on Cooper's ideas, adding dance to music. She called it "isotonic dance" and the center called Aerobic Dance.



Exercise by Gender and Age

A habit that can accompany us throughout life.

Gonzalo and Ines, both middle-aged, have four children: two are in middle school; one is taking general education courses; and the youngest is 5 years old. They are very well-informed parents and well aware of their children's needs. Thus, they allow them to watch television and play on the computer, albeit with much supervision and moderation. From the time their children were born, they have provided plenty of opportunities for physical recreation with other children. As they grow, they are encouraged to participate in a soccer, basketball, tennis, or swimming club, depending on each child's preference. As parents who take an interest in exercise, they tend to organize recreation for the family that promotes physical activity. Training suggestions are usually of an active nature (going to the park with a ball, bicycle, or skates, or camping in the mountains), avoiding passive leisure as much as possible (going to the movies, staying at home without any firm plans, etc.)

This chapter underscores the importance of practicing sports and exercise in all stages of life, from a very young to an old age. In this manner,

5.06

EXERCISE IN AN OLDER ADULT

It is necessary in the prevention of coronary heart disease, hypertension, cerebrovascular accidents, type 2 diabetes, metabolic syndrome, colon and breast cancer, depression, among others.

Evolutionary psychology classifies an older adult as one who is between the ages of 35 and 60—an extensive stage in which the greatest professional achievements are reached, the next generation is created, and even the members of the third generation are born. However, they are also the years of quick and progressive loss of strength and endurance. It is here that continued physical exercise is fundamental to counteract a possible decline in health. Precisely because of the various demands from work, family, and other social ties, there may not be time or energy for physical exercise. For those reasons, in this unit we analyze the obstacles in its practice and how to overcome them, as well as the possible ways to maintain physical activity.

BENEFITS OF PHYSICAL ACTIVITY

The healthy effects of exercise are very similar to those in the young adulthood stage, with the particular characteristic that the risks of disease considerably increase over time. Exercise produces a beneficial effect on heart disease, hypertension, cerebrovascular accidents, obesity, type 2 diabetes, metabolic syndrome, colon cancer, breast cancer, and depression. An active adult, additionally, has a lower mortality rate and a lower risk of a hip or spinal column fracture. Women obtain particular benefits from exercise. A woman has a natural tendency to lose bone mineral density with the arrival of menopause. Physical activity, specifically, compensates for this loss (see the attached research table).

It is not always easy to practice exercise! On these pages, we help you integrate it to your life.

5.01

MALE-FEMALE DIFFERENCES

Some conditions that must be considered in order to organize and optimize physical exercise.

There are physiological differences between men and women that must be taken into account at the time of planning and implementing physical exercise and sport routines. There are also contrasts in general marked by culture and society that separate men and women to a greater extent than their biological constitutions. The tendency in the most recent decades has been to reduce those differences and maintain the physical activity arena open to everyone, regardless of past discriminatory practices. In this unit we present the most notable differences between both sexes and suggest forms of practicing the appropriate exercises.

PHYSICAL DIFFERENCES

The differences that we are about to analyze are those that affect motor activity in certain terms, understanding that there are particular exceptions. Primarily, the differences of both differ in the thoracic bulk (more prominent in men (with greater capacity)). The waist, hips, and knees are that is markedly different in men.

On average, a man is greater than a woman in 15 cm.



Examples of Aerobic Exercise for Five Days

Objective: 150-160 minutes of average intensity or 75 minutes of high intensity or a combination of both

	Day 1	Day 2	Day 3	Day 4
Example 1	a 20 min speed walking	20 min light cycling 15 min swimming	20 min speed walking	20 min light cycling 15 min swimming
Example 2	a 20 min moderate running	25 min individual tennis	20 min moderate running	25 min individual tennis
Example 3	a 30 min garden work 6 min stair climbing	6 min stair climbing	30 min garden work 6 min stair climbing	6 min stair climbing
Example 4	a 15 min intense running (>5 km/h)	15 min physical exercise, muscle strengthening	15 min intense running (>5 km/h)	15 min physical exercise, muscle strengthening

a = average intensity (times x 1) h = high intensity (times x 2)

appointment. Look for a companion who will encourage you and vice versa. Discuss with others the exercise you are doing and how you feel, as this will reinforce the habit. Read and look for information regarding the physical activity that you are performing, and purchase some gear to motivate yourself.

• Physical exercise is boring. Look for an activity that interests you; not all exercise has to be boring. If through



The Challenge of Integrating Exercise into Life

Don't wait until tomorrow.

Edward found it amusing to see people jogging through parks and fields, sweating and panting. His methodical and organized personality and his own profession as an accountant were a reflection of his lifestyle, fundamentally sedentary. However, when he reached the age of 40 and felt increasingly frequent muscle numbness—when his abdomen expanded and he gasped for air at the slightest effort—he began to consider a change in leisure activities, and the hours previously spent sitting in front of the television or reading magazines were converted into physical exercise outdoors. He purchased a pedometer to count steps (both walking and running), and he started to keep a record of each kilometer covered, calories burned, pulse before, during, and after exercise, weight lost at the end of each month, etc. A written account of his physical achievements was Edward's incentive to begin and maintain a good level of regular physical activity.

This chapter deals with the great challenge of heading into the path believed by many to be the best, yet only a few actually taking that road. In the following pages the reader will find distinct advice that will serve as a guide toward the integration of physical exercise into his or her life.



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Ready, set, go! How to maintain healthy exercise habits in time.

6.02

HOW TO GET STARTED IN EXERCISE

A courageous decision that will bring many benefits.

Getting started in a good physical exercise plan is both easy and difficult. Easy, because individuals can begin to train themselves; difficult, because if no measures have been taken to establish it, the plan will be abandoned soon. The design of a personal plan entails acceptance of profound changes in daily habits and the understanding that these changes should be perpetuated for the very long term. Modifications are needed (sometimes radical) in the way of thinking and acting. This unit is dedicated to the techniques, particularly of a psychological nature, that will facilitate a plan for physical exercise and its implementation.

BARRIERS

Nowadays the majority of environments in which it is to do physical exercise, and reduced to negligible distances, automobiles, elevators, home electric wheelchairs, informatics have transformed work and in activities that were performed in motorized function. As a result, being pushed into a sedentary life when in actuality the design requires movement and activity.

In the middle of these circumstances, the messages that try to promote, to make a transition against the current of course, breaking and arriving at a goal. How to cope with this? We answer this question in the following paragraphs already discussed regarding barriers for adults. But it applies to all a variety of which w



THE POWER OF PHYSICAL EXERCISE • 6.02

6.03

HOW TO CONTINUE

Discipline and willpower to meet challenges.

Starting any type of exercise or variation of sports is an extremely important step. However, the challenge of being persistent and making it an integral part of daily life remains ahead. Lack of consistency and continuity is perhaps the major barrier to achieve an active life. This unit offers specific strategies to remain in the practice of continued exercise.



KEEPING PHYSICAL EXERCISE

There is no secret to begin an exercise routine; it is to persevere in it. This is more about the task of continuity from various fronts in the manner explained in the following paragraphs.

We insist once again that goals be adapted to personal ability and be attainable. If this case, they should be changed, as achievement elements of much importance in the maintenance of exercise. Also recommended is the use of prizes or rewards that serve as motivation to a sporting event, a new breathable shirt, a friend, etc., avoiding rewards involving cream, cakes, or chocolates, which are not only not healthy but also recover lost calories.

Keeping a record of times, distances, weight lost and lost calories is an incentive for many as they observe their path and establish

1. Strength and Flexibility of the Upper Body

Many of the muscles are located above the waist, and it is necessary to keep them strong and flexible for various functions in life. Remember to allow 48 hours of rest after strength.

Neck stretches.
In a sitting position, tilt your head to the right, trying to touch your shoulder (ear) and hold for five seconds. Return to original position. Tilt your head to the left side and hold for five seconds. Return to original position.



b) From original position, turn your head to the right side (as if naturally glancing to the side) and hold for five seconds. Return to original position. Turn your head to the left side and hold for five seconds. Repeat each exercise five times.



Let's focus on your case: we offer you several types of specific exercises for daily situations and also special cases.

Physical Exercise in the Prevention and Treatment of Health Problems

of Training

must always begin with a warm-up for the purpose of preparing the body to endure the exertion it will

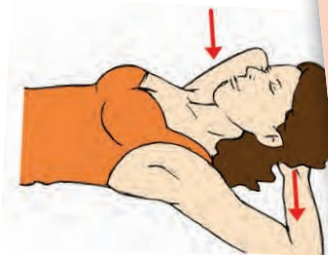
NG TRAINING
f training presented in this book does not require the use of a pulsometer. In the event of being under
re to regulate blood pressure, it is advisable to first consult a specialist and obtain a pulsometer.



EXERCISES TO AVOID BACK PAIN

PAIN IN THE DORSAL REGION

1. Lying face down with the knees flexed and the whole back touching the ground, place the hands behind the head with elbows to the sides, trying to draw them to the ground, expanding the chest without losing dorsal region support nor tensing the neck muscles.



2. Stand facing a wall and place the hands against it at shoulder level with the arms extended and a straight back. Draw the shoulders inward to the greatest extent possible bringing your chest to the wall. Then push against the wall as you slowly pull back the chest.

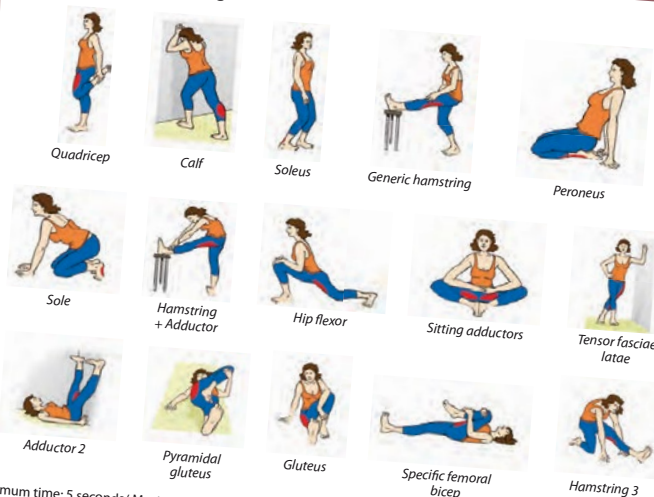


- Get closer to the wall, raise the hands and place them slightly separated against it. Without bending the elbows, separate the left palm, flexing the shoulder to the greatest extent possible. Hold the position for 20 seconds and then switch hand.



THE POWER OF PHYSICAL EXERCISE · 7 · Physical Exercise in the Prevention and Treatment of Health Problems

Warm-Up and Stretching



Minimum time: 5 seconds/ Maximum: 15 seconds. Complete a circuit one or two days per week; six sets of two repetitions the remaining days (20 seconds to recover), without bouncing motions, pain or excessive stretching. No more than six exercises. The greater the concentration and breathing, the greater the benefits will be.

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EXERCISES FOR CARDIOVASCULAR DISORDERS, OBESITY AND DIABETES

WALKING, LIGHT RUNNING OR RIDING A BICYCLE

Perform three to five times per week until reaching a minimum of 30 to 40 minutes. Monitor the pulse before, during and upon ending the exercise. It is very important to do a warm-up beforehand and to end with stretching, relaxation and controlled breathing.

To obtain better results, each session must last a minimum of 30 minutes. It is best to exercise in the morning or twice a day.





EXERCISES FOR PREGNANCY

Warnings: The practice of exercise is discouraged in the event of a medical or obstetric complication during a pregnancy unless—after a medical assessment—a routine is recommended.

Exercise should not be performed in the following cases:

- Arterial hypertension induced by pregnancy
- Premature rupture of membrane (amniotic sac)
- Premature labor
- Habitual abortion or reoccurrence
- Cervical incompetence (insufficiency)
- Vaginal hemorrhage
- Placenta or vasa previa
- IGR (intrauterine growth restriction)
- History of premature birth
- Morbid obesity
- Two or more previous Caesarean sections

In the following cases, physical exercise should be suspended if a pregnant woman suffers constant dizziness, hypotension, breathing difficulty, headaches, thoracic pain, contractions, among others:

- Arterial hypertension unrelated to pregnancy
- Endocrine disorders (hyperthyroidism)
- Cardiac disease
- Valvulopathy
- Chronic vascular disease
- Chronic pulmonary disease
- Multiple pregnancies (twins, triplets)
- Maternal anemia (<9Hb)

If exercise causes excessive fatigue, the pregnant woman should stop such practice.

1. Relaxation exercises

In a supine position with a cushion under the head and another under the knees, extend the arms along the body with the hands facing up. Pair soft music to the exercise or carry it out in a quiet environment.



EXERCISES FOR OSTEOPOROSIS AND RHEUMATIC PAIN

spinal column as a result of mechanical stress.

nts such as big jumps or shocks or risky balance exercises.

then your toes as you walk.



gether, perform small jumps
rt on soft surfaces such as a
e ground.



with one leg while
tion. Repeat 10 times,



ightly jump from one leg to the other, flexing the knees especially in
e beginning.



on yourself in front of a table or an object that allows you to
down with the arms. Repeat the exercise 10 times holding the
action for 5 seconds.



EXERCISES TO PRACTICE AT WORK

his program is for persons who sit or stand during their workday.
he approximate time is from 5 to 15 minutes daily.

1. Stretch for 3 Minutes

Standing, with the hands on the back part of the hips and the elbows back, gently push forward. Hold the position 10 to 15 seconds, lifting the chest.



Standing, with the hands on the hips, slowly twist the upper half of your body until you feel the stretch. Hold the position 10 to 15 seconds and reverse the movement.



Position yourself in front of a wall and support your forearms against it, resting the head on the hands. Place your right leg forward with the knee flexed and stretch the left leg without lifting the heels off the floor. Maintain a mild tension 10 to 20 seconds. Reverse the position. Do not hold your breathing.



EXERCISES FOR THE ELDERLY

Practical recommendations for keeping vigor and strength.

g old age, all persons who wish to commence a
s activity must undergo a medical examination, which
es a stress test. Thus, the functional capacity and
ce of ischemic cardiopathy (heart disease) can be
ed. Fundamentally, aerobic-type physical exercise
mmended for the elderly to mobilize large muscle
Additionally, if a light component of resistance
is added, such as 1 to 2 kg weights, specific muscle
can be strengthened.

istics of training for the elderly:

ne of exercise must be individually selected.
the many aerobic-training possibilities, if
nt osteoarticular problems exist, all jumping,
or running must be eliminated.

- If there are vision problems, bicycle exercise is not recommended unless it is stationary.
- Swimming and training in pools are very advisable. However, heat and vasodilation can cause dizziness due to hypotension. Hence, the environment in which exercise is carried out must be controlled in relation to temperature and the levels of humidity.
- Exercises or sports games that entail a major risk of injury due to trauma should not be practiced.
- Competition must not be stressed, except in highly trained persons.

1. WARM-UP (10 to 15 minutes)

2. AEROBIC EXERCISE (15 to 60 minutes)



Practical indexes are included so that you can easily find the information or solution you need at anytime.

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The sports or physical activities of this book are grouped according to their type.

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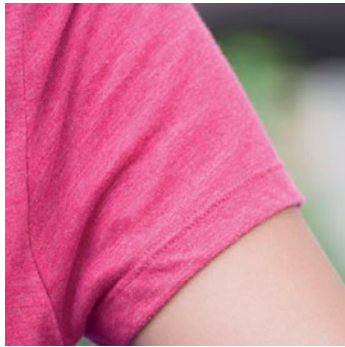
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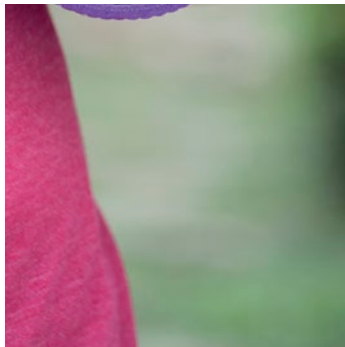

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THE POWER OF PHYSICAL EXERCISE

Physical exercise is one of the most beneficial activities for the integral health of human beings. Its positive effects on the physical, mental, spiritual, and social domains of life have been revealed by many studies. For that reason, the author suggests a series of sports, highlighting the benefits they provide, including the psychological elements of some. Moreover, he suggests the performance of exercise as a means to prevent and cure some of the problems that affect millions of people. Thus, he proposes practical routines that will help us enjoy a better physical and mental well-being.



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