PHYSICAL FITNESS

&

WELLNESS

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PHYSICAL FITNESS & WELLNESS

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DEDICATION

This book is dedicated to all people who are living just a sedentary life and would like to increase their physical activity and increase overall well-being. Overall well-being has many factors and increasing physical activity (based on consultation with one's doctors) can significantly reduce the risk of many physical and mental health problems along with providing more energy to experience life's joys with greater enhancement. The foundation of wellness is the basis on which human society can truly make progress in all areas of human endeavors. Hence, this book is heartily dedicated to you, the reader. It is the heartfelt hope of the author that the ideas presented will be inspirational in increasing physical activity leading to increased well-being.

ACKNOWLEDGEMENTS

My success in physical fitness is due to many inspirational people who have guided me along very tricky and uncertain paths toward success in reaching my goals. I acknowledge these mentors and many others who have encouraged me on my journey toward physical fitness success.

Additionally, I wish to recognize my wife, Manjeet Kaur for her continued support in all my endeavors. Her patience, steadiness, and wisdom have always supported me. Due to many business endeavors, I have not been able to spend as much time at home as I would like, and my wife has done an extraordinary job with raising both our children. It is only with her support and encouragement that I have been able to expand my achievements.

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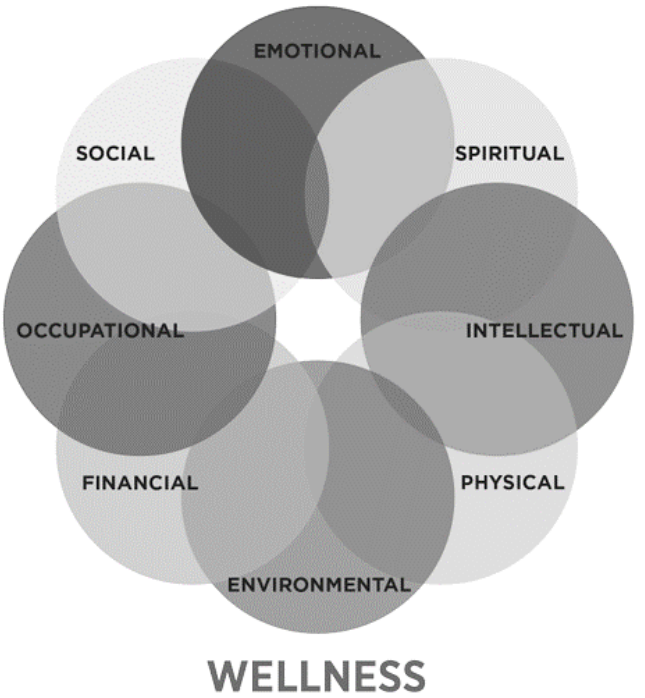

The Eight Dimensions of Wellness take into account an individual's physical health along with all the factors that contribute to a person's overall wellness.[0.1]

INTRODUCTION: WHAT IS WELLNESS?

Each person wants to be healthy, disease-free, and have overall well-being. Lifestyle decisions have a major impact on one's overall health. Physical fitness and optimal wellness are goals that can be accomplished when one decides to change one's lifestyle from a sedentary life to a life of increased movement.

Although between 1975 and 2014 the life expectancy in the United States increased, recent years have seen a decline in that figure. The average life expectancy for a man in the United States is now 76.1 years, while a woman may expect to live 81.1 years. Sadly, studies anticipate that the average life expectancy in the United States will continue to fall over the next decade as a result of the effect of a large number of primary diseases as well as the growth in the number of deaths caused by drug overdoses (e.g., opioid abuse). In the United States, cardiovascular illness is the leading cause of death, followed by cancer and respiratory diseases as the next most common causes. The number of deaths attributed to diabetes is also rising. The risk of illness may be reduced by adopting a healthy lifestyle. For instance, consuming a nutritionally balanced diet, regularly engaging in physical activity, and maintaining a healthy body weight can reduce the risk of developing cardiovascular disease, diabetes, and various types of cancer. Quitting smoking and staying away from secondhand smoke are two of the best ways to reduce your risk of developing cardiovascular and respiratory conditions.

According to the findings of the Surgeon General, the four factors that have the most impact on one's health and ability to live a long life are: one's way of life, heredity, the environment, and the caliber of medical treatment received. The most important factor in determining a human life is one's way of life, which is responsible for 53 percent of the variation in length of life. Genetics is the second most significant component that contributes to health and longevity. According to research on families, hereditary variables are responsible for twenty-five percent of an individual's lifetime. It is estimated that the environment and the level of medical care people get are responsible for around 23 percent of the variation in longevity. Because we have control over 75% of the factors that determine whether or not we will get unwell, the measures that we take to safeguard our health and advance our well-being have the potential to have a considerable impact.

Once upon a time, being disease-free was considered the gold standard of health. In the 1970s, a large number of researchers in the field of exercise science and educators in the field of health grew unsatisfied with this narrow definition. These forward-thinking health experts held the belief that health encompasses more than just physical fitness; it also involves emotional and spiritual well-being. They have come up with a new term for the notion, which they call *wellbeing*. One way to describe wellness is as an individual's state of optimum health, which incorporates all aspects of one's well-being. A state of well-being may be attained by following a healthy lifestyle that incorporates regular physical exercise, correct diet, emotional and spiritual equilibrium, and the elimination of undesirable habits. A variety of factors contribute to an individual's state of wellness. Wellness consists of eight interrelated components: *Physical wellness, Emotional wellness, Intellectual wellness, Spiritual wellness, Social wellness, Environmental wellness, Occupational wellness, and Financial wellness.*

PHYSICAL WELLNESS

The term *physical wellness* refers to all of the actions that are taken to maintain a healthy physique. A healthy body weight and a level of physical fitness are both essential components that should be prioritized. It is essential to have a healthy body weight since having a high percentage of body fat raises the risk of getting type 2 diabetes and heart disease. Maintaining a healthy level of physical fitness has a favorable impact on one's health by lowering one's illness risk and elevating one's quality of life. Other key habits for one's physical health include maintaining a good diet, getting regular checkups from a doctor, and being vigilant about personal safety.

EMOTIONAL WELLNESS

When it comes to how you feel about yourself and others, your emotions play a significant role in their overall impact. Emotional wellness, often known as mental health, refers to a person's level of social competence as well as the quality of their connections with other people. Your degree of self-esteem and your capacity to deal with the mundane stresses of day-to-day life are additional factors that go into determining your emotional wellbeing.

***Emotional stability* is measured by how effectively people can cope with pressures that they face daily. The majority of individuals are well prepared to deal with the highs and lows that are inevitable in life; nonetheless, an inability**

to deal with ordinary events may lead to poor emotional health or ailments such as depression and anxiety disorders. Mental illnesses are the primary cause of impairment for persons of working age (between the ages of 15 and 44). Emotional health is achieved when one can react appropriately to the many challenges that life throws at them, therefore avoiding extended periods of either an exceptionally high or very low emotional state.

INTELLECTUAL WELLNESS

You may maintain your intellectual well-being by continuing your education throughout your life. This will keep your mind engaged. The experience of college life is great for the development of this aspect. Attending lectures, reading, and participating in in-depth conversations with friends and professors are all activities that contribute to improved intellectual health. Your capacity to describe issues and find solutions continue to improve and the accumulation of new knowledge may give you a feeling of accomplishment and satisfaction. Take use of the possibilities that are presented to you so that you may expand your intellect. Keep up with current events, participate in in-depth conversations with other people, and read books or listen to book readings.

SPIRITUAL WELLNESS

People have various interpretations of what the word "spiritual" means to them. A feeling of meaning and purpose is often included in descriptions of what it means to be spiritually healthy. Although many individuals base their definition of spiritual well-being on their religious views, it is important to note that religion is not required for spiritual wellness. People discover their purpose in life via activities such as praying, volunteering, appreciating the natural world, and helping others. No matter how one understands the concept of spiritual health, it is an essential component of well-being due to the strong connection it has with emotional health. To be in the best possible spiritual health, you must be able to comprehend the fundamental meaning of your existence, feel love, pleasure, grief, peace, and sadness; while cherishing and respecting all forms of life. The joy of preserving one's spiritual health to its utmost potential is something that can be appreciated by anybody who has ever seen a breathtaking sunset or inhaled the first fresh fragrances of spring.

SOCIAL WELLNESS

The formation and upkeep of meaningful interpersonal connections, which ultimately leads to a support network consisting of friends and family, are essential components of *social wellbeing*. Having strong social health makes you more self-assured in your relationships with other people and gives you a sense of emotional stability. It is not always the number of individuals in your significant support network; rather, what is crucial is the quality of those ties. The cultivation of excellent communication skills is very necessary for the upkeep of a robust social network.

ENVIRONMENTAL WELLNESS

The effect of one's surroundings on one's health is one component of environmental wellness, along with one's actions and how those actions impact the surrounding environment. Our surroundings have the potential to either promote or inhibit the overall health of our bodies. For instance, environmental problems such as air pollution and water contamination may have a negative impact on one's physical health. Inhaling filthy air may put a person at risk for developing several different respiratory diseases. Infectious diseases may be acquired via drinking water that is tainted with pathogenic bacteria and drinking water that is tainted with carcinogens can raise the chance of developing certain forms of cancer. Your surroundings have the potential to positively affect your state of health as well. For instance, being in a secure place might elicit emotions of comfort and security, which are beneficial to your mental health. If you feel comfortable in your surroundings, you will have a greater propensity to spend time outside, where you may work on your physical fitness and improve your overall health. The connection that we have with our surrounding world is a two-way street. What kind of effects do our actions have on the surrounding area? Do you recycle regularly, or does a significant portion of your waste be dumped in landfills? When you have the opportunity, do you participate in carpooling or do you utilize public transportation? To achieve comprehensive health, you must first educate yourself about the environment, then take precautions to protect yourself from environmental threats, and last, you must be responsible for the influence you have on the environment.

OCCUPATIONAL WELLNESS

Having a high degree of work satisfaction is a key component of *occupational wellbeing*. This is the result of a job that gives you a sense of purpose, challenges you intellectually, and connects you with like-minded people at work and beyond. Even though a high salary is desired, it does not ensure a healthy work environment. An employee's sense of well-being may be obtained if they appreciate what they do and are recognized for it. Occupational well-being is not a stand-alone aspect, but rather a significant contributor to the other three pillars of well-being: emotional, intellectual, and social.

FINANCIAL WELLNESS

Financial wellness **refers to the ability to live comfortably on your income and have the means to save for financial emergencies and goals such as education and retirement. Financial wellness involves your ability to manage your money responsibly. It can provide you with peace of mind and contribute to your emotional, social, and occupational wellness.**

INTERACTION OF WELLNESS COMPONENTS

None of the components of wellness works in isolation; all eight work closely together. For example, people with an anxiety or depressive disorder who also have a chronic physical illness report more physical symptoms than those who do not have a mental health disorder.[1] Strong spirituality is associated with lower rates of mental disorders, better immune function, and greater participation in health-promoting behaviors.[2,3] Total wellness is achieved through a balance of all aspects of wellness.

There is no doubt that wellness is an ever-changing phenomenon. Every day's decisions affect where you are on the wellness spectrum. Total well-being may be achieved by completing all eight wellness components at the same time at one end of the continuum. As a consequence, a low degree of well-being is achieved when just a few wellness components are achieved. Making healthy habits a part of your daily routine may help you achieve a state of optimum well-being.

None of the eight health components can operate alone; rather, they must all act together. Those who have mental health problems in addition to a long-term medical ailment, such as anxiety or depression, may have more physical

symptoms than those who do not. Spirituality has been linked to lower rates of mental illness, improved immunological function, and higher involvement in health-promoting activities. Only when all areas of well-being are examined can one achieve wholeness.

It should come as no surprise that well-being is an ongoing endeavor. The decisions you make daily advance you along a continuum of wellbeing that you have created for yourself. The state of complete well-being, which is located at one end of the continuum, is attained when all eight components of wellness are concurrently attained. A low degree of well-being, on the other hand, lies at the other end of the continuum. This kind of well-being is the outcome of merely accomplishing a few of the wellness components. Eliminating harmful behaviors and incorporating healthy habits into your daily routine are two steps you may take to improve your overall health and well-being.

EXERCISE IS ONE TYPE OF PHYSICAL ACTIVITY

Both "physical activity" and "exercise" refer to distinct aspects of human movement, yet they are often used interchangeably. Any kind of movement that involves using your muscles is considered to be a kind of physical exercise, regardless of how much energy it burns or why you do it. Getting active might be a lifestyle choice, something you do as part of your profession, or something you do for fun in your own time. Housework, walking to class, and using the stairs are all examples of activities that contribute to an active lifestyle. Any action that you do when you have spare time is considered to be a physical exercise for leisure.

In the context of physical activity, "exercise" refers to any action that is planned, organized, and carried out to enhance or maintain one's level of physical fitness. Because they are planned and contribute to either the maintenance or improvement of a person's physical fitness, almost all activities that focus on conditioning and fitness are considered forms of exercise. To improve one's health and level of physical fitness, people engage in a physical activity known as exercise, which often consists of strenuous activities such as jogging or swimming. Although there are positive effects on your health from participating in any kind of physical activity, exercise is the one that causes the most significant effects.

HEALTH BENEFITS OF EXERCISE AND PHYSICAL ACTIVITY

A recent report from the U.S. Centers for Disease Control and Prevention (CDC) reveals that only 20% of American adults engage in the recommended amount of exercise to promote health. Most of us are aware that there are many health benefits gained from regular exercise and physical activity. In addition to improving muscle tone and reducing body fat, regular exercise improves our fitness levels and ability to perform everyday tasks. Perhaps even more important, it can help you achieve total wellness.[4]

The advantages of regular physical activity are emphasized in the Surgeon General's report on physical activity and health. According to the results of this poll, inactivity is a major public health problem. On the other hand, studies have shown that as little as 30 minutes of mild to moderate physical exercise five days a week may significantly benefit one's health. According to this study, physical activity and exercise provide several health benefits. Various health benefits need varying levels of physical exercise. Cardiovascular disease, type 2 diabetes, and several cancers may all be reduced by regular exercise and physical activity. As we age, our bone mass declines, but when we exercise, we build it back up. Maintaining physical working capability as a person ages, extending life expectancy, and improving quality of life are all benefits of regular exercise. The benefits of regular physical activity include improved mood and a lower risk of depression and anxiety disorders.[5,6]

Health-related physical fitness and skill-related physical fitness are two broad categories of exercise training programs. The emphasis of this book is on increased overall physical activity for the sake of one's health. A health-related physical fitness program's overarching purpose is to enhance one's quality of life. Health risks may be reduced, and overall health can be improved by participating in this kind of workout program. Sport- and skill-related fitness, on the other hand, aims to enhance one's ability to participate in a certain sport or activity.

The majority of exercise experts think that health-related physical fitness is comprised of five main components: cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition. The execution of motor skills is considered the sixth component by some exercise experts. Agility and synchronization in the movement are examples of motor talents. Physical fitness as it relates to health is not heavily reliant on motor

skills, even though these abilities are critical for sports performance. These motor abilities, on the other hand, become more important as we become older since they may assist prevent falls in the elderly. Health-related physical fitness consists of five components: cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition.

It is possible to improve your overall well-being and happiness by adopting a healthy way of living. You're more likely to achieve comprehensive well-being if you engage in the following behaviors:

- **Stay physically active and engage in regular exercise**
- **Avoid sitting for extended periods**
- **Maintain a healthy weight**
- **Consume a nutritious diet**
- **Manage stress**
- **Stay away from drugs and cigarettes**
- **Keep your alcohol intake to a reasonable level**
- **Reduce your risk of injury**
- **Have your health checked regularly, and take precautions to prevent contracting infectious illnesses**
- **Keep up good ties with your family and friends**
- **A healthy spiritual practice involves looking for meaning in one's life and concentrating on the good qualities of that meaning and existence.**
- **Participate in a line of work that gives you a sense of accomplishment and happiness.**
- **Maintain a standard of living that is appropriate for your income level and be responsible with your money.**

THE PHASES OF CHANGE

Stage 1: Individuals in stage 1 have no current plans to change their unhealthy behavior. They might not realize the need to change, or they simply may not want to change. Moving from this stage to the next requires increased knowledge about the benefits of healthy behaviors so that the need for change is recognized.

Stage 2: In stage 2, a person is aware of the need for behavior change and intends to make a change within the next several months. However, people in this stage are often unclear about how to accomplish this change. To advance

beyond this stage, additional information and details about how to initiate behavior change are needed.

Stage 3: During stage 3, the person plans to take action within a month. He or she acknowledges the benefits of behavior change and is aware of the process required. In some cases, the person might have created a change plan.

Stage 4: In stage 4, the person is actively doing things to bring about behavior change. This phase requires motivation and commitment. Relapse into old and unhealthy patterns is common during this stage, and the individual could regress to the previous stage.

Stage 5: After sustaining the behavior change for 6 months, the person enters the maintenance stage. At this point, the change has become a habit and requires less conscious effort. As this stage progresses, the temptation to resume old habits steadily decreases. The length of time that a person spends in each of the previous stages is highly individual, and people often move back and forth between the stages several times before they can make the behavior change permanent.

Stage 6: After a person has maintained a behavior for more than 5 years, they have reached the final stage. Reaching this stage means that the healthy behavior has become normal behavior, and there is no fear of returning to old harmful patterns. People in this stage have attained an improved self-image and are capable of maintaining their target behavior.

NEGATIVE SIDE EFFECTS OF A SEDENTARY LIFESTYLE

YOU BURN FEWER CALORIES WHILE SITTING

Obviously, a trip to the gym or a yoga class burns calories. But you'd be surprised at how many calories you burn doing even the simplest of things such as standing and walking. This type of low-level energy-burning is called NEAT — *non-exercise activity thermogenesis*. Ensuring you keep this level of energy high is one of the best ways you can battle weight gain. Low-energy activities such as sitting or lying down do not require much energy, and thus are putting limitations on the number of calories you burn every day via NEAT.[1]

MORE TIME SITTING MEANS HIGHER CHANCES OF WEIGHT GAIN

This shouldn't come as a surprise — the more time you spend sitting, the fewer calories you burn, and thus, the higher your chances are of gaining weight. Not only does sitting for long periods leads to weight gain, but it can also lead to severe weight gain, in the form of obesity. The more sedentary your lifestyle, the greater your chances are to become obese. A study found that people who are obese spend an additional 2 hours sitting each day than your average person. That means, that someone who is obese spends at least 14 hours a day sitting.[2]

LONG PERIODS OF SITTING PUT YOU AT RISK FOR CHRONIC DISEASE

The more time you spend sitting, the higher your chances are of developing one of the 30 chronic diseases that are related to a sedentary lifestyle. The biggest diseases you're at risk for when you spend too much of your life sitting are type 2 diabetes and heart disease. In fact, those leading sedentary lives are at a 112% higher risk of developing type 2 diabetes, and a 147% higher risk of developing heart disease. People who walk less than 1,500 steps a day and sit for extended periods without adjusting their caloric intake are much more likely to become insulin resistant. In other words, the more inactive you are, the higher your chances of developing insulin resistance, and thus, likely type 2 diabetes.[3]

SITTING TOO MUCH MAY LEAD TO EARLY DEATH

Though quite morbid, this is an unavoidable topic. Quite a bit of research has been done on the subject, and it has been determined by some that the majority of people leading sedentary lives were putting themselves at a 22-49% higher risk of early death.[4]

ONE HOUR OF EXERCISE DOES NOT REVERSE ALL THE SITTING TIME

Wouldn't it be great if you could spend one hour at the gym or running outside to reverse the negative effects of sitting all day? Unfortunately, it does not work that way. Regardless of your daily exercise habit, sitting for long periods will lead to some health problems. While those health problems increase when you're not exercising at all, don't think that your daily yoga classes will offset the hazards of your 8-12 hours of sitting for the day.[5]

SEDENTARY BEHAVIOR, EXERCISE, AND CARDIOVASCULAR HEALTH

Sedentary behavior and physical inactivity are among the leading modifiable risk factors worldwide for cardiovascular disease and multi-factor mortality. The promotion of physical activity and exercise training leading to improved levels of cardiorespiratory fitness is needed in all age groups, races, ethnicities, and both sexes to prevent many chronic diseases, especially cardiovascular disease. There is negative impact of sedentary behavior and physical inactivity, as well as the beneficial effects of physical activity and exercise training and cardiorespiratory fitness for the prevention of chronic noncommunicable diseases, including cardiovascular disease.[6]

Although the American Heart Association, the American College of Cardiology, and the American College of Sports Medicine, among other leading organizations, have emphasized that sedentary behavior and physical inactivity are major modifiable cardiovascular disease risk factors, a sizable percentage of the United States and worldwide population still present with high levels of sedentary behavior and low levels of physical activity. Recently, a major emphasis has been directed at making health promotion a priority, including the promotion of exercise training and improving levels of cardiorespiratory fitness in the United States and worldwide in efforts to prevent chronic diseases, especially cardiovascular disease. In addition to the positive cardiovascular health effects associated with increases in moderate and vigorous activity, there is emerging evidence of negative health consequences associated with sedentary behavior. It is important to emphasize that sedentary

behavior is distinct from physical inactivity, where an individual does not perform moderate-to-vigorous activity. One can envision the situation where someone is physically active for the recommended 150 to 300 minutes per week, yet they may sit for several hours a day in a sedentary occupation or during their leisure time.[7]

PROBLEMS WITH PROLONGED SITTING

The American Heart Association recommends minimizing time spent sitting and breaking up periods of prolonged sitting. Experimental studies have mimicked sedentary behavior in a laboratory setting and have compared individuals with prolonged sitting with individuals who perform intermittent light-intensity activity. Compared with prolonged sitting, breaking up sitting time with intermittent, light-intensity activity can promote better health. Individuals that chronically sit for long periods without intermittent activity have reduced metabolism. Taken together, these results indicate that the metabolic disturbances observed with sedentary behaviors result from lowered overall metabolism. There are a large number of studies of the associations between sedentary behaviors, such as daily sitting time or television viewing, and health outcomes. There is also considerable evidence for the associations between sedentary behavior and mortality from cardiovascular and other diseases.[8]

SEDENTARY LIFESTYLES & HEALTH RISKS

SEDENTARY LIFESTYLES, MORTALITY, AND MORBIDITY

A sedentary lifestyle is strongly associated with cardiovascular disease, diabetes, cancer, and premature mortality. The total daily sedentary time and television viewing time are correlated with increased mortality risks. Sedentary time (sitting time, television or screen viewing time, leisure time while sitting in a day) is associated with, cardiovascular and other related diseases. In particular, the adverse effect of sedentary time was more evident among people who engaged in little physical activity compared to those who engaged in frequent physical activity. The relative risk for multi-cause mortality was 30% higher with high physical activity compared to that with low physical activity.[1]

SEDENTARY LIFESTYLES AND METABOLIC DISEASES

Diabetes Mellitus – The prevalence of type 2 diabetes mellitus increases with increasing sedentary time has been consistently documented in various studies. In an assessment of risk considering both sedentary time and physical activity, the risk increased with the increasing daily sedentary time, and the effect was not offset by the level of physical activity. The risk for cardiovascular disease also increased with the increasing daily sedentary time, and although the physical activity level slightly offset this effect, sedentary time still significantly increased the risk. This shows that the level of physical activity does not influence the impact of prolonged sedentary time on the risk for cardiovascular disease. A few biological mechanisms can explain the impact of the total daily sedentary time on cardiovascular disease and risk. Prolonged sitting is known to affect the content and activity of muscle glucose transporter proteins.[2]

Hypertension - A sedentary lifestyle affects blood pressure through various mechanisms, and subsequently changes the blood pressure by altering the cardiac output and total peripheral vascular resistance. A prolonged sedentary time reduces the metabolic demands and systemic blood flow, and by stimulating the sympathetic nervous system, it decreases insulin sensitivity and vascular function while increasing oxidative stress and promoting the low-grade inflammatory cascade. Among sedentary behaviors, non-interactive sedentary behaviors (watching television, sleeping) have been reported to further escalate the risk compared to interactive sedentary behaviors (driving,

using a computer).[3]

Dyslipidemia - Sedentary behaviors induce metabolic dysfunction characterized by elevated blood triglyceride levels, reduced -cholesterol levels, and diminished insulin sensitivity. A study reported that sedentary behaviors increased the rate and risk of newly diagnosed dyslipidemias.[4]

Obesity - Sedentary time is known to have significant correlations with waist circumference. Obese patients tend to move less; therefore, increasing the activity levels is necessary for better health. Sitting too long is associated with obesity and poor health.[5]

SEDENTARY LIFESTYLES AND CANCER RISK

Sedentary behavior is also closely related to the prevalence of cancer. According to a study that investigated the correlation between sedentary behavior and cancer prevalence, the cancer risk was 13% higher in the group with the longest sedentary time compared to that with the shortest sedentary time, and another study reported that sedentary time increased the overall cancer risk by 20%. Prolonged sitting increases colorectal, endometrial, ovarian, and prostate cancer risks, and it has been reported to increase cancer mortality, particularly in women. There is a significant correlation between sedentary behavior and increased cancer mortality, incidences of breast, colorectal, endometrial, and epithelial ovarian cancers. Additionally, television viewing time was also positively correlated with colon cancer and endometrial cancer. Occupational sitting time was positively correlated with only colon cancer. Sedentary behavior leads to metabolic dysfunctions such as hyperglycemia, hyperinsulinemia, insulin resistance, perturbation of the insulin-like growth factor axis, and changes in the circulation levels of sex hormones. Altered circulation levels of sex hormones can be linked to hormone-related cancers such as breast and endometrial cancers.[6]

SEDENTARY LIFESTYLES AND OSTEOPOROSIS

Sedentary behavior is known to show a negative association with the bone mineral density irrespective of moderate to vigorous physical activity. Bone mineral density was correlated with the duration and not the frequency of sedentary behavior.[7]

SEDENTARY LIFESTYLES AND MUSCULOSKELETAL DISEASES

A prolonged sedentary time was correlated with chronic knee pain. In an analysis of the correlation between chronic knee pain and the total daily sedentary time, the results claimed that the incidence of chronic knee pain was higher in individuals with longer sedentary times. In particular, a sedentary time >10 hours a day was markedly correlated with chronic knee pain. People who engaged in greater physical activity had less chronic knee pain but women with >10 hours of sedentary time while engaging in greater physical activity were highly likely to experience chronic knee pain. Research studies recommend individuals shorten their sedentary times to <10 hours a day.[8]

SEDENTARY LIFESTYLES AND OTHER DISEASES

Depression - Mentally passive sedentary behaviors such as television viewing, sitting, listening to music, and talking while sitting were positively correlated with depression risks. In contrast, mentally active sedentary behaviors such as reading books or newspapers, driving, attending a meeting, or knitting or sewing were not markedly correlated with depression risk. Using a computer, which is a mentally active sedentary behavior, was not correlated with depression risk in one study but was positively correlated with depression risk in another study, and thus its correlation with depression remains controversial. The mechanism underlying the correlation between sedentary behavior and depression may involve the following: sedentary behaviors may increase the risk for depression by blocking direct communication and lowering social interactions, or by reducing the available time to engage in physical activities that help to prevent and treat depression.[9]

PHYSICAL ACTIVITY & MENTAL ACTIVITY

WHAT IS PHYSICAL ACTIVITY?

Physical activity can be defined as any movement of the body that requires energy expenditure. This includes any motion you do through the day excluding sitting still or lying down. For example, walking to class, taking the stairs, mowing the lawn, and even cleaning your house can be considered physical activities. Exercise is a type of physical activity but not every physical activity is exercise. Exercise is a planned, structured, and repetitive activity to improve or maintain physical fitness.[1]

WHY SHOULD I BE PHYSICALLY ACTIVE?

The fight against obesity: More than one-third of U.S. adults (35.7%) are obese. In simplest terms, obesity is excessive fat accumulation that impairs health. Obesity has a wide range of medical complications, including pulmonary disease, cancer, stroke, gall bladder disease, diabetes, and many more. The cause of obesity in two people is rarely the same – genetics, lifestyles, and even viruses all play a role.[2] Fighting obesity can be influenced by certain risk factors. Modifiable risk factors related to obesity include physical activity, excess caloric intake, and low socioeconomic status. There are also non-modifiable risk factors; age, heredity, ethnicity/race, culture, and metabolism. Obesity is a growing epidemic in our nation. *The change starts with us.*[2]

WHAT THE EXPERTS SAY

Performing physical activity regularly will help to improve overall health and fitness, as well as decrease the risk for many chronic diseases.[2]

HEALTH: The World Health Association defines it as, "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."[2]

HEALTH-RELATED FITNESS: The American Academy of Sports Medicine defines health-related fitness as a set of attributes one already has or works towards. This develops through physical activity and aids in the performance of daily function with vigor and without fatigue.[2]

CHRONIC DISEASES: A condition that impairs daily living and decreases longevity and quality of life. Some examples include cancer, heart disease, diabetes, and Alzheimer's disease.[3]

WHAT DOES THIS MEAN FOR YOU?

Benefits of Physical Activity

- **Reduced risk for cardiovascular disease, type II diabetes, certain cancers, and other chronic health conditions**
- **Help with weight control**
- **Strengthens bones and muscles**
- **Improves mental health, mood, and energy level**
- **Better quality of life**[4]

FOUR TYPES OF EXERCISE CAN IMPROVE YOUR HEALTH AND PHYSICAL ABILITY

Most people tend to focus on one type of exercise or activity and think they're doing enough. Research has shown that it's important to get all four types of exercise: *endurance, strength, balance, and flexibility*. Each one has different benefits. Doing one kind also can improve your ability to do the others, and variety helps reduce boredom and the risk of injury. No matter your age, you can find activities that meet your fitness level and needs![5]

- **Endurance**
- **Strength**
- **Balance**
- **Flexibility**
- **Endurance exercises for older adults**

Endurance activities often referred to as aerobic, increase your breathing and heart rates. These activities help keep you healthy, improve your fitness, and help you perform the tasks you need to do every day. Endurance exercises improve the health of your heart, lungs, and circulatory system. They also can delay or prevent many diseases that are common in older adults such as diabetes, colon and breast cancers, heart disease, and others. Physical activities that build endurance include:[6]

- **Brisk walking or jogging**
- **Yard work (mowing, raking)**
- **Dancing**
- **Swimming**
- **Biking**

- **Climbing stairs or hills**
- **Playing tennis or basketball**

Increase your endurance or "staying power" to help keep up with your grandchildren during a trip to the park, dance to your favorite songs at a family wedding, rake the yard and bag up leaves. Build up to at least 150 minutes of activity a week that makes you breathe hard. Try to be active throughout your day to reach this goal and avoid sitting for long periods.

SAFETY TIPS

Do a little light activity, such as easy walking, before and after your endurance activities to warm up and cool down. Listen to your body: endurance activities should not cause dizziness, chest pain or pressure, or a feeling like heartburn. Be sure to drink liquids when doing any activity that makes you sweat. If your doctor has told you to limit your fluids, be sure to check before increasing the amount of fluid you drink while exercising. If you are going to be exercising outdoors, be aware of your surroundings. Dress in layers so you can add or remove clothes as needed for hot and cold weather. To prevent injuries, use safety equipment, such as a helmet when bicycling. A quick tip: test your exercise intensity. When you're being active, try talking: if you're breathing hard but can still have a conversation easily, it's moderate-intensity activity. If you can only say a few words before you have to take a breath, it's vigorous-intensity activity.[7]

STRENGTH EXERCISES FOR OLDER ADULTS

Your muscular strength can make a big difference. Strong muscles help you stay independent and make everyday activities feel easier, like getting up from a chair, climbing stairs, and carrying groceries. Keeping your muscles strong can help with your balance and prevent falls and fall-related injuries. You are less likely to fall when your leg and hip muscles are strong. Using your own weight to improve your muscle strength is a form of "strength training" or "resistance training."

Some people choose to use weights to help improve their strength. If you do, start by using light weights at first, then gradually add more. Other people use resistance bands, stretchy elastic bands that come in varying strengths. If you are a beginner, try exercising without the band or use a light band until you are comfortable. Add a band or move on to a stronger band (or more weight) when you can do two sets of 10 to 15 repetitions easily. Try to do strength

exercises for all your major muscle groups at least 2 days per week, but don't exercise the same muscle group on any 2 days in a row. Below are a few examples of strength exercises:[8]

- **Lifting weights**
- **Carrying groceries**
- **Gripping a tennis ball**
- **Overhead arm curl**
- **Arm curls**
- **Wall push-ups**
- **Lifting your body weight**
- **Using a resistance band**

SAFETY TIPS

- **Don't hold your breath during strength exercises and breathe regularly.**
- **Breathe out as you lift or push and breathe in as you relax.**
- **Talk with your doctor if you are unsure about doing a particular exercise.**
- **Balance exercises for older adults**
- **Balance exercises help prevent falls, a common problem in older adults that can have serious consequences. Many lower-body strength exercises also will improve your balance.**[9]

LIFESTYLE CHANGES

MAKING LIFESTYLE CHANGES THAT LAST

You're once again feeling motivated to eat better, exercise more, drink less caffeine, or make any number of the positive lifestyle changes you've been telling yourself you want to make. You've tried before—probably declaring another attempt as a New Year's resolution—but without feeling much success. Making a lifestyle change is challenging, especially when you want to transform many things at once. This time, think of it not as a resolution but as an evolution. Make a plan that will stick. Your plan is a map that will guide you on this journey of change. You can even think of it as an adventure. When making your plan, be specific. Want to exercise more? Detail the time of day when you can take walks and how long you'll walk. Write everything down and ask yourself if you're confident that these activities and goals are realistic for you. If not, start with smaller steps. Post your plan where you'll most often see it as a reminder. *Start small.* After you've identified realistic short-term and long-term goals, break down your goals into small, manageable steps that are specifically defined and can be measured. Is your long-term goal to lose 20 pounds within the next five months? A good weekly goal would be to lose one pound a week. If you would like to eat healthier, consider as a goal for the week replacing dessert with a healthier option, like fruit or yogurt. At the end of the week, you'll feel successful knowing you met your goal. Change one behavior at a time. Unhealthy behaviors develop over the course of time, so replacing unhealthy behaviors with healthy ones requires time. Many people run into problems when they try to change too much too fast. To improve your success, focus on one goal or change at a time. As new healthy behaviors become a habit, try to add another goal that works toward the overall change you're striving for. Involve a buddy. Whether it be a friend, coworker, or family member, someone else on your journey will keep you motivated and accountable. Perhaps it can be someone who will go to the gym with you or someone who is also trying to stop smoking. Talk about what you are doing. Consider joining a support group. Having someone with whom to share your struggles and successes makes the work easier and the mission less intimidating. Ask for support. Accepting help from those who care about you and will listen strengthens your resilience and commitment. If you feel overwhelmed or unable to meet your goals on your own, consider seeking help from a psychologist. Psychologists are uniquely trained to understand the connection between the mind and body, as well as the factors that promote

behavior change. Asking for help doesn't mean a lifetime of therapy; even just a few sessions can help you examine and set attainable goals or address the emotional issues that may be getting in your way.[1]

Making the changes that you want takes time and commitment, but you can do it. Just remember that no one is perfect. You will have occasional lapses. Be kind to yourself. When you eat a brownie or skip the gym, don't give up. Minor missteps on the road to your goals are normal and okay. Resolve to recover and get back on track.[2]

LIFESTYLE CHANGES FOR IMPROVED HEALTH

Your lifestyle includes any choice or action you make that influences your life in some small way. Taken together, these choices and actions reflect your attitude and values. During a wellness program, you'll be encouraged to make changes to your lifestyle. While medications can help you lose weight, overcome pain and reduce some symptoms of aging, making changes to your lifestyle will allow you to maintain those benefits long-term.[3]

WHAT ARE LIFESTYLE CHANGES?

Lifestyle changes are behavior modifications or habit changes that encourage positive changes in your life. These are fundamental components of any wellness program.

Examples of lifestyle habits include:

- **Sleeping patterns**
- **Eating tendencies**
- **Level of physical activity**
- **Stress management practices**
- **Hydration habits**

Making changes to these habits can create lasting effects on your well-being. The foods you eat, the amount of sleep you get, and your exercise habits can all influence your weight, hormone health, and level of pain.

HOW TO MAKE A HEALTHY LIFESTYLE CHANGE

Healthy habit formation requires practice and routine. After approximately 21 days, engaging in a new behavior begins to feel natural. This means you could form a healthy habit in just three weeks. Habit replacement is the most effective method for making lifestyle changes. Instead of just stopping an unhealthy habit or simply starting a healthy one, find behavior that needs improvement and replace it with something related. For example, the habit of snacking while watching TV can be replaced with basic hand-weight exercises or walking on a treadmill while watching TV.

There are three primary categories of lifestyle changes. They are:

- **Psychological changes: This includes changes to your attitude, your mood, and the way you manage stress. To make healthy psychological changes, you may find it useful to join a support group or keep a journal.**
- **Behavioral changes: While all lifestyle changes are technically behavior, this category refers to things like your sleeping habits, activity level, and planning efforts.**
- **Dietary changes: Making healthy changes to your diet can help you lose weight, balance hormone levels, and manage pain. These changes will include controlling portion sizes, drinking more water, and following a nutritious diet.**

The most effective way to make lasting changes in your life is to start small. This includes approaching each habit you have and evaluating the way it is impacting your lifestyle. Then make simple, realistic changes as needed. Changing just one behavior at a time can lead to lasting changes in your life, and is much less intimidating than attempting to completely overhaul your current lifestyle.[4]

LIFESTYLE CHANGES FOR GOOD HEALTH

1. Get fat…in your diet

No, this is not a license to make fried food a dietary staple (please, please don't do that). But good fats from foods like avocado, olive oil, fatty fish, and nuts are essential for immune system function, fat burning, feeling full, and glowing skin. The fear of fat had a lot to do with a long era of carb and sugar diet dominance, which we now know had all kinds of negative health effects.[4.1]

2. Get 7–9 hours of sleep every single night.

The drawbacks to skimping on sleep are no joke. Consider this: if you're skipping just an hour and getting six each night, your risk of obesity goes up 23 percent. You need seven to nine every night, even if that means skipping a 6:00-a.m. workout every once in a while. If you have trouble getting to sleep, use calming essential oils, eat sleep-promoting foods, or try learning from your sleep patterns by wearing a tracking watch. You can also work on creating a better environment for sleep.[4.2]

3. Drink water like it's going out of style.

It's impossible to overstate how important staying hydrated is. Drinking enough water (ideally 64 ounces, or eight eight-ounce glasses per day) will lead to more energy, better skin, and maybe even weight loss.[4.3]

4. Get up and get moving.

Yes, vigorous exercise is essential, but heavy lifting for an hour can't undo the negative effects of sitting for the entire rest of the day. In fact, a recent study found some of exercise's benefits were negated by prolonged periods of sitting. Invest in a tool that tracks your steps, like to encourage you to move enough throughout the day. Try taking the stairs or taking short walks around your office at the top of every hour.[4.4]

5. Take a probiotic.

Which supplements you need and don't need can be super confusing, but science is increasingly pointing to the vast health benefits of a healthy gut, from a better mood to a strong immune system. One easy way to start working on your microbiome is to pop a high-quality probiotic daily.[5]

ENERGY EXPENDITURE

HOW TO BOOST YOUR ENERGY EXPENDITURE

Energy expenditure is the amount of energy that a person needs to carry out physical functions such as breathing, circulating blood, digesting food, or exercising. Energy is measured in calories, and your total daily energy expenditure (TDEE) is the number of calories you burn each day. To prevent weight gain, energy intake must be balanced with energy expenditure.[1]

WHAT IS ENERGY EXPENDITURE?

To understand energy expenditure, you must understand how your body produces energy. To provide fuel for movement and daily functions, your body makes energy in the form of heat.

WHAT ARE KILOCALORIES?

The energy found in food is measured in kilocalories, or calories as we commonly refer to them. Technically speaking, a kilocalorie is the amount of heat required to raise the temperature of one kilogram of water by one degree Celsius. The total number of calories you burn for energy each day is your total daily energy expenditure. Total daily energy expenditure varies from person to person, depending on body size, sex, body composition, genetics, and activity level. The total energy expenditure for a small, sedentary woman, for example, might be 1800 calories or less per day. The TDEE for a large, active man, on the other hand, can easily be over 2000 calories. Because the man in this example has more muscle mass, a higher daily activity level, and is a larger person, his TDEE is greater.[2]

WEIGHT LOSS

To lose weight, your body must use more calories than you eat. That means that you either need to increase your energy expenditure, decrease your calorie intake, or, ideally, do a combination of both to create a calorie deficit. Most experts recommend creating a total calorie deficit of 3500–7000 calories per week to lose 1–2 pounds of body fat per week. You may come across websites, diet companies, and even "experts" who say you should ignore energy expenditure when weight loss is your goal or perhaps you feel like the calories in/calories out method has failed you in the past. But it's important to note that even if you get your calories from nutritious foods, you still need to reduce your

total intake in order to lose weight. Creating a calorie deficit may sound simple on paper but trying to lose weight can be a challenge. Learning to change your daily habits is challenging.[3]

THERMIC EFFECT OF FOOD (TEF)

It may sound counterproductive, but you also expend energy when you eat. The process of chewing and digesting food requires effort and energy from your body. And certain foods burn more calories than others. Scientists call this the Thermic Effect of Food. Unfortunately, eating alone won't burn enough calories to make a noticeable difference in your weight loss program. But to give yourself every advantage, choose foods that burn more calories to give your total daily energy expenditure a little nudge.[4]

THE ROLE OF PILLS AND SUPPLEMENTS

There are several pills and supplements that claim to help increase your metabolism, allowing you effortlessly to burn more calories each day. But many of these diet pills are either unsafe or ineffective. Diet pills and supplements are generally not recommended unless prescribed by your physician. Unfortunately, if something sounds too good to be true, it usually is. It's always better to be safe than sorry if you're thinking about experimenting with diet pills.[5]

BASAL ENERGY EXPENDITURE AND RESTING ENERGY EXPENDITURE

Basal Energy Expenditure (BEE) is the minimum amount of energy expended that is compatible with life. BEE typically represents 60%–70% of total energy expenditure. The resting energy expenditure (REE) is the amount of energy expended by a resting individual in a thermoneutral environment without the effects of meal consumption, physical activity, or physiological or mental stress. REE maybe 10%–20% greater than the true basal metabolic rate. REE also differs from BEE; in that, it is measured in the morning upon awakening after 12–18 hours of rest and is dependent on the circadian rhythms at that time of day.[6]

Energy Expenditure: - Each cell in the human body requires energy to maintain its structure and functional capabilities. This energy required to maintain the structure of all cells of an organism is called basal metabolic rate and is sometimes used synonymously with resting metabolic rate.[7]

A person's basal metabolic rate is closely correlated to the amount and proportion of the free fat mass (FFM). FFM was shown to be seven times more metabolically active than fat mass. This explains why males exhibit a 5%–10% higher basal metabolic rate than females because of their somewhat higher FFM percentage. The higher rate of metabolism of infants and adolescents due to the demands of growth also leads to an increased basal metabolic rate. The FFM is not a homogenous mass but consists of different organs and tissues exhibiting different metabolic rates.[8]

Assessment of Protein & Energy Requirements: - basal energy expenditure can be calculated from age, height, and weight using one of the standard formulae.[9]

Energy Balance—Intake and Expenditure and Nutrition: - There is a strong connection between all these factors as related to overall fitness, wellness, and the ability to make appropriate decisions based on one's health circumstances. One needs to be aware of energy expenditure in relation to weight loss plans, resting energy expenditure, and overall physical activity.[10]

ENJOYMENT OF PHYSICAL ACTIVITY

Children and youth must develop a lifestyle of regular physical activity to maximize long-term health benefits. To do this, means "turning children on" to physical activity by making it enjoyable and keeping them coming back due to an intrinsic desire to be physically active. Providing enjoyable experiences is a potent strategy for increasing activity levels in youth, their attitude about the value of exercise, and ultimately long-term health outcomes. But what factors will enhance the probability that physical activity will be fun for children and youth? More specifically, what social, environmental, and individual difference factors maintain or enhance children's interest in participating in physical activity? There are many sources of enjoyment among youth in various activities such as club volleyball, Little League baseball, age-group swimming, and high-level figure skating. Robust enjoyment sources included positive social interactions, support, and involvement from parents, coaches, and peers, self-perceptions of physical ability, social recognition of physical competence, effort exerted in learning and demonstrating skills, mastery, and achievement of skills, and movement sensations. Movement sensations represent a unique component to physical activity experiences that are not found in other achievement domains (academic, music, art). Children and youth often report exhilaration from gliding through the water while swimming or skiing, negotiating a path while speeding on rollerblades, and flipping through the air in gymnastics and skating. We must be mindful of these particular sources of enjoyment as we seek to offer opportunities for experiencing fun.[1]

Sports commitment **is defined as the desire and resolve to continue participation in an activity. Multiple determinants influence commitment to an activity positively or negatively. Sport enjoyment is defined as a positive affective response to an activity that reflects feelings of pleasure, liking, and fun. Involvement alternatives reflect the attractiveness of other activities that could compete with continued participation in the current activity. Three barriers were identified to discontinuing one's current involvement. Personal investments pertain to the time, effort, energy, and any other resources that would be lost if participation in the activity was discontinued. Social constraints refer to perceived pressure from significant adults and peers to remain in the activity that instills a sense of obligation to continue involvement. Finally, involvement opportunities are the anticipated benefits afforded from continued participation in physical activity such as friendships, positive interactions with adults, skill mastery, and enhanced physical conditioning or appearance.[2]**

ENHANCING PHYSICAL ACTIVITY IN KIDS

Perceptions of competence and self-esteem influence enjoyment and physical activity behaviors. Thus, intervention strategies must focus on maintaining and enhancing children's self-evaluations of physical ability to ensure continued interest and participation. Enjoyment and other positive emotional experiences associated with physical activity sustain commitment toward and actual levels of physical activity. The activities that kids do must be fun and more appealing than alternative unhealthy activities. Finally, social support from parents, teachers, coaches, and peers is essential to positive self-beliefs, enjoyment, and motivation to continue the activity. There are meaningful relationships among social support, self-evaluations, enjoyment, and physical activity. Several strategies for maintaining and enhancing motivation and physical activity in kids exist. *Provide optimal challenges.* An optimal challenge matches the difficulty level of activities to the child's capabilities. Thus, children's successful mastery of skills is within reach, but they must exert the necessary effort and persistence to attain the goal. One can think of optimal challenges as "matching the activity to the child, and not the child to the activity." Skills that are too easy in relation to a child's talents are boring and do not allow for realistic goals. Skills that are too difficult invoke anxiety and frustration when persistent efforts are unsuccessful. Because children use mastery of skills, effort expenditure, and self-improvement as criteria for determining how physically competent they are, optimal challenges offer children a prime opportunity for developing and demonstrating competence that is at the cutting edge of their capabilities. Teachers, coaches, and parents should ensure developmental progressions in skills and physical activities, collaborate with children in setting realistic goals for physical activity, and modify games or activities to allow for optimal challenges.[3]

CREATE A MASTERY MOTIVATIONAL CLIMATE

Coaches and teachers influence children's beliefs, affective responses, and behaviors by shaping the learning environment or motivational climate in which activities take place. Motivational climate focuses on how success is defined, how children are evaluated, what is recognized and valued, and how mistakes are viewed. A mastery motivational climate promotes learning, effort, and self-improvement, and mistakes are viewed as part of the learning process. Success is self-referenced, and personal improvements are recognized, praised, and emphasized. In contrast, a performance climate emphasizes norm-

referenced modes of success and evaluation for recognition that focuses upon favorable comparison to peers. The motivational climate that is perceived by participants impacts their perceptions of ability, attraction toward physical activity, and motivation. The acronym TARGET is used to identify effective strategies for structuring a mastery motivational climate in physical activity contexts. TARGET stands for dimensions of *Task, Authority, Recognition, Grouping, Evaluation, and Time*. Specifically, task variety and optimal challenges, opportunities for choice and shared decision-making, recognition of effort and self-improvement, partner and small-group problem-solving tasks, evaluation criteria focused on self-referenced standards, and adequate time for learning and demonstrating skills define the ingredients for maximizing a mastery climate. Parents, teachers, and coaches are charged with coloring the physical activity environment to achieve these "targeted" goals. A mastery climate emphasizes cooperative learning rather than competition, diverse abilities, recognition based on individual improvement, and reduction of peer comparison. Such an environment is also most conducive to fostering positive peer relationships, enhancing peer acceptance, and creating opportunities for close friendship development.[4]

MAKE PHYSICAL ACTIVITY FUN

Time and again enjoyment emerges as a strong predictor of motivated behavior. When we enjoy the activities that we do, we want to do them more often. This not only applies to children and teenagers but adults as well! What makes activities fun? We know from studies with children and adolescents that high action and scoring, high personal involvement in the action, close games, and opportunities to affirm friendships are key to activity enjoyment. Change-of-pace activities (e.g., varying activity type and doing so relatively often) and allowing children some choices in activity selection are also key.[5]

SUBCOMPONENTS & ELEMENTS OF PHYSICAL ACTIVITY

COMPONENTS OF PHYSICAL FITNESS

The 5 components of physical fitness are often used in our school systems, health clubs, and fitness centers to gauge how good of a shape we are truly in. The 5 components that makeup total fitness are:[1]

- **Cardiovascular Endurance**
- **Muscular Strength**
- **Muscular Endurance**
- **Flexibility**
- **Body Composition**

Total fitness can be defined by how well the body performs in each one of the components of physical fitness as a whole. It is not enough to be able to bench press your body weight. You also need to determine how well you can handle running a mile etc.[2]

A closer look at the individual components: Cardiovascular endurance is the ability of the heart and lungs to work together to provide the needed oxygen and fuel to the body during sustained workloads. Examples would be jogging, cycling, and swimming.[3]

Muscular strength is the amount of force a muscle can produce. Examples would be the bench press, leg press, or bicep curl. The push-up test is most often used to test muscular strength. Muscular endurance is the ability of the muscles to perform continuously without fatigue. Examples would be cycling, step machines, and elliptical machines. The sit-up test is most often used to test muscular endurance. Flexibility is the ability of each joint to move through the available range of motion for a specific joint. Examples would be stretching individual muscles or the ability to perform certain functional movements such as the lunge. The sit and reach test is most often used to test flexibility. Body composition is the amount of fat mass compared to lean muscle mass, bone, and organs. This can be measured using underwater weighing, skinfold readings, and bioelectrical impedance. Underwater weighing is considered the "gold standard" for body fat measurement, however because of the size and expense of the equipment needed very few places are

set up to do this kind of measurement.[4]

COMPONENTS OF PHYSICAL FITNESS IN ACTION

Ladies, being physically fit is not just about looking good in a bikini or having a tight backside, or not having fat dangling from your arms when waving. Gentlemen, being physically fit is not about how much weight you can bench press, how big your biceps are, or whether you have a four-pack or a six-pack for abs. Certainly, this is all good stuff. However, everyone should consider all aspects of physical fitness in order to be defined as a physically fit individual.[5]

The 11 Components of physical fitness include:

- **Agility**
- **Balance**
- **Body Composition**
- **Cardiovascular Endurance**
- **Coordination**
- **Flexibility**
- **Muscular Endurance**
- **Muscular Strength**
- **Power**
- **Reaction Time**
- **Speed**

All 11 components of fitness are present in everyone's daily lives. You just may not realize it. For instance, you use agility when walking quickly through a crowd during Christmas shopping at the mall. Muscular strength and endurance are being used when unloading a carload of groceries from Costco. Your reaction time is being challenged every day you drive your car to work or drive the kids to school. Your body composition is stagnating every time you choose not to go for a long walk outside and instead sit on the couch watching Real Housewives or your favorite sports team. Trying to incorporate 10 of the 11 components into one workout may seem impossible. But take some time and consider a training session that utilizes an exercise step or, some dumbbells, a medicine ball, and your body. You will find you can incorporate the 10 components into one workout. Knowing all 11 components of physical fitness will help you to be stronger, and leaner, and will increase your fitness level at

any age. These components should not be forgotten when heading off to the gym or when heading out for an evening walk. You may find yourself doing an extra push-up or picking up your pace and starting into a light jog. Enjoy your training and have fun.[6]

PHYSICAL FITNESS

The need for physical fitness and well-being, as discussed earlier, provide manifold benefits. The quality of life of an individual improves when he/she consciously adopts a healthy lifestyle that promotes physical fitness as follows:

Physical fitness: - improves:

- **the functioning of the heart and lungs by increasing the availability of oxygen to all tissues and organs in the body system**
- **improves muscle tone**
- **promotes the development of good posture, proportionate figure, and thereby positive body image and physical appearance**
- **ensures quick recovery after injury and illness**
- **decreases the risk of cardiovascular disease**
- **reduces and controls undesirable body fat**
- **the maintenance of ideal body weight**
- **the increased energy level of a person**
- **improves the mood by reducing depression and anxiety**
- **postpones fatigue and reduces recovery time after vigorous activity**
- **helps people to meet challenges of life**
- **makes them self-confident and delays the aging process**

Being physically fit is important for all age groups. To live a better life to the fullest and enjoy all the opportunities, one tries to be physically fit. Physical fitness is essential for every individual at all stages of life. To achieve fitness, various modes and methods are available. Before adopting such methods, warming up before activities and cooling down after activities are essential to minimize any risk of injuries for every individual.

Components of Physical Fitness: - Physical fitness can be classified into health-related fitness and skill-related fitness. The health-related components are:

- **Cardiovascular Fitness**
- **Muscular Strength**

- **Muscular Endurance,**
- **Body Composition**
- **Flexibility.**

THE SKILL-RELATED FITNESS COMPONENTS

- **Agility**
- **Balance**
- **Neuro Muscular Adaptations and Coordinative Abilities**
- **Speed**
- **Strength**
- **Reaction Time**

Cardio-respiratory endurance reflects the ability of the body's circulatory and respiratory systems to supply fuel during sustained physical activity. To improve your cardio-respiratory endurance, try activities that keep your heart rate elevated at a safe level for a sustained length of time such as walking, running, jogging, swimming, bicycling, etc. The activity you choose need not be strenuous enough to improve your cardio-respiratory endurance. Start slowly with an activity you enjoy, and gradually work up to increase to a more intense pace. *Muscular Strength* is the amount of force applied to muscle or muscle groups, which can exert one maximal effort (contraction). The key to making your muscles stronger is working them against resistance, whether that be from weights or gravity. If you want to gain muscle strength, try exercises such as lifting weights (under proper supervision).[7]

DISTINCTION BETWEEN PHYSICAL ACTIVITY & EXERCISE

WHAT IS THE DIFFERENCE BETWEEN PHYSICAL ACTIVITY AND EXERCISE?

In life, we have circumstances that give us extra time. One of the ways we can utilize extra time is by doing things that will help increase our physical and mental health. One of the best ways to improve our physical health is exercise. Exercise can improve the health of our heart and lungs, our ability to remember things, reduce our risk for chronic diseases, and provide countless other benefits. However, there are many misconceptions when it comes to getting daily exercise. A lot of people will commonly mistake physical activity for exercise. But what is the difference you may ask?[1]

Exercise vs. Physical Activity:- According to the American College of Sports Medicine and the American Heart Association, the following are definitions of physical activity, exercise, and cardiovascular exercise respectively:[2]

- **Physical activity is any movement that is carried out by the muscles that require energy. In other words, it is any movement a person does.**
- **Exercise is, by definition, planned, structured, repetitive, and intentional movement. Exercise is also intended to improve or maintain physical fitness.**
- **Cardiovascular exercise, by definition, is an exercise that challenges the heart and vascular systems to increase the heart's ability to pump blood and distribute oxygen to the tissues of the body.**

The key thing to focus on when trying to determine if something is just physical activity or exercise is to ask ourselves a few questions:

- **"Am I doing this because I'm trying to improve my physical fitness or health?"**
- **"Do I plan to do this consistently from week to week or even day to day?"**

If the answer to both or one of these questions is no, then the activity probably cannot be considered exercise and is truly physical activity. While if you

answered yes to both, then it is most likely considered exercise.

Combining Physical Activity and Exercise:- In our daily lives, we do a lot of physical activities like walking in the grocery store and pushing the cart, gardening, and carrying the laundry basket to the washer. These are common examples, while some examples for exercising are intentionally going for a walk every day, doing a group workout, or even walking your dog.[3]

Research shows significant evidence that all physical activity contributes to overall health and wellbeing, and that exercise assists with the improvement of physical fitness. While doing only one of these can be beneficial, the combination of both brings the greatest impact on our health.[4,5]

HOW DID YOU SPEND YOUR LAST 24 HOURS? WHAT DO YOU DO DURING A TYPICAL 24-HOUR WEEKDAY?

Take a few moments and divide up those 24 hours and reflect on how you typically spend that time. How many hours did you spend sleeping? How many hours did you spend sitting down (don't forget the times you sit in the car, while you eat, etc.)? How many hours did you spend moving?[6]

Once you have completed your 24-hour self-reflection activity, think more specifically about your movement time. What type of movement did you do? What was the intensity and intentionality of that movement?[7]

Over the past few decades, Americans have heard over and over that a minimum of 30 minutes of daily exercise is essential to good health. However, the latest research suggests that how much time we spend sitting could be just as important as how much time we spend exercising. A new term has been coined to describe those who exercise but spend the majority of their days being sedentary: active couch potatoes.[8]

While the term "couch potato" usually refers to a lazy person who prefers to just sit around and watch TV, an "active couch potato" refers to someone inactive for the majority of the day, but regularly makes sure to get in 30 minutes of exercise on most days. An active couch potato is not necessarily lazy, but spends most of his or her time sitting during leisure time, work (and commuting to and from work), and while eating meals. In other words, they're almost completely physically inactive throughout the day, except for 30 or minutes of daily exercise. Although 30 minutes of exercise is absolutely beneficial and healthful, the rest of the day is causing tremendous health

hazards. In fact, the World Health Organization has identified physical inactivity as an independent risk factor for chronic disease development, and it is now the fourth leading cause of death worldwide.[9]

So, exactly how do we differentiate between exercise and being physically active? And is the distinction important? Here are some definitions that should help clear things up:[10]

- **Physical activity is a movement that is carried out by the skeletal muscles that require energy. In other words, any movement one does is physical activity.[11]**

- **Exercise, however, is planned, structured, repetitive, and intentional movement intended to improve or maintain physical fitness. Exercise is a subcategory of physical activity.[12]**

Research provides significant evidence that ALL physical activity positively contributes to overall health and well-being. Exercise also assists with the improvement of physical fitness, which consists of five specific components:

- **Cardiorespiratory fitness**
- **Muscular strength fitness**
- **Muscular endurance fitness**
- **Flexibility fitness**
- **Body composition**

The American Institute for Cancer Research emphasizes the importance of both daily physical activity AND structured exercise (concerning cancer indicators).[13]

HOW CAN YOU BECOME MORE PHYSICALLY ACTIVE?

An easy way to start transforming a sedentary lifestyle into a more active one is to begin standing more and sitting less. If you work at a desk all day, create a workstation that requires you to stand (and therefore move more). Think about creating opportunities to walk at lunchtime and before or after work. Consider adding leisure time activities to your weekly routines, especially those that involve the whole family, such as bike rides, hikes, and walks around the

neighborhood. What about your home? Do you enjoy gardening? Make time for it throughout the week instead of leaving it all to the weekend. And instead of dedicating just one day every other week to cleaning, try to include daily active chores that take 10 minutes or less. When you engage with technology, creatively think about how you can move. Try placing some simple equipment like a yoga mat or resistance ball or resistance bands in your living room so they are easily accessible while watching TV. There are countless opportunities to increase daily physical activity, but you do have to look for them. As you evaluate your 24-hour activity reflection, consider making a detailed plan that includes both elements: [14]

1. Daily increased physical activity

2. Structured, planned, intentional exercise to improve physical fitness

Omitting one or the other can have serious and detrimental consequences for your health, fitness, and overall well-being. Don't be a couch potato or an active couch potato—make the change today and add BOTH elements to your life to reap the life-changing benefits of physical activity and exercise. [15, 16]

HEALTH - WELL-BEING & MOVEMENT

SIMPLY MOVING BENEFITS YOUR MENTAL HEALTH

Exercise can reduce anxiety by making your brain's "fight or flight" system less reactive. When anxious people are exposed to physiological changes they fear, such as a rapid heartbeat, through regular aerobic exercise, they can develop a tolerance for such symptoms. Protect yourself from the damage of chronic inflammation. science has proven that chronic, low-grade inflammation can turn into a silent killer that contributes to cardiovascular disease, cancer, type 2 diabetes, and other conditions. The surprising benefits of synchronizing your movements, both physical exercise and structured movement, are activities that you can do by yourself. On their own, they can improve the way you feel. But a recent study found that when you try to move in synchrony with someone else, it also improves your self-esteem. In 2014, psychologist Joanne Lumsden and her colleagues conducted a study that required participants to interact with another person via a video link. The person performed a standard exercise — arm curls — while the participants watched, and then performed the same movement. The "video link" was a pre-recorded video of a 25-year-old female in a similar room, also performing arm curls. As part of the experiment, participants had to either coordinate their movement or deliberately not coordinate their movement with the other person's arm curls. They filled out a mood report before and after each phase of synchronizing or falling out of synchrony. They also reported on how close they felt to the other person.[1] The results were interesting. When subjects intentionally synchronized their movement with the recording, they had higher self-esteem than when they did not. Prior studies had shown that synchronizing your movement with others makes you like them more. You also cooperate more with them and feel more charitable toward them. Movement synchrony can make it easier to remember what people say and to recall what they look like. This was the first study to show that it makes you feel better about yourself. That's probably why dance movement therapy can help depressed patients feel better.[2]

<u>Putting it all together</u>: - Your mind and body are intimately connected. While your brain is the master control system for your body's movement, the way you move can also affect the way you think and feel. Movement therapies are often used as adjunctive treatments for depression and anxiety when mental effort, psychotherapy, or medication is not enough. When you are too exhausted to

use thought control strategies such as focusing on the positive or looking at the situation from another angle, movement can come to the rescue. By working out, going on a meditative walk by yourself, or going for a synchronized walk with someone, you may gain access to a "back door" to the mental changes that you desire without having to "psych yourself" into feeling better.[3]

KEY POINTS TO REMEMBER

- The objective of aerobic exercise is to improve the capacity of the cardiorespiratory system. To accomplish this, the heart muscle has to be overloaded like any other muscle in the human body. Just as the biceps muscle in the upper arm is developed through strength training, the heart muscle is exercised to increase in size, strength, and efficiency.[4]

Activities of Daily Living: Everyday behaviors that people normally do to function in life (cross the street, carry groceries, lift objects, do laundry, sweep floors).[5]

Vigorous Exercise: An exercise intensity that is either above 6 metabolic equivalents (METs) or 60 percent of maximal oxygen uptake or that provides a "substantial" challenge to the individual.[6]

Moderate Versus Vigorous-Intensity Exercise: As fitness programs became popular in the 1970s, vigorous-intensity exercise was routinely prescribed for all fitness participants. Following extensive research in the late 1980s and 1990s, we learned that moderate-intensity physical activity provided substantial health benefits—including decreased risk for cardiovascular mortality, a statement endorsed by the U.S. Surgeon General in 1996. Thus, the emphasis switched from vigorous- to moderate-intensity training in the mid-1990s. In the 1996 report, the Surgeon General also stated that vigorous-intensity exercise would provide even greater benefits than moderate-intensity activity.[7]

Mode of Exercise = Form of exercise (e.g., aerobic).
Aerobic Exercise = Activity that requires oxygen to produce the necessary energy to carry out the activity.
Duration of Exercise = Time exercising per session.
Warm-Up = A preliminary period when exercise begins slowly.
Cool-Down = A period at the end of an exercise session when exercise is tapered off.
Frequency of Exercise = How often a person engages in an exercise session.[8]

MUSCULAR STRENGTH & ENDURANCE

The capacity of muscle cells to exert force increases and decreases according to demands placed upon the muscular system. If specific muscle cells are overloaded beyond their normal use, such as in strength-training programs, the cells increase in size (hypertrophy), strength, endurance, or some combination of these. If the demands on the muscle cells decrease, such as in sedentary living or required rest because of illness or injury, the cells decrease in size (atrophy) and lose strength.[9]

OVERLOAD PRINCIPLE

The overload principle states that for strength or endurance to improve, demands placed on the muscle must be increased systematically and progressively over time, and the resistance (weight lifted) must be of a magnitude significant enough to produce development. In simpler terms, just like all other organs and systems of the human body, muscles have to be taxed beyond their accustomed loads to increase in physical capacity.[10]

SPECIFICITY OF TRAINING

Muscular strength is the ability to exert maximum force against resistance. Muscular endurance (also referred to as localized muscular endurance) is the ability of a muscle to exert submaximal force repeatedly over time. Both of these components require specificity of training.[11]

MODE OF TRAINING

Two basic training methods are used to improve strength: isometric and dynamic. Isometric exercise involves pushing or pulling against immovable objects. Dynamic exercise requires movement with muscle contraction, such as extending the knees with resistance (weight) on the ankles. Isometric training was used commonly several years ago, but its popularity has waned. Because strength gains with isometric training are specific to the angle of muscle contraction, this type of training remains beneficial in sports such as gymnastics, which require regular static contractions during routines. Dynamic exercise (referred to as isotonic exercise) can be conducted without weights or with free weights (barbells and dumbbells),fixed-resistance machines, variable resistance machines, and isokinetic equipment. When performing dynamic exercises without weights (for example, pull-ups, and

push-ups), with free weights, or with fixed-resistance machines, a constant resistance (weight) is moved through a joint's full range of motion. The greatest resistance that can be lifted equals the maximum weight that can be moved at the weakest angle of the joint, because of changes in muscle length and angle of pull as the joint moves through its range of motion.[12]

REFLECTIVE QUESTIONS

- **What role should strength training have in fitness programs?**
- **Should people be motivated for the health and fitness benefits, or should they participate to enhance their body image?**
- **What are your feelings about individuals (male or female) with large body musculature?**[13]

WHAT IS PHYSICAL FITNESS?

Physical fitness refers to the ability of your body systems to work together efficiently to allow you to be healthy and perform activities of daily living. Being efficient means doing daily activities with the least effort possible. A fit person can perform schoolwork, meet home responsibilities, and still have enough energy to enjoy sports and other leisure activities. A fit person can respond effectively to normal life situations, such as raking leaves at home, stocking shelves at a part-time job, and marching in the band at school. A fit person can also respond to emergencies - for example, by running to get help or aiding a friend in distress.[1]

THE PARTS OF PHYSICAL FITNESS

Physical fitness is made up of 11 parts - 6 of them health-related and 5 skill related. All of the parts are important to good performance in physical activity, including sports. But the 6 are referred to as contributing to health-related physical fitness because scientists in kinesiology have shown that they can reduce your risk of chronic disease and promote good health and wellness. These parts of fitness are body composition, cardiorespiratory endurance, flexibility, muscular endurance, power, and strength. They also help you function effectively in daily activities.[2]

As the name implies, skill-related physical fitness components help you perform well in sports and other activities that require motor skills. For example, speed helps you in sports such as track and field. These 5 parts of physical fitness are also linked to health but less so than the health-related components. For example, among older adults, balance, agility, and coordination are very important for preventing falls (a major health concern), and reaction time also relates to the risk for automobile accidents.[3]

HEALTH-RELATED PHYSICAL FITNESS

Think about a runner. She can probably run a long distance without tiring; thus, she has good fitness in at least one area of health-related physical fitness. But does she have good fitness in all six parts? Running is an excellent form of physical activity, but being a runner doesn't guarantee fitness in all parts of health-related physical fitness. As a runner, you may be more fit in some parts of fitness than in others.[4]

FIT FACT

Power, formerly classified as a skill-related part of fitness, is now classified as a health-related part of fitness. A report by the independent Institute of Medicine provides evidence of the link between physical power and health. The report indicates that power is associated with wellness, higher quality of life, reduced risk of chronic disease and early death, and better bone health. Power, and activities that improve power, have also been found to be important for healthy bones in children and teens.

How do you think you rate each of the six health-related parts of fitness? To be healthy, you should be fit for each of the six parts. Fit people are less likely to develop a hypokinetic condition - a health problem caused partly by lack of physical activity - such as heart disease, high blood pressure, diabetes, osteoporosis, colon cancer, or a high body fat level. People who are physically fit also enjoy better wellness. They feel better, look better, and have more energy. You don't have to be a great athlete to enjoy good health and wellness and be physically fit. Regular physical activity can improve anyone's health-related physical fitness.[5]

SKILL-RELATED PHYSICAL FITNESS

Just as the runner in our example may not achieve a high rating in all parts of health-related physical fitness, he/she also may not rate the same in all parts of skill-related physical fitness. Though most sports require several parts of skill-related fitness, different sports can require different parts. For example, a skater might have good agility but lack good reaction time. Some people have more natural ability in some areas than in others. No matter how you score on the skill-related parts of physical fitness, you can enjoy some type of physical activity. Remember, too, that good health doesn't come from being good in skill-related physical fitness. It comes from doing activities designed to improve your health-related physical fitness, and it can be enjoyed both by great athletes and by people who consider themselves poor athletes. As noted earlier, health-related fitness offers a double benefit. It not only helps you stay healthy but also helps you perform well in sports and other activities. For example, cardiorespiratory endurance helps you resist heart disease and helps you perform well in sports such as swimming and cross-country running. Similarly, strength helps you perform well in sports such as football and wrestling, muscular endurance is important in soccer and tennis, flexibility helps in sports such as gymnastics and diving, and power helps in track

activities such as the discus throw and the long jump. Having a healthy amount of body fat makes your body more efficient in many activities.[6]

MAINTAINING A GOOD LEVEL OF PHYSICAL FITNESS

Experts define physical fitness as "one's ability to execute daily activities with optimal performance, endurance, and strength with the management of disease, fatigue, and stress and reduced sedentary behavior." This description goes beyond being able to run quickly or lift heavy weights. Despite being important, these attributes only address single areas of fitness.[7]

FIVE MAIN COMPONENTS OF PHYSICAL FITNESS

Fast facts on fitness:

- Maintaining good physical fitness can help prevent some health conditions.
- With exercise, body composition can change without changing weight.
- Athletes' hearts show different changes depending on their chosen sport.
- Muscle strength increases due to fiber hypertrophy and neural changes.
- Stretching to increase flexibility can ease a number of medical complaints.[8]

CARDIORESPIRATORY PERFORMANCE

Cardiorespiratory endurance indicates how well the body can supply fuel during physical activity via the body's circulatory and respiratory systems. Activities that help improve cardiorespiratory endurance are those that cause an elevated heart rate for a sustained period of time.[9]

These activities include:

- swimming
- brisk walking
- jogging
- cycling

People who regularly engage in these activities are more likely to be physically fit in terms of cardiorespiratory endurance. It is important to begin

these activities slowly and gradually increase the intensity over time. Exercising increases cardiorespiratory endurance in a number of ways, such as additional small arteries grow within muscle tissue so that they can deliver blood to working muscles more effectively when needed.[10]

HOW DOES HEART HEALTH CHANGE WITH EXERCISE?

The heart's efficiency changes and improves after persistent training. However, recent research suggests that different types of activity change the heart in subtly different ways. All types of exercise increase the heart's overall size, but there are significant differences between endurance athletes such as rowers and strength athletes such as football players. The hearts of endurance athletes show expanded left and right ventricles, whereas those of strength athletes show thickening of the heart wall, particularly the left ventricle.[11]

HOW DOES LUNG HEALTH CHANGE WITH EXERCISE?

Although the heart steadily strengthens over time, the respiratory system does not adjust to the same degree. Lung size does not change, but the lungs do use oxygen, exercise encourages the body to become more efficient at taking on, distributing, and using oxygen. Over time, this improvement increases endurance and overall health.[12]

WALKING

The most natural, easiest, safest, and least expensive form of aerobic exercise is walking. For years, many fitness practitioners believed that walking was not vigorous enough to improve cardiorespiratory functioning, but brisk walking at speeds of 4 miles per hour or faster does improve cardiorespiratory fitness. From a health fitness viewpoint, a regular walking program can prolong life significantly. Although walking takes longer than jogging, the caloric cost of brisk walking is only about 10 percent lower than jogging the same distance. Walking is perhaps the best activity to start a conditioning program for the cardiorespiratory system.[13]

JOGGING

Next with walking, jogging is one of the most accessible forms of exercise. A person can find places to jog almost everywhere. The main requirement to prevent injuries is a good pair of jogging shoes. The popularity of jogging in the United States started shortly after the publication of Dr. Kenneth Cooper's

first Aerobics book in 1968. Jim Fixx's Complete Book of Running in the mid-1970s contributed further to the phenomenal growth of jogging as a fitness activity in the United States. Jogging three to five times a week is one of the fastest ways to improve cardiorespiratory fitness. The risk for injury, however— especially in beginners— is higher with jogging than walking. For proper conditioning, jogging programs should start with one to two weeks of walking. As fitness improves, walking and jogging can be combined, gradually increasing the jogging segment until it fills the full 20 to 30 minutes.[14]

HEALTHY EATING & PHYSICAL ACTIVITY

HEALTH-RELATED OUTCOMES OF PHYSICAL ACTIVITY AND EXERCISE

Health Tips for Adults: - Consuming healthy foods, beverages, and snacks, and getting regular physical activity may help you reach and maintain healthy body weight. Making suitable lifestyle choices may also help men and women prevent some health problems.[1]

Here's a quick overview of some ways to eat better and be more active.

- **Choose whole grains more often. Try whole-wheat bread and pasta, oatmeal, or brown rice.**
- **Select a mix of colorful vegetables. Vegetables of different colors provide a variety of nutrients. Try collards, kale, spinach, squash, sweet potatoes, and tomatoes.**
- **At restaurants, eat only half of your meal and take the rest home.**
- **Walk-in parks, around a track, or in your neighborhood with your family or friends.**
- **Make getting physical activity a priority.**
- **Try to do at least 150 minutes a week of moderate-intensity aerobic activity, like biking or brisk walking.**
- **If your time is limited, work on small amounts of activity throughout your day.[1]**

Learn more ways to move more and eat better—for yourself and your family!

HEALTHY WEIGHT

If it is tough to manage your weight, you are certainly not alone in today's world. More than 39 percent of American adults have obesity.1 Excess weight may lead to heart disease, type 2 diabetes, kidney disease, and other chronic health problems. Setting goals to improve your health may help you lower the chances of developing weight-related health problems.[2]

HOW CAN YOU TELL IF YOU ARE AT A HEALTHY WEIGHT?

Your body mass index can help you determine if you are at a healthy weight, overweight, or have obesity. Mass index is a measure based on your weight in relation to your height. You can use an online tool to calculate your mass index. A BMI of 18.5 to 24.9 is in the healthy range. A person with a mass index of 25

to 29.9 is considered overweight. Someone with an of 30 or greater is considered to have obesity.[3] Another important measure is your waist size. Women with a waist size of more than 35 inches, and men with a waist size of more than 40 inches, may be more likely to develop health problems. Men are more likely than women to carry extra weight around their abdomen, or belly. Extra fat, especially in the abdomen, may put people at risk for certain health problems, even if they have a normal weight.[4]

WHY DO SOME PEOPLE BECOME OVERWEIGHT?

Many factors, including consuming more calories than you need from food and beverages, lack of sleep, and low levels of physical activity, may play a part in gaining excess weight. Here are some factors that may influence weight and overall health:[5]

The world around you. Your home, community, and workplace all may affect how you make daily lifestyle choices. Food and beverages high in fat added sugar, and calories are easy to find and sometimes hard to avoid. And they often cost less than healthier choices like fruits and vegetables. On top of that, smartphones and other devices may make it easy for you to be less active in your daily routine.[6]

Families. Overweight and obesity tend to run in families, suggesting that genes may play a role in weight gain. Families also share food preferences and habits that may affect how much, when, and what we eat and drink.[7]

Medicines. Some medicines such as steroids and some drugs for depression and other chronic health problems may lead to weight gain. Ask your health care professional or pharmacist about whether weight gain is a possible side effect of medicines you are taking and if other medicines can help your health without gaining weight.[8]

Emotions. Sometimes people snack, eat, or drink more when they feel bored, sad, angry, happy, or stressed—even when they are not hungry. Consider whether it might be your emotions making you want to eat, and try doing something else to help you cope with negative feelings or celebrate your good mood. That can help you feel better and avoid weight gain.[9]

Lack of sleep. In general, people who get too little sleep tend to weigh more than those who get enough sleep. There are several possible explanations. Sleep-deprived people may be too tired to exercise. They may take in more calories simply because they are awake longer and have more opportunities to eat. Lack of sleep may also disrupt the balance of hormones that control appetite. Researchers have noticed changes in the brains of people who are sleep deprived. These changes may spark a desire for tasty foods.[9,10]

Consuming Healthy Food and Beverages. Being aware of food portion size, the kinds of foods and beverages you consume, and how often you have them may be a step to help you make healthier food choices.[11]

What kinds of foods and drinks should I consume? Visit MyPlate.gov to learn more about what kinds of food and drinks to consume and what kinds to limit so you can have a healthy eating plan.[12] Consuming more nutrient-rich foods. like vitamins and dietary fiber—nourish our bodies by giving them what they need to be healthy. Adults are encouraged to consume some of the following foods and beverages that are rich in nutrients:[13]

- **fruits and vegetables**
- **whole grains, like oatmeal, whole-grain bread, and brown rice**
- **seafood, lean meats, poultry, and eggs**
- **beans, peas, unsalted nuts, and seeds**
- **sliced vegetables or baby carrots with hummus**
- **fat-free or low-fat milk and milk products**

If you're sensitive to milk and milk products, try substituting

- **nondairy soy, almond, rice, or other drinks with added vitamin D and calcium**
- **lactose-reduced fat-free or low-fat milk**
- **dark leafy vegetables like collard greens or kale**

Consume less or eliminate foods and beverages that do not suit your system. Some foods and beverages have many calories but few of the essential nutrients your body needs. Added sugars and solid fats pack a lot of calories into food and beverages but provide a limited amount of healthy nutrients. Salt does not contain calories, but it tends to be in high-calorie foods. Adults should aim to limit foods and drinks such as:[14]

- **sugar-sweetened drinks and foods**
- **foods with solid fats like butter, margarine, lard, and shortening**
- **white bread, rice, and pasta that are made from refined grains**
- **foods with added salt (sodium)**

Instead of sugary, fatty snacks, try fat-free or low-fat milk or yogurt and try fresh/canned fruit, without added sugars. Keep in mind the following:

- **Reduce the overall calories you consume. If you consume more calories than you use through daily living, exercise, and other activities, it may lead to weight gain. If you consume fewer calories than you use through physical activity, it may lead to weight loss.**
- **Have healthy snacks on hand. Whether you are at home, at work, or on the go, healthy snacks may help combat hunger and prevent overeating. Look for snacks that are low in added sugar and salt. Your best bets are whole foods—like baby carrots, fresh fruit, or low-fat or fat-free yogurt instead of chips, cakes, or cookies—rather than packaged or processed foods.**
- **Select a mix of colorful vegetables each day. Choose dark, leafy greens—such as spinach, kale, collards, and mustard greens—and red and orange vegetables such as carrots, sweet potatoes, red peppers, and tomatoes. If you have had kidney stones, be aware that some vegetables, like spinach and sweet potatoes, are high in oxalate, a chemical that combines with calcium in urine to form a common type of kidney stone. So, if you have kidney stones, you may need to watch how much of this you eat. But for others, these are great choices. Eat a rainbow of food colors!**

NUTRITION

HOW CAN POPULAR FOODS BENEFIT OUR HEALTH?

Though the field of medicine continues to advance and branch out in many ways, nutritionists and health experts continue to praise the benefits of certain foods. Selecting the right foods can reduce hypertension, obesity, Type 2 diabetes, immune function and cancers, osteoporosis, and lower back pain. Eating healthfully has been shown to reduce the risk of obesity, cardiovascular illnesses, and even certain types of cancer. Medical Nutrition Therapy specifies the health benefits of a much wider range of foods. There are many delicious and nutritious options for individuals who wish to boost their health by eating healthfully. Below is a list of foods along with information regarding their potential health benefits.[1]

Almonds:- Almonds are a rich source of vitamin E, copper, magnesium, good quality protein, and healthy unsaturated fatty acids. Studies have revealed that almonds can potentially help prevent cardiovascular diseases, cut the risk of cancer, and help prolong life.[2]

Apples: - Apples are sometimes called "nutritional powerhouses" because of their impressive nutritional profile. Apples contain about 14 percent of our daily needs of Vitamin C (a powerful natural antioxidant), B-complex vitamins, dietary fiber, phytonutrients (which help protect the body from the detrimental effects of free radicals), and minerals such as calcium and potassium. Studies have revealed that eating apples can potentially help prevent dementia and reduce the risk of stroke and diabetes.[3]

Arugula: - Along with other leafy greens, arugula contains very high nitrate levels (more than 250 milligrams per 100 grams). High intakes of dietary nitrate have been shown to lower blood pressure, reduce the amount of oxygen needed during exercise, and enhance athletic performance. The potential health benefits of arugula include lowering the risk of cancer, preventing osteoporosis, and improving muscle oxygenation during exercise.[4]

Asparagus: - Asparagus is very rich in dietary fiber and contains high levels of vitamin B6, calcium, zinc, and magnesium. The potential health benefits of asparagus include: reducing the risk of diabetes, preventing kidney stones, and lowering the risk of neural tube defects in babies. Asparagus is also a natural

diuretic, which can help with fluid balance in the body and influence blood pressure and edema.[5]

Bananas:- are naturally free of fat, cholesterol, and sodium, and are very rich in potassium. The potential health benefits of bananas include lowering blood pressure, reducing the risk of developing childhood leukemia, and supporting heart health.[6]

Basil: - Basil is rich in vitamin A, vitamin K, vitamin C, magnesium, iron, potassium, and calcium. Studies have revealed that basil can potentially reduce inflammation and swelling, prevent the harmful effects of aging, and may be useful in treating arthritis and inflammatory bowel diseases.[7]

Bok choy:- Bok choy belongs to the cruciferous vegetable family, which also includes kale, broccoli, cauliflower, brussels sprouts, cabbage, collard greens, rutabaga, and turnips. These nutrition powerhouses supply loads of nutrients for little calories. If you are trying to eat healthier, cruciferous vegetables like bok choy should be at the very top of your grocery list.[8]

Broccoli: - Broccoli contains high levels of fiber (both soluble and insoluble) and is a rich source of vitamin C. In addition, broccoli is rich in vitamin A, iron, vitamin K, B-complex vitamins, zinc, phosphorus, and phytonutrients. Studies have found that broccoli can potentially help protect skin against the effects of UV light, reverse diabetes, and heart damage, and reduce bladder cancer risk.[9]

Chocolate: - Chocolate is rich in antioxidants. Despite its bad reputation for causing weight gain, there are several health benefits associated with its consumption (particularly dark chocolate). The potential benefits of eating chocolate include: lowering cholesterol levels, preventing cognitive decline, and reducing the risk of cardiovascular problems.[10]

Coffee: - is one of the main sources of antioxidants in the U.S. population. The potential health benefits of drinking coffee in moderation include: protecting against type 2 diabetes, preventing Parkinson's disease, lowering the risk of liver cancer, preventing liver disease, etc.[11]

IMPRESSIVE HEALTH BENEFITS OF APPLES

With over 7,000 different cultivars available worldwide, it's no surprise that apples are the most widely consumed fruit globally. From sweet red varieties, like Red Delicious, Fuji, or Gala, to tangy green ones, like Granny Smith — there sure is an apple for everyone. They're commonly used in recipes, like pies, cookies, muffins, jam, salads, oatmeal, or smoothies. They also make a great snack on their own or wedged and smeared with nut butter. In addition to their culinary versatility and numerous colors and flavors to choose from, apples are an exceptionally healthy fruit with many research-backed benefits.[12]

Nutritious: - Apples are considered nutrient-dense fruits, meaning they provide a lot of nutrients per serving. The current Dietary Guidelines for Americans recommend 2 cups of fruit daily for a 2,000-calorie diet, emphasizing whole fruits, like apples. One medium 7-ounce (200-grams) apple offers the following nutrients:[12]

- **Calories: 104**
- **Carbs: 28 grams**
- **Fiber: 5 grams**
- **Vitamin C: 10% of the Daily Value**
- **Copper: 6% of the Daily Value**
- **Potassium: 5% of the Daily Value**
- **Vitamin K: 4% of the Daily Value**

May support weight loss: - Apples are high in fiber and water, two qualities that make them filling. An increasing feeling of fullness works as a weight-loss strategy, as it helps manage your appetite. This, in turn, might lead you to reduce your energy intake. In one study, eating whole apples increased feelings of fullness for up to 4 hours longer than consuming equal amounts of apple purée or juice. This happened because whole apples reduce gastric emptying — the rate at which your stomach empties its contents. Research also suggests apple intake may significantly reduce Body Mass Index, a weight-related risk factor for heart disease. Interestingly, apple polyphenols may also have anti-obesity effects.[12]

Could be good for your heart: - Apples have been linked to a lower risk of heart disease. One reason may be that they contain soluble fiber. This kind of fiber can help lower your blood cholesterol levels. Another reason may be that they offer polyphenols. Some of these, namely the flavonoid epicatechin, may lower blood pressure. Studies have also linked high intakes of flavonoids with a lower risk of stroke. Plus, flavonoids can help prevent heart disease by lowering blood pressure, reducing LDL cholesterol oxidation, and reducing atherosclerosis, which is the buildup of plaque in your arteries. Another study has also linked eating white-fleshed fruits and vegetables, like apples and pears, to a reduced risk of stroke. For every 1/5 cup (25 grams) of apple slices consumed per day, the risk of stroke decreased by 9%.[13]

Linked to a lower risk of diabetes: - Eating apples may also reduce your risk of type 2 diabetes. A compilation of studies found that eating apples and pears was associated with an 18% reduction in type 2 diabetes risk. Just one serving per week may reduce the risk by 3%. Their high content of the antioxidant polyphenols, quercetin and phlorizin could explain this beneficial effect. Quercetin's anti-inflammatory effects may reduce insulin resistance, a big risk factor for the onset of diabetes. Meanwhile, phlorizin is believed to reduce sugar uptake in the intestines, contributing to a reduced blood sugar load and thereby reducing diabetes risk.[14]

May promote gut health: - Apples contain pectin, a type of fiber that acts as a prebiotic. This means it feeds your gut microbiota, which is the good bacteria in your gut. Being involved in many functions related to both health and disease, your gut microbiota plays an essential role in your overall well-being. A healthy gut is often key to better health. Since dietary fiber cannot be digested, pectin reaches your colon intact, promoting the growth of good bacteria. It especially improves the ratio of Bacteroidetes to Firmicutes, the two main types of bacteria in your gut. New research suggests that, by beneficially altering your gut microbiota, apples may help protect against chronic diseases like obesity, type 2 diabetes, heart disease, and cancer.[14,15]

MENTAL HEALTH BENEFITS OF EXERCISE

THE BENEFITS OF MENTAL HEALTH

The benefits of intentionally practicing (via movement and exercises) to improve mental health are a response to the chronic stress reported at epidemic levels around the world. Chronic stress has been proven to deteriorate the hippocampus (a brain part).[1] This stress also leads to decreased concentration and memory, confusion, loss of sense of humor, anger, irritability, and fear. Stress is not good for the brain and improved mental health practices can reduce the risk.[1]

Other benefits of exercise on mental health include, but aren't limited to:

- **Anxiety reduction**
- **Improved moods**
- **Clearer thinking**
- **A greater sense of calm or inner peace**
- **Increased self-esteem**
- **Reduced risk of depression**
- **Improvements in relationships**

The development of practical coping skills has never been more necessitated in this ever-changing world. Rather than continuing to simply soldier on, a focus on thriving through adversity is where mental health benefits can be achieved. Improved mental health has been well documented with the introduction of improved levels of physical fitness.[2]

The fitness industry has decades of research showing the benefits of taking special and intentional care of one's body. The concept of being mentally healthy is not necessarily new, but it certainly has more areas of growth in scientific research. This is likely because historically, medicine has studied what was wrong so that it could be cured.[3]

A more recent approach to physical and mental well-being has been prevention. Exercise is a preventative activity for both physical and mental health. When you strengthen your body, there is less pain in aging. The same can be said for strengthening our mental health.[4]

Benefits of mental health through physical fitness include, but aren't limited to:

- **Sharper memory**
- **The clarity in thinking**
- **Higher self-esteem**
- **Better sleep**
- **Increased energy**
- **Stronger resilience**
- **Increased BDNF (Brain-Derived Neurotrophic Factor), which improves neurotransmission**

Counseling has, unfortunately, had a stigma attached. The medical model was developed to fix what was "broken." People receiving counseling are not broken. Human beings are malleable and can rewire themselves. A professional counselor can help with this plasticity by allowing the release of painful or unhelpful thoughts and behaviors.[5]

POTENTIAL BENEFITS OF COUNSELING ALONG WITH EXERCISE

- **Improvement in communication and interpersonal skills**
- **Greater self-acceptance**
- **Increased self-esteem**
- **Improved self-expression and management of emotions**
- **Relief from depression, anxiety, and other mental health conditions**
- **Clarity**
- **Coaching is another area where practitioners can increase the benefits of mental health. While coaching is not therapy, it can be very therapeutic. Having a trained coach can create areas of growth that clear the way for massive personal improvement.**

POTENTIAL BENEFITS OF COACHING

- **Learning acceptance and self-appreciation**
- **Improved connection with self and others**
- **Simplifying life**
- **Reduced stress**
- **Harmony and peace**
- **Increased self-awareness**
- **Reduction in isolation**
- **Improvements in relationships**
- **Improved communication**
- **Overcoming procrastination**
- **Gaining work and or life satisfaction**

- **Increased self-reliance**
- **Improved decision making**
- **Mindset shifts**
- **Increased self-worth**
- **Improved time management skills**

THINGS YOU CAN DO TO GET BENEFITS

Move your body: - If more people knew the benefits of exercise in avoidance of neurodegenerative diseases such as Alzheimer's Disease, more people would be running to join a local gym. Exercise helps increase (reactive oxygen species), resulting in decreases in the incidence of oxidative stress-related diseases. All disease has links to inflammation. Regular exercise increases the body's ability to reduce that inflammation, therefore, slowing the aging process. Start small and grow your exercise practice slowly and consistently. Jumping in with excessive weight training or aerobic exercise can be harmful and lessen the willingness to continue with the practice. A slow, steady increase in levels of activity is highly recommended.[6]

Counseling: - When thoughts and feelings are interfering with your daily life, advice can be very helpful. Navigating trauma, depression, anxiety, or other strains on mental health is complicated. Doing it alone makes it even more so. Reaching out for help from a professional doesn't mean you're weak; it means you're ready to start getting stronger.[7]

Coaching: - People come to coaching for a variety of reasons. Coaches specialize their practices, just as counselors do, to best serve their clients. Seeking the services of a coach can help clients realize their power in their actions and generate motivation to move from A to B, while space is held by a trained professional.[8]

Journaling: - There are a million ways to start a journaling practice. Keeping track of thoughts, actions, and motivations can be very powerful when actively reflecting on personal change. It helps adults and children alike. It also shines a light on daily actions and whether one is being honest with oneself.[9]There are many ways to start a journaling practice. Keeping track of thoughts, actions, and motivations can be very powerful when actively reflecting on personal change. It helps adults and children alike. It also shines a light on daily actions and whether one is being honest with oneself.[10]

BENEFITS OF GOOD MENTAL HEALTH

Just as physical fitness helps our bodies to stay strong, mental fitness helps us to achieve and sustain a state of good mental health. When we are mentally healthy, we enjoy our life and environment, and the people in it. We can be creative, learn, try new things, and take risks. We are better able to cope with difficult times in our personal and professional lives. We feel the sadness and anger that can come with the death of a loved one, a job loss, or relationship problems and other difficult events, but in time, we can get on with and enjoy our lives once again. Nurturing our mental health can also help us combat or prevent the mental health problems that are sometimes associated with a chronic physical illness. In some cases, it can prevent the onset or relapse of a physical or mental illness. Managing stress well, for instance, can have a positive impact on heart disease. Chances are, you are already taking steps to sustain your mental health, as well as your physical health – you just might not realize it. Three important ways to improve your mental fitness are to get physical, eat right, and take control of stress.[11]

Get Physical: - We've known for a long time about the benefits of exercise as a proactive way to enhance our physical condition and combat disease; now, exercise is recognized as an essential element in building and maintaining mental fitness. So, if you already do exercise of some kind, give yourself two pats on the back – you're improving your physical and mental fitness.[12]

EXERCISE HAS MANY PSYCHOLOGICAL BENEFITS

- **Physical activity is increasingly becoming part of the prescription for the treatment of depression and anxiety. Exercise alone is not a cure, but it does have a positive impact.**
- **Research has found that regular physical activity appears as effective as psychotherapy for treating mild to moderate depression. Therapists also report that patients who exercise regularly simply feel better and are less likely to overeat or abuse alcohol and drugs.**

OBTAIN PHYSICAL CHECKUP BY DOCTORS

WHAT SHOULD I ASK MY DOCTOR DURING A CHECKUP?

Asking questions is key to good communication with your doctor. If you don't ask questions, he or she may assume you already know the answer or that you don't want more information. Don't wait for the doctor to raise a specific question or subject; he or she may not know it's important to you. Be proactive. Ask questions when you don't know the meaning of a word (like aneurysm, hypertension, or infarct) or when instructions aren't clear (for example, does taking medicine with food mean before, during, or after a meal?).[1]

LEARN ABOUT MEDICAL TESTS

Sometimes, doctors need to do blood tests, X-rays, or other procedures to find out what is wrong or to learn more about your medical condition. Some tests, such as Pap tests, mammograms, glaucoma tests, and screenings for prostate and colorectal cancer, are done regularly to check for hidden medical problems.[2]

Before having a medical test, ask your doctor to explain why it is important, what it will show, and what it will cost. Ask what kind of things you need to do to prepare for the test. For example, you may need to have an empty stomach, or you may have to provide a urine sample. Ask how you will be notified of the test results and how long they will take to come in.[3]

QUESTIONS TO ASK YOUR DOCTOR BEFORE A MEDICAL TEST

- **Why is the test being done?**
- **What steps does the test involve? How should I get ready?**
- **Are there any dangers or side effects?**
- **How will I find out the results? How long will it take to get the results?**
- **What will we know after the test?**

When the results are ready, make sure the doctor tells you what they are and explains what they mean. You may want to ask your doctor for a written copy of the test results. If the test is done by a specialist, ask to have the results sent to your primary doctor. Discuss your diagnosis and what to expect. A diagnosis identifies your disease or physical problem. The doctor makes a diagnosis based on the symptoms you are experiencing and the results of the physical

exam, laboratory work, and other tests. If you understand your medical condition, you can help make better treatment decisions. If you know what to expect, it may be easier for you to deal with the condition. Ask the doctor to tell you the name of the condition and why he or she thinks you have it. Ask how it may affect you and how long it might last. Some medical problems never go away completely. They can't be cured, but they can be treated or managed.[4]

HOW OFTEN SHOULD YOU SEE YOUR DOCTOR FOR A CHECKUP?

It's better to prevent an illness than to have to treat it. That's why regular checkups are routinely evaluating your risk factors for various medical conditions, screening for cancer and other diseases. Assessing your lifestyle habits helps you stay healthy while reducing your risk of chronic or life-threatening diseases.[5]

HOW OFTEN SHOULD ADULTS GET A CHECKUP?

The recommendations regarding the frequency of routine checkups are based on your age, risk factors, and current health status. While opinions vary, routine checkups with your doctor are generally recommended as follows: once every 3 years if you're under the age of 50 and in good health once a year once you turn 50. If you have a chronic disease, like diabetes or COPD for instance, you should see your doctor more frequently, no matter how old you are. Your doctor may suggest more or less time between your checkups based on your risk factors, screening test results, and current health status.[6]

WHAT ARE THE BENEFITS OF REGULAR CHECKUPS?

Regular checkups with your healthcare provider can benefit your health in many ways. Some of the key benefits include: finding potentially life-threatening health issues early before they cause a problem early treatment of health conditions, which increases the odds of a good outcome regular monitoring of existing health issues, which lowers the risk of worsening symptoms or severe complications staying up-to-date on vaccinations and screening tests limiting extra healthcare costs associated with treating complicated or serious conditions that aren't caught early developing and maintaining an open, honest relationship with your primary care physician learning new ways to live a healthy, longer life and improving your health.[7]

WHAT SHOULD BE INCLUDED IN A CHECKUP?

During your annual checkup, your doctor will review your past health history, evaluate your current health, and schedule appropriate screening tests. For men and women, an adult annual checkup should include a review and update of:

- **your medical history**
- **your family history, if necessary**
- **your medication list and allergies**
- **your vaccination and screening test history**

Men and women are typically screened for:

- **high blood pressure**
- **obesity, based on your body mass index**
- **tobacco use**
- **alcohol and drug misuse**
- **depression**
- **HIV screening for adults ages 15 to 65 and anyone at high risk**
- **hepatitis C for anyone born between 1945 and 1965**
- **type 2 diabetes for anyone with risk factors or a family history**
- **colorectal cancer starting at age 50**
- **lung cancer with a yearly low-dose scan for adults ages 55 to 80 who currently smoke or have smoked within the last 15 years**

Women:

Additional screening tests for women include:

- **intimate partner violence screening for women of childbearing age**
- **a mammogram for breast cancer screening, between ages 50 and 74**
- **a pap smear for cervical cancer screening, between ages 21 and 65**
- **high cholesterol screening, starting at age 45**
- **osteoporosis screening, starting at age 65**

Men:

Additional screening tests for men include:

- **abdominal aortic aneurysm screening, from ages 65 to 75 with a smoking history**

- **a prostate exam isn't generally recommended, but you and your doctor may decide you should have it starting at age 50**
- **high cholesterol screening, starting at age 35**

WALKING, STRETCHING, JOGGING, AEROBICS, & SWIMMING

THE BEST TIME OF DAY TO WALK AND EXERCISE

Walking and being generally physically active comes with many benefits no matter when you choose to lace up your shoes. However, there are some reasons you may which choose to exercise during different times of the day. Explore the unique benefits and potential drawbacks of exercising in the morning, afternoon, and evening.[1]

BENEFITS OF MORNING EXERCISE

Morning workouts may fit into your schedule if you're an early riser. But night owls might struggle with an early fitness session. There are many benefits to getting in your walks or workouts in the morning. For instance, a study published in 2012 found reduced attraction to photos of food after a 45-minute brisk morning walk and more activity throughout the rest of the day.[1] Another study published in 2013 found that male cyclists had better endurance capacity in the morning than evenings. Exercising in the morning may help you feel more energized, increasing your blood flow and waking up the nervous system. Once you get used to working out in the morning, it can be habit-forming since you start each day the same way, building a routine. If you exercise outdoors, the air can be cooler and less polluted in the morning, boosting the positive effects of getting into green space.[2]

DRAWBACKS OF MORNING EXERCISE

Safety can be a concern if you need to walk before the sun rises. When days are shorter, it may be too dark to walk safely very early in the morning. And there are other drawbacks to walking in the morning. Body temperature is at its lowest one to three hours before awakening, making the morning a time of naturally lower energy and blood flow. Cold, stiff muscles may be more prone to injury. To combat this, be sure to warm up well before doing a higher-speed workout and do gentle stretching.[3]

BENEFITS OF MID-DAY EXERCISE

If you have a sedentary job, it can do your body a lot of good to break up the workday with exercise. It's also a great time to socialize with walking partners

and take time away from sitting at your desk. Consider these other benefits of adding a walk to the middle of your day. A brisk walk can improve blood flow to the brain, so you may be sharper in the afternoon when you return to work. If you usually experience a mid-day slump, this could be especially beneficial for you. Another plus is that walking or exercise provides stress relief from work, school, or home. Forming a habit of walking at lunch during your break can help build a consistent routine. Since you are already in the habit of taking a lunch break, adding a walk or some other form of physical activity during this time can build on that existing routine.[4]

DRAWBACKS OF MID-DAY EXERCISE

Although taking an active break from work can be a boost to the rest of your day, some aspects make mid-day exercise potentially more challenging. Changing into exercise clothes (or at least shoes) and out of sweaty clothes may not work for some people.[5] Not everyone has a consistent lunch break period either. If your lunch break is unpredictable, you may not be able to walk a full 30 to 60 minutes for a full workout. If you are a stay-at-home parent or caregiver, you may not be able to make time to exercise during this busy time of day when demands for lunch or naps are in full force.[6]

BENEFITS OF LATE AFTERNOON EXERCISE

Research has suggested that the afternoon is the best time to exercise for both performances and for building muscle. This includes resistance and endurance-type training. Afternoon exercise may help regulate the amount of food you feel like eating for dinner. Research shows that exercise can suppress appetite for a time, although overall calorie intake is usually not affected. The afternoon is when you have the lowest perceived exertion of the day: You can exert yourself more while feeling it less, so you may be able to work out harder or faster in the afternoon. As well, you can exercise for stress relief after a day at work, school, or home.[9] Choose a form of exercise that helps you wind down. This could be walking, yoga, a run, boxing, or any other form of movement you enjoy.[7]

DRAWBACKS OF LATE AFTERNOON EXERCISE

Many people feel an energy slump in the late afternoon. And there are other reasons that this time slot may not be the best time to walk. For instance, if you use the gym for exercise or equipment such as the treadmill, it may be

crowded and hard to get the workout you want. As well, commitments and responsibilities can mount through the day; You may find that things keep coming up that force you to work late or tempt you to socialize rather than exercise. After a day of work and focus, you may feel less inclined to put effort into a workout.[8]

EVENING EXERCISE

You may be able to schedule your exercise sessions for the evening hours more easily than at other times of the day. There are benefits and drawbacks to evening exercise to consider.[9]

BENEFITS OF EVENING EXERCISE

An evening workout can be just the thing you need to destress after a hard workday. And there are other benefits. Evening exercise can help curb nighttime snacking by diverting your energy and boredom to movement instead. As well, exercise can blunt the appetite for a time, which may let any food cravings or desire to snack pass. Of course, if you are hungry, you may want to eat something, especially if you perform intense exercise. Post-dinner evening exercise can be an excellent time to connect with family with healthy activity. Building a family habit of a post-dinner walk can encourage everyone to add some movement to their day. What's more, evening exercise could help everyone get better sleep.[10]

DRAWBACKS OF EVENING EXERCISE

At dark times of the year, it may not be as safe to walk outside. If you choose this time to walk, be sure to wear reflective gear when walking outdoors. A full day's worth of new crises and distractions can keep you from getting a consistent workout. If you discover sleeping problems, you need to schedule your workout earlier or simply walk at a low-moderate intensity.[11]

BEST TIME TO WALK

Walking can only do you good if you do it. Experts agree—it is not the time of day that matters as much as finding the time you can set aside consistently for your workouts. The best time to walk is the time that will fit best into your schedule so you can do it consistently. Choose a time of day that makes building a habit more likely, and work toward walking or exercising several days a week. It's ok to start with just one day and build from there.[12]

STRETCHES FOR WALKING

While walking may not seem like a strenuous exercise, walking fast for long distances can cause serious muscle injuries without proper training and preparation. Incorporate regular walking stretches into your walk training schedule to prepare your body for the physical demands of walking.[13]

MUSCLES USED IN WALKING

Whether for exercise or sport, walking is an activity that requires cardiovascular and muscular endurance. Good lower body strength is required, especially when walking hills. Balance is essential when Race Walking or walking on uneven terrain. Walkers also require good strength in their lower bodies to ensure balance and endurance. Race Walking rules require the walker to adhere to a strict form that is taxing on the hips and legs.[14]

The major muscles used when walking are:

- **The muscles of the legs; the calves – gastrocnemius and soleus, and the upper leg-the quadriceps and hamstrings**
- **The muscles of the hips; the adductor and abductor muscles, the hip flexors, and the gluteals**
- **The core muscles; are the rectus abdominus, obliques, and spinal erectors**
- **The muscles of the upper extremities and shoulder; the biceps, the triceps, and the deltoids**

WALKING REGULARLY: TRIM YOUR WAISTLINE, IMPROVE YOUR HEALTH

Know the benefits

Physical activity doesn't need to be complicated. Something as simple as a daily brisk walk can help you live a healthier life.

For example, regular brisk walking can help you:

- **Maintain a healthy weight and lose body fat**
- **Prevent or manage various conditions, including heart disease, stroke, high blood pressure, cancer, and type 2 diabetes**
- **Improve cardiovascular fitness**

- **Strengthen your bones and muscles**
- **Improve muscle endurance**
- **Increase energy levels**
- **Improve your mood, cognition, memory, and sleep**
- **Improve your balance and coordination**
- **Strengthen immune system**
- **Reduce stress and tension**

The faster, farther, and more frequently you walk, the greater the benefits. For example, you may start as an average walker, and then work your way up to walking faster and walking a mile in a shorter amount of time than an average walker, similar to power walkers. This can be a great way to get aerobic activity, improve your heart health and increase your endurance while burning calories. You can also alternate periods of brisk walking with leisurely walking. This type of interval training has many benefits, such as improving cardiovascular fitness and burning more calories than regular walking. And interval training can be done in less time than regular walking.[15]

PROPER WALKING TECHNIQUE

Turning your normal walk into a fitness stride requires good posture and purposeful movements. Ideally, here's how you'll look when you're walking:

- **Your head is up. You're looking forward, not at the ground.**
- **Your neck, shoulders, and back are relaxed, not stiffly upright.**
- **You're swinging your arms freely with a slight bend in your elbows. A little pumping with your arms is OK.**
- **Your stomach muscles are slightly tightened, and your back is straight, not arched forward or backward.**
- **You're walking smoothly, rolling your foot from heel to toe.**

PLAN YOUR ROUTINE

As you start your walking routine, remember to:

- **Get the right gear. Choose shoes with proper arch support, a firm heel, and thick flexible soles to cushion your feet and absorb shock.**

- **Wear comfortable, loose-fitting clothes and gear appropriate for all types of weather, such as layers in cooler weather. Aim to wear moisture-wicking fabrics, which will keep you more comfortable. If you walk**

outdoors when it's dark, wear bright colors or reflective tape for visibility. Wear sunscreen, a hat, and sunglasses if you're going out during the day.

Some people choose to use an activity tracker, app, or pedometer. These can be helpful to track your time, distance, heart rate, and calories.

- Choose your course carefully. If you'll be walking outdoors, avoid paths with cracked sidewalks, potholes, low-hanging limbs, or uneven turf.

- If the weather isn't appropriate for walking, consider walking in a shopping mall that offers open times for walkers.

- Warm-up. Walk slowly for five to 10 minutes to warm up your muscles and prepare your body for exercise.

- Cool down. At the end of your walk, walk slowly for five to 10 minutes to help your muscles cool down.

- Stretch. After you cool down, gently stretch your muscles. If you'd rather stretch before you walk, remember to warm up first.

SET REALISTIC GOALS

For most healthy adults, the Department of Health and Human Services recommends these exercise guidelines:

- Aerobic activity. Get at least 150 minutes of moderate aerobic activity or 75 minutes of vigorous aerobic activity a week, or a combination of moderate and vigorous activity. The guidelines suggest that you spread out this exercise over a week. Greater amounts of exercise will provide even greater health benefits. But even small amounts of physical activity are helpful. Being active for short periods throughout the day can add up to provide health benefits.

- Strength training. Do strength training exercises for all major muscle groups at least two times a week. Aim to do a single set of each exercise, using a weight or resistance level heavy enough to tire your muscles after about 12 to 15 repetitions.

As a general goal, aim for at least 30 minutes of physical activity a day. If you can't set aside that much time, try several short sessions of activity throughout the day. Any amount of activity is better than none at all. Even small amounts

of physical activity are helpful, and accumulated activity throughout the day adds up to provide a health benefit.

Remember it's OK to start slowly — especially if you haven't been exercising regularly. You might start with five minutes a day the first week, and then increase your time by five minutes each week until you reach at least 30 minutes. For even more health benefits, aim for at least 60 minutes of physical activity most days of the week.

TRACK YOUR PROGRESS

Keeping a record of how many steps you take, the distance you walk, and how long it takes can help you see where you started from and serve as a source of inspiration. Just think how good you'll feel when you see how many miles you've walked each week, month, or year. Try using an activity tracker, app, or pedometer to calculate steps and distance, or record these numbers in a walking journal.

STAY MOTIVATED

Starting a walking program takes initiative. Sticking with it requires a strong commitment. To stay motivated:

- **Set yourself up for success. Start with a simple goal, such as, "I'll take a 5- or 10-minute walk during my lunch break." When your 5- or 10-minute walk becomes a habit, set a new goal, such as, "I'll walk for 20 minutes after work."**

- **Find specific times for walks. Soon you could be reaching for goals that once seemed impossible.**

- **Make walking enjoyable. If you don't like walking alone, ask a friend or neighbor to join you. If you're energized by groups, join a health club or walking group. You might like listening to music while you walk.**

- **Vary your routine. If you walk outdoors, plan several different routes for variety. If you often walk in your neighborhood, consider walking somewhere new, such as a city or state park. Try taking routes with hills or stairs as you become used to walking more. Or walk faster for a few minutes and then slow down for a few minutes and repeat the cycle. If**

you're walking alone, tell someone which route you're taking. Walk-in safe, well-lit locations.

- **Take missed days in stride. If you find yourself skipping your daily walks, don't give up. Remind yourself how good you feel when you include physical activity in your daily routine, and then get back on track.[15]**

Once you take that first step, you're on the way to an important destination — better health.

WHAT ARE THE BENEFITS OF WALKING?

Walking can help you burn calories. Burning calories can help you maintain or lose weight. Your actual calorie burn will depend on several factors, including:

- **walking speed**
- **distance covered**
- **terrain (you'll burn more calories walking uphill than you'll burn on a flat surface)**
- **your weight**

JOGGERS (AND WALKERS) SHOULD FOLLOW THESE PRECAUTIONS

1. Stay away from high-speed roads.
2. Do not wear headphones, so that you can be aware of your surroundings. Using headphones may keep you from hearing a car horn, a voice, or a potential attacker.
3. Go against the traffic so that you can spot and avoid all oncoming traffic.
4. Do not wear dark clothes. Reflective clothing or fluorescent material is worn on different parts of the body is highly recommended. A flashlight, particularly an LED light, not only alerts drivers to your presence but also helps illuminate the street. Motorists can see a light from a greater distance than they can spot the reflective material.
5. Wear a billed cap and clear glasses in the dark. The billed cap will hit a branch or other object before such hits your head. Clear glasses can protect your eyes from unseen objects or insects.
6. Run behind vehicles at intersections. Drivers often look only in the direction of oncoming traffic and do not look in the opposite direction before proceeding

onto the street.
7. Select different routes. A potential attacker may lie in wait if you are predictable in your running route. Running with a partner is also preferable because there is always strength in numbers. And do not wear your hair in a ponytail, as such provides an easy grip for a potential attacker.
8. Avoid walking or jogging in unfamiliar areas. When visiting a new area, always inquire as to safe areas to walk or jog.[16]

AEROBICS

Aerobics, formerly known as aerobic dance, consists of a combination of stepping, walking, jogging, skipping, kicking, and arm swinging movements performed to music. It is a fun way to exercise and promote cardiorespiratory development at the same time. High-impact aerobics (HIA) is the traditional form of aerobics. The movements exert a great amount of vertical force on the feet as they contact the floor. Proper leg conditioning through other forms of weight-bearing aerobic exercises (brisk walking and jogging), as well as strength training, is recommended before participating in HIA. HIA is an intense activity, and it produces the highest rate of aerobics injuries. Shin splints, stress fractures, low back pain, and tendinitis are all too common in HIA enthusiasts. These injuries are caused by the constant impact of the feet on firm surfaces. As a result, several alternative forms of aerobics have been developed. In low-impact aerobics (LIA), the impact is reduced because each foot contacts the surface separately, but the recommended intensity of exercise is more difficult to maintain than with HIA. To help elevate the exercise heart rate, all arm movements and weight-bearing actions that lower the center of gravity should be accentuated. Sustained movement throughout the program is also crucial to keep the heart rate in the target cardiorespiratory zone. A third aerobics modality is step aerobics (SA), in which participants step up and down from a bench. Benches range in height from 2 to 10 inches. SA adds another dimension to the aerobics program. Variety adds enjoyment to aerobic workouts. SA is considered a high-intensity but low-impact activity. The intensity of the activity can be controlled easily by the height of the bench. Aerobic benches or plates can be stacked together safely to adjust the height of the steps. Beginners are encouraged to use the lowest stepping height and then advance gradually to a higher bench. This will decrease the risk of injury. Even though one foot is always in contact with the floor or bench during step aerobics, this activity is not recommended for individuals with ankle, knee, or hip problems. Other forms of aerobics include a combination of HIA and LIA,

as well as moderate-impact aerobics (MIA). MIA incorporates plyometric training. This type of training is used frequently by jumpers (high, long, and triple jumpers) and athletes in sports that require quick jumping ability, such as basketball and gymnastics. With MIA, one foot is in contact with the ground most of the time. Participants, however, continually_try to recover from all lower-body flexion actions. This is done by extending the hip, knee, and ankle joints quickly without allowing the foot (or feet) to leave the ground. These quick movements make the exercise intensity of MIA quite high.[17]

SWIMMING

Swimming, another excellent form of aerobic exercise, uses many of the major muscle groups in the body. This provides a good training stimulus for the heart and lungs. Swimming is a great exercise option for individuals who cannot jog or walk for extended periods. Compared with other activities, the risk for injuries from swimming is low. The aquatic medium helps to support the body, taking pressure off bones and joints in the lower extremities and the back. Maximal heart rates during swimming are approximately 10 to 13 beats per minute (bpm) lower than during running. The horizontal position of the body is thought to aid blood flow distribution throughout the body, decreasing the demand on the cardiorespiratory system. Direct contact with cool water seems to help dissipate body heat more efficiently, further decreasing the strain on the heart. Some exercise specialists recommend that this difference in maximal heart rate (10 to 13 bpm) be subtracted before determining cardiorespiratory training intensities. For example, the estimated maximal swimming heart rate for a 20-year-old would be approximately 187 bpm. Studies are inconclusive as to whether this decrease in heart rate in water also occurs at submaximal intensities below 70 percent of maximal heart rate.[17] One can argue, nonetheless, that healthy people can achieve higher work capacities during land-based activities; thus, the same exercise intensity can be given for water activities. If a lower intensity is used, training benefits may be decreased. To produce better training benefits during swimming, swimmers should minimize gliding periods such as those in the breaststroke and side stroke. Achieving proper training intensities with these strokes is difficult. The forward crawl is recommended for better aerobic results. Overweight individuals have to swim fast enough to achieve an adequate training intensity. Excessive body fat makes the body more buoyant, and often the tendency is to float along. This may be good for reducing stress and relaxing, but it does not greatly increase caloric expenditure to aid with weight loss. Walking or jogging in waist- or

armpit-deep water is a better choice for overweight individuals who cannot walk or jog on land for an extended period. Regarding the principle of specificity of training, cardiorespiratory improvements from swimming cannot be measured adequately with a land-based walk/jog test. This is because most of the work with swimming is done by the upper body musculature. Although the heart's ability to pump more blood improves significantly with any type of aerobic activity, the primary increase in the ability of cells to utilize oxygen (oxygen uptake [VO2]) with swimming occurs in the upper body and not the lower extremities. Therefore, fitness improvements with swimming are best attained by comparing changes in the distance a person swims in a given time; say, 12 minutes.[18]

REFLECTIONS

Keep in mind: Participation in sports is a good predictor of adherence to exercise later in life.

• What previous experiences have you had with participation in sports?

• Were these experiences positive, and what effect do they have on your current physical activity patterns?

RELEASING STORED ENERGY FROM THE BODY

THREE PRIMARY ENERGY PATHWAYS

We all know that the human body needs the energy to function, but where does this energy come from? Ultimately, the energy that keeps us moving comes from the food we eat. However, we cannot use energy directly from food—it must first be converted into adenosine triphosphate, or ATP, the immediate useable form of chemical energy utilized for all cellular functions. The body does store a minimal amount of ATP within the muscles, but the majority is synthesized from the foods we eat.[1] Food is made up of carbohydrates, fats, and proteins, and these nutrients are broken down into their simplest forms (glucose, fatty acids, and amino acids) during digestion. Once these nutrients are broken down, they are transported through the blood to either be used in a metabolic pathway or stored for later use.[2] Because we do not store a significant amount of ATP and need a continuous supply, it must be constantly resynthesized. This occurs in several ways using one of three energy systems: [3]

1. **Phosphagen (immediate source)**
2. **Anaerobic (somewhat slow, uses carbohydrates)**
3. **Aerobic (slow, uses either carbohydrate or fat)**

PHOSPHAGEN

This system uses creatine phosphate and has a very rapid rate of ATP production. The creatine phosphate is used to reconstitute ATP after it's broken down to release its energy. The total amount of creatine phosphate and ATP stored in muscles is small, so there is limited energy available for muscular contraction. It is, however, instantaneously available and is essential at the onset of activity, as well as during short-term high-intensity activities lasting about 1 to 30 seconds in duration, such as sprinting, weightlifting, or throwing a ball.[4]

ANAEROBIC GLYCOLYSIS

Anaerobic glycolysis does not require oxygen and uses the energy contained in glucose for the formation of ATP. This pathway occurs within the cytoplasm and breaks glucose down into a simpler component called pyruvate. As an intermediate pathway between the phosphagen and aerobic system, anaerobic

glycolysis can produce ATP quite rapidly for use during activities requiring large bursts of energy over somewhat longer periods (30 seconds to three minutes max, or during endurance activities before a steady state is achieved).[5]

AEROBIC GLYCOLYSIS

This pathway requires oxygen to produce ATP because carbohydrates and fats are only burned in the presence of oxygen. This pathway occurs in the mitochondria of the cell and is used for activities requiring sustained energy production. Aerobic glycolysis has a slow rate of ATP production and is predominantly utilized during longer-duration, lower-intensity activities after the phosphagen and anaerobic systems have fatigued.[6]

It is important to remember that all three of these systems contribute to the energy needs of the body during physical activity. These systems do not work independently of each other, but rather dominate at different times, depending on the duration and the intensity of the activity.[7]

ENERGY FOR EXERCISE

Why is a muscle like a motorbike?

Although muscles and engines work in different ways, they both convert chemical energy into energy of motion.

- **A motorbike engine uses the stored energy of petrol and converts it to heat and energy of motion (kinetic energy).**
- **Muscles use the stored chemical energy of the food we eat and convert that to heat and energy of motion (kinetic energy).**

Where does the energy for muscle contraction come from?

The source of energy that is used to power the movement of contraction in working muscles is adenosine triphosphate – the body's biochemical way to store and transport energy. However, adenosine triphosphate is not stored to a great extent in cells. So once muscle contraction starts, the making of more adenosine triphosphate must start quickly.[8]

Since adenosine triphosphate is so important, the muscle cells have several different ways to make it. These systems work together in phases. The three biochemical systems for producing adenosine triphosphate are, in order:

- **using creatine phosphate**
- **using glycogen**
- **aerobic respiration**

Using creatine phosphate

All muscle cells have a little adenosine triphosphate within them that they can use immediately – but only enough to last for about 3 seconds! So, all muscle cells contain a high-energy compound called creatine phosphate which is broken down to make more adenosine triphosphate quickly. Creatine phosphate can supply the energy needs of a working muscle at a very high rate, but only for about 8–10 seconds.

Using glycogen (and no oxygen)

Fortunately, muscles also have large stores of carbohydrates, called glycogen, which can be used to make ATP from glucose. But this takes about 12 chemical reactions, so it supplies energy more slowly than creatine phosphate. It's still rapid, though, and will produce enough energy to last about 90 seconds. Oxygen is not needed – this is great because it takes the heart and lungs some time to get increased oxygen supply to the muscles. A byproduct of making ATP without using oxygen is lactic acid. You know when your muscles are building up lactic acid because it causes tiredness and soreness.[9]

Using aerobic respiration (using oxygen again)

Within two minutes of exercise, the body starts to supply working muscles with oxygen. When oxygen is present, aerobic respiration can take place to break down the glucose for adenosine triphosphate. This glucose can come from several places:

- **remaining glucose supply in the muscle cells**
- **glucose from food in the intestine**
- **glycogen in the liver**
- **fat reserves in the muscles**
- **in extreme cases (like starvation), the body's protein**

Aerobic respiration takes even more chemical reactions to produce ATP than either of the above two systems. It is the slowest of all three systems – but it can supply ATP for several hours or longer, as long as the supply of fuel lasts.

Here's how it works

You have missed the bus and start running to college for a 9.00 am exam:

- **For the first 3 seconds of your run to college, your muscle cells use the ATP they have within them.**
- **For the next 8–10 seconds, your muscles use creatine phosphate stores to provide ATP.**
- **Since you haven't made it to college yet, the glycogen system (which doesn't need any oxygen) kicks in.**
- **Still not there, so finally aerobic respiration (that's ATP using oxygen) takes over.**

Different forms of exercise use different systems to produce ATP. A sprinter is getting ATP in a very different way from a marathon runner.

- **Using creatine phosphate – This would be the major system used for short bursts (weightlifters or short-distance sprinters) because it is fast but lasts for only 8–10 seconds.**
- **Using glycogen (no oxygen) – This lasts for 1.3–1.6 minutes, so it would be the system used in events like the 100-meter swim or the 200 m or 400 m run.**

Using aerobic respiration – This last for an unlimited time, so it's the system used in endurance events like marathon running, rowing, distance skating and so on.[10]

REGULARITY IN WALKING

MENTAL BENEFITS OF WALKING

Walking provides the best of both worlds. It offers the physical benefits of exercise while also boosting your emotional well-being. Walking regularly can help ease symptoms related to chronic mental health conditions like anxiety and depression.[1] You can walk anywhere without equipment or a special membership. The more you do it, the more positive effects you'll experience.[2]

THE BENEFITS OF WALKING

There are numerous benefits of walking. Some of the most common include.

- **Improved sleep**
- **Better endurance**
- **Stress relief**
- **Improvement in mood**
- **Increased energy and stamina**
- **Reduced tiredness can increase mental alertness**
- **Weight loss**
- **Reduced cholesterol and improved cardiovascular (heart) health**

Walking helps boost your mood because it increases blood flow and blood circulation to the brain and body. It has a positive influence on your hypothalamic-pituitary-adrenal (HPA) axis, which is your central nervous response system. This is good because the HPA axis is responsible for your stress response. When you exercise by walking, you calm your nerves, which can make you feel less stressed.[3] You can build on the positive effects of walking by inviting friends to join you. Walking with others for one or two days per week can have enormous benefits. Physical exercise combined with positive social interactions can improve negative moods, ward off depression, and improve self-esteem. Try to walk 3 days a week for 10-30 minutes at a time.[4]

HOW TO CREATE A WALKING ROUTINE

One of the best ways to begin a new walking routine is to start small and take it easy on yourself as you gradually build up endurance. Before you take a long walk, stretch to warm up. Start at a pace that feels relaxed, then build up to a brisk walk. Toward the end of your walk, give yourself time to slow down again.[5] Each time you go out, carve out a comfortable walking route, then

extend your distance over the next few days or weeks. Give yourself goals to reach and celebrate your wins. Remember, it's not always about the length of your route. It's also about the quality of the walk and the benefits you get from doing it consistently.[6] A good rule of thumb is to walk for about 30-45 minutes, either all at once or broken into 10-minute chunks. This ends up being about 2-4 miles. You can measure your distance by wearing a watch to measure the time or buckling a pedometer to your belt to measure the distance.[7]

HERE ARE SOME HELPFUL TIPS

Set yourself up for success. Start with a simple goal such as taking a 5-minute walk during your lunch break. When this becomes a routine, set a new goal like walking for 20 minutes after work. Find enough time during the day for your walks. With this plan, you could be setting goals that seemed impossible at the start.[8]

Make walking enjoyable. If you don't like walking by yourself, you can ask a neighbor or a friend to join you. If your group energizes you, consider joining a walking group or a health club. You can try listening to music. This might make walking less boring.[9]

Don't forget about comfort. You'll want to have comfortable shoes that won't hurt your feet if you're walking for long distances. It's helpful to give some thought to what you want to wear as well. Layers can help in unpredictable weather conditions. Water-repellent synthetic fabric can help keep you cool and dry if you work up a sweat.[10]

Do it safely. If you're planning on walking at night, consider wearing brightly colored clothing and a reflector to help cars see you when they're passing by. Keep an eye on your surroundings, and always stay safe.[11]

Switch up your routine. If you walk outdoors, you can plan a variety of different routes. If you're walking by yourself, tell someone which route you're taking for the day. Always walk in well-lit and safe locations.[12]

Don't worry about missed days. If you find yourself forgetting to go on your daily walks from time to time, don't give up. Get back on track by reminding yourself of how good you feel when you include physical activity in your daily routine.[13]

PROMOTING WALKING AND WALKABLE COMMUNITIES: A STRATEGY TO IMPROVE HEALTH

One out of every two U.S. adults is living with a chronic disease, such as heart disease, cancer, or diabetes. These diseases contribute to disability and premature death. In addition, the medical treatment of chronic diseases incurs substantial costs for individuals, families, and the nation. The good news is that many chronic diseases can be delayed, prevented, or managed through healthy behaviors. Along with eating a healthy diet and avoiding tobacco use, people can decrease their risk of chronic disease by being physically active. Physical activity can help people with chronic diseases manage their conditions. In addition, physical activity reduces the risk of premature death and supports positive mental health and healthy aging—making it one of the most important actions people can take to improve their overall health. To obtain substantial health benefits, the 2008 Physical Activity Guidelines for Americans recommends that adults get at least 150 minutes of moderate-intensity aerobic physical activity or 75 minutes of vigorous-intensity physical activity, or an equivalent combination, each week and that children and adolescents be active for at least 60 minutes every day. Despite the many benefits of physical activity, only one-half of all U.S. adults and about one-quarter of high school students meet the guideline for aerobic physical activity in the 2008 Physical Activity Guidelines for Americans. Walking is an excellent way for most people to increase their physical activity. It is a powerful public health strategy for the following reasons:

- **Walking is an easy way to start and maintain a physically active lifestyle.**

- **Walking is the most common form of physical activity for people across the country.**

- **Walking can serve many purposes. It can be a way to exercise, have fun, or get to school, work, or other nearby destinations.**

- **Making walking easier can help communities by improving safety, social cohesion, and local economies and reducing air pollution.**

To promote walking, community strategies can be implemented where people live, learn, work, and play. Places for walking can be designed and enhanced to improve their walkability. Improving walkability means that communities are created or enhanced to make it safe and easy to walk and that pedestrian activity is encouraged for all people. Improving the walkability of

communities can benefit people of all abilities, including those who run, bike, skate, or use wheelchairs. The publication*, Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities* was intended to increase walking across the United States by calling for improved access to safe and convenient places to walk and wheelchair roll, as well as for a culture that supports these activities for people of all ages and abilities. This *Call to Action* presents five goals and supporting implementation strategies that are grounded in scientific and practice-based evidence. These goals call for action by multiple sectors of society, including transportation, land use, and community design; parks, recreation, and fitness; education (schools, colleges, and universities); business and industry; volunteer and nonprofit; health care; media; and public health. Families and individuals will also need to be involved to achieve these goals.[14]

This Call-to-Action complements existing recommendations to help Americans become more physically active, such as those found in the National Prevention Strategy: *America's Plan for Better Health and Wellness and the Solving the Problem of Childhood Obesity Within a Generation*, *White House Task Force on Childhood Obesity Report to the President,* as well as the national health objectives for physical activity in Healthy People 2020. It also aligns with the goals of initiatives such as *Let's Move!* the *Go4Life Campaign*, the *U.S. Department of Transportation's Safer People*, *Safer Streets Initiative*, the *America's Great Outdoors Initiative*, and the *Partnership for Sustainable Communities*. In addition, this Call-to-Action builds on the National Physical Activity Plan, which was developed by public and private partners to provide a comprehensive set of policies, programs, and initiatives that can help all people become more physically active and meet the 2008 Physical Activity Guidelines for Americans.[15]

VIGOROUS VS. MODERATE ACTIVITY

How can one tell an activity at a moderate level from a vigorous one? Vigorous activities take more effort than moderate ones. Here are just a few moderate and vigorous aerobic physical activities. Do these for 10 minutes or more at a time.[1]

MODERATE ACTIVITIES

(I can talk while I do them, but I can't sing.)

- **Ballroom and line dancing**
- **Biking on level ground or with few hills**
- **Canoeing**
- **General gardening (raking, trimming shrubs)**
- **Sports where you catch and throw (baseball, softball, volleyball)**
- **Tennis (doubles)**
- **Using your manual wheelchair**
- **Using hand cyclers-also called ergometers**
- **Walking briskly**
- **Water aerobics**

VIGOROUS ACTIVITIES

(I can only say a few words without stopping to catch my breath.)

- **Aerobic dance**
- **Biking faster than 10 miles per hour**
- **Fast dancing**
- **Heavy gardening (digging, hoeing)**
- **Hiking uphill**
- **Jumping rope**
- **Martial arts (such as karate)**
- **Race walking, jogging, or running**
- **Sports with a lot of running (basketball, hockey, soccer)**
- **Swimming fast or swimming laps**
- **Tennis (singles)**

LIGHT, MODERATE, & VIGOROUS ACTIVITY

Light intensity activities require the least amount of effort, compared to moderate and vigorous activities. The definition of light intensity activity is an activity that is classified as < 3 METS. (MET stands for the metabolic equivalent of task. One MET is the amount of energy used while sitting quietly. Physical activities may be rated using METs to indicate their intensity. For example, reading may use about 1.3 METs while running may use 8-9 METs.) One MET, or metabolic equivalent, is the amount of oxygen consumed while sitting at rest. Thus, an activity classified as 2 METS would be equal to 2 times the amount of oxygen consumed while sitting at rest (1 MET). METS are a convenient and standard method for describing the absolute intensity of physical activities. Some examples of light physical activities include walking slowly, sitting at your computer, making the bed, eating, preparing food, and washing dishes.[2]

Moderate-intensity activities are defined as activities ranging between 3 - < 6 METS. These activities require more oxygen consumption than light activities. Some examples of moderate physical activities include sweeping the floor, walking briskly, slow dancing, vacuuming, washing windows, and shooting a basketball.[3]

Vigorous-intensity activities are defined as activities ≥ 6 METS. Vigorous activities require the highest amount of oxygen consumption to complete the activity. Examples of vigorous physical activities include running (5 mph >), swimming, shoveling, soccer, jumping rope, and carrying heavy loads (i.e. bricks).[4]

An easy way to estimate the intensity of activities is through a method called the "talk test". This method is a simple, practical way for individuals to measure their activity intensity. If you are doing a moderate-intensity activity, you can talk, but not sing during the activity. If you are doing vigorous-intensity activity, you will not be able to say more than a few words without taking a breath.[5]

EXAMPLES OF MODERATE AND VIGOROUS PHYSICAL ACTIVITY

Exercise experts measure activity in metabolic equivalents or METs. One MET is defined as the energy it takes to sit quietly. For the average adult, this is about one calorie per every 2.2 pounds of body weight per hour; someone who weighs 160 pounds would burn approximately 70 calories an hour while

sitting or sleeping.[7]

Moderate-intensity activities are those that get you moving fast enough or strenuously enough to burn off three to six times as much energy per minute as you do when you are sitting quietly or exercises that clock in at 3 to 6 METs.

Vigorous-intensity activities burn more than 6 METs.[8] **One limitation to this way of measuring exercise intensity is that it does not consider the fact that some people have a higher level of fitness than others. Thus, walking at 3 to 4 miles per hour is considered to require METs and to be a moderate-intensity activity, regardless of who is doing the activity, a young marathon runner or a 90-year-old grandmother. As you might imagine, a brisk walk would likely be an easy activity for the marathon runner, but a very hard activity for the grandmother.**[9]

THE BENEFITS OF VIGOROUS-INTENSITY EXERCISE

Vigorous-intensity exercise—sometimes called high-intensity exercise—is a physical activity done with a large amount of effort, resulting in a substantially higher heart rate and rapid breathing. Your exertion would be considered hard to extremely hard, making it difficult to speak in full sentences. Activities like running, cycling, and singles tennis are usually classified as vigorous. The American Heart Association recommends a mixture of moderate-to-vigorous intensity activity for 40 minutes at a time, three or four days per week to lower blood pressure and cholesterol.

MEASURING EXERCISE INTENSITY

Though you might have an idea when you hit a vigorous level, you can look to these specific markers to know for sure.

Talk test: The simplest way to determine if you're at a vigorous level of exercise is with a talk test. At vigorous intensity, you can speak only a few words at a time, not in full sentences.

MET and calories burned: The effort required for vigorous-intensity exercise is defined by the Centers for Disease Control as greater than 6 metabolic equivalents, burning more than 7 kilocalories per minute. This is six times the energy cost of sitting quietly, 1 MET, which burns 1.2 kilocalories per minute.

Heart rate: Vigorous-intensity is also defined by the AHA as exercise at a heart rate of 70% to 85% of a person's maximum heart rate.1 This varies by age and fitness level, so you should use a heart rate zone chart or calculator to find this number for your age and gender.

Rate of perceived exertion: If you were to rate your effort on the Borg perceived exertion scale (6 being no exertion to 20 being maximal exertion), vigorous-intensity is 15 to 19, the range you would rate subjectively as hard, very hard, or extremely hard, according to the AHA.[10]

BENEFITS OF VIGOROUS PHYSICAL ACTIVITY

There are plenty of reasons to take your workout up a notch. Engaging in vigorous physical activity can provide many health advantages.

Lower Risk of Chronic Disease: A lack of exercise can lead to a greater chance of developing chronic diseases such as coronary heart disease, osteoporosis, and various types of cancer. For example, a 2012 study followed up with more than 44,000 men aged 40 to 75 after 22 years and concluded that vigorous exercise was associated with a lower risk of chronic disease among participants.[11]

Improved Brain Health: All exercise, but particularly vigorous workouts, amps up blood flow in the brain and oxygenates frontal areas of the brain. This has been shown among school-age students—those who partook in vigorous exercise received better grades—as well as in older populations.

A 2017 review focusing on the link between exercise and Parkinson's disease or Alzheimer's disease found that when people 70 to 80 years old logged 150 minutes of moderate to vigorous exercise per week within the last five years, they have a 40% lower chance of developing Alzheimer's compared to sedentary individuals in their age group.[12]

BELIEFS & ATTITUDES

ATTITUDES, VALUES, AND BELIEFS

The first type of persuasive argument involves a change in someone's attitudes, values, and beliefs. An attitude is defined as an individual's general predisposition toward something as being good or bad, right or wrong, or negative or positive. Maybe you believe that local curfew laws for people under twenty-one are a bad idea, so you want to persuade others to adopt a negative attitude toward such laws. You can also attempt to persuade an individual to change her or his value toward something.[1]

A value refers to an individual's perception of the usefulness, importance, or worth of something. We can value a college education or technology or freedom. Values, as a general concept, are fairly ambiguous and tend to be very lofty ideas. Ultimately, what we value in life motivates us to engage in a range of behaviors. For example, if you value technology, you are more likely to seek out new technology or software on your own. On the contrary, if you do not value technology, you are less likely to seek out new technology or software unless someone, or some circumstance, requires you to. Lastly, you can attempt to get people to change their personal beliefs. A belief is a proposition or position that an individual holds as true or false without positive knowledge or proof. Typically, beliefs are divided into two basic categories: core and dispositional. A Core belief is a belief that people have actively engaged in and created throughout their lives.[2] A dispositional belief, on the other hand, is a belief that people have not actively engaged in but rather judgments that they make, based on their knowledge of related subjects, when they encounter a proposition. For example, imagine that you were asked the question, "Can stock cars reach speeds of one thousand miles per hour on a one-mile oval track?" Even though you may never have attended a stock car race or even seen one on television, you can make split-second judgments about your understanding of automobile speeds and say with a fair degree of certainty that you believe stock cars cannot travel at one thousand miles per hour on a one-mile track. We sometimes refer to dispositional beliefs as virtual beliefs.[3]

When it comes to persuading people to alter core and dispositional beliefs, persuading audiences to change core beliefs is more difficult than persuading audiences to change dispositional beliefs. For this reason, you are very unlikely to persuade people to change their deeply held core beliefs about a topic in a

five- to ten-minute speech. However, if you give a persuasive speech on a topic related to an audience's dispositional beliefs, you may have a better chance of success. While core beliefs may seem to be exciting and interesting, persuasive topics related to dispositional beliefs are generally better for novice speakers with limited time allotments.[4]

VALUES, BELIEFS, AND ATTITUDES

Human beings are complex, multifaceted creatures. Psychologists and sociologists have written thousands of pages of text attempting to explain what makes human beings "tick" to better understand why individuals behave as they do. Why does one person laugh off an insult while another feels the need to punch the offender? Why do some cultures value the uniqueness of the individual while others believe that a group working as a whole is more important? What makes one person persevere while another gives up? In one small section of this chapter, we certainly cannot hope to comprehensively cover all that comprises human psychology, but we do need to identify a few key terms that have relevance in our study of communication and speech. For our purposes, the terms values, beliefs, and attitudes are especially important as you attempt to analyze your audience. These terms are defined for you in the table below.[5]

Values: The underlying principles or standards of desirable or ideal behavior that we use to justify our beliefs and attitudes.

Beliefs: Ideas we express about subjects that may explain our attitudes towards them.

Attitudes: A frame of mind in favor of or opposed to a person, policy, belief, institution, topic, etc.

SOCIAL SUPPORT & WELLBEING

WHAT IS A SOCIAL SUPPORT NETWORK?

A social support network is made up of friends, family, and peers. Social support is different from a support group, which is generally a structured meeting run by a lay leader or mental health professional.[1] Although both support groups and support networks can play an important role in times of stress, a social support network is something you can develop when you're not under stress. It provides the comfort of knowing that your friends are there for you if you need them.[2] You don't need to formalize your support network. A coffee break with a friend at work, a quick chat with a neighbor, a phone call to your sibling, a visit to a house of worship or volunteer work are all ways to develop and foster lasting relationships with others.[3] A social support network goes a long way in promoting consistency in exercise and overall wellbeing.

RISKS OF ISOLATION AND BENEFITS OF SOCIAL SUPPORT

Studies have demonstrated that social isolation and loneliness are associated with a greater risk of poor mental health and poor cardiovascular health, as well as other health problems. Other studies have shown the benefit of a network of social support, including the following:[4]

- **Improving the ability to cope with stressful situations**
- **Alleviating the effects of emotional distress**
- **Promoting lifelong good mental health**
- **Enhancing self-esteem**
- **Lowering cardiovascular risks, such as lowering blood pressure**
- **Promoting healthy lifestyle behaviors**
- **Encouraging adherence to a treatment plan**

CULTIVATING YOUR SOCIAL SUPPORT NETWORK

If you want to improve your mental health and your ability to combat stress, surround yourself with at least a few good friends and confidants who are excited about exercise and overall wellbeing. Here are some ideas for building your social network:

- **Volunteer. Pick a cause that's important to you and get involved. You're sure to meet others who share similar interests and values.**

- **Join a gym or fitness group. Incorporating physical fitness into your day is an important part of a healthy lifestyle. You can make friends while you exercise. Look at gyms in your area or check a local community center.**
- **Take a class. A local college or community education course puts you in contact with others who share similar hobbies or pursuits.**
- **Look online. Social networking sites can help you stay connected with friends and family. Many good sites exist for people going through stressful times, such as chronic illness, loss of a loved one, a new baby, divorce, and other life changes. Be sure to stick to reputable sites and be cautious about arranging in-person meetings.**

GIVE AND TAKE: THE FOUNDATION OF SOCIAL NETWORKS

A successful relationship is a two-way street that requires active participation. Here are some suggestions for nurturing your relationships:

- **Stay in touch. Answering phone calls, returning emails and reciprocating invitations let people know you care.**
- **Don't compete. Be happy instead of jealous when your friends succeed.**
- **Be a good listener. Listen when your friends are speaking. Find out what's important to them.**
- **Don't overdo it. Be careful not to overwhelm friends and family with phone calls and emails. Save those high-demand times for when you need them.**
- **Appreciate your friends and family. Take time to say thank you and express how important they are to you.**
- **Give back. Be available for family and friends when they need support.[4]**

HOW SOCIAL SUPPORT CONTRIBUTES TO PSYCHOLOGICAL HEALTH

Social support is often identified as a key component of solid relationships and strong psychological health, but what exactly does it mean? Essentially, social support involves having a network of family and friends that you can turn to in times of need.[5] Whether you are facing a personal crisis and need immediate assistance, or you just want to spend time with people who care about you, these relationships play a critical role in how you function in your day-to-day life.[6] It is social support that builds people up during times of stress and often gives them the strength to carry on and even thrive.[7] But social support is certainly not a one-way street. In addition to relying on others, you also serve as a form of support for many people in your life.

WHY STRONG SOCIAL SUPPORT IS SO IMPORTANT

Psychologists and other mental health professionals often talk about the importance of having a strong social support network. When trying to reach our goals or deal with a crisis, experts frequently implore people to lean on their friends and family for support.[8]

Research has also demonstrated the link between social relationships and many different aspects of health and wellness.1 Poor social support has been linked to depression and loneliness and has been shown to alter brain function and increase the risk of the following:[9]

- **Alcohol use**
- **Cardiovascular disease**
- **Depression**
- **Suicide**

In one study of middle-aged men over seven years, those with strong social and emotional support were less likely to die than those who lacked such relationships.[10]

SOCIAL SUPPORT

Social support refers to the psychological and material resources provided by a social network to help individuals cope with stress. Such social support may come in different forms and might involve:[11]

- **Helping a person with various daily tasks when they are ill or offering financial assistance when they are in need**
- **Advising a friend when they are facing a difficult situation**
- **Providing caring, empathy, and concern for loved ones in need**

SOCIAL INTEGRATION

Social integration is the actual participation in various social relationships, ranging from romantic partnerships to friendships.4 This integration involves emotions, intimacy, and a sense of belonging to different social groups, including being part of a:

- **Family**
- **Partnership**

- **Religious community**
- **Social activity**

Experts suggest that being integrated into such social relationships confers a protective benefit against maladaptive behaviors and damaging health consequences.

TYPES OF SOCIAL SUPPORT

Supportive social networks can come in different forms and play different roles in your life.

EMOTIONAL SUPPORT

Sometimes the people in your life provide emotional support. They back you up when you need it and are there with a shoulder to cry on when things don't go your way. This type of support can be particularly important during times of stress or when people are feeling lonely.[12]

INSTRUMENTAL SUPPORT

In other cases, the people in your social network might provide instrumental support. They take care of your physical needs and offer a helping hand when you need it. This might involve bringing you a hot meal when you are sick or giving you a ride when your car is in the shop. Such support is important when people have immediate needs that must be addressed.[13]

INFORMATIONAL SUPPORT

People can also provide what is known as informational support. This can involve providing guidance, advice, information, and mentoring. Such support can be important when making decisions or big changes in one's life. By having this form of support, people may feel less anxious and stressed out about the problems they are trying to solve thanks to the advice of a trusted friend, mentor, or loved one.[14]

REFERENCES

0.1 https://store.samhsa.gov/sites/default/files/d7/priv/sma16-4953.pdf

INTRODUCTION: WHAT IS WELLNESS?

[1] Katon, W., E.H.B. Lin, and K. Kroenke. The association of depression and anxiety with medical symptom burden in patients with chronic medical illness. General Hospital Psychiatry 29:147-155, 2007.
[2] Koeing, H.G. Religion, spirituality, and medicine: Research findings and implications for clinical practice. Southern Medical Journal 97:1194-1200, 2004.
[3] Weaver, A. J., and K.J. Flannelly. The role of religion/spirituality for cancer patients and their caregivers. Southern Medical Journal 97:1210-1214, 2004.
[4] National Institute of Mental Health. The Numbers Count: Mental Disorders in America. Fact Sheet. http://www.nimh.nih.gov/publicat/numbers.cfm#MajorDepressive.
[5] U.S. Department of Health and Human Services. Physical Activity and Health: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 1996.
[6] Rogers, V.L. et al. Heart disease and stroke statistics – 2012 update. Circulation 125:e12-e230, 2012.

NEGATIVE SIDE EFFECTS OF A SEDENTARY LIFESTYLE

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8

https://www.veinclinics.com/blog/top-5-negative-effects-of-a-sedentary-lifetyle/
https://cdnsciencepub.com/doi/full/10.1139/apnm-2012-0235
Abel M., Hannon J., Mullineaux D., and Beighle A. 2011. Determination of step rate thresholds corresponding to physical activity classifications in adults. J. Phys. Act. Health, 8(1): 45–51.
Ainsworth B.E., Haskell W.L., Herrmann S.D., Meckes N., Bassett D.R. Jr., Tudor-Locke C., et al. 2011. 2011 Compendium of Physical Activities: A second update of codes and MET values. Med. Sci. Sports Exerc. 43(8): 1575–1581.
Barbat-Artigas S., Plouffe S., Dupontgand S., and Aubertin-Leheudre M. 2012. Is functional capacity related to the daily amount of steps in postmenopausal women? Menopause, 19(5): 541–548.
Barreira T.V., Katzmarzyk P.T., Johnson W.D., and Tudor-Locke C. 2012*a*. Cadence patterns and peak cadence in U.S. children and adolescents: NHANES 2005–2006. Med. Sci. Sports Exerc. 44(9): 1721–1727.
Barreira T.V., Tudor-Locke C., Champagne C., Broyles S.T., Harsha D., Kennedy B.M., et al. 2012*b*. Comparison of YAMAX pedometer and GT3X accelerometer steps/day in a free-living sample of overweight and obese adults. J. Phys. Act Health.
Bassett D.R. Jr. and John D. 2010. Use of pedometers and accelerometers in clinical populations: validity and reliability issues. Phys. Ther. Rev. 15(3): 135–142.
Bassett D.R. Jr., Tremblay M.S., Eslinger D.W., Copeland J.L., Barnes J.D., and Huntington G.E. 2007. Physical activity and body mass index of children in an Old Order Amish community. Med. Sci. Sports Exerc. 39(3): 410–415.
Beets M.W., Bornstein D., Beighle A., Cardinal B.J., and Morgan C.F. 2010*a*. Pedometer-measured physical activity patterns of youth: a 13-country review. Am. J. Prev. Med. 38(2): 208–216.
Beets M.W., Agiovlasitis S., Fahs C.A., Ranadive S.M., and Fernhall B. 2010*b*. Adjusting step count recommendations for anthropometric variations in leg length. J. Sci. Med. Sport, 13(5): 509–512.
Bell G.J., Harber V., Murray T., Courneya K.S., and Rodgers W. 2010. A comparison of fitness training to a pedometer-based walking program matched for total energy cost. J. Phys. Act Health, 7(2): 203–213.
Bennett G.G., Wolin K.Y., Puleo E., and Emmons K.M. 2006. Pedometer-determined physical activity among multiethnic low-income housing residents. Med. Sci. Sports Exerc. 38(4): 768–773.
Bennett G.G., McNeill L.H., Wolin K.Y., Duncan D.T., Puleo E., and Emmons K.M. 2007. Safe to walk? Neighborhood safety and physical activity among public housing residents. PLoS Med. 4(10): e306.
Bradley J.M., Kent L., Elborn J.S., and O'Neill B. 2010. Motion sensors for monitoring physical activity in cystic fibrosis: what is the next step? Phys. Ther. Rev. 15(3): 197–203.
Bravata D.M., Smith-Spangler C., Sundaram V., Gienger A.L., Lin N., Lewis R., et al. 2007. Using pedometers to increase physical activity and improve health: a systematic review. JAMA, 298(19): 2296–2304.
Caspersen C.J., Powell K.E., and Christenson G.M. 1985. Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. Public Health Rep. 100(2): 126–131.
Cavanaugh J.T., Kochi N., and Stergiou N. 2010. Nonlinear analysis of ambulatory activity patterns in community-dwelling older adults. J. Gerontol. A: Biol. Sci. Med. Sci. 65(2): 197–203.
Chan C.B., Ryan D.A., and Tudor-Locke C. 2006. Relationship between objective measures of physical activity and weather: a longitudinal study. Int. J. Behav. Nutr. Phys. Act, 3: 21.

Temple V.A. 2010. Objectively measured physical activity of people with intellectual disability: participation and contextual influences. Phys. Ther. Rev. 15(3): 183–196.
Tudor-Locke C., Pangrazi R.P., Corbin C.B., Rutherford W.J., Vincent S.D., Raustorp A., et al. 2004*b*. BMI-referenced standards for recommended pedometer-determined steps/day in children. Prev Med. 38(6): 857–864.
Tudor-Locke C., McClain J.J., Hart T.L., Sisson S.B., and Washington T.L. 2009*c*. Expected values for pedometer-determined physical activity in youth. Res. Q. Exerc. Sport, 80(2): 164–174.

Tudor-Locke C., Johnson W.D., and Katzmarzyk P.T. 2010*a.* Accelerometer-determined steps/day in U.S. children and youth. Med. Sci. Sports Exerc. 42(12): 2244–2250.
Tudor-Locke C., Brashear M.M., Johnson W.D., and Katzmarzyk P.T. 2010*b.* Accelerometer profiles of physical activity and inactivity in normal weight, overweight, and obese U.S. men and women. Int. J. Behav. Nutr. Phys. Act, 7(1): 60.
Tudor-Locke C., Johnson W.D., and Katzmarzyk P.T. 2011*a.* Relationship between accelerometer-determined steps/day and other accelerometer outputs in U.S. adults. J. Phys. Act Health, 8: 410–419.
Tudor-Locke C., Johnson W.D., and Katzmarzyk P.T. 2011*b.* U.S. population profile of time-stamped accelerometer outputs: impact of wear time. J. Phys. Act Health, 8: 693–698.
Tudor-Locke C., Craig C.L., Cameron C., and Griffiths J.M. 2011*c.* Canadian children's and youth's pedometer-determined steps/day, parent-reported TV watching time, and overweight/obesity: the CANPLAY Surveillance Study. Int. J. Behav. Nutr. Phys. Act, 8: 66.
Tudor-Locke C., Leonardi C., Johnson W.D., Katzmarzyk P.T., and Church T.S. 2011*d.* Accelerometer steps/day translation of moderate-to-vigorous activity. Prev. Med. 53: 31–33.
Tudor-Locke C., Camhi S.M., Leonardi C., Johnson W.D., Katzmarzyk P.T., Earnest C.P., et al. 2011*e.* Patterns of adults stepping cadence in the 2005-2006 NHANES. Prev. Med. 53: 178–181.
Tudor-Locke C., Craig C.L., Beets M.W., Belton S., Cardon G.M., Duncan S., et al. 2011*f.* How many steps/day are enough? For children and adolescents. Int. J. Behav. Nutr. Phys. Act, 8: 78.
Tudor-Locke C., Craig C.L., Aoyagi Y., Bell R.C., Croteau K.A., De Bourdeaudhuij I., et al. 2011*g.* How many steps/day are enough? For older adults and special populations. Int. J. Behav. Nutr. Phys. Act, 8: 80.
Tudor-Locke C., Craig C.L., Brown W.J., Clemes S.A., De Cocker K., Giles-Corti B., et al. 2011*h.* How many steps/day are enough? For adults. Int. J. Behav. Nutr. Phys. Act, 8: 79.
Tudor-Locke C., Camhi S.M., and Troiano R.P. 2012. A catalog of rules, variables, and definitions applied to accelerometer data in the National Health and Nutrition Examination Survey, 2003-2006. Prev. Chronic Dis. 9: E113.
Tully M.A. and Tudor-Locke C. 2010. Physical activity monitors: clinical and research applications. Phys. Ther. Rev. 15(3): 133–134.
.Lavie CJ, Arena R, Swift DL, Johannsen NM, Sui X, Lee DC, Earnest CP, Church TS, O'Keefe JH, Milani RV, Blair SN. Exercise and the cardiovascular system: clinical science and cardiovascular outcomes.
.Fletcher GF, Landolfo C, Niebauer J, Ozemek C, Arena R, Lavie CJ. Promoting physical activity and exercise: JACC health promotion series.
Wisloff U, Lavie CJ. Taking physical activity, exercise, and fitness to a higher level.
.urco JV, Inal-Veith A, Fuster V. Cardiovascular health promotion: an issue that can no longer wait.
.remblay MS, Aubert S, Barnes JD, Saunders TJ, Carson V, Latimer-Cheung AE, Chastin SFM, Altenburg TM, Chinapaw MJM; SBRN Terminology Consensus Project Participants. Sedentary behavior research network (SBRN) - terminology consensus project process and outcome.
19.2018 Physical Activity Guidelines Advisory Committee. Physical Activity Guidelines Advisory Committee Scientific Report. Washington, DC: U.S. Department of Health and Human Services; 2018.
.Katzmarzyk PT, Church TS, Craig CL, Bouchard C. Sitting time and mortality from all causes, cardiovascular disease, and cancer.Med Sci Sports Exerc.
.Dunstan DW, Barr EL, Healy GN, Salmon J, Shaw JE, Balkau B, Magliano DJ, Cameron AJ, Zimmet PZ, Owen N. Television viewing time and mortality: the Australian Diabetes, Obesity and Lifestyle Study (AusDiab).
.Chau JY, Grunseit AC, Chey T, Stamatakis E, Brown WJ, Matthews CE, Bauman AE, van der Ploeg HP. Daily sitting time and all-cause mortality: a meta-analysis

SEDENTARY LIFESTYLES AND HEALTH RISKS

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7700832/
World Health Organization. Geneva: World Health Organization; 2020. Physical inactivity: a global public health problem [Internet] [cited 2020 Jun 15]. Available from: https://www.who.int/dietphysicalactivity/factsheet_inactivity/en/
Korea Centers for Disease Control and Prevention. Cheongju: Korea Centers for Disease Control and Prevention; 2019. Trends in the percentage of physical activity, among Korean adults aged ≥19 years, 2007- 2017 [Internet] [cited 2020 Jun 15]. Available from: https://www.cdc.go.kr/board.es?mid=a20602010000&bid=0034&list_no=364483&act=view.
Patterson R, McNamara E, Tainio M, de Sa TH, Smith AD, Sharp SJ, et al. Sedentary behavior and risk of all-cause, cardiovascular and cancer mortality, and incident type 2 diabetes: a systematic review and dose-response meta-analysis. *Eur J Epidemiol.*
Statistics Korea. *Korea health statistics 2018: Korea National Health and Nutrition Examination Survey (KNHANES VII-3)* Daejeon: Statistics Korea; 2018.
Fennell C, Barkley JE, Lepp A. The relationship between cell phone use, physical activity, and sedentary behavior in adults aged 18-80. *Comput Human Behav.*]
World Health Organization. *Global recommendations on physical activity for health.* Geneva: World Health Organization;
Sedentary Behaviour Research Network. Ottawa: Sedentary Behaviour Research Network; 2020. SBRN Terminology Consensus Project: 2017-2020 [Internet] [cited 2020 Nov 6]. Available from: https://www. sedentarybehaviour.org/sbrn-terminology-consensus-project/
Jochem C, Wallmann-Sperlich B, Leitzmann MF. The influence of sedentary behavior on cancer risk: epidemiologic evidence

and potential molecular mechanisms. *Curr Nutr Rep*.
Ainsworth BE, Haskell WL, Herrmann SD, Meckes N, Bassett DR, Jr, Tudor-Locke C, et al. 2011 Compendium of physical activities: a second update of codes and MET values. *Med Sci Sports Exerc*.
Katzmarzyk PT, Church TS, Craig CL, Bouchard C. Sitting time and mortality from all causes, cardiovascular disease, and cancer. *Med Sci Sports Exerc*. 2009;41:998–1005.
Lynch BM. Sedentary behavior and cancer: a systematic review of the literature and proposed biological mechanisms. *Cancer Epidemiol Biomarkers Prev*.
Brown WJ, Bauman AE, Bull FC, Burton NW. *Development of evidence-based physical activity recommendations for adults (18-64 years): report prepared for the Australian Government Department of Health*. Canberra: Commonwealth of Australia; 2012.
Department of Health, Australian Government. Canberra: Commonwealth of Australia; 2019. Australian 24-hour movement guidelines for the early years (birth to 5 years): an integration of physical activity, sedentary behavior, and sleep [Internet] [cited 2020 Jun 15]. Available from: https://www1.health.gov.au/internet/main/publishing.nsf/Content/ti-0-5years.
Commonwealth of Australia. Repatriation Commission . *Choose health: be active: a physical activity guide for older Australians*. Canberra: Commonwealth of Australia and the Repatriation Commission; 2005.

PHYSICAL ACTIVITY & METAL ACTIVITY

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9

https://www.hhs.k-state.edu/kines/about/outreach/activity-guide/whatispa.html
CNS Neuroscience & Therapeutics. Review of the brain health benefits of exercise. Last updated June 3, 2020. Accessed March 31, 2022.
American Psychological Association. Working out boosts brain health. Last updated March 4, 2020. Accessed April 29, 2022.
Advances in Preventive Medicine. The interrelationship between sleep and exercise: A systemic review. Last updated March 26, 2017. Accessed March 31, 2022.
Ibid.
National Institute of Mental Health. Depression. Last updated February 2018. Accessed March 31, 2022.
The American Journal of Psychiatry. Exercise and the prevention of depression: Results of the HUNT Cohort Study. Last updated October 3, 2017. Accessed March 31, 2022.
Psychology Today. Nature and Mental Health. What is the link? Last updated October 22, 2019. Accessed April 26, 2022.
Journal of psychiatric research. Assessing BDNF as a mediator of the effects of exercise on depression. Last updated February 8, 2020. Accessed April 26, 2022.
Mayo Clinic. Depression and anxiety: Exercise eases symptoms. Last updated September 27, 2017. Accessed March 31, 2022.
Frontiers in Psychiatry. Physical activity is associated with a lower long-term incidence of anxiety in a population-based, large-scale study. Last updated September 10, 2021. Accessed March 31, 2022.
Psychiatry Research. An examination of the anxiolytic effects of exercise for people with anxiety and stress-related disorders: A meta-analysis. Last updated January 6, 2017. Accessed May 5, 2022.
JAMA Psychiatry. A Mendelian Randomization Approach for Assessing the Relationship Between Physical Activity and Depression. Last updated January 23, 2019. Accessed April 26, 2022.

LIFESTYLE CHANGES

All references for this section are shown below as per superscripts 1,2,3,4,5

https://www.apa.org/topics/behavioral-health/healthy-lifestyle-changes
https://www.delightmedical.com/wellness-guide/lifestyle-changes-for-improved-health
https://www.lenmed.co.za/seven-lifestyle-factors-that-will-benefit-your-health/
https://quizlet.com/66393223/10-lifestyle-factors-flash-cards/

ENERGY EXPENDITURE

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9,10

https://www.verywellfit.com/what-is-energy-expenditure-3496103
Calcagno M, Kahleova H, Alwarith J, et al. The thermic effect of food: A review. J Am Coll Nutr. 2019;38(6):547-551. doi:10.1080/07315724.2018.1552544
Ravn AM, Ture Gregersen N, Christensen R, et al. Thermic effect of a meal and appetite in adults: an individual participant data meta-analysis of meal-test trials. Food & Nutrition Research. 2013;57(1):19676. doi:10.3402/for.v57i0.19676.
Bosy-Westphal A, Hägele FA, Müller MJ. What is the impact of energy expenditure on energy intake? Nutrients.

2021;13(10):3508. doi:10.3390/nu13103508
Bosy-Westphal A, Hägele FA, Müller MJ. What is the impact of energy expenditure on energy intake? Nutrients. 2021;13(10):3508. doi:10.3390/nu13103508
U.S. National Library of Medicine. Can you boost your metabolism?.
https://medlineplus.gov/benefitsofexercise.html
https://pubmed.ncbi.nlm.nih.gov/35709585/
Pataky Z, Armand S, Müller-Pinget S, Golay A, Allet L. Effects of obesity on functional capacity. Obesity 2014; 22:56–62. 9 Westerterp KR. Daily physical activity is determined by age, body mass, and energy balance. Eur J Appl Physiol 2015; 115:1177–1184.
Forbes GB. Lean body mass-body fat interrelationships in humans. Nutr Rev 1987; 45: 225–231.
Hall KD. Body fat and fat-free mass inter-relationships: Forbes's theory revisited. Br J Nutr 2007; 97: 1059–1063. 12 Westerterp KR. Physical activity, food intake and body weight regulation: insights from doubly labeled water studies. Nutr Rev 2010; 68: 148–154.
Bray GA, Redman LM, De Jonge L, Covington J, Rood J, Brock C, et al. Effect of protein overfeeding on energy expenditure measured in a metabolic chamber. Am J Clin Nutr 2015; 101: 496–505.
Hochstenbach-Waelen A, Veldhorst MA, Nieuwenhuizen AG, WesterterpPlantenga MS, Westerterp KR. Comparison of 2 diets with either 25% or 10% of energy as casein on energy expenditure, substrate balance and appetite profile. Am J Clin Nutr 2009; 89: 831–838.
Keys A, Brozek J, Henschel A, Mickelsen O, Taylor HL. The Biology of Human Starvation. University of Minnesota Press: Minneapolis, USA, 1950.
Major GC, Doucet E, Trayhurn P, Astrup A, Tremblay A. Clinical significance of adaptive thermogenesis. Int J Obes 2007; 31:204–212.
Rosenbaum M, Hirsch J, Gallagher DA, Leibel RL. Long-term persistence of adaptive thermogenesis in subjects who have maintained reduced body weight. Am J Clin Nutr 2008; 88:906–912.

ENJOYMENT OF PHYSICAL ACTIVITY

All references for this section are shown below as per superscripts 1,2,3,4,5

World Health Organization. Global Recommendations on Physical Activity for Health. World Health Organization; Geneva, Switzerland: 2010.
World Health Organization Global Health Risks. Mortality and Burden of Disease Attributable Selected Major Risks, 2009. [(accessed on 15 January2015)]. Available online:
http://www.Who.Int/healthinfo/global_burden_disease/globalhealthrisks_report_full.Pdf
Allender S., Foster C., Scarborough P., Rayner M. The burden of physical activity-related ill health in the UK. J. Epidemiol. Community Health. 2007;61:344–348. DOI: 10.1136/jech.2006.050807.
Garrett N.A., Brasure M., Schmitz K.H., Schultz M.M., Huber M.R. Physical inactivity: Direct cost to a health plan. Am. J. Prev. Med. 2004;27:304–309. DOI: 10.1016/j.amepre.2004.07.014.
Allen J.B., & Howe, B. (1998). Player ability, coach feedback, and female adolescent athletes' perceived competence and satisfaction Journal of Sport & Exercise Psychology, 20, 280-299.
Ames, C. (1992). Achievement goals, motivational climate, and motivational processes. In G.C. Roberts (Ed.), Motivation or sport and exercise (pp. 161-176). Champaign, IL Human Kinetics.
Bbdc, SJ., & Weiss, M.R. (1992). The relationship among perceived coaching behaviors, perceptions of ability, and motivation by competitive age-group swimmers. Jams? of Sport & &arise Psyckg,14, 309-325. Brustad, U. (1993). Who will go out and play? Parental and psychological influences on children's attraction to physical activity. Pediatric Exercise Science, 5,710-223.
Brustad, R.J. (1996a). Parental and peer influence on children's psychological development through sport In F.L. Smolt & R.E. Smith (Eds.), Children and youth at sport A biopsytlmocial perspective (pp. 112-124).
Madison, WI: Brown & Bendmark. Brustad, R.J. (1996b). Medico to physical activity in urban schoolchildren Parental socialization and gender influences. Research Quarterly fa Exercise and Sport 67, 316-323. Centers for Disease Control and Prevention (1997). Guidelines for school and community programs to promote lifelong physical activity among young people. MMWR 46 (No. RR-6).
Coakley J.J. (1993). Social dimensions of intensive training and participation in youth sports. In B.R. Cahill & AJ. Pearl (Eds.), extensive participation in children's sports (pp. 77-94). Champaign IL Human Kinetics. Coakley, JJ., & White, A. (1992).
Making decisions: Gender and sport participation among British adolescents. Sociology of Sport Journal, 9, 20-35. Dempsey, J.M., Kimiecik J.C., & Hony, T.S. (1993). Parental influence on children's moderate to vigorous physical activity participation An expectancy-value approach. Pediatric Exercise Science, 5,151.167.
Duncan, S.C. (1993). The role of cognitive appraisal and friendship, provisions in adolescents' effect and motivation toward activity in physical education. Research Quarterly for Exercise and Sport 64, 314-323.
Ferrer-Caja, E., Si Weiss MR. (in press). Predictors of intrinsic motivation among adolescent students in physical education. Research Quarterly R. and Sport Harter, S. (1987). The determinants and 'radiational role of global sett -wash in children In N. Eisenberg (Ed.). Contemporary topes in developmental psychology (pp. 219-242). New York: Wiley. Hom, T.S. (1984).
Expectancy effects h the interscholastic athletic setting: Methodological considerations. Journal of Sport Psydkkgy 6, 60-76.
Hom, IS. (1985). Coaches feedback on oral changes in children's perceptions of their physical competence. Journal of Educational Psychology, 77, 174-186.

Perceptions of peer relationships and physical activity participation in early adolescence. Journal of Sport & Exercise Psychology, 21, 329-350. Smith, RE., & Smoll, F.L. (1996).
The coach is a focus of research and htententicn in youth sports. In EL Smell & R.E. Smith (Eds.), Children and youth in sport A biopsychosocial perspective (pp. 125-141).
Madison, WE Broom & BencOnark Weiss, M.R. (1991). Psychological skill development in children and adolescents. The Sport Psychologist 5, 335-354. Weiss, M. R. (1993a(. Psychological effects of intensive sport participation on children and youth: Self-esteem and motivation In B.R. Cahill & A.J. Pearl (Eds.), intensive participation in children's sports (pp. 39-69). Champaign. IL Human Kinetics Publishers.
Weiss, MR. (1993k). Children's participation in physical activity: Are we having fun yet? Pediatric Exercise Scktice, 5,205Weiss, M.R (1995).

SUBCOMPONENTS, OR ELEMENTS, OF PHYSICAL ACTIVITY

All references for this section are shown below as per superscripts 1,2,3,4,5, 6, 7

https://www.spps.org/Page/18206
https://www.bringithomepersonaltraining.com/11-components-of-physical-fitness-in-action/
Sedentary Behaviour Research Network. 2012. Standardized use of the terms "sedentary" and "sedentary behaviors". Appl. Physiol. Nutr. Metab. 37: 1–3.
Shephard R.J. and Aoyagi Y. 2010. Objective monitoring of physical activity in older adults: clinical and practical implicati ons. Phys. Ther. Rev. 15(3): 170–182.
Sigmundova D., El Ansari W., and Sigmund E. 2011. Neighborhood environment correlates of physical activity: a study of eight Czech regional towns. Int. J. Environ. Res. Public Health, 8(2): 341–357.
Sisson S.B., Camhi S.M., Church T.S., Tudor-Locke C., Johnson W.D., and Katzmarzyk P.T. 2010. Accelerometer-determined steps/day and metabolic syndrome. Am. J. Prev. Med. 38(6): 575–582.
Sisson S.B., Camhi S.M., Tudor-Locke C., Johnson W.D., and Katzmarzyk P.T. 2012. Characteristics of step-defined physical activity categories in U.S. Adults. Am. J. Health Promot. 26(3): 152–159.
Spence J.C. and Lee R.E. 2003. Toward a comprehensive model of physical activity. Psych. Sports Exerc. 4: 7–24.
Sugiyama T., Salmon J., Dunstan D.W., Bauman A.E., and Owen N. 2007. Neighborhood walkability and TV viewing time among Australian adults. Am. J. Prev. Med. 33(6): 444–449.
Swartz A.M., Strath S.J., Bassett D.R., Moore J.B., Redwine B.A., Groer M., et al. 2003. Increasing daily walking improves glucose tolerance in overweight women. Prev. Med. 37(4): 356–362.
Temple V.A. 2010. Objectively measured physical activity of people with intellectual disability: participation and contextual influences. Phys. Ther. Rev. 15(3): 183–196.
Thompson D.L., Rakow J., and Perdue S.M. 2004. Relationship between accumulated walking and body composition in middle-aged women. Med. Sci. Sports Exerc. 36(5): 911–914.
Thyfault J.P. and Krogh-Madsen R. 2011. Metabolic disruptions induced by reduced ambulatory activity in free-living humans. J. Appl. Physiol. 111(4): 1218–1224.
Timperio A., Salmon J., Ball K., te Velde S.J., Brug J., and Crawford D. 2012. Neighborhood characteristics and TV viewing in youth: nothing to do but watch TV? J. Sci. Med. Sport, 15(2): 122–128.

DISTINCTION BETWEEN PHYSICAL ACTIVITY & EXERCISE

All references for this section are shown below as per superscripts

1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16

https://www.cardio.com/blog/what-is-the-difference-between-physical-activity-and-exercise
https://www.acefitness.org/resources/everyone/blog/5460/physical-activity-vs-exercise-what-s-the-difference/
Dempsey PC, Larsen RN, Dunstan DW, Owen N, Kingwell BA. Sitting less and moving more: implications for hypertension. Hypertension.
Yanagibori R, Kondo K, Suzuki Y, Kawakubo K, Iwamoto T, Itakura H, et al. Effect of 20 days' bed rest on the reverse cholesterol transport system in healthy young subjects. J Intern Med.
Hamburg NM, McMackin CJ, Huang AL, Shenouda SM, Widlansky ME, Schulz E, et al. Physical inactivity rapidly induces insulin resistance and microvascular dysfunction in healthy volunteers. Arterioscler Thromb Vasc Biol.
Hamilton MT, Hamilton DG, Zderic TW. Role of low energy expenditure and sitting in obesity, metabolic syndrome, type 2 diabetes, and cardiovascular disease. Diabetes.
Bey L, Hamilton MT. Suppression of skeletal muscle lipoprotein lipase activity during physical inactivity: a molecular reason to maintain daily low-intensity activity. J Physiol.
Zerwekh JE, Ruml LA, Gottschalk F, Pak CY. The effects of twelve weeks of bed rest on bone histology, biochemical markers of bone turnover, and calcium homeostasis in eleven normal subjects. J Bone Miner Res.
Kim H, Iwasaki K, Miyake T, Shiozawa T, Nozaki S, Yajima K. Changes in bone turnover markers during 14-day 6 degrees

head-down bed rest. J Bone Miner Metab.
Smith SM, Davis-Street JE, Fesperman JV, Calkins DS, Bawa M, Macias BR, et al. Evaluation of treadmill exercise in a lower body negative pressure chamber as a countermeasure for weightlessness-induced bone loss: a bed rest study with identical twins. J Bone Miner Res.
Zwart SR, Hargens AR, Lee SM, Macias BR, Watenpaugh DE, Tse K, et al. Lower body negative pressure treadmill exercise as a countermeasure for bed rest-induced bone loss in female identical twins. Bone.
Katzmarzyk PT, Powell KE, Jakicic JM, Troiano RP, Piercy K, Tennant B, et al. Sedentary behavior and health: update from the 2018 Physical Activity Guidelines Advisory Committee. Med Sci Sports Exerc.
Exercise Dependence and Anxiety in Cross-Trainers, Bodybuilders, and Gym Exercisers During COVID19.
Salvador R, Frontini R, Ramos C, Lopes P, Oliveira J, Maia J, Monteiro D.Percept Mot Skills. 2022 May 16:315125221098326. doi: 10.1177/00315125221098326. Online ahead of print.PMID: 35574906.
A narrative exploratory study on the perspectives about physical exercise practice in a sample of Portuguese elderly.
Rosa M, Antunes R, Marques P, Coelho R, Mendes P, Frontini R.Qual Quant. 2022 Apr 19:1-19. doi: 10.1007/s11135-022-01380-2. Online ahead of print.PMID: 35465024.
Protective effects of physical activity against health risks associated with type 1 diabetes: "Health benefits outweigh the risks".
Wake AD.World J Diabetes. 2022 Mar 15;13(3):161-184. doi: 10.4239/wjd.v13.i3.161.PMID: 35432757 **article.** Review.
Text Messages and Financial Incentives to Increase Physical Activity in Adolescents With Prediabetes and Type 2 Diabetes: Web-Based Group Interviews to Inform Intervention Design.
Vajravelu ME, Hitt TA, Mak N, Edwards A, Mitchell J, Schwartz L, Kelly A, Amaral S.JMIR Diabetes. 2022 Apr 6;7(2):e33082. DOI: 10.2196/33082.PMID: 35384850.
Effectiveness and safety of aerobic exercise for rheumatoid arthritis: a systematic review and meta-analysis of randomized controlled trials.
Ye H, Weng H, Xu Y, Wang L, Wang Q, Xu G.BMC Sports Sci Med Rehabil. 2022 Feb 5;14(1):17. DOI: 10.1186/s13102-022-00408-2.PMID: 35123568.

HEALTH-WELL-BEING & MOVEMENT

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9, 10, 11, 12, 13

https://www.health.harvard.edu/blog/how-simply-moving-benefits-your-mental-health-201603289350
Gatrell AC (2011) Mobilities and Health. 1st Edition. London and New York: Routledge, MPGBooksGroup.
W. L. Haskell et al., "Physical Activity and Public Health: Updated Recommendation for Adults from the American College of Sports Medicine and the American Heart Association," Medicine and Science in Sports and Exercise 39 (2007): 1423–1434.
U.S. Department of Health and Human Services, Physical Activity and Health: A Report of the Surgeon General (Atlanta: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 1996).
American College of Sports Medicine, ACSM's Guidelines for Exercise Testing and Prescription (Baltimore: Williams & Wilkins, 2006).
National Academy of Sciences, Institute of Medicine, Dietary Reference Intakes for Energy, Carbohydrates, Fiber, Fat, Protein and Amino Acids (Macronutrients) (Washington, DC: National Academy Press, 2002).
U.S. Department of Health and Human Services and Department of Agriculture, Dietary Guidelines for Americans, 2005 (Washington, DC: DHHS, 2005).
W. L. Haskell et al., "Physical Activity and Public Health: Updated Recommendation for Adults from the American College of Sports Medicine and the American Heart Association," Medicine and Science in Sports and Exercise 39 (2007): 1423–1434.
American College of Sports Medicine, Guidelines for Exercise Testing and Prescription (Philadelphia: Lippincott Williams & Wilkins, 2006).
W. J. Evans, "Exercise Nutrition and Aging," Journal of Nutrition 122 (1992): 786–801.
R. Kjorstad, Validity of Two Field Tests of Abdominal Strength and Muscular Endurance, unpublished master's thesis, Boise State University, 1997.
G. L. Hall, R. K. Hetzler, D. Perrin, and A. Weltman, "Relationship of Timed Sit-Up Tests to Isokinetic Abdominal Strength," Research Quarterly for Exercise and Sport 63 (1992): 80–84.
U.S. Department of Health and Human Services, Physical Activity and Health: A Report of the Surgeon General (Atlanta: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 1996).
D. P. Swain, "Moderate- or Vigorous-Intensity Exercise: What Should We Prescribe?" ACSM's Health & Fitness Journal 10, no. 5 (2006): 7–11.
D. P. Swain and B. A. Franklin, "Comparative Cardioprotective Benefits of Vigorous vs. Moderate Intensity Aerobic Exercise," American Journal of Cardiology 97, no. 1 (2006): 141–147.
E. T. Poehlman et al., "Effects of Endurance and Resistance Training on Total Daily Energy Expenditure in Young Women: A Controlled Randomized Trial," Journal of Clinical Endocrinology and Metabolism 87 (2002): 1004–1009; L. M. Van Etten et al., "Effect of an 18-wk Weight-Training Program on Energy Expenditure and Physical Activity," Journal of Applied Physiology 82 (1997): 298–304;
W. W. Campbell, M. C. Crim, V. R. Young, and W. J. Evans, "Increased Energy Requirements and Changes in Body Composition with Resistance Training in Older Adults," American Journal of Clinical Nutrition 60 (1994): 167–175; Z.

Wang et al., "Resting Energy Expenditure: Systematic Organization and Critique of Prediction Methods," Obesity Research 9 (2001): 331–336.

WHAT IS PHYSICAL FITNESS?

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9, 11, 12, 13, 14

https://us.humankinetics.com/blogs/excerpt/what-is-physical-fitness
Hornbuckle L.M., Bassett D.R. Jr., and Thompson D.L. 2005. Pedometer-determined walking and body composition variables in African-American women. Med. Sci. Sports Exerc. 37(6): 1069–1074.
Inoue S., Ohya Y., Tudor-Locke C., Tanaka S., Yoshiike N., and Shimomitsu T. 2011*a*. Time trends for step-determined physical activity among Japanese adults. Med. Sci. Sports Exerc. 43(10): 1913–1919.
Inoue S., Yumiko O., Odagiri Y., Takamiya T., Suijo K., Kamada M., et al. 2011*b*. Sociodemographic determinants of pedometer-determined physical activity among Japanese adults. Am. J. Prev. Med. 40(5): 566–571.
Ishikawa-Takata K., Tanaka H., Nanbu K., and Ohta T. 2010. The beneficial effect of physical activity on blood pressure and blood glucose among Japanese male workers. Diabetes Res. Clin. Pract. 87(3): 394–400.
Jakicic J.M., Davis K.K., Garcia D.O., Verba S., and Pellegrini C. 2010. Objective monitoring of physical activity in overweight and obese populations. Phys. Ther. Rev. 15(3): 163–169.
Janssen I. and Leblanc A.G. 2010. A systematic review of the health benefits of physical activity and fitness in school-aged children and youth. Int. J. Behav. Nutr. Phys. Act, 11(7): 40.
Janssen I., Shields M., Craig C.L., and Tremblay M.S. 2011. Prevalence and secular changes in abdominal obesity in Canadian adolescents and adults, 1981 to 2007-2009. Obes. Rev. 12(6): 397–405.
Janssen I., Shields M., Craig C.L., and Tremblay M.S. 2012. Changes in the obesity phenotype within Canadian children and adults, 1981 to 2007-2009. Obesity (Silver Spring), 20(4): 916–919.
Jennersjo P., Ludvigsson J., Lanne T., Nystrom F.H., Ernerudh J., and Ostgren C.J. 2012. Pedometer-determined physical activity is linked to low systemic inflammation and low arterial stiffness in Type 2 diabetes. Diabet. Med. 29(9): 1119–1125.
Jiang H., Qian X., Li M., Lynn H., Fan Y., He F., et al. 2012. Can physical activity reduce excessive gestational weight gain? Findings from a Chinese urban pregnant women cohort study. Int. J. Behav. Nutr. Phys. Act, 9: 12.
Ju S., Wilbur J., Lee E., and Miller A. 2011. Lifestyle physical activity behavior of Korean American dry cleaner couples. Public Health Nurs. 28(6): 503–514.

HEALTHY EATING & PHYSICAL ACTIVITY

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9, 11, 12, 13, 14

Katzmarzyk P.T., Church T.S., Craig C.L., and Bouchard C. 2009. Sitting time and mortality from all causes, cardiovascular disease, and cancer. Med. Sci. Sports Exerc. 41(5): 998–1005.
Kemper K.A. and Welsh R.S. 2010. Physical activity behaviors of students of a rural historically black college. J. Am. Coll. Health, 58(4): 327–334.
King W.C., Brach J.S., Belle S., Killingsworth R., Fenton M., and Kriska A.M. 2003. The relationship between convenience of destinations and walking levels in older women. Am. J. Health Promot. 18(1): 74–82.
Knudsen S.H., Hansen L.S., Pedersen M., Dejgaard T., Hansen J., Hall G.V., et al. 2012. Changes in insulin sensitivity precede changes in body composition during 14 days of step reduction combined with overfeeding in healthy young men. J. Appl. Physiol. 113(1): 7–15.
Kondo K., Lee J.S., Kawakubo K., Kataoka Y., Asami Y., Mori K., et al. 2009. Association between daily physical activity and neighborhood environments. Environmental Health and Preventive Medicine, 14(3): 196–206.
Kozey-Keadle S., Libertine A., Lyden K., Staudenmayer J., and Freedson P.S. 2011. Validation of wearable monitors for assessing sedentary behavior. Med. Sci. Sports Exerc. 43(8): 1561–1567.
Kozo J., Sallis J.F., Conway T.L., Kerr J., Cain K., Saelens B.E., et al. 2012. Sedentary behaviors of adults about neighborhood walkability and income. Health Psychol. 31(6): 704–713.
Krogh-Madsen R., Thyfault J.P., Broholm C., Mortensen O.H., Olsen R.H., Mounier R., et al. 2010. A 2-wk reduction of ambulatory activity attenuates peripheral insulin sensitivity. J. Appl. Physiol. 108(5): 1034–1040.
Krumm E.M., Dessieux O.L., Andrews P., and Thompson D.L. 2006. The relationship between daily steps and body composition in postmenopausal women. J. Women's Health, 15(2): 202–210.
Kump D.S. and Booth F.W. 2005*a*. A sustained rise in triacylglycerol synthesis and increased epididymal fat mass when rats cease voluntary wheel running. J. Physiol. 565(Pt 3): 911–925.
Kump D.S. and Booth F.W. 2005*b*. Alterations in insulin receptor signaling in the rat epitrochlearis muscle upon cessation of voluntary exercise. J. Physiol. 562(Pt 3): 829–838.
Kump D.S., Laye M.J., and Booth F.W. 2006. Increased mitochondrial glycerol-3-phosphate acyltransferase protein and enzyme activity in rat epididymal fat upon cessation of wheel running. Am. J. Physiol. Endocrinol. Metab. 290(3): E480–E489.
Lara S., Casanova G., and Spritzer P.M. 2010. Influence of habitual physical activity on body composition, fat distribution, and metabolic variables in early postmenopausal women receiving hormonal therapy. Eur. J. Obstet. Gynecol. Reprod. Biol. 150(1): 52–56.
Laye M.J., Thyfault J.P., Stump C.S., and Booth F.W. 2007. Inactivity induces increases in abdominal fat. J. Appl. Physiol. 102(4): 1341–1347.

Le Masurier G.C. and Corbin C.B. 2006. Step counts among middle school students vary with aerobic fitness levels. Res. Q. Exerc. Sport, 77(1): 14–22.
Le Masurier G.C. and Tudor-Locke C. 2003. Comparison of pedometer and accelerometer accuracy under controlled conditions. Med. Sci. Sports Exerc. 35(5): 867–871.
Le Masurier G.C., Lee S.M., and Tudor-Locke C. 2004. Motion sensor accuracy under controlled and free-living conditions. Med. Sci. Sports Exerc. 36(5): 905–910.

NUTRITION

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9, 11, 12

https://www.medicalnewstoday.com/articles/intermittent-fasting-is-it-all-its-cracked-up-to-behttps://www.ncbi.nlm.nih.gov/pmc/articles/PMC4730527/
Warburton D.E., Nicol C.W., Bredin S.S. Health benefits of physical activity: The evidence. *CMAJ*. 2006;**174**:801–809. DOI: 10.1503/cmaj.051351.
Blair S.N., Cheng Y., Holder J.S. Is physical activity or physical fitness more important in defining health benefits? *Med. Sci. Sports Exerc.* 2001;**33**:S379–S399. DOI:
Lee I.M., Shiroma E.J., Lobelo F., Puska P., Blair S.N., Katzmarzyk P.T. Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *Lancet*.
World Health Organization. *Global Recommendations on Physical Activity for Health*. World Health Organization; Geneva, Switzerland: 2010.
World Health Organization Global Health Risks. Mortality and Burden of Disease Attributable Selected Major Risks, 2009. [(accessed on 15 January2015)]. Available online: http://www.Who.Int/healthinfo/global_burden_disease/globalhealthrisks_report_full.Pdf
Allender S., Foster C., Scarborough P., Rayner M. The burden of physical activity-related ill health in the UK. *J. Epidemiol. Community Health*. 2007;**61**:344–348. DOI: 10.1136/jech.2006.050807.
Garrett N.A., Brasure M., Schmitz K.H., Schultz M.M., Huber M.R. Physical inactivity: Direct cost to a health plan. *Am. J. Prev. Med.* 2004;**27**:304–309. DOI: 10.1016/j.amepre.2004.07.014.
Katzmarzyk P.T., Janssen I. The economic costs associated with physical inactivity and obesity in Canada: An update. *Can. J. Appl. Physiol.* 2004;**29**:90–115. DOI: 10.1139/h04-008.
Pratt M., Macera C.A., Wang G. Higher direct medical costs associated with physical inactivity. *Physician Sportsmed.*
Wang F., McDonald T., Reffitt B., Edington D.W. BMI, physical activity, and health care utilization/costs among medicare retirees. *Obes. Res.*
Wang G., Pratt M., Macera C.A., Zheng Z.J., Heath G. Physical activity, cardiovascular disease, and medical expenditures in U.S. Adults. *Ann. Behav. Med.* 2004;**28**:88–94. DOI: 10.1207/s15324796abm2802_3.
National Health Insurance Corporation. [(accessed on 15 January 2015)]. Available online: http://www.Nhis.Or.Kr/retrievehomemain.Xx
Jee S.H., Sull J.W., Park J., Lee S.Y., Ohrr H., Guallar E., Samet J.M. Body-mass index and mortality in Korean men and women. *N. Engl. J. Med.* 2006;**355**:779–787. DOI: 10.1056/NEJMoa054017.
Faries D.E., Leon A.C., Maria H.J., Obenchain R.L. *Analysis of Observational Health Care Data Using SAS®*. SAS Institute Inc.; Cary, NC, USA: 2010.
Leitzmann M.F., Park Y., Blair A., Ballard-Barbash R., Mouw T., Hollenbeck A.R., Schatzkin A. Physical activity recommendations and decreased risk of mortality. *Arch. Intern. Med.* 2007;**167**:2453–2460. DOI: 10.1001/archinte.167.22.2453.
Franco O.H., de Laet C., Peeters A., Jonker J., Mackenbach J., Nusselder W. Effects of physical activity on life expectancy with cardiovascular disease. *Arch. Intern. Med.* 2005;**165**:2355–2360. DOI: 10.1001/archinte.165.20.2355.
Caspersen C.J., Powell K.E., Christenson G.M. Physical activity, exercise, and physical fitness: Definitions and distinctions for health-related research. *Public Health Rep.* 1985;**100**:126–131.
Dunn A.L., Trivedi M.H., O'Neal H.A. Physical activity dose-response effects on outcomes of depression and anxiety. *Med. Sci. Sports Exerc.* 2001;**33**:S587–S597. DOI: 10.1097/00005768-200106001-00027.
Sargeant L.A., Wareham N.J., Khaw K.T. Family history of diabetes identifies a group at increased risk for the metabolic consequences of obesity and physical inactivity in EPIC-Norfolk: A population-based study. The European Prospective Investigation into Cancer. *Int. J. Obes. Relat. Metab. Disord.* 2000;**24**:1333–1339. DOI: 10.1038/SJ.ijo.0801383.
Begg S., Vos T., Barker B., Stevenson C., Stanley L., Lopez A. *The Burden of Disease and Injury in Australia 2003*. AIHW; Canberra, Australia: 2007. [(accessed on 4 January 2015)]. Available online: http://www.aihw.gov.au/publication-detail/?id=6442467990
Martin B.W., Beeler I., Szucs T., Smala A.M., Brugger O., Casparis C., Allenbach R., Raeber P.A., Marti B. Economic benefits of the health-enhancing effects of physical activity: First estimates for Switzerland. *Sportmed. Sportraumatol.* 2001;**49**:131–133.

MENTAL HEALTH BENEFITS OF EXERCISE

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9, 11, 12

https://positivepsychology.com/benefits-of-mental-health/
Dasgupta K., Joseph L., Pilote L., Strachan I., Sigal R.J., and Chan C. 2010. Daily steps are low year-round and dip lower in fall/winter: findings from a longitudinal diabetes cohort. Cardiovasc Diabetol. 9: 81.

De Cocker K., Cardon G., and De Bourdeaudhuij I. 2007. Pedometer-determined physical activity and its comparison with the International Physical Activity Questionnaire in a sample of Belgian adults. Res. Q. Exerc. Sport, 78(5): 429–437.
De Cocker K.A., De Bourdeaudhuij I.M., Brown W.J., and Cardon G.M. 2008. The effect of a pedometer-based physical activity intervention on sitting time. Prev. Med. 47(2): 179–181.
De Greef K., Deforche B., Tudor-Locke C., and De Bourdeaudhuij I. 2010. A cognitive-behavioral pedometer-based group intervention on physical activity and sedentary behavior in individuals with type 2 diabetes. Health Educ. Res. 25(5): 724–736.
De Greef K.P., Deforche B.I., Ruige J.B., Bouckaert J.J., Tudor-Locke C.E., Kaufman J.M., et al. 2011. The effects of a pedometer-based behavioral modification program with telephone support on physical activity and sedentary behavior in type 2 diabetes patients. Patient Educ. Couns. 84(2): 275–279.
DePew Z., Novotny P., and Benzo R. 2012. How many steps are enough to avoid severe physical inactivity in patients with chronic obstructive pulmonary disease? Respirology, 17(6): 1026–1027.
Duncan J.S., Hopkins W.G., Schofield G., and Duncan E.K. 2008. Effects of weather on pedometer-determined physical activity in children. Med. Sci. Sports Exerc. 40(8): 1432–1438.
Duncan M.J., Nevill A., Woodfield L., and Al-Nakeeb Y. 2010. The relationship between pedometer-determined physical activity, body mass index, and lean body mass index in children. Int. J. Pediatr. Obes. 5(5): 445–450.
Duru O.K., Sarkisian C.A., Leng M., and Mangione C.M. 2010. Sisters in motion: a randomized controlled trial of a faith-based physical activity intervention. J. Am. Geriatr. Soc. 58(10): 1863–1869.
Dwyer T., Hosmer D., Hosmer T., Venn A.J., Blizzard C.L., Granger R.H., et al. 2007. The inverse relationship between number of steps per day and obesity in a population-based sample: the AusDiab study. Int. J. Obes. (London), 31(5): 797–804.
Dwyer T., Ponsonby A.L., Ukoumunne O.C., Pezic A., Venn A., Dunstan D., et al. 2011. Association of change in daily step count over five years with insulin sensitivity and adiposity: population-based cohort study. BMJ, 342: c7249.
Emerson A., Nystrom F.H., and Lindstrom T. 2010*a*. Long-term increase of fat mass after a four-week intervention with fast food-based hyper-alimentation and limitation of physical activity. Nutr. Metab. (London), 7: 68.
Ernersson A., Lindstrom T., Nystrom F.H., and Frisman G.H. 2010*b*. Young healthy individuals develop a lack of energy when adopting an obesity-provoking behavior for 4 weeks: a phenomenological analysis. Scand. J. Caring Sci. 24(3): 565–571.
Emerson A., Frisman G.H., Sepa Frostell A., Nystrom F.H., and Lindstrom T. 2010*c*. Obesity-provoking behavior negatively influences young normal-weight subjects' health-related quality of life and causes depressive symptoms. Eat Behav. 11(4): 247–252.
FAO/WHO/UNU. 2001. Human energy requirements. Report of a Joint FAO/WHO/UNU Expert Consultation. Food and Agriculture Organization of the United Nations. Rome, Italy.

OBTAIN PHYSICAL CHECKUP BY DOCTORS

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9

Graff S.K., Alves B.C., Toscani M.K., and Spritzer P.M. 2012. Benefits of pedometer-measured habitual physical activity in healthy women. Appl. Physiol. Nutr. Metab. 37(1): 149–156.
Hamilton M.T., Hamilton D.G., and Zderic T.W. 2007. Role of low energy expenditure and sitting in obesity, metabolic syndrome, type 2 diabetes, and cardiovascular disease. Diabetes, 56(11): 2655–2667.
Healy G.N., Dunstan D.W., Salmon J., Cerin E., Shaw J.E., Zimmet P.Z., et al. 2007. Objectively measured light-intensity physical activity is independently associated with 2-h plasma glucose. Diabetes Care, 30(6): 1384–1389.
Healy G.N., Wijndaele K., Dunstan D.W., Shaw J.E., Salmon J., Zimmet P.Z., et al. 2008. Objectively measured sedentary time, physical activity, and metabolic risk: the Australian Diabetes, Obesity, and Lifestyle Study (AusDiab). Diabetes Care, 31(2): 369–371.
Healy G.N., Clark B.K., Winkler E.A., Gardiner P.A., Brown W.J., and Matthews C.E. 2011. Measurement of adults' sedentary time in population-based studies. Am. J. Prev. Med. 41(2): 216–227.
Hilgenkamp T.I., Reis D., van Wijck R., and Evenhuis H.M. 2012. Physical activity levels in older adults with intellectual disabilities are extremely low. Res. Dev. Disabil. 33(2): 477–483.
Hirvensalo M., Telama R., Schmidt M.D., Tammelin T.H., Yang X., Magnussen C.G., et al. 2011. Daily steps among Finnish adults: Variation by age, sex, and socioeconomic position. Scand. J. Public Health, 39(7): 669–677.
Kambas A., Michalopoulou M., Fatouros I.G., Christoforidis C., Manthou E., Giannakidou D., et al. 2012. The relationship between motor proficiency and pedometer-determined physical activity in young children. Pediatr. Exerc. Sci. 24(1): 34–44.
Kang M., Marshall S.J., Barreira T.V., and Lee J.O. 2009. Effect of pedometer-based physical activity interventions: a meta-analysis. Res. Q. Exerc. Sport, 80(3): 648–655.

WALKING, STRETCHING, JOGGING, AEROBICS, & SWIMMING

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9,10, 11, 12,13,14,15,16,17,18

https://www.verywellfit.com/the-best-time-of-day-to-walk-and-exercise-3432463
J. L. Christi, L. M. Sheldahl, F. E. Tristani, L. S. Wann, K. B. Sagar, S. G. Levandoski, M. J. Ptacin, K. A. Sobocinski, and R. D. Morris, "Cardiovascular Regulation During Head-out
Water Immersion Exercise," Journal of Applied Physiology 69 (1990): 657–664; L. M. Sheldahl, F. E. Tristani, P. S. Clifford, C. V. Hughes, K. A. Sobocinski, and R. D. Morris, "Effect of Head-out Water Immersion on Cardiorespiratory Response to Dynamic Exercise," Journal of American College of Cardiology 10 (1987): 1254–1258; J. Svedenhang and J. Seger, "Running on

Land and in Water: Comparative Exercise
Physiology," Medicine and Science in Sports and Exercise 24
(1992): 1155–1160.
W. W. K. Hoeger, D. Hopkins, and D. Barber, "Physiologic Responses to Maximal Treadmill Running and Water Aerobic Exercise," National Aquatics Journal 11 (1995): 4–7.
W. W. K. Hoeger, T. A. Spitzer-Gibson, N. Kaluhiokalani, R. K. M. Cardejon, and J. Kokkonen, "A Comparison of Physiological Responses to Self-Paced Water Aerobics and Self-Paced Treadmill Running," International Council for Health, Physical Education, Recreation, Sport, and Dance Journal 30, no. 4 (2004): 27–30.
W. W. K. Hoeger, T. S. Gibson, J. Moore, and D. R. Hopkins, "A Comparison of Selected Training Responses to Low Impact Aerobics and Water Aerobics," National Aquatics Journal 9 (1993): 13–16.
E. J. Marcinick, J. Potts, G. Schlabach, S. Will, P. Dawson, and B. F. Hurley, "Effects of Strength Training on Lactate Threshold and Endurance Performance," Medicine and Science in Sports and Exercise 23 (1991): 739–743.
S. N. Blair, "Surgeon General's Report on Physical Fitness: The Inside Story," *ACSM's Health & Fitness Journal* 1 (1997):14–18.
R. F. DeBusk, U. Stenestrand, M. Sheehan, and W. L. Haskell, "Training Effects of Long Versus Short Bouts of Exercise in Healthy Subjects," *American Journal of Cardiology* 65 (1990): 1010–1013.
National Academy of Sciences, Institute of Medicine, *Dietary Reference Intakes for Energy, Carbohydrates, Fiber, Fat, Protein and Amino Acids (Macronutrients)* (Washington, DC: National Academy Press, 2002).
U.S. Department of Health and Human Services, Department of Agriculture, *Dietary Guidelines for Americans 2005* (Washington, DC: DHHS, 2005).
W. W. K. Hoeger, D. R. Hopkins, S. L. Barette, and D. F. Hale, "Relationship Between Repetitions and Selected Percentages of One Repetition Maximum: A Comparison Between Untrained and Trained Males and Females," *Journal of Applied Sport Science Research* 4, no. 2 (1990): 47–51.
M. E. Nelson et al., "Physical Activity and Public Health in Older Adults: Recommendation from the American College of Sports Medicine and the American Heart Association,"
Medicine and Science in Sports and Exercise 39 (2007):1435–1445.
Gatorade Sports Science Institute, "Core Strength Training," *Sports Science Exchange Roundtable* 13, no. 1 (2002): 1–4.
S. B. Thacker, J. Gilchrist, D. F. Stroup, and C. D. Kimsey, Jr., "The Impact of Stretching on Sports Injury Risk: A Systematic Review of the Literature," *Medicine and Science in Sports and Exercise* 36 (2004): 371–378."Should You Stretch Before Exercise?" *Gatorade Sports Science*
Institute: Sports Science Exchange 30, no. 1 (2007).
R. Deyo, "Chiropractic Care for Back Pain: The Physician's Perspective," *HealthNews* 4 (September 10, 1998).
J. A. Hides, G. A. Jull, and C. A. Richardson, "Long-Term Effects of Specific Stabilizing Exercises for First-Episode Low Back Pain," *Spine* 26 (2001): E243–E248.
https://www.mayoclinic.org/healthy-lifestyle/fitness/in-depth/walking/art-20046261

RELEASING STORED ENERGY FROM THE BODY

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9, 10

https://www.acefitness.org/fitness-certifications/ace-answers/exam-preparation-blog/3256/the-three-primary-energy-pathways-explained/
https://www.sciencelearn.org.nz/resources/1920-energy-for-exercise
Cook I., Alberts M., and Lambert E.V. 2010*a*. Effect of body mass and physical activity volume and intensity on pedometry-measured activity energy expenditure in rural black South Africans in the Limpopo Province. SAJSM, 22(1): 3–7.
Cook I., Alberts M., Brits J.S., Choma S.R., and Mkhonto S.S. 2010*b*. Descriptive epidemiology of ambulatory activity in rural, black South Africans. Med. Sci. Sports Exerc. 42(7): 1261–1268.
Cook I., Alberts M., and Lambert E.V. 2011. Compliance with physical activity guidelines in rural, black South Africans in the Limpopo Province: an energy expenditure approach. Br. J. Sports Med. 45(8): 619–625.
Craig C.L., Cameron C., Griffiths J.M., and Tudor-Locke C. 2010. Descriptive epidemiology of youth pedometer-determined physical activity: CANPLAY. Med. Sci. Sports Exerc. 42(9): 163–1643.
Craig C.L., Shields M., Leblanc A.G., and Tremblay M.S. 2012. Trends in aerobic fitness among Canadians, 1981 to 2007-2009. Appl. Physiol. Nutr. Metab. 37(3): 511–519.
Craig C.L., Cameron C., and Tudor-Locke C. 2013. CAN PLAY pedometer normative reference data for 21 271 children and 12 956 adolescents. Med. Sci. Sports Exerc. 45(1): 123–129.
Croteau K.A. and Richeson N.A. 2005. A matter of health: Using pedometers to increase the physical activity of older adults. Act. Adapt. Aging, 30(2): 37–47.
Crouter S.E., Schneider P.L., Karabulut M., and Bassett D.R. Jr. 2003. Validity of 10 electronic pedometers for measuring steps, distance, and energy cost. Med. Sci. Sports Exerc. 35(8): 1455–1460.
Crouter S.E., Clowers K.G., and Bassett D.R. Jr. 2006. A novel method for using accelerometer data to predict energy expenditure. J. Appl. Physiol. 100(4): 1324–1331.
CSEP. 2011. Cutting down on sitting down: the world's first evidence-based sedentary behavior guidelines released. Canadian Society for Exercise Physiology. Toronto, Ontario, Canada. Available
from www.csep.ca/CMFiles/Guidelines/CSEP%20SBG%20Launch%20-%20National%20Release%20-%20FINAL.pdf[Accessed 15 May 2012.]
Damschroder L.J., Lutes L.D., Goodrich D.E., Gillon L., and Lowery J.C. 2010. A small-change approach delivered via telephone promotes weight loss in veterans: Results from the ASPIRE-VA pilot study. Patient Educ. Couns. 79(2): 262–266.
Feito Y., Bassett D.R., and Thompson D.L. 2012. Evaluation of activity monitors in controlled and free-living environments.

Med. Sci. Sports Exerc. 44(4): 733–741.
Garber C.E., Blissmer B., Deschenes M.R., Franklin B.A., Lamonte M.J., Lee I.M., et al. 2011. Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: guidance for prescribing exercise. Med. Sci. Sports Exerc. 43(7): 1334–1359.
Gardner A.W., Ritti-Dias R.M., Khurana A., and Parker D.E. 2010. Daily ambulatory activity monitoring in patients with peripheral artery disease. Phys. Ther. Rev. 15(3): 212–223.
Gilson N.D., Puig-Ribera A., McKenna J., Brown W.J., Burton N.W., and Cooke C.B. 2009. Do walking strategies to increase physical activity reduce reported sitting in workplaces: a randomized control trial. Int. J. Behav. Nutr. Phys. Act, 6: 43.
Karabulut M., Crouter S.E., and Bassett D.R. Jr. 2005. Comparison of two waist-mounted and two ankle-mounted electronic pedometers. Eur. J. Appl. Physiol. 95(4): 335–343.
Katzmarzyk P.T. 2010. Physical activity, sedentary behavior, and health: paradigm paralysis or paradigm shift? Diabetes, 59(11): 2717–2725.
Levine J.A., Schleusner S.J., and Jensen M.D. 2000. Energy expenditure of nonexercise activity. Am. J. Clin. Nutr. 72(6): 1451–1454.
Lubans D.R., Morgan P.J., Callister R., and Collins C.E. 2008. The relationship between pedometer step counts and estimated VO2Max as determined by a submaximal fitness test in adolescents. Pediatr. Exerc. Sci. 20(3): 273–284.
Lutes L.D. and Steinbaugh E.K. 2010. Theoretical models for pedometer use in physical activity interventions. Phys. Ther. Rev. 15(3): 143–153.
Maraki M.I., Aggelopoulou N., Christodoulou N., Anastasiou C.A., Toutouza M., Panagiotakos D.B., et al. 2011. Lifestyle intervention leading to moderate weight loss normalizes postprandial triacylglycerolemia despite persisting obesity. Obesity (Silver Spring), 19(5): 968–976.
Marshall S.J., Levy S.S., Tudor-Locke C.E., Kolkhorst F.W., Wooten K.M., Ji M., et al. 2009. Translating physical activity recommendations into a pedometer-based step goal: 3000 steps in 30 minutes. Am. J. Prev. Med. 36(5): 410–415.
Masse L.C., Fuemmeler B.F., Anderson C.B., Matthews C.E., Trost S.G., Catellier D.J., et al. 2005. Accelerometer data reduction: a comparison of four reduction algorithms on select outcome variables. Med. Sci. Sports Exerc. 37(11 Suppl): S544–S554.
Matthews C.E., Chen K.Y., Freedson P.S., Buchowski M.S., Beech B.M., Pate R.R., et al. 2008. Amount of time spent in sedentary behaviors in the United States, 2003-2004. Am. J. Epidemiol. 167(7): 875–881.
McCormack G.R., Giles-Corti B., Timperio A., Wood G., and Villanueva K. 2011*a*. A cross-sectional study of the individual, social, and built environmental correlates of pedometer-based physical activity among elementary school children. Int. J. Behav. Nutr. Phys. Act, 8: 30.
Go to Citation
McCormack G.R., Rutherford J., Giles-Corti B., Tudor-Locke C., and Bull F. 2011*b*. BMI-referenced cut-points for recommended daily pedometer-determined steps in Australian children and adolescents. Res. Q. Exerc. Sport, 82(2): 162–167.
McKercher C.M., Schmidt M.D., Sanderson K.A., Patton G.C., Dwyer T., and Venn A.J. 2009. Physical activity and depression in young adults. Am. J. Prev. Med. 36(2): 161–164.
Mestek M.L., Plaisance E., and Grandjean P. 2008. The relationship between pedometer-determined and self-reported physical activity and body composition variables in college-aged men and women. J. Am. Coll. Health, 57(1): 39–44.
Mikus C.R., Oberlin D.J., Libla J.L., Taylor A.M., Booth F.W., and Thyfault J.P. 2012. Lowering physical activity impairs glycemic control in healthy volunteers. Med. Sci. Sports Exerc. 44(2): 225–231.
Miller R., Brown W., and Tudor-Locke C. 2006. But what about swimming and cycling? How to 'count' non-ambulatory activity when using pedometers to assess physical activity. J. Phys. Act Health, 3(3): 257–266.
Mitsui T., Shimaoka K., Tsuzuku S., Kajioka T., and Sakakibara H. 2008. Pedometer-determined physical activity and indicators of health in Japanese adults. J. Physiol. Anthropol. 27(4): 179–184.
Mitsui T., Barajima T., Kanachi M., and Shimaoka K. 2010. Daily walking activity among male office workers in a rural town in northern Japan. J. Physiol. Anthropol. 29(1): 43–46.
Motl R.W. and Sandroff B.M. 2010. Objective monitoring of physical activity behavior in multiple sclerosis. Phys. Ther. Rev. 15(3): 204–211.

REGULARITY IN WALKING

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9, 10, 11, 12, 13, 14, 15

https://www.webmd.com/fitness-exercise/mental-benefits-of-walking
Rothney M.P., Apker G.A., Song Y., and Chen K.Y. 2008. Comparing the performance of three generations of ActiGraph accelerometers. J. Appl. Physiol. 105(4): 1091–1097.
Rowe D.A., Welk G.J., Heil D.P., Mahar M.T., Kemble C.D., Calabro M.A., et al. 2011. Stride rate recommendations for moderate-intensity walking. Med. Sci. Sports Exerc. 43(2): 312–318.
Schmidt M.D., Blizzard C.L., Venn A.J., Cochrane J.A., and Dwyer T. 2007. Practical considerations when using pedometers to assess physical activity in population studies: lessons from the Burnie Take Heart Study. Res. Q. Exerc. Sport, 78(3): 162–170.
Schmidt M.D., Cleland V.J., Shaw K., Dwyer T., and Venn A.J. 2009. Cardiometabolic risk in younger and older adults across an index of ambulatory activity. Am. J. Prev. Med. 37(4): 278–284.
Sedentary Behaviour Research Network. 2012. Standardized use of the terms "sedentary" and "sedentary behaviors". Appl. Physiol. Nutr. Metab. 37: 1–3.
Shephard R.J. and Aoyagi Y. 2010. Objective monitoring of physical activity in older adults: clinical and practical implications. Phys. Ther. Rev. 15(3): 170–182.

Sigmundova D., El Ansari W., and Sigmund E. 2011. Neighborhood environment correlates of physical activity: a study of eight Czech regional towns. Int. J. Environ. Res. Public Health, 8(2): 341–357.
Sisson S.B., Camhi S.M., Church T.S., Tudor-Locke C., Johnson W.D., and Katzmarzyk P.T. 2010. Accelerometer-determined steps/day and metabolic syndrome. Am. J. Prev. Med. 38(6): 575–582.
Sisson S.B., Camhi S.M., Tudor-Locke C., Johnson W.D., and Katzmarzyk P.T. 2012. Characteristics of step-defined physical activity categories in U.S. Adults. Am. J. Health Promot. 26(3): 152–159.
Spence J.C. and Lee R.E. 2003. Toward a comprehensive model of physical activity. Psych. Sports Exerc. 4: 7–24.
Sugiyama T., Salmon J., Dunstan D.W., Bauman A.E., and Owen N. 2007. Neighborhood walkability and TV viewing time among Australian adults. Am. J. Prev. Med. 33(6): 444–449.
Swartz A.M., Strath S.J., Bassett D.R., Moore J.B., Redwine B.A., Groer M., et al. 2003. Increasing daily walking improves glucose tolerance in overweight women. Prev. Med. 37(4): 356–362.

VIGOROUS VS. MODERATE ACTIVITY

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9, 10, 11, 12

https://www.princetonlifestylemedicine.com/health/exercise/moderate-vs-vigorous-exercise/
https://extension.sdstate.edu/light-moderate-and-vigorous-activity
https://www.hsph.harvard.edu/obesity-prevention-source/moderate-and-vigorous-physical-activity/
Choi L., Liu Z., Matthews C.E., and Buchowski M.S. 2011. Validation of accelerometer wear and non-wear time classification algorithm. Med. Sci. Sports Exerc. 43(2): 357–364.
Choi S.W., Lee J.H., Jang Y.K., and Kim J.R. 2010. Assessment of ambulatory activity in the Republic of Korea Navy submarine crew. Undersea Hyperb. Med. 37(6): 413–417.
Cohen T.R., Plourde H., and Koski K.G. 2010. Our Canadian women achieving a fit pregnancy? A pilot study. Can. J. Public Health, 101(1): 87–91.
Colley R.C., Janssen I., and Tremblay M.S. 2012. Daily step target to measure adherence to physical activity guidelines in children. Med. Sci. Sports Exerc. 44(5): 977–982.
Cook I., Alberts M., and Lambert E.V. 2008. Relationship between adiposity and pedometer-assessed ambulatory activity in adult, rural African women. Int. J. Obes. (London), 32(8): 1327–1330.
Moy M.L., Danilack V.A., Weston N.A., and Garshick E. 2012. Daily step counts in a US cohort with COPD. Respir. Med. 106(7): 962–969.
Musto A., Jacobs K., Nash M., DelRossi G., and Perry A. 2010. The effects of an incremental approach to 10 000 steps/day on metabolic syndrome components in sedentary overweight women. J. Phys. Act Health, 7(6): 737-745.
Naal F.D. and Impellizzeri F.M. 2010. How active are patients undergoing total joint arthroplasty?: A systematic review. Clin. Orthop. Relat. Res. 468(7): 1891–1904.
Oka K. and Shibata A. 2012. Determinants of meeting the public health recommendations for physical activity among community-dwelling elderly Japanese. Current Aging Science, 5(1): 58–65.
Olsen R.H., Krogh-Madsen R., Thomsen C., Booth F.W., and Pedersen B.K. 2008. Metabolic responses to reduced daily steps in healthy non-exercising men. JAMA, 299(11): 1261–1263.
Owen N., Leslie E., Salmon J., and Fotheringham M.J. 2000. Environmental determinants of physical activity and sedentary behavior. Exerc. Sports Sci. Rev. 28(4): 153–158.
Owen N., Healy G.N., Matthews C.E., and Dunstan D.W. 2010. Too much sitting: the population health science of sedentary behavior. Exerc. Sport Sci. Rev. 38(3): 105–113.
Owen N., Sugiyama T., Eakin E.E., Gardiner P.A., Tremblay M.S., and Sallis J.F. 2011. Adults' sedentary behavior determinants and interventions. Am. J. Prev. Med. 41(2): 189–196.
Panton L.B., Kushnick M.R., Kingsley J.D., Moffatt R.J., Haymes E.M., and Toole T. 2007. Pedometer measurement of physical activity and chronic disease risk factors of obese lower socioeconomic status African American women. J. Phys. Act Health, 4(4): 447–458.
Park H., Togo F., Watanabe E., Yasunaga A., Park S., Shephard R.J., et al. 2007. Relationship of bone health to yearlong physical activity in older Japanese adults: cross-sectional data from the Nakanojo Study. Osteoporos. Int. 18(3): 285–293.
Pate R.R., O'Neill J.R., and Lobelo F. 2008. The evolving definition of "sedentary". Exerc. Sport Sci. Rev. 36(4): 173–178.
Payn T., Pfeiffer K.A., Hutto B., Vena J.E., LaMonte M.J., Blair S.N., et al. 2008. Daily steps in midlife and older adults: relationship with demographic, self-rated health, and self-reported physical activity. Res. Q. Exerc. Sport, 79(2): 128–132.
Physical Activity Guidelines Advisory Committee. 2008. Physical Activity Guidelines Report, 2008. US Department of Health and Human Services, Washington, DC, USA. Available from www.health.gov/paguidelines/report/pdf/CommitteeReport.pdf. [Accessed 15 May 2012.]
Richardson C.R. 2010. Objective monitoring and automated coaching: a powerful combination in physical activity interventions. Phys. Ther. Rev. 15(3): 154–162.
Richardson C.R., Newton T.L., Abraham J.J., Sen A., Jimbo M., and Swartz A.M. 2008. A meta-analysis of pedometer-based walking interventions and weight loss. Ann. Fam. Med. 6(1): 69–77.
Rogers L.Q. 2010. Objective monitoring of physical activity after a cancer diagnosis: challenges and opportunities for enhancing cancer control. Phys. Ther. Rev. 15(3): 224–237.

BELIEFS AND ATTITUDES

All references for this section are shown below as per superscripts 1,2,3,4,5

http://kell.indstate.edu/public-comm-intro/chapter/11-4-attitudes-values-and-beliefs/
Festinger, L. (1957). A theory of cognitive dissonance. Stanford, CA: Stanford University Press.
Frymier, A.B., & Nadler, M.K. (2013). Persuasion: Integrating theory, research, and practice (3rd ed.). Kendall Hunt Publishing.
Hovland, C.I., & Sherif, M. (1980). Social judgment: Assimilation and contrast effects on communication and attitude change. Westport, CT: Greenwood Press.
Monroe, A.H. (1943). Monroe's principles of speech (military edition). Chicago, IL: Scott Foresman and Company.

SOCIAL SUPPORT & WELLBEING

All references for this section are shown below as per superscripts 1,2,3,4,5,6,7,8,9,10,11,12,13, 14

https://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/social-support/art-20044445
Manage stress: Strengthen your support network. American Psychological Association.
http://www.apa.org/helpcenter/emotional-support.aspx. Accessed June 9, 2018.
Seaward BL. Additional coping skills. In: Essentials of Managing Stress. 3rd ed. Sudbury, Mass.: Jones & Bartlett Publishers; 2014.
Sood A. Week 8: Relationships. In: The Mayo Clinic Handbook for Happiness: A 4-Step Plan for Resilient Living. Cambridge, Mass.: Da Capo Press/Lifelong Books; 2015.
Making and keeping friends: A self-help guide. Substance Abuse and Mental Health Services Administration. http://store.samhsa.gov/product/Making-and-Keeping-Friends-A-Self-Help-Guide/SMA-3716. Accessed June 9, 2018.
Leigh-Hunt N, et al. An overview of systematic reviews on the public health consequences of social isolation and loneliness. Public Health. 2017;152:157.
Ditzen B, et al. Psychobiology of social support: The social dimension of stress buffering. Restorative Neurology and Neuroscience. 2014;32:149.
Levula A, et al. Social network factors as mediators of mental health and psychological distress. International Journal for Social Psychiatry. 2017;63:235.
Rakel RE, et al., eds. Psychosocial influences on health. In: Textbook of Family Medicine. 9th ed. Philadelphia, Pa.: Elsevier Saunders; 2016. https://www.clinicalkey.com. Accessed June 9, 2018.
Sood A. Your tribe: Seed and feed. In: The Mayo Clinic Guide to Stress-Free Living. Cambridge, Mass.: Da Capo Press/Lifelong Books; 2013.
Hitchcott PK, et al. Psychological well-being in Italian families: An exploratory approach to the study of mental health across the adult life span in the Blue Zone. Europe's Journal of Psychology. 2017;13:441.
Fastame MC, et al. Resilience in elders of the Sardinian Blue Zone: An explorative study. Behavioral Sciences. 2018;8:30.

NOTE:

ABOUT THE AUTHOR

Mr. Ricky Singh was born in New Delhi, India on July 28th, 1969, as the oldest of three children (i.e., two sisters and Ricky). Immigrated to the United States in 1988, Ricky purchased his first business in 1992 and has not looked back since that time. He has diverse business experiences and expertise, running convenience stores, gas stations, 7-Elevens, tobacco stores, technology startups, restaurants, delis, and other food establishments. Accomplishments include the following:

a) Successful serial entrepreneur
b) Owner of all Speedy Gas stations in Delaware
c) Completed 52 marathons in 50 states
d) Ultra-endurance athlete, running multiple distances, ranging from 5K to 150 miles
e) Climbed multiple peaks including Mt. Manasalu (8th highest point) and Mt. Everest
f) Third Indian American and first American Sikh to summit Mt. Everest
g) Passionate philanthropist, interested in human upliftment
h) A motivational speaker in diverse settings

Mr. Singh is a loving father with two children, is dedicated to married life with his wife, and believes firmly in taking care of his parents. His mother lives with him in their home in Wilmington Delaware.