

Strategies

FOR HEALTHY LIVING



GROSSMONT
COLLEGE

**Department of Exercise Science, Nutrition and Health
(ESNH)**

8th Edition, 2024

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Welcome to the Exercise Science, Nutrition, and Health Department

The Exercise Science, Nutrition, and Health Department (ESNH) employs a holistic, evidence-based approach to enhancing health and reducing chronic diseases through dietary adjustments, physical activity, and health-conscious behaviors. Our curriculum spans multiple disciplines of physical literacy, emphasizing the vital roles of movement proficiency, cognitive development, physical well-being, healthy living, and nutrition as essential life components that require education and reinforcement.

In Exercise Science, we explore the impact of physical activity on skill acquisition, disease prevention, fitness improvement, and athletic performance. These courses are designed to impart knowledge, develop skills, and refine techniques, empowering students to enhance their physical fitness through structured learning progressions.

Nutrition is the scientific study of food and its nourishing effects on the body. Our nutrition courses delve into both the scientific and artistic aspects of food, from digestion and metabolism to promoting healthy eating habits across the lifespan. Students also examine how cultural influences shape dietary choices, principles of food preparation, dietary strategies for optimizing athletic performance, and career opportunities in nutrition and dietetics.

Health Education is divided into two main categories: Personal Health and Public Health. Both areas challenge students to understand the importance of making informed, proactive decisions that impact personal well-being and contribute to the broader societal health landscape.

The preparation for major courses helps students immerse themselves in the field of study, providing a broad range of cognitive and practical classroom experiences. These courses enhance the development of the kinesiology major and support the chosen career path.

The Exercise Science, Nutrition, and Health Department offers courses that meet General Education requirements and are tailored for Associate of Arts and AA-T in Kinesiology programs.

Sincerely,

Randall O. Abshier Jr

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Co-Chair Exercise Science, Nutrition, and Health Department

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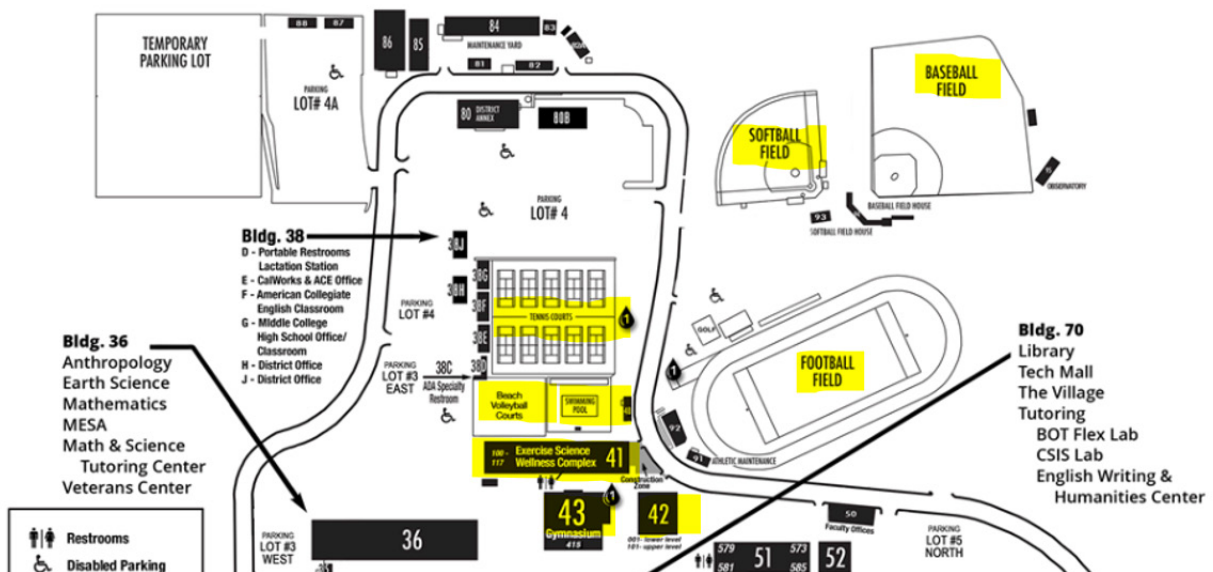
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ESNH Facilities



GROSSMONT COLLEGE CAMPUS MAP



The Department Booklet

We are passionate about our discipline of Exercise Science because we know the value of understanding science and physiological changes that occur with physical fitness. This booklet provides you with comprehensive information about the key strategies and concepts we want you to take away from any course you take within our department. Additionally, we recognize that each of you is uniquely YOU and we want you to have your own experience with this booklet. To help optimize your experience, you will notice several analogies used consistently throughout the booklet to help you understand and apply the concepts and strategies you are learning. Let's get started!

Imagine someone gave you the car of your dreams, but under the condition that it would be the only automobile you could ever own. How would you take care of the car to ensure it lasted an entire life with as little damage as possible? You would most likely change the oil every 3,000 miles, choose the best gasoline, change your air filter when needed, use it regularly and not let it sit, and learn everything you could about the care and maintenance of your car. If you didn't do these things, you would likely spend a fortune on repairs and once it broke down, how would you travel? Your attitude toward the car-of-your-dreams is analogous to your body - you've only got one, and it, like the car scenario, must last you a lifetime. Your body is a high-performance machine. Despite medical advances that can fix many things, repairs are less effective compared to preventing or reducing problems. Just as a magical pill won't fix your car, there is no magic pill for keeping the body healthy.

There are many factors in the care and maintenance of the body, including physical fitness, exercise, nutrition, weight control, heart disease prevention, and daily self-care habits. Participating in sports and fitness activities can be fun, exciting, and challenging! Our exercise classes are designed for more than just sport skills, rules, strategies and theories. In all activity classes, students learn exercise training principles, strategies to prevent heart disease, concepts of weight control and nutrition. Moreover, our students consistently let us know that our classes have changed their lives. They feel more energetic and less stressed. Knowing these basics can help you to live a long and healthy life!

What is Physical Literacy?

One of the first steps to take when learning to care for our bodies is to build our physical literacy. **Physical literacy** means that we can move our bodies with competence and confidence in a wide variety of physical activities across multiple environments (17). If you are **physically literate**, you have the knowledge, skills, and fitness necessary to be active throughout life!

Health and Physical Educators (SHAPE America), are shown in figure 1.4.



Figure 1.4 The characteristics of physical literacy.

Similar to physical literacy, **health literacy** is the capacity to make sound health decisions that lead to adopting healthy lifestyles now and later in life. Health literacy and physical literacy work together to help you develop healthy lifestyle habits. Key characteristics of health literacy include being able to:

- Obtain health information
- Process health information
- Understand health information
- Make appropriate health decisions
- Identify and choose health services

What is Physical Fitness?

Many people perceive health, wellness, and fitness as one and the same, yet there is a definite distinction between the concepts. The term **health** is traditionally defined as ‘absence of disease’ and **wellness** refers to a person’s overall state of being with respect to their physical, mental, social, environment, occupational and emotional well-being. While some experts use health and wellness as interchangeable terms, they are really quite different. Similarly, the term **fitness** is broadly used and often vaguely defined but is most used to refer to physical fitness. **Physical fitness** is a major factor in the physical component of health and wellness and can be defined as a person’s ability to perform physical activity or physical work without undue fatigue.

Physical fitness is achieved by engaging in certain types of physical activity, namely exercise. Being physically fit helps you perform physical activity including activities of daily living. [ACSM](#) defines **physical activity** as “any bodily movement produced by the contraction of skeletal muscles that results in an increase in caloric requirements over resting energy expenditure”. **Exercise** is a physical activity comprised of repetitive movement that is planned, structured and results in physical fitness. It’s important to point out that your physical fitness has to be maintained, and effort must be put into increasing your level of physical fitness. If you do not stay active (use it), your physical fitness will decline (lose it).

Health-Related Fitness (HRF)	Skill-related Fitness (SRF)
Cardiorespiratory endurance: the ability of the circulatory and respiratory system to supply oxygen during sustained physical activity	Balance: the maintenance of equilibrium while stationary or moving
Body composition: the relative amounts of muscle, fat, bone, and other vital parts of the body	Coordination: the ability to use the senses, such as sight and hearing, together with body parts in performing tasks smoothly and accurately
Flexibility: the range of motion available at a joint	Agility: the ability to change the position of the body in space with speed and accuracy
Muscular endurance: the ability of muscle to continue to perform without fatigue	Reaction time: the time elapsed between stimulation and the beginning of the reaction to it
Muscular strength: the ability of muscle to exert force	Power: the ability or rate at which one can perform work
	Speed: the ability to perform a movement within a short period of time

Why is Physical Fitness Important?

We have all heard the phrase “exercise is good for you”, but why is it important? Health professionals agree that if exercise were medicine, it would be the most universally prescribed medicine on the planet, used to both prevent and treat conditions such as: cardiovascular disease, coronary artery disease, obesity, diabetes, osteoporosis, hypertension, elevated cholesterol, cancer, cognitive decline, and depression. In addition to preventing chronic disease, exercise also improves mental fitness by decreasing stress, promoting self-esteem, and improving concentration, memory, and overall academic achievement. Exercise aids in weight control, joint flexibility, and maintains both cardiovascular and muscular strength. In short, exercise can help you to live longer and better! And it can be at no cost to you!

Benefits of Physical Activity

We want you to be excited about the immediate and long-term health benefit of being physically active! In the next section, we discuss benefits connected to specific fitness categories. But first we want you to know that there are 7 easy overarching benefits as described by the Mayo Clinic. (22)

1. **Exercise controls weight**

Exercise burns calories and doing it consistently helps with maintaining a healthy body weight. Take the stairs instead of the elevator or park the car farther away from the grocery store – little steps in everyday life help to build consistency (literally!)

2. **Exercise combats health conditions and diseases**

Regular exercise helps prevent or manage many health problems and concerns, including:

- Stroke
- Metabolic syndrome
- High blood pressure
- Type 2 diabetes
- Depression
- Anxiety
- Many types of cancer
- Arthritis (motion is lotion for joints!)
- Osteoporosis
- Falls

It can also help improve cognitive function and lower the risk of death from all causes.

3. **Exercise improves mood**

Physical activity stimulates various brain chemicals, called endorphins, that can leave you feeling happier, more relaxed and less anxious. You may also feel better about yourself when you exercise regularly which can boost your confidence and improve your self-esteem.

4. **Exercise improves energy**

Exercise gets your heart pumping and your lungs working harder which means more oxygen is delivered to all parts of your body resulting in more energy. As your muscles get stronger, you'll be able to complete everyday activities more easily.

5. **Exercise improves sleep**

When you're exercising regularly, you're more likely to be able to fall asleep faster and to get better quality sleep. It's best to stop exercise 1-2 hours before bedtime so your body has time to wind down.

6. **Exercise puts the spark back into your sex life**

We already mentioned how exercise gives you more energy...well, that increased energy can also help boost your sex life. You may feel more confident about your physical appearance too which can help fuel intimacy. The benefits don't stop there! Men who exercise regularly have fewer problems with erectile dysfunction, and women who are physically active may experience enhanced arousal.

7. **Exercise can help you be more social**

Finally, being physically active gives you many ways to connect with family and friends while doing fun things! Physical activities mean more than lifting weights and running on treadmill. You can meet a friend at a dance class, hike your favorite trail with your partner, or make new friends while learning to kayak. The possibilities are endless!

5 Components of Physical Fitness

There are five basic components of physical fitness: **1) muscular strength, 2) muscular endurance, 3) flexibility, 4) cardiorespiratory endurance, and 5) body composition.** Paying attention to each of these components is important for increasing and maintaining your physical fitness. For example, when a person trains to run a marathon, they might focus their training to improve muscular endurance, cardiorespiratory endurance, and body composition so they can finish the 26.2-mile event. Including muscular strength in their training helps their physical fitness by allowing them to generate power to beat other competitors in a sprint across the finish line, while including flexibility helps to prevent injuries. Addressing each component of physical fitness allows the runner to run the race successfully and safely.

Muscular Strength

Muscular strength (MS) is the amount of force that can be exerted by a muscle, or a group of muscles, in one single, maximal effort. For example, if you went into the weight room and wanted to see how many pounds you could bench press, the absolute heaviest weight you could press successfully one time would indicate the strength of muscles responsible for that movement. Not everyone needs to have the muscular strength of a bodybuilder to be considered adequately fit in this area. Having adequate muscular strength decreases the likelihood of injuries and enhances activities of daily living.

Muscular Endurance

Muscular endurance (ME) reflects the capacity of a muscle or muscle group to contract repeatedly. Examples of this are curl-ups or push-ups in an exercise class. Sometimes professionals combine these two components into a single category called muscular strength and endurance (MSE).

Flexibility

Flexibility is defined as the range of motion in a joint of the body. Flexibility plays an important role in our health and well-being, and especially for those who participate in sports. Flexibility may reduce the chance of injury during an activity and adequate flexibility allows the body to move with ease during everyday tasks. Some research suggests that regular maintenance of joint flexibility might also reduce the severity of future joint problems such as arthritis or bursitis.

Cardiorespiratory Fitness

Cardiorespiratory Fitness (CRF) is the ability of the heart and blood vessels to deliver adequate amounts of oxygen to the body. Also referred to as cardiovascular or aerobic fitness, this component has received a great deal of attention, as research has found the following responses and benefits from performing regular aerobic exercise:

- Reduced risk of cardiovascular disease (*heart disease is the nation's number one killer!*) Participating in regular aerobic exercise strengthens your heart muscle and improves its ability to circulate blood to your lungs and other parts of your body. A regular exerciser is less likely to suffer a heart attack, and more likely to survive if one does occur.
- Reduced blood pressure - A stronger heart means blood can be pumped more easily and with less force on the arteries. Reducing the force on the arteries decreases your blood pressure.
- Reduced resting heart rate (RHR) - RHR represents the number of times the heart beats per minute while at rest. A decrease in RHR because of regular aerobic exercise indicates the heart can more efficiently circulate blood and deliver oxygen throughout the body.
- Increased stroke volume (SV) - SV is the amount of blood the heart can eject with each beat, which is another indication that heart strength has improved.
- Increased Tidal Volume (TV) - TV is the amount of air that passes in and out of the lungs in an ordinary breath, which indicates a more efficient lung function.
- Increased Healthy Cholesterol - Regular aerobic exercise increases the levels of healthy cholesterol (HDL or High-Density Lipoprotein) that helps reduce heart disease risk.
- Reduction of certain cancers - Participating in regular exercise can help lower the risk of prostate, breast, and colon cancers by regulating hormones, supporting the immune system, and maintaining a healthy body weight.

- Type 2 Diabetes can be prevented and managed - Regular aerobic exercise improves your body's ability to remove glucose from the blood and transport it to cells to be used for energy. Exercise also improves the cells' sensitivity to insulin, the hormone that carries glucose, allowing glucose to more easily enter the cell.
- Reduced Excess Body Fat – Less body fat allows your heart to pump blood throughout your body more easily which helps prevent heart disease. Reduced body fat also helps prevent Type 2 diabetes and improve chronic inflammation.

TABLE 1 - PERCENT BODY FAT CLASSIFICATION

WOMEN	20-39 years	40-59 years	60-79 years
	Percent Body Fat (%)		
Essential Fat ^a	8-12	8-12	8-12
Low/athletic ^b	13-20	13-22	13-23
Recommended	21-32	23-33	24-35
Overfat ^c	33-39	34-39	36-41
Obese ^c	≥ 39	≥ 40	≥ 42
MEN	Percent Body Fat (%)		
Essential Fat ^a	3-5	3-5	3-5
Low/athletic ^b	6-7	6-10	6-12
Recommended	8-19	11-21	13-24
Overfat ^c	20-24	22-27	25-29
Obese ^c	≥ 25	≥ 28	≥ 30

The cutoffs for recommended overfat, and obese ranges in this table are based on a study that linked body mass index classifications for the NIH with predicted percent body fat (measured using dual energy X-ray absorptiometry).

- Essential body fat is necessary for the basic functioning of the body
- Percent body fat in the low/athletic range may be appropriate for some people as long as it is not the result of illness or disordered eating habits.
- Health risks increase as percent body fat exceeds the recommended range.

(1) Fit & Well: Core Concepts & Labs in Physical Fitness and Wellness, 6th Edition. McGraw-Hill, 2005.

Body Composition

Body composition (BC) refers to the relationship between the amount of fat and the amount of lean tissue your body contains. Muscle, bone, and organs make up your lean body weight (also termed **fat-free mass**) and the remaining weight is stored **body fat** (or adipose tissue). Your BC is largely determined by genetics, physical activity level, diet, age, and sex (females require a higher percentage of fat than males for reproductive purposes). Table 1 shares guidelines for recommended percent body fat. We suggest you strive to maintain a body fat percent that supports your health and the demands of your lifestyle while honoring the uniqueness of your body (e.g. bone structure). For example, a gymnast will likely find it easier to compete if his/her percent body fat is in the *Low/athletic range*, whereas individuals who are not competitive athletes may feel their best at a percent body fat in the Recommended range. Keep in mind that having too little or too much body fat can negatively affect your health, so it is best to aim for a value that supports health and function.

While it is important to know your body composition numbers, the typical body weight scale does not tell the whole story! Most at-home weight scales only measure your total body weight and do not distinguish between how much of your weight is body fat or lean body weight. Some at-home scales can measure body composition; however, they are best used to monitor trends in lean mass and body fat over time. A healthy body weight with an appropriate amount of body fat is an important goal for each of us and there are tools that can help you understand your how your body composition may be affecting your risk for disease.

Body Mass Index

Body Mass Index (BMI) is a screening tool used to assess individual health risks due to excess body weight. BMI is the ratio of a person's weight to their height calculated by dividing your weight by your height and multiplying by a constant (see formula below). BMI is appropriate to use for many individuals but is less reliable for individuals who have a lot of muscle mass, like football players, and for older adults. Race should also be considered when calculating BMI. For example, ACSM states that "for most people, obesity-related health problems increase beyond a BMI of 25", however Asians typically see negative health effects due to excess body weight before a BMI of 25.0 is reached. Similarly, African Americans tend to have higher bone density compared to other groups which can lead to an overestimation of BMI.

Formula for Calculating BMI: Divide body weight in pounds by height in inches squared and multiply by 704.5. (*Plug in your values.*)

$$\frac{\text{weight}(lbs)}{(\text{height}(inches))^2} \times 704.5$$

[CALLOUT: link for online Version: https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmicalc.htm]

We know that the risk for diseases increases exponentially once a BMI of 30.0 is reached and continues to increase at an accelerated rate as a person's BMI continues to increase. It is important to note that health risks also increase when BMI drops below 18, although these risks are different than those associated with a high BMI.



"Body-mass index and all-cause mortality: individual participant-data meta-analysis of 239 prospective studies in four continents" by The Global BMI Mortality Collaboration in *The Lancet*, 2016.

Waist Circumference

You have learned that BMI provides information about your risk for disease. Waist circumference is another tool to assess if you are at an increased risk for disease from having excess body fat. Waist circumference is measured by placing a measuring tape around your waist halfway between the top of your hip bones and the bottom of your ribs. Be sure to breathe out normally while measuring. Waist circumference predicts risk for disease from too much abdominal (also known as visceral fat) which can increase your risk of cardiovascular disease and diabetes. Just like BMI, waist circumference is not as accurate for certain groups including South Asian, Chinese and Japanese adults. Neither BMI nor waist circumference are appropriate to use for pregnant people.

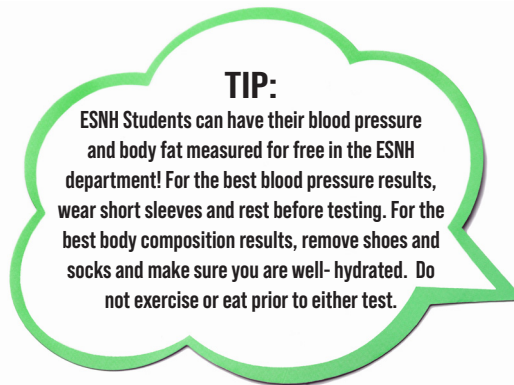
The chart below shows the disease risk associated with different BMI categories and waist circumferences. In general, your health risks are lowest when BMI is below 25.0 and circumference is less than or equal to 40 inches for men and 35 inches for women. NOTE: a person can have extra abdominal fat without having a high BMI so using both tools will provide you with a fuller picture of your potential disease risks.

	BMI (kg/m ²)	Obesity Class	Disease Risk* Relative to Normal Weight and Waist Circumference	
			Men 102 cm (40 in.) or less	Men >102 cm (40 in.)
			Women 88 cm (35 in.) or less	Women >88 cm (35 in.)
Underweight	<18.5		–	–
Normal	18.5 – 24.9		–	–
Overweight	25.0 – 29.9		Increased	High
Obesity	30.0 – 34.9	I	High	Very high
	35.0 – 39.9	II	Very high	Very high
Extreme obesity	40.0 [†]	III	Extremely high	Extremely high

*Disease risk for type 2 diabetes, hypertension, and CVD.

[†]Increased waist circumference can also be a marker for increased risk, even in persons of normal weight.

Source: National Heart, Lung and Blood Institute. <http://www.caloriecontrol.org>. Permission to reprint information in whole or in part contained on this site is granted, provided customary credit is given.



How Much Physical Activity Is Necessary? (PA guidelines)

Before learning how to improve your physical fitness, it is important to understand how much activity your body needs for health as well as for optimal fitness. In short, physical activity is a health habit that is just as important as brushing your teeth! ANY amount of physical activity is better than no physical activity, so focus on moving more and sitting less. If you're not currently active, you can still achieve health benefits with any amount and intensity of physical activity; the important thing is to just get moving.

ACSM-AHA Physical Activity Recommendations (for Adults ages 18-65 years of age)			
Type of Activity	How often	How long	Component Targeted
Moderate aerobic physical activity OR	5 days per week	30 minutes per day/150 minutes per week	Cardiorespiratory endurance Body composition
Vigorous aerobic physical activity AND	3 days per week	20 minutes per day/ 75 minutes per week	Cardiorespiratory endurance Body composition
Muscle strengthening activity that work ALL major muscle groups	2 days or more days per week	Varies	Muscle strength & endurance Body composition

As shown in the chart above, 150 minutes of moderate intensity activity or 75 minutes of vigorous intensity activity (OR a combination of both), is recommended for general health purposes. You can reap even more benefits by being active at least 300 minutes, or 5 hours, per week. While these numbers can seem large, keep in mind that physical activity can be broken down into smaller chunks of time that add up to the recommended minutes per week. For example, you can spend 10 minutes walking, 10 minutes dancing, and 10 minutes biking to school and achieve your 30 minutes of moderate activity for today! Focus on spreading out your activity throughout the week instead of doing one long bout (e.g. a 3-hour hike) once per week.

Moderate versus Vigorous Intensity

You might be wondering what the difference is between **moderate and vigorous intensity physical activity** (MVPA). You'll learn about intensity in the next section so for right now let's just say intensity is how much energy the activity requires you to expend while doing the activity. This is known as the absolute intensity of an activity. Moderate intensity activities require you to expend 3 to 6 times the energy you expend while sitting down. During these activities you will notice your heart beating faster and you'll be breathing harder, but you should still be able to speak a full sentence between breaths. Vigorous intensity activities will push your body further and require you to expend 6 or more times the energy you expend at rest. You'll sweat and you won't be able to talk much without getting out of breath when doing these activities.

Examples of Different Aerobic Physical Activities and Intensities, Based on Absolute Intensity

Moderate-Intensity Activities

- Walking briskly (2.5 miles per hour or faster)
- Recreational swimming
- Bicycling slower than 10 miles per hour on level terrain
- Tennis (doubles)
- Active forms of yoga (for example, Vinyasa or power yoga)
- Ballroom or line dancing
- General yard work and home repair work
- Exercise classes like water aerobics
- Arm cycling, wheelchair sprints

Vigorous-Intensity Activities

- Jogging or running
- Swimming laps
- Tennis (singles)
- Vigorous dancing
- Bicycling faster than 10 miles per hour
- Jumping rope
- Heavy yard work (digging or shoveling, with heart rate increases)
- Hiking uphill or with a heavy backpack
- High-intensity interval training (HIIT)
- Exercise classes like vigorous step aerobics or kickboxing

Fitness Training Principles

To exercise safely, see improvements in your physical fitness, and reach your goals, it is important to have a plan. You are much more likely to be successful with a map that lays out the route leading to your destination. In this section we will discuss the physical fitness training principles that will help you to create your map to success. The principles of fitness training include *progressive overload, specificity, reversibility, and individual differences*. Let's get started!

Progressive Overload

Overload is the foundation of any physical fitness program, and it applies to all types of exercise. To see improvements in physical fitness, you must push the body beyond the limits that you are accustomed to working. By running a little faster or farther than usual, forcing yourself to do three more crunches when you don't think you can do more, or swimming an extra lap when you feel like quitting, you enable your body to adjust to the increasing demands placed upon it. Pushing beyond your comfort zone may feel hard at first, but it challenges your body systems, and this is when you will see increases in your physical fitness! Be sure not to confuse overload with overkill – the key is to progress gradually and systematically. Extreme exertion is not necessary to improve basic fitness levels and can lead to injury or so much discomfort you may want to give up exercising altogether, which we don't want.

Specificity

The fitness principle of **specificity** states that specific exercises and activities will improve specific components of fitness and corresponding body systems. This means that activities and exercises included in your fitness program should be specific to your individual goals as well as any sport for which you might be training. To improve joint flexibility, stretching exercises are needed. To see greater muscle tone in the thigh muscles, strengthening movements for the thighs must be done. If you want to be a sprinter on the track team, you must focus on exercises that build explosive power and speed.

Reversibility

A third fitness training principle, **reversibility** states that the results of training can be reversed if the training stimulus or overload stops. Research findings show that deterioration in all fitness parameters begin to occur just 72 hours after the last workout and continues to degenerate at about the same rate that initial improvements took place. Up to 50% of fitness improvements can be lost in two months! Consistency with your exercise activity is key. The good news is that fit individuals will regain their fitness at a quicker rate after a stoppage than previously unfit individuals. **Our tip . . . use or lose it.**

Individual differences

This principle states that everyone will respond differently to a fitness training stimulus. If you and a group of friends decide to increase your physical fitness by jogging, each of your friends will respond differently based on individual motivation, genetics, age, previous training experience, current fitness, and eating habits.

Rest and Recovery

An often-overlooked aspect of fitness training is rest and recovery which is essential for muscle repair and rebuilding. Light workouts may require only 24 hours of recovery while more challenging workouts could take 2-3 days. Athletes often need a rest day every 7-10 days. Rest days should include 'active recovery' which includes light activities such as walking, gentle stretching, foam rolling, water activities, low-intensity cycling or yoga. Be sure to eat a balanced diet and get enough sleep as part of the rest and recovery process.

Building Your Physical Fitness Program - F.I.T.T. Principle

Once you have decided to start a conditioning regime, there are several things to consider when defining objectives and designing an appropriate program. To continue with the car analogy, think about revving your engine with RPM (repetition, progression, modality). An easy way to remember these factors is to use the **F.I.T.T. Principle**, which is an effective way to ensure overload and the other training principles apply to your exercise program. The key is to progressively overload each component of fitness using step-by-step increases to see benefits. Refer to the FITT Grid at the back of the booklet for a summary.

F = Frequency - How often you exercise can determine its effectiveness and safety

I = Intensity - How hard the exercise should be to accomplish specific objectives.
Your fitness goals dictate exercise intensity.

T = Time - The duration of each exercise session and the corresponding components is, again, highly specific to your exercise goals

T = Type - The mode of exercise will be determined by what fitness component you are trying to improve

The four factors of the F.I.T.T. Principle can guide you in creating a plan specific to your goals and current fitness level. For example, if you want to train for a 5K, you will need to focus on increasing your muscle endurance, cardiorespiratory endurance, and flexibility. If you want to win the race you will also need to focus on muscle strength. Your current activity level will determine your starting point and how you progress. Let's focus on cardiorespiratory endurance. A simple starting plan for a new runner who is fairly active might be to run (type) 3 days per week (frequency) for 20 minutes (time) at 60% of their THR (intensity). If you can run 1 mile in 20 minutes, the next week increase your distance by 5-10%. Increasing time in small amounts safely helps build cardiorespiratory endurance while increasing your distance and pace. Once you can cover a reasonable distance, work to increase intensity by including sprints in your runs. This overloads your system and improves your cardiorespiratory fitness. Take a moment to think about how you would use the F.I.T.T. Principle factors for the other components of fitness using the same goal of running a 5K. The chart below can help guide you.

Using the F.I.T.T. Principle for the Components of Fitness

Component of Fitness	F = Frequency	I = Intensity	T = Time	T = Type
Muscle Strength	2 times per week per body part (abdominals may be trained moderately daily)	70% or more of max	3 -5 sets of 3 to 8 repetitions (For general toning in a limited amount of time, perform 1-2 sets of 8-12 repetitions.)	Weight machines, elastic tubing, free weights, your own body weight
Muscle Endurance	2 times per week per body part (abdominals may be trained moderately daily)	40-60% or less of max	2 to 3 sets of 12-15 or more repetitions	Weight machines, elastic tubing, free weights, your own body weight
Flexibility	3 times per week/ daily	Stretch to the point of tension	Hold static stretches for 15-60 seconds	Static, dynamic, and contract-relax
Cardiorespiratory Endurance	3-5 times per week	Target heart rate (THR) at 40-85% or rate of perceived exertion (RPE) of 4-6	20-60 minutes	Aerobic activities (i.e. jogging, biking, rollerblading)
Body Composition	Using the F.I.T.T Principle for body composition is as simple as managing your energy intake and staying active. While simple in theory, there are many moving parts which you'll learn more about in the "Improving Body Composition" section below.			

Exercise Strategies

Next, let's talk about strategies to improve your general fitness with a focus on each specific component of physical fitness and learn how the F.I.T.T Principle can be applied. A single exercise session will ideally have three parts:

1. Warm-up: dynamic movements that mimic what you will do in the next section. Lasting 5-8 minutes, this is designed to increase heart rate and body temperature, lubricate the joints, and activate fuel for the upcoming activity.
2. Conditioning/skill development: activities will vary depending on your goals i.e., resistance training, aerobic exercise, or a sport skill development such as tennis, badminton, or swimming.
3. Cool-down: perform light aerobic activities to gently return the heart rate to a resting level; perform static stretches for all the major muscle groups

Improving Muscle Strength (MS)

An improvement in muscular strength requires an increase in the amount of resistance you usually lift. If you can bench press 100 pounds five to ten times in a row, lift more than 100 pounds to become stronger; remember progressive overload! As you become stronger, your muscles will increase in strength, tone, and size (**hypertrophy**) as they adapt to the greater weight demands placed upon them. To increase muscular strength, the general rule is to lift a relatively heavy weight for a few repetitions several times.



TIP:

To improve muscular strength, complete more sets and less repetitions at a higher intensity level.

To improve muscular endurance, complete less sets and more repetitions at a lower intensity level.

Improving Muscle Endurance (ME)

Muscular endurance demands that a muscle group be worked repeatedly. Using the bench press example, imagine you can lift 40 pounds twelve times. To improve muscular endurance, increase the number of repetitions rather than increasing the weight. As muscle endurance increases, so does the general tone of the muscle group, although, there may be little or no enlargement in the size or bulk of the muscle group exercised.

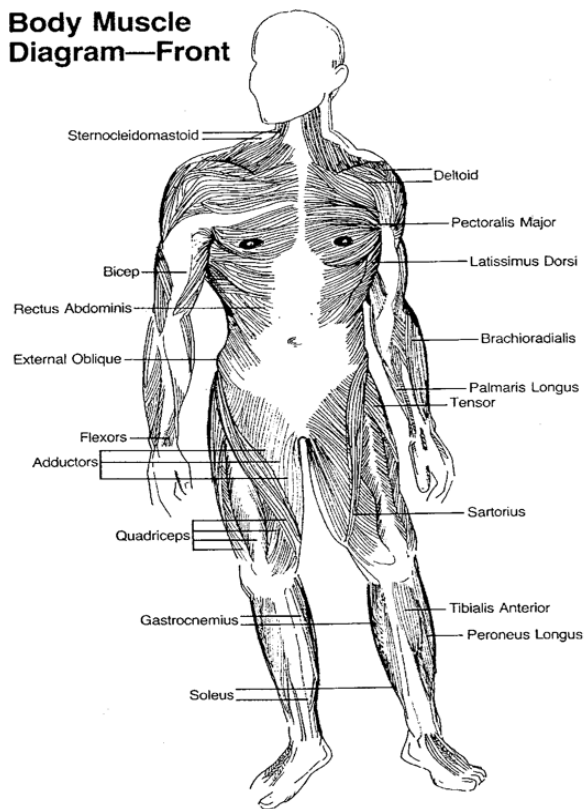
Muscle work, for both strength and endurance, should be done with some resistance (remember the idea of overload) but doesn't necessarily require any fancy machines or gym memberships. You can often use your own body weight as resistance (push-ups, squats, lunges, and crunches) or use hand-held weights, resistance bands, water-filled jugs, a backpack filled with books. Using equipment especially designed for muscle work is optimal, but not required.

Many times, women will avoid muscle work because they fear they will bulk up and look too masculine, yet women very rarely have this outcome since they lack the testosterone necessary for significant muscle gain. Women can certainly improve the tone and size of muscles but will not look like a male body builder by performing a basic muscle workout. Increased muscle mass will help raise resting metabolic rate which helps tremendously to burn more calories at rest and with weight control by increasing metabolism. So, ladies, don't ignore your muscles!

Refer to the table for suggested exercises to improve muscle strength and endurance (not a complete list by any means.) The next page shows a diagram of major muscles you may wish to improve. You may also want to consider enrolling in classes that specifically focus on muscle strength and endurance - see the list of classes on page X.

MAJOR MUSCLE EXERCISES TO ASSIST YOU IN GYM OR AT HOME WORKOUTS		
Muscle Group	Weight Machine Exercise	Home Exercise
Pectoralis Major	Chest press (flat, incline, decline) Chest fly Upward chest cable fly	Push-ups (wide arms, narrow arms) Flys (lay on back and press weights)
Rhomboids/Mid-Trapezius	Shoulder press Seated row Cable low rows	Posterior fly One-arm row
Trapezius	Smith machine upright row Barbell shrugs	Shrugs Upright row
Deltoids	Smith machine upright rows Shoulder press Front or side cable raise	Lateral raises Upright rows Overhead press Upright row into overhead press
Gluteals, Quadriceps & Hamstrings	Leg press Smith machine squats Squat rack Leg curl Leg extension	Squats Lunges (stationary and walking)
Biceps	Assisted pull-up Cable machine biceps curl	Arm curls Concentration curls (on knees)
Triceps	Triceps pushdown Cable rope triceps extensions Skull crusher	Triceps kickbacks Overhead extensions Dips
Gastrocnemius	Calf raise Smith machine calf raises	Heel raise (up on toes)
Abdominal	Horizontal cable wood chops Cable Pallof press Hanging leg raises Stability ball/Bosu curls	Crunches Plank (front and side) Crunch with rotation (Oblique) Pelvic tilts
Erector Spinae (low back)	Seated back extension	Back lifts (lay on stomach & lift chest up)

Body Muscle Diagram—Front



Improving Flexibility

Moving your joints can become restricted (resulting in stiffness) if not regularly used throughout the joints' entire range of motion. Take a moment to move your arms and legs – can you feel areas where you are tight? Flexibility exercises can be done at home, do not require any special equipment, and can serve as a stress management activity.

Two of the most common types of flexibility training are static and dynamic. **Static flexibility** exercises involve moving a joint into an extended position and holding that position for a minimum of 15-30 seconds. **Dynamic flexibility** involves conscious, controlled movement through the joint's range of motion.

Muscles and tendons stretch most effectively when muscle temperature is slightly higher than normal. This is where the term warm-up comes from: before exercise, perform light movements that mimic the activity that you will do next. Dynamic stretching should be done during the warm-up phase, whereas static stretching should be done after the body is thoroughly warm. Recent research indicates that pre-exercise static stretching is not likely to prevent injuries so you will want to do static stretching at the end of a workout session to achieve long-term flexibility.

Increasing Cardiorespiratory Endurance

Improving cardiorespiratory endurance requires you to do aerobic exercise which involves moving the large muscles of the body rhythmically and continuously. Walking, dance exercise, jogging, running, swimming, bicycling, cross-country skiing, and rowing are activities that can improve CRE if overload is achieved. If you are new to exercise, gradually increase the number of days you perform aerobic activities to reach the recommended target of 5 days per week. You can then increase the amount of time you are doing the activity and the intensity. Intensity can be increased a number of ways such as going faster and going uphill in short bouts that gradually increase in length. Finally, switching the type of exercise keeps your body challenged which also leads to increases in physical fitness.

Exercising every day may help you cardiovascularly but be cautious about the effects on other parts of your body: progress gradually. Your instructor can answer questions to help you plan your program so that it is safe, progressive, and effective.

Choosing an Intensity for Aerobic Exercise

Target Heart Rate & Intensity

Intensity refers to how hard or intense you should exercise to achieve positive training effects without getting injured. An effective way to monitor your exercise intensity is to determine your **Target Heart Rate Zone (THR)** which provides an estimated range of how hard your heart should be working during aerobic activity.

Individuals with health conditions, new exercisers, or those who do not exercise regularly should exercise within a low intensity range while those in relatively good shape who participate in frequent exercise can work toward the high end of their THR zone. It is better to begin at a lower intensity and gradually increase to the higher end of the zone – speak with your instructor for additional input on what is best for you. As you become fitter or change your goals, it is common to adjust your THR zone to meet overload. Choose your appropriate intensity zone:

- New exercisers or those with health issues (Zone 1): THR zone: 40-50% up to 50-60% (low intensity)
- Beginning/intermediate exercisers (Zone 2): THR zone: 60-75% (moderate intensity)
- Physically fit individuals (Zone 3): THR zone: 70-85% (high intensity)

Calculating Target Heart Rate

Calculating your THR involves a minor calculation using the Heart Rate Reserve Method based on your age, **resting heart rate** (HR_{rest}) and estimated **maximum heart rate** (HR_{max}, the greatest number of times your heart can beat per minute). Follow these steps to calculate your THR:

1. Determine your HR_{rest} - Find your pulse and count it for one full minute OR count it for 30 seconds and multiply by 2. Ideally, you should do this first thing in the morning or after you have been resting quietly.
2. Record this value in **beats per minute (BPM)**.
3. Determine your HR_{max} - *Use Gellish's age-adjusted formula (HR_{max} = 207 - 0.7 x age) to calculate your HR_{max}*. Multiple your age by 0.7 and subtract that number from 207 OR directly measure your HR_{max} during a maximal exercise test.
4. Calculate the lower end of your THR zone - Using Zone 2 as an example, calculate the lower end of your THR by multiplying your HR_{max} by .60 (or 60%). The product will be your heart rate in BPM.
5. Calculate the upper end of your THR zone – Using Zone 2 as an example, calculate the upper end of your THR by multiplying your HR_{max} by .75 (or 75%). The product will be your heart rate in BPM.

Refer to the box for an example of how to calculate your THR zone. Hint: The high end of your zone will never be more than your maximum heart rate, and the low end will not be less than your resting heart rate.

Calculating THR Zone

Formula: (Intensity in decimal form)(HR_{max} – HR_{rest}) + HR_{rest}

Example:

- Luis is 40-years old
- Resting HR (HR_{rest}) = 72 bpm
- Beg/intermediate exerciser so his intensity range is Zone 2 or 60-75% according to ACSM guidelines
- Estimated Max HR (HR_{max}) = 206.9 – (.67 x age)

#1 Calculate Estimated Maximal Heart Rate:

$$206.9 - (.67 \times 40 \text{ yrs}) = 180.1$$

#2 Convert intensity to decimal:

$$60\% = .60 \text{ (Low end)}$$

$$75\% = .75 \text{ (High end)}$$

#3 Calculate Low end of Target Heart Rate Zone(Plug numbers into the above equation):

$$= (.60)(180.1 - 72) + 72$$

$$= (.60)(108.1) + 72$$

$$= 64.86 + 72$$

$$= \mathbf{136.86 \text{ bpm}}$$

#4 Calculate High end of Target Heart Rate Zone:

Repeat step 3 but change the intensity to the High end value

$$= (.75)(180.1 - 72) + 72$$

$$= (.75)(108.1) + 72$$

$$= 81.08 + 72$$

$$= \mathbf{153.08 \text{ bpm}}$$

Answer: Luis' THR Zone is 136.86 to 153.08 bpm

Using THR During Exercise

Monitor your heart rate periodically during an aerobic workout by taking your pulse and/or within 10 seconds of stopping exercise. Count the pulse for 6 seconds and multiply by 10 or count for 10 seconds and multiply by 6 (a 10-second heart rate conversion chart is on page X.) Ideally your exercise heart rate will be within your Target Heart Rate zone, which means you are maximizing the fitness benefits from your cardio workout. If your exercise heart rate is below the low end of your THR, increase intensity.

Rate of Perceived Exertion (RPE)

Another mode to monitor exercise intensity is to use the RPE scale which involves subjectively rating exercise intensity on a scale of 1 to 10. RPE is especially helpful for those unable to measure pulse or those taking medications that affect heart rate response.

To use the RPE scale, the American College of Sports Medicine states *“pay close attention to how hard you feel the exercise work rate is. This feeling should reflect your total amount of exertion and fatigue, combining all sensations and feelings of physical stress, effort, and fatigue. Don’t concern yourself with any one factor such as leg pain, shortness of breath or exercise intensity, but try to concentrate on your total inner feeling of exertion. Try not to underestimate or overestimate your feelings of exertion; be as accurate as you can.”* Refer to the RPE Scale below.

Borg’s Rate of Perceived Exertion (RPE) Scale

1	Very weak exertion
2	
3	Moderate exertion
4	
5	Strong exertion/heavy effort
6	
7	Very strong
8	
9	
10	Extremely strong Absolute maximum

Improving Body Composition

Applying the FITT principle to this component of physical fitness can be a bit more involved. Many individuals have likely attempted to change body composition, with most wanting a little more muscle, or a little less fat, or both! You've already learned how to increase muscular strength and endurance using the FITT principle, which increases lean mass, and thus, improves body composition. Exercising aerobically teaches the body how to use stored fat as a fuel source. So why might losing excess body fat be a challenge?

The human body has amazing self-preservation mechanisms, one of which is a predisposition to store fat extremely efficiently for survival purposes (our ancestors often had to go for periods of time without food, during which the body had to rely on stored fat for energy.) The average adult has approximately 30 to 40 billion fat cells which, if completely empty and arranged in one space, represent a volume approximately the size of a clenched fist.

A fat cell is very much like a sponge in that it can shrink as well as swell and has the capacity to increase its size considerably. If each of the body's billions of fat cells were filled, they could weigh over a quarter of a ton; and be enough to stuff a small sofa. By the same token, they can shrink and become very small, and it is believed that the cells themselves never disappear in humans.

Heredity has a significant effect on the number of fat cells an individual body contains (you usually have a basic body type like one or both parents), but it is not the only factor. Previously, the theory regarding fat storage stated that despite fat cells' ability to expand in size, the actual number of fat cells would not increase in adults. Our current obesity epidemic in children is demonstrating a new theory that excess caloric intake may result in the development of new fat cells in kids. When kids put on weight, especially before reaching puberty, their bodies tend to make new fat cells. Having more fat cells in childhood usually results in easier weight gain as an adult and a harder time losing excess weight. In addition, excess weight in childhood is causing adult diseases like high cholesterol and type 2 diabetes to develop in children with obesity.

Energy Balance Equation

Resting Metabolic Rate (RMR)

One approach to altering body composition is to adjust your body's energy balance. The basic components of energy balance include energy intake (the food you eat), energy expenditure (the energy you spend existing and moving), and energy storage (stored body fat). Body weight can change only when there is an imbalance between energy intake and energy expenditure over a given period. When you eat you take in energy in the form of protein, carbohydrates, fat, and alcohol. Your body then expends energy through your **resting metabolic rate** (RMR), which is the amount of energy needed to fuel your body at rest; the thermic effect of food, which is the energy cost of absorbing and metabolizing the food you eat; and the energy you expend through physical activity. RMR is proportional to body mass, particularly the amount of fat-free mass. This means that the more muscle mass you have, the higher your RMR will be because muscle tissue is 'active' and needs a lot of energy to function. Even at rest your body is still at work. Your heart is beating, your lungs are allowing you to breathe, and your body is carrying out vital functions such as making new cells and eliminating waste. Your brain is overseeing and controlling all these functions. This work is considered your metabolism. The rate at which your body uses calories to do this work is your "resting metabolic rate". To lose weight safely and permanently without lowering metabolism and causing the other negative health effects discussed earlier, you must consume enough calories to meet your body's basic needs.

When energy intake equals energy expenditure, your body is in energy balance and body energy is stable (generally equivalent to body weight). However, the time when energy balance is controlled or regulated is not well understood. This means that reducing energy intake may not immediately show up as a decrease in body energy or weight. Your physiology functions the same as other people, however you are also quite unique. This uniqueness means there is a large variability in individual responses to weight loss interventions and other disturbances to the energy balance system. Any genetic or environmental factor that affects body weight must act through one or more components of energy balance (energy intake, energy expenditure, and/or energy storage).

Calculate your RMR using an online calculation tool can be found at the following link:
<https://www.active.com/fitness/calculators/bmr>

How the Body Achieves Energy Balance

We do not have a complete understanding of how the body maintains energy balance, but we do know that there is a complex physiological control system involved. This system includes signals about the state of our energy stores, and changes can influence the body to defend energy stores, maintain energy balance, and prevent shifts in body mass. Simply put, energy balance is usually checked by looking at body weight or body composition (to estimate total energy). Measuring energy balance directly is difficult; instead, we measure things that indicate the balance between energy coming in and going out, and the energy stored in the body. Because we can't measure the small changes in energy balance that might influence body weight, we need to be careful when predicting weight changes based on energy intake and use.

Effects of Low-Calorie Intake

Weight loss is all about creating an energy deficit – eating fewer calories than our body expends each day. However, creating too large of a calorie deficit can backfire. Our bodies are smart and will adapt for survival! When calories are severely limited, your body thinks it's entering a famine, and that it needs to do more with fewer calories. Your body adapts to the restricted caloric intake and uses less calories to perform the same tasks. Thus, your metabolism slows down and energy and fat are conserved not burned.

Metabolism is the rate at which the body burns fuel for energy. The basal metabolic rate is the minimum number of calories needed to perform daily basic functions such as breathing, growth, cellular repair, and digestion. When calories are restricted, the body will try and compensate by holding on to the few calories that are consumed.

Additional drawbacks to a severe reduction of calories include:

1. **Malnutrition** – A diet with extremely low calories does not allow for adequate amounts of vitamins, minerals and antioxidants the body needs to perform its daily life processes. Vitamin deficiencies can lead to various problems, including fatigue and an impaired immune system.
2. **Muscle loss** – Your body requires a certain amount of protein for growth, repair, electrolyte balance and maintaining the immune system. When protein intake is reduced, the body will burn its own muscles or organs to gain the needed protein. Individuals who follow very low-calorie diets may lose weight but also lose a great deal of lean body tissue which will lower their overall metabolism.
3. **Ketones** – When carbohydrates are lowered due to fasting, starvation or very-low calorie diets, production of ketones increases because of fat metabolism. Ketones are acidic and the body tries to eliminate them through urine which causes dehydration. High levels of ketones can be toxic and in severe cases can lead to coma or death. Symptoms of ketoacidosis include dizziness, lethargy, thirst, and a very distinctive breath odor.
4. **Foggy brain** - The brain, which accounts for 2 percent of our body weight, uses roughly 20 percent of our daily calories. A picky eater, our brain demands a constant supply of glucose – primarily obtained from recently eaten carbohydrates (fruits, vegetables, grains, etc.) Ever wonder why you get a little dizzy or get a headache when you haven't eaten in a while? Avoid low carbohydrates diets because they do not provide the brain with adequate fuel.
5. **Disordered eating** – Dieting often results in obsession with food. Very restrictive diets (under 1200) can cause symptoms of depression, irritability, and social withdrawal. Even skipping meals – a technique often used to lose weight – can cause emotional symptoms within hours. Withholding calories can also lead to another disordered behavior – binge eating (periods of uncontrollable eating).

Behaviors that negatively affect your health or daily functioning are termed 'disordered'. The habits listed below can be examples of a **'disordered behavior'**:

- | | |
|--|---|
| <ul style="list-style-type: none">• very strong fear of gaining 5 pounds• following strict food rules• dieting for more than three quarters of your life• use of diet pills & laxatives• fasting or juice cleanses to lose weight• over exercising• cutting entire food groups from your diet, except for religious reasons• eating the same 'safe' foods every day• extreme calorie restriction• thinking about food more than 50% of the time• obsession with calorie counting | <ul style="list-style-type: none">• Intentionally skipping meals to lose weight• bingeing or vomiting• smoking for weight loss• lying about how much, you've eaten• weighing yourself daily - if it becomes obsessive• consistently overeating when you're not hungry• eating a lot of no- or low-calorie foods• thinking of foods as 'bad' or 'good'• visiting pro-anorexia or pro-bulimia websites• adopting a vegetarian or vegan diet solely for weight loss |
|--|---|

If you or someone you know is suffering from an eating disorder, please seek help immediately. Eating disorders are serious and can be life-threatening. To find an eating disorder treatment specialist in your area, contact your primary care doctor or the Student Health Services on campus. The National Eating Disorders Association's toll-free hotline at 1-800-931-2237 (Mon-Fri, 8:30 am to 4:30 pm PST).

<http://www.nationaleatingdisorders.org/find-help-support>

Best Approach for Maximal Fat Loss

The safest and most effective fat loss approach involves a combination of a small reduction in calories (food), and regular exercise. “Slow and steady wins the race” is probably not what most people trying to lose weight want to hear, especially when social media is full of content about fad diets that promise fast results or “miracle plans”. It takes time and patience to lose weight, especially if you want to keep it off...remember, slow and steady wins the race!

The most successful approach to weight loss is based on the **Energy Balance Equation** which states that the number of calories one takes in via food must be equal to the number of calories burned to maintain current body weight. To lose weight, the number of calories in must be LESS than the calories out. However, it is very important to NOT go below your Resting Metabolic Rate (RMR) as discussed previously.

Know Your Numbers

Take a minute to think about any weight gain or weight loss goals you currently have – do your goals focus on your long-term health and wellbeing, or are they focused on getting to a certain weight as fast as possible? Working towards health-based goals may take a bit longer because you are ideally building healthy lifestyle habits versus following a diet in order to reach a particular number on the scale. A **diet** is an eating plan used to achieve a particular goal. Some diets, like the DASH or Mediterranean diets, are nutritionally sound and promote permanent dietary change to improve health and achieve a balanced body weight. However, most diets can be considered fad diets, like those in magazines or on social media that promise quick weight loss or other ‘too good to be true’ results. These eating plans are often extreme and are often not backed by research.

A healthy rate of fat loss is $\frac{1}{2}$ to 1 pound per week – this generally means the person is eating a little less calories and gaining/keeping muscle mass. There are approximately 3500 calories in one pound of stored body fat which is a lot of calories - the same number of calories in $\frac{3}{4}$ gallons of chocolate ice cream! To lose one pound of fat per week, you would need to create a caloric deficit of 500 calories each day (3500 calories per pound divided by 7 days in a week). Two pounds of fat loss may be acceptable for some, but it requires 1,000 calories less per day, (for most people this is a drastic and unattainable goal without going below your RMR which we don’t want to do).

Weight Gain

Some of you may have a goal of gaining weight. Knowing your numbers is just as important for weight gain as it is for weight loss. To gain a pound of weight you will need to increase the number of calories you take in while at the same time considering your body composition. Monitoring your fat and lean mass gain can be important for optimal health, however making appropriate food choices and engaging in muscle building activities can ensure your success. Although weight gain requires an increase in the number of calories you eat, make those calories count. Eating smaller meals more frequently (every 2-3 hours) will help to increase calories but it is also essential to choose foods high in nutrients. For example, candy and ice cream are foods that contain a lot of calories, however they are deficient in nutrients and won’t lead to healthy weight gain. On the other hand, nut butters and healthy fats are excellent sources of nutrients and ensure you will feel your best.

Weight Loss Theories

The principles of fat loss previously discussed are valid and based on scientific research and evidence. On a practical level, anyone who has ever dieted knows that the fat reduction game is not as clear cut as science and the Energy Balance Equation would have us believe.

Some experts have suggested that the “yo-yo” syndrome typically experienced by dieters may occur in part due to a biological phenomenon referred to as the body’s set-point. The **Set-Point Theory** proposes that each person’s body becomes accustomed to a certain weight or body composition, and various things occur at the cellular level to maintain this set-point even though calories are reduced, or for that matter, increased. Think of it being like a thermostat on a furnace in your home - you set the thermostat to maintain an environmental temperature you find comfortable, and if the temperature in the home rises or drops, the furnace automatically turns on or shuts off to restore the previously chosen temperature.

A possible new theory based on research published in the British Journal of Nutrition (May 2013) states that a diet high in saturated fat and simple carbohydrates may set in motion a chain reaction of “metabolic dysfunction” involving the appetite-regulating hormones *leptin* and *ghrelin*. Leptin’s job is to suppress appetite, ghrelin’s to increase it. Such diets may change/damage the nerves that conduct signals through parts of the brain, affecting the function of appetite hormones and thus the body’s ability to regulate weight and metabolism.

Changing habits is a process

Obesity and overweight can be changed through diet, exercise, persistence, and patience. It can take time for the body to adjust to a new weight or body composition, and the slower the process, the more readily the body will accommodate the change. It is not uncommon for people to follow a diet (which isn’t a permanent plan for eating) and to regain the weight once they go off of the diet. Adopting healthy eating and exercise habits for life is the surest path to long-term success, and we are hoping the ES classes you take at Grossmont will help you to build these habits.

Myths

Beware of diet gimmicks promising quick and effortless weight loss - many are merely money-making tools for a ruthless con-artist! The \$60 billion diet/weight loss industry is big business in America – pun intended. Not only do these diets rarely work as promised, but they can also actually be quite dangerous. Avoid diet plans that do not allow for a wide variety in the foods eaten because they most likely will not provide enough of the essential nutrients your body needs. Look for eating plans that: teach you how to modify behaviors eating and exercise behaviors, portion control, variety, are within your cultural and monetary needs, and convenience (cooking yourself vs. driving a long distance to pick up pre-packaged food).

Be conscious that most weight loss diets are high in protein while keeping carbohydrates and fats to a minimum. As you remember, an active body needs an ample supply of carbohydrates to function properly. Think of carbohydrates as the kindling to get a fire started – big logs won't burn without the kindling. Most individuals do not realize that excess protein (or extra calories from any source) will be converted and stored as body fat. Protein-rich diets often result in quick initial weight loss, but the loss is primarily water and not fat.

For those wishing to trim down thighs or reduce their 'muffin-top' around the belly area, research has repeatedly shown that it is impossible to 'spot reduce'. Each person has a genetic predisposition to store fat in specific areas of his or her body: each of us will usually store fat in the same places as parents and siblings. Body fat is lost generally all over the body: not from one place at a time. Exercising a specific muscle group will tone that muscle group but will not burn the layer of fat directly over the muscle group. *(If excessive exercise of a selected area of the body burned fat from only that spot, wouldn't all habitual gum chewers have super skinny and lean cheeks?)* In other words, to slim down one's thighs, an individual must follow a diet and exercise approach designed for general fat loss: reduce calories consumed and increase physical activity. Your body's genetic map will determine the areas where stored fat will be taken, and there is literally nothing, short of surgical removal of fat cells (a process known as **liposuction**), that can change this. Cellulite wraps (cellulite is just normal body fat), reducing creams, and thousands of leg lifts will not reduce fat deposits! Again, when you reduce body fat in general, those trouble spots will change, but only to the degree that your body dictates. We all have areas of our bodies that we might like to be different. Have self-compassion for those areas while focusing on the things you can change AND on all of the amazing things our bodies do for us!

Colonic irrigation or 'cleansing' is also unnecessary and can have dangerous side effects. The body is well equipped with the liver and kidneys to rid the body of toxins. Any weight loss resulting in this method is temporary and mostly water. Colon health is enhanced by increasing fiber intake. Americans typically do not consume enough fiber - only 10-15 grams - but the recommendation is closer to 20-35 grams/day. Drinking plenty of fluids is also important.

You Can Do This!

It may be as long as six weeks before you notice any significant results from your diligent efforts to improve your fitness. Changes are taking place but in very subtle ways - you are training your body to function in new ways! Remain patient, consistent, and persistent, and set realistic goals and expectations. We hope it is apparent that maintaining physical fitness is a lifetime commitment and if you don't use it, you will lose it. Strive to **make exercise an integral part of your lifestyle** and encourage your family and friends to join you so you have support along the way. If you have trouble fitting exercise into your busy day, enroll in one or two exercise science courses at Grossmont each semester. This way, you can plan it into your daily schedule and exercise will start to become routine. After a few years, you'll have an excellent chance of developing a lifetime habit which will help you control your weight, reduce your stress, decrease your risk for many diseases, and provide hours of fun and enjoyment!

Six Essential Nutrients

What you eat is equally as important as movement in maintaining your health and well-being. Your body requires certain nutrients, all of which play a vital role in the health of an active individual. Remember the car analogy? Food is your fuel! It is important to become familiar with your body's basic needs so you can fuel your body with the best food choices possible.

Your body needs six nutrients to function effectively: **carbohydrates, fats, proteins, vitamins, minerals, and water**. The first three are or can be, fuel sources for the body, and the others are instrumental in facilitating internal processes. A well-rounded diet with foods taken from all the **basic food groups** (dairy products, breads and cereals, fruits and vegetables, and meat/protein) helps to ensure that the body gets the essential nutrients it needs. Knowing the role each nutrient plays in the body's functioning can help you become more aware of what is needed in a nutritionally sound diet.

Carbohydrate

Researchers have suggested that approximately 45% to 65% of your diet should consist of carbohydrates. This nutrient is your body's main and most efficient fuel source, and is found mostly in vegetables, fruits, cereals, and grains. Carbohydrates are often grouped into two categories: **simple carbohydrates** (found in table sugar, honey, candy, soft drinks and often thought of as less healthy to eat) and **complex carbohydrates** (found in grains, fruits and vegetables often considered the healthier type). The body breaks down and uses simple and complex carbohydrates identically as a fuel source (glucose), but other differences in the two types, like how quickly they are broken down and get into your bloodstream, have various ramifications.

Fiber

Experts now know that carbohydrate digestion is a much more complicated process and are grouping them into sugars, fibers, and starches (potatoes, rice). For instance, most complex carbohydrates are found in foods that also have a relatively high fiber content. Fiber is critical to digestion and waste evacuation. We need 20-35 grams of fiber per day and the average American gets only half that amount. Researchers at Harvard found that a high intake of fiber resulted in a 40% risk reduction for heart disease! Carbohydrates with fiber take a longer time to digest (slow burning fuel) and are said to have a low glycemic index. (**Glycemic index** is a way to classify carbohydrates based on how they boost blood sugar.) Simple carbohydrates, on the other hand, are often found in more processed foods which are often low in fiber, high in calories and not 'nutrient dense' meaning that you'll consume lots of calories with little nutrients (think fast burning fuel and high glycemic index). Processed foods are those items that have undergone much alteration from their original source – *Twinkies, cookies, crackers, and Flaming Hot Cheetos*.

Unprocessed Choices

Your diet should consist of mostly complex and unrefined sources, such as whole grains, fruits, and vegetables. Avoid sugary foods and ultra-processed foods. Remember that excess carbohydrates not burned or stored in the muscles and liver will be converted to and stored as fat . . . so stay active!

Dietary Fat

It is recommended that fat contributes 20% to 35% of your total dietary intake. Saturated fat intake should be less than 7%-10% of total energy and trans-fat kept at an absolute minimum – more about these later. Higher intakes of fat increase the risk for obesity and its complications, such as heart disease and diabetes. However, it is important to note that diets too low in fat and too high in carbohydrates can also increase the risk of heart disease.

Although people trying to lose weight may believe they need to consume less than 20% of their total calories from fat, evidence shows that doing so may do more harm than good, especially if the diet is also very low in calories (less than 1500) – see “Effects of Low-Calorie Intake”. Most people feel more satisfied and are less preoccupied with food with fat kept at 20-25 percent of total energy intake.

Dietary Fat = Beneficial

Despite their sometimes-bad reputation, fats have many important functions. Body fat provides protection for internal organs, helps insulate the body (ever notice that your skinny friends are chronically cold?), and serves as a fuel reserve. Small amounts of fats are also essential to the construction of cell walls and in the manufacture of some hormones. Fat contained in food (dietary fat) serves a critical role in certain vitamins (A, D, E and K) which can only be carried and stored in fat. Foods with a relatively high fat content tend to be more flavorful than foods low in fat, and a higher fat content in meat contributes to the meat’s tenderness. As you can see, fat isn’t all bad.

Types of Dietary Fats

There are three types of dietary fats: **saturated**, **unsaturated** and **trans fat**. Fats are made up of glycerol molecules and fatty acids. More solid types of fat, known as **saturated** are found in butter, animal fat, and certain vegetable sources (palm and cottonseed oils, shortening) and have been found to contribute to atherosclerosis (hardening of the arteries) and coronary heart disease by raising LDL cholesterol (the lazy cholesterol). **Unsaturated** fats, typically found in vegetable sources (olive, canola, peanut, avocado) are considered heart healthy fats. One type of unsaturated fat you may have read about is **omega-3 fatty acids**, which decreases the risk of heart disease and helps lower blood pressure levels.

Recent technology has allowed us to convert unsaturated fat into a more solid type of fat for use in baking, cookies, and other packaged foods. Unfortunately, this process (known as **hydrogenation**) creates **trans fat**, which has similar negative effects on our arteries, as does saturated fat, plus it decreases HDL cholesterol (the helpful cholesterol)! (There are also some naturally occurring trans-fats in dairy and animal products.) It is important that you learn to read the label on packaged foods, so you can determine how much saturated fat is in the food, as well as any hydrogenated oil.

Despite the type or source of fat, a diet high in fat means there are more fat calories available for the body to fill fat cells, thereby contributing to the overall fatness of an individual. As you will read in the next section, dietary fats also have an impact on heart disease. Research indicates that currently about 37% of the average American diet is made up of fat, which may reflect why heart disease, atherosclerosis and obesity are such rampant health problems in our culture.

Protein

It is recommended that protein makes up 10-35% of your total dietary intake. It is best to calculate protein by grams per kilogram body weight. The average sedentary adult needs .8 grams of protein per kilogram of body weight per day. On average, most Americans easily consume 14% to 16% of their total daily intake as protein.

Proteins are long chains of nitrogen-containing molecules called amino acids. These amino acids are regarded as the 'building blocks' of the body as they are essential for the growth and repair of body tissues. Although protein is important, most American adults consume much more of it than they need, which has interesting ramifications. Most of the popular protein sources, (red meat, eggs, cheese) also tend to be relatively high in saturated fat, so as an individual increases protein intake, fat intake also increases. Protein is converted to amino acids and sits in a pool ready for use – any extra is easily converted to fat and stored in fat cells. In addition, the breakdown of protein requires a fair amount of calcium, and excess intake of protein can result in either reduction of calcium absorption by the bones or the body taking calcium out of bones to provide enough for protein digestion. The loss of calcium from the bones or the inhibition of its absorption into the bones may result in an increased risk for osteoporosis (a condition where the bones become less dense and more brittle).



Plant-based Protein Sources

It's easy to find plant-based sources of protein at the grocery store. Just look at all these options! These foods also tend to be high in fiber, vitamins, minerals and other important nutrients.

 Beans and legumes	 Broccoli	 Chickpeas	 Edamame
 Lentils	 Nut butter	 Nuts and seeds	 Oats
 Peas	 Quinoa	 Sorghum	 Soy milk
 Spinach	 Tempeh	 Tofu	 Veggie patties

Minerals

Minerals are essential to maintaining the internal chemical balance of your body and play vital roles in many bodily functions. Examples of these functions include muscle contraction (potassium), maintenance of proper water content in the blood and entire body (sodium), growth and repair of bones and teeth (calcium), and regulation of the blood's ability to transport oxygen throughout the body (iron). Most minerals are contained in a well-balanced diet, but mineral supplements are available for those whose dietary sources are inadequate.

Vitamins

Vitamins act as catalysts and regulators in your body processes by assisting the body in utilizing other nutrients. Your body can manufacture only one vitamin, Vitamin D (produced in the presence of sunshine), so it must get all other vitamins from dietary sources. Classified as either water soluble, meaning that they are transported in a water-based medium, or fat soluble, stored and carried in fatty substances, there are possibly more than the twenty-six currently identified vitamins, many of whose functions have yet to be fully understood. Because they are so essential to bodily functions, many individuals assume that mega-doses, the ingestion of vitamins that far exceed the Recommended Daily Allowances, will insure maximal health. (Recommended Daily Allowances or RDA is the average daily nutrient intake level sufficient to meet the nutrient requirement of nearly all (97 to 98 percent) healthy individuals in a particular life stage and gender group.) Interestingly, the excess water-soluble vitamins not needed by the body are eliminated as waste while the fat-soluble vitamins (A, E, D, and K) are stored in body fat and organs. High levels of these fat-soluble vitamins can be toxic and may cause various physical problems as a result of excessive accumulation. In regard to vitamins, the tendency for Americans to believe that more is better not only inspires the quip that we have the most expensive urine in the world (all those excess water-soluble vitamins being eliminated as waste) but also can lead us dangerously close to upsetting the delicate chemical balance maintained by our bodies when appropriate vitamin levels are present. For many reasons and for many people, dietary sources do not adequately provide the essential vitamins, and supplementation may be in order. It is wise to check with a registered dietician or physician to identify your needs and help avoid potentially dangerous amounts of vitamins before you start supplementing your diet with vitamins.

Water

Water comprises approximately 60% of your total body weight. In addition to providing a medium in which all the body's chemical reactions take place, it plays a crucial role in temperature regulation, transportation of nutrients, wastes, and hormones. Water is also a vital component of blood and other fluids essential to the survival of your body. Be sure to consistently provide your body with plenty of water, paying particular attention to its need for fluid during and after exercise. The Institute of Medicine advises that men consume roughly 3.0 liters (about 13 cups) of total beverages a day and women consume 2.2 liters (about 9 cups) of total beverages a day. The term cup means a measured cup, not the size of your super-size coffee mug. Additional fluid intake is needed to stay hydrated during and after exercise, especially in the hot weather indicative of El Cajon! Avoid getting thirsty, as this signal indicates the body is deficient in water and, therefore, not operating under optimal conditions. Two common myths are that:

- Drinking water during exercise causes cramps
- Drinking during exercise isn't helpful nor needed

Not drinking when you need to, especially before, during, and after exercise, can make you dehydrated, which can lead to serious medical consequences. If you drink way too much water (i.e., a gallon all at once) it can cause cramps so drink smaller amounts of water – a few gulps here and there.

Healthy Eating Strategies

But I'm An Athlete, Aren't My Needs Different?

In short – No!

Per the American College of Sports Medicine and the Academy of Nutrition and Dietetics, athletes do not need a diet substantially different from the recommendations in the Dietary Guidelines for Americans. Energy (calorie) needs for an individual athlete will depend on the type, duration, frequency, and intensity of the exercise along with sex, age, body size and body composition. If calories are inadequate, fat and protein will be used to fuel the body and lean body mass will be lost resulting in a loss of strength and endurance. It's been suggested that the acceptable macronutrient distribution ranges for all athletes, including vegetarians, are 45% to 65% of calories from carbohydrate, 20% to 35% from fat, and 10% to 35% from protein.

First and foremost, athletes need to consume enough energy to maintain appropriate weight and body composition for their sport. Sport dietitians use a variety of methods for calculating energy needs. The DRI method and the Harris-Benedict equation are typically used to estimate total energy expenditure at the back of the booklet.

High protein diets have been popular throughout history, especially among athletes. The truth is most Americans already eat almost twice as much protein as they need for muscle development. Thus, athletes can easily meet their increased needs if they are consuming the proper number of calories required for their sport and training routine. The **dietary allowance (RDA)** is 0.8 grams/kg body weight. This is the minimum to prevent deficiency and the ACSM and Academy position recommends amounts slightly higher for most athletes. The recommendation is 1.2 to 1.7 g/kg of protein for strength athletes and 1.2 to 1.4 g/kg for endurance athletes.

The Truth about Protein Powder and Amino Acid Supplements

Research has shown that protein powders and amino acid supplements are not necessary to enhance muscle. In fact, such supplements have not shown a positive impact on athletic performance. A recent study in the Journal of the International Society of Sports Nutrition looked at the effects of consuming a very high protein diet. The experimental group consumed five times the recommendation (4.4 g/kg/day) by taking mostly whey protein supplements compared to the control group who ate only 138 grams/day (well within the recommendation for athletes). The experimental group consumed 800 more calories but only gained .9kg more than the control group. Of that weight gain only .6 kg was considered lean muscle mass. This was far less than expected and statistically insignificant. For athletes who want to bulk up and add muscle, Sports Dietitian and author, Nancy Clark, recommends they not waste their money on protein supplements but rather focus on following a meal plan that will supply adequate calories, carbohydrate, protein, and fat each day. Protein should be distributed equally throughout the day and emphasis should be placed on consuming high-quality protein. An athlete's diet should always be thoroughly assessed before turning to supplements.

Tool #1: Choose My Plate



The U.S.D.A. offers a robust website and tools called “My Plate” (myplate.gov) which helps people to visualize a healthy balance of different foods on their plate. On this website you will be guided through creating a healthy eating plan based on your personal profile. You have a chance to use this interactive tool when completing the “Your Own Personal Plate” assignment located at the end of the booklet. More information about this assignment and its due date will be given in class.

When navigating this site, take note of what constitutes a **servicing size** which is defined as a unit of measure that describes a recommended amount of a certain food. A serving size does not equal a portion size. Most Americans struggle with portion sizes, often eating much more than is needed or recommended which often leads to a gain in body fat. A **portion size** is the amount of food you choose to eat. There are recommendations for healthy portion sizes (i.e. Protein serving = size of a woman's palm). Get to know these recommendations and make sure to read food labels

What is a Serving?

Carbohydrate group:

- 1 slice of bread
- ½ cup cooked rice or pasta
- ½ cup cooked cereal

Vegetable group:

- ½ cup chopped raw or cooked vegetables
- 1 cup of leafy raw vegetables

Fruit group:

- 1 piece of fruit or melon wedge
- ¾ cup of fruit juice
- ½ cup canned fruit
- ¼ cup dried fruit

Dairy group:

- 1 cup milk or yogurt
- 1.5 ounces natural cheese
- 2 ounces processed cheese

Meat/protein group:

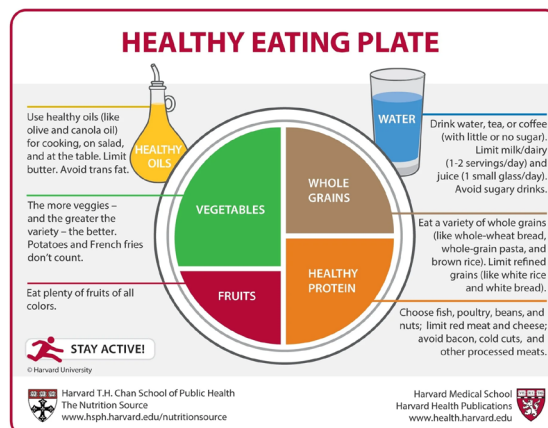
- 2.5-3 ounces cooked lean meat, poultry or fish
- ½ cup cooked beans
- 1 egg
- 2 tablespoons of peanut butter

Fats & Sweets:

- Allow yourself a few fun foods in this category but keep them to a minimum!

Tool #2: Harvard Healthy Eating Plate

Another helpful tool for understanding how to structure healthy meals and establish nutrient-dense eating habits was created by nutrition experts at Harvard University's T.H. Chan School of Public Health. This evidence-based model was created to provide nutrition guidance in a simple format while addressing gaps in the MyPlate recommendations. These gaps include shifting away from the amount of carbohydrates to eat and instead focusing on the type of carbohydrates our bodies need including fruits, vegetables, beans, and whole grains. The **Healthy Eating Plate** (<https://www.hsph.harvard.edu/nutritionsource/healthy-eating-plate/>) also highlights the importance of avoiding sugary beverages which are common in the American diet but offer no nutritional value. Finally, the Healthy Eating Plates encourages the use of healthy plant-based oils and avoiding low-fat diets which are often comprised of ultra-processed foods.



Cultural and Ethnic Food Patterns

Our food choices are strongly influenced by our cultural and ethnic backgrounds. Just as many cultural groups have shaped the American diet, as immigrants integrate into American culture, their diets shift as well. As a person's diet becomes more westernized, their risk for heart disease, diabetes, and high blood pressure can increase, particularly if they consume more sodium, saturated fat, added sugar, or processed foods. However, it's possible to eat healthfully while following an eating pattern that is aligned with your culture. Below are some examples of healthful eating patterns in traditional Latin American, Asian, and African Heritage diets, accompanied by food pyramids that illustrate these healthy eating patterns.

The Latin American diet, for example, emphasizes fresh fruits and vegetables, beans, and whole grains such as corn. It also includes moderate amounts of lean proteins such as chicken and fish, and healthy fats like avocado. Traditional Latin American dishes often include a combination of these ingredients and are flavored with a variety of herbs and spices.

The Asian diet is diverse and varies depending on the country. In general, it emphasizes more vegetables, rice, and noodles, along with smaller amounts of animal foods such as meat or fish. Many Asian cultures also include small amounts of meat and dairy in their diets. In addition, traditional Asian diets often include fermented foods, such as miso and pickled vegetables, which provide beneficial probiotics for gut health.

The African heritage diet is rooted in traditional African cuisine and emphasizes a variety of plant-based foods, such as leafy greens, root vegetables like sweet potatoes and yams, and whole grains like millet and sorghum. This diet also includes small amounts of lean proteins, such as fish and legumes, and healthy oils. Traditional African dishes often include a variety of spices and herbs, adding both flavor and health benefits.

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Latin American Diet Pyramid La Pirámide de La Dieta Latinoamericana



Illustration by George Middleton

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Asian Diet Pyramid

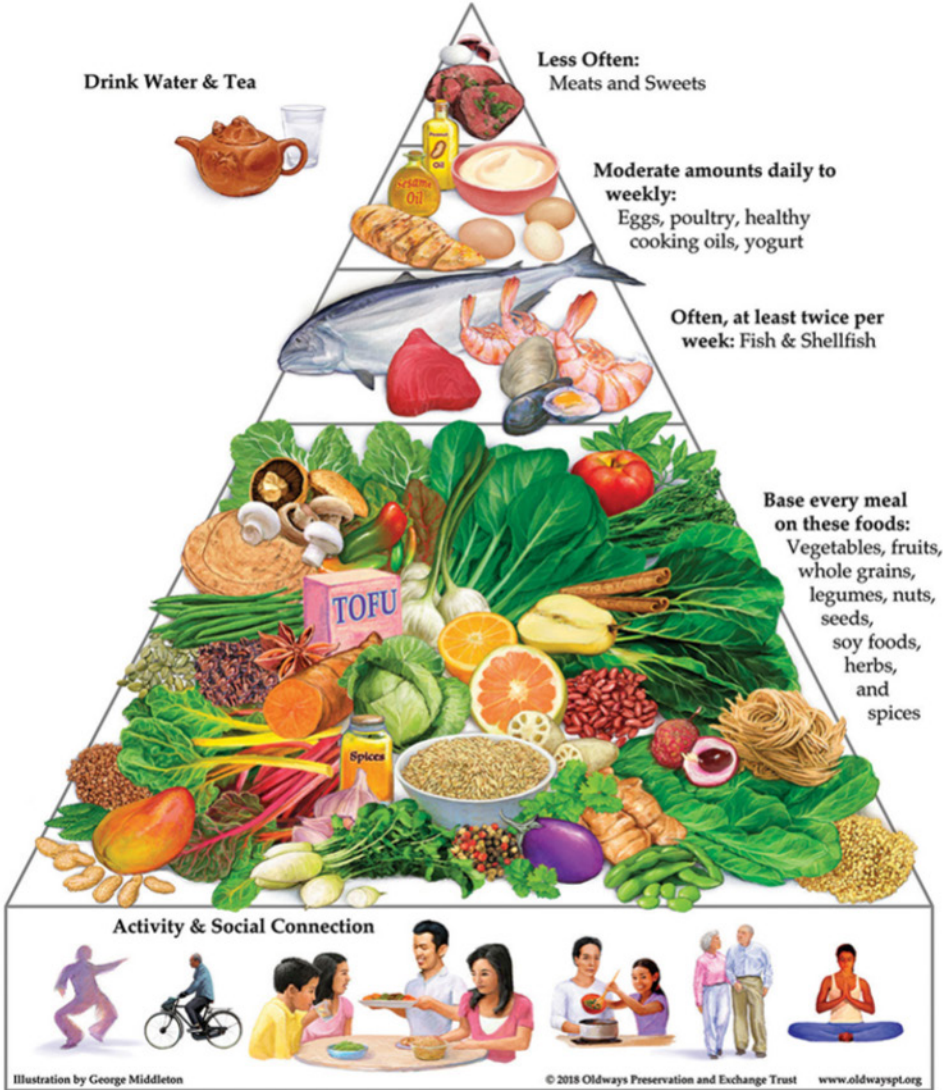


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AFRICAN HERITAGE DIET PYRAMID

CLAIMING YOUR HEALTH BY CLAIMING YOUR HISTORY



Illustration by George Middleton

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ENJOY A HEALTHY LIFESTYLE
BE PHYSICALLY ACTIVE AND ENJOY MEALS WITH OTHERS



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Mediterranean Diet

The Mediterranean Diet is a style of eating that supports heart health and can reduce other risk factors for disease including obesity, high cholesterol and high blood pressure, and type 2 diabetes. This diet focuses on consuming plant-based foods including whole grains, nuts, herbs and spices, beans and legumes, fruits, vegetables and healthy fats (olive oil and foods high in omega-3 fatty acids like walnuts). Small quantities of animal proteins can also be included daily or a few times a week, and fish and other seafood at least twice per week. Red meat is limited to a few times per month.

Recent research has shown that the Mediterranean Diet is powerful medicine! [One study](#) found that women who followed this type of diet had 25% lower risk of developing cardiovascular disease likely due to decreased inflammation, blood sugar, and body weight. Other benefits include improvement in brain health and decreases in cognitive decline. These findings might seem counter to standard dietary recommendations because the fat intake for most individuals following a Mediterranean-style of eating is between 39-42% of total daily calories which exceeds the 20-35% of daily intake recommendation.

Unlike other diets, the amount to eat at each meal is left up to the individual so that physical activity and body size can be considered. While the extra fat content of the diet can help you feel full and stay full longer resulting in a lower calorie intake, it also could lead to an overconsumption of calories. As such, following the plate guidance of the Healthy Eating Plate or MyPlate while choosing the foods recommended in the Mediterranean Diet might be the best path forward.

DASH Diet

The DASH (Dietary Approaches to Stop Hypertension) Diet was introduced by the [American Heart Association](#) as a way for people to reduce their blood pressure through diet. This eating plan suggests eating a certain number of servings of fruits and vegetables, whole grains, low fat dairy foods, protein, fats and oils, and nuts, seeds, and beans each week. The dietary focus is on reducing foods high in sodium, saturated and trans fats, sugar, and red meat while increasing the intake of foods rich in potassium, calcium, magnesium, fiber, and protein. The latter nutrients are thought to help control blood pressure.

Research on this diet has found broad health benefits including decreases in blood pressure, lower cardiovascular risk especially in women and Black adults, and prevention of diabetes and kidney disease. While this diet initially requires the user to plan each meal to reach the correct servings of planned foods, the benefits of doing so speak for themselves.

TIP:

A simple way to shop for healthful foods is to focus on selecting items from the perimeter of the grocery store. There you will find fruits and vegetables, protein sources, and low-fat dairy products. The aisles of the store typically have processed foods and snack items.

Reading Food Labels

Learning to read food labels is an important skill that shows you exactly what you are putting into your body and empowers you to select appropriate foods to balance your diet. Make it a habit to check the labels on the foods you buy at the store or grab from your kitchen cupboard. Use this tool to get a feel for the balance of fats, carbohydrates, and proteins you need for healthy living. The first step to label reading is to note the serving size!

SERVING SIZE: This is the size on which all other information is based

CALORIES: Total calories are listed as well as calories from fat. In one serving of this item, 110 of the 250 calories are from fat!! To calculate the % of calories from fat, divide the fat calories (110) by the total calories (250) and multiply by 100.

$$110 \div 250 = .44 \times 100 = 44\%$$

44% of this food's calories are from fat!

% DAILY VALUE: Tells you what percent of the recommended daily intake of a nutrient is available in this food per serving (based on a 2000 calorie intake per day)

DAILY VALUE FOOTNOTE: Lists the recommended nutrient intake for a person eating 2000 or 2500 calories per day. Your daily values maybe higher or lower depending on how many calories you eat each day

CALORIE CONVERSION INFORMATION:

Provides the number of calories in the energy-yielding nutrients (fat, protein & carbohydrate)

Calories per gram:

Fat 9 Carbohydrates 4 Protein 4



INGREDIENTS: Below the label is a list of all the ingredients in descending order of the amount contained in the food.

NUTRITION FACTS LABEL: SAMPLE FOR FROZEN LASAGNA

1. Serving Information →

2. Calories →

3. Nutrients →

4. Quick Guide to percent Daily Value (%DV)
• 5% or less is **low**
• 20% or more is **high**

Nutrition Facts	
4 servings per container	
Serving size	1 cup (227g)
Amount per serving	
Calories	280
% Daily Value*	
Total Fat 9g	12%
Saturated Fat 4.5g	23%
Trans Fat 0g	
Cholesterol 35mg	12%
Sodium 850mg	37%
Total Carbohydrate 34g	12%
Dietary Fiber 4g	14%
Total Sugars 6g	
Includes 0g Added Sugars	0%
Protein 15g	
Vitamin D 0mcg	0%
Calcium 320mg	25%
Iron 1.6mg	8%
Potassium 510mg	10%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

From fda.gov

Heart Disease – The Nation’s #1 Killer

Cardiovascular disease is a word used to describe all of the diseases that affect the heart (cardio) and blood vessels (vascular) in the body. These diseases can cause heart attacks, strokes and other conditions resulting in decreased quality of life and even death. Perhaps you know of a family friend, neighbor or coworker who has one of these diseases? [Currently in the United States, more than 127.9 million people live with one or more types of Cardiovascular Disease \(CVD\).](#)

Heart disease, a type of cardiovascular disease, is a catch-all phrase for a variety of conditions that affect the heart’s structure and how it works. **Coronary heart disease (CHD)** is a type of heart disease where the arteries of the heart cannot deliver enough oxygen-rich blood to the heart. It is the leading cause of death in the United States. About [20.5 million American adults have coronary artery disease](#), making it the most common type of heart disease in the United States, according to the Centers for Disease Control and Prevention.

Coronary artery disease affects the larger coronary arteries on the surface of the heart. Another type of heart disease, called coronary microvascular disease, affects the tiny arteries in the heart muscle. Coronary microvascular disease is more common in women.

The [cause](#) of coronary heart disease depends on the type. Coronary artery disease is often caused by cholesterol, a waxy substance that builds up inside the lining of the coronary arteries forming plaque. This buildup can partially or totally block blood flow in the large arteries of the heart. Coronary microvascular disease happens when the heart’s tiny blood vessels do not work normally. For most people, coronary heart disease is preventable with a [heart-healthy lifestyle](#).

Uncontrollable Risk Factors

Heart disease is the leading cause of death for men and women in the United States claiming about 2300 lives every day. Research over the last 25 years has shown a direct link between lifestyle choices and heart disease. The American Heart Association has identified six major risk factors for heart disease, all of which are controllable by the choices we make – more about these six in a moment. In other words, making and maintain healthy lifestyle choices throughout your life can help prevent or postpone heart disease.

In addition to controllable risk factors, there are uncontrollable and contributing factors. Age, gender, race, and family history of heart disease (genetics) are examples of uncontrollable factors because you cannot change these. Heart disease risk factors and diagnoses are more common among ethnic minorities, and these individuals are often diagnosed with the disease at a younger age. **As shown in the table below, sourced from the National Center for Health Statistics**, heart disease and related conditions vary across racial groups. If you belong to one of these racial or ethnic groups, consider speaking with your healthcare provider about your health risks. If you do not have a provider, community organizations and local resources can help connect you to one. Regular checkups from a young age can establish baseline readings for blood pressure, cholesterol, and blood sugar, and working with your provider to monitor and manage these levels can help lower your risks.

Source: Javed Z, Haisum Maqsood M, Yahya T, et al. Race, racism, and cardiovascular health: Applying a social determinants of health framework to racial/ethnic disparities in cardiovascular disease. (<https://pubmed.ncbi.nlm.nih.gov/35041484/>) Circ Cardiovasc Qual Outcomes. 2022 Jan;15(1):e007917. Accessed 5/15/2022

Heart Disease Prevalence (% who have HD or Cardiovascular Disease Risk Factors) based on Race				
Adults age 20 and older	Black	White	Hispanic or Latino	Asian or Pacific Islander
Heart Disease Prevalence	47%	36%	45%	Range is 22-46%**
Hypertension (high blood pressure)	42%	34%	24%	28%
High Total cholesterol *	9.2-10.5%	10-13%	9-12%	10-13%
Obesity	50%	41%	47%	16%
Diabetes (Type 2)	24%	22%	27%	27%

* Statistic for total cholesterol vary greatly based on gender – [cdc.gov-cholesterol facts](https://www.cdc.gov/cholesterol/facts)

** Statistics vary greatly among Asian populations- See the National Center for Health Statistics (NCHS), National Vital Statistics System for specific breakdown

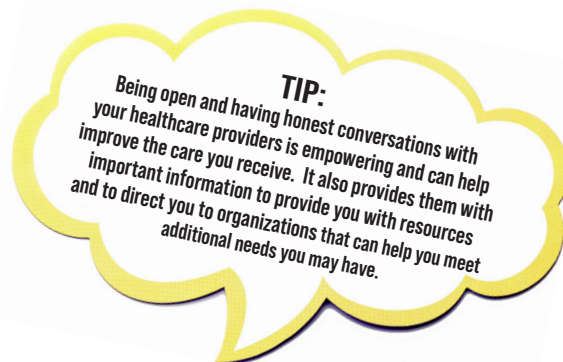
Source for table: National Center for Health Statistics, Center for Disease Control and Prevention

The differences in disease prevalence among ethnic groups is partially due to health disparities. [According to the CDC](#), health disparities are “preventable differences in the burden of disease, injury, violence, or opportunities to achieve optimal health that are experienced by socially disadvantaged populations.” Health disparities often result from social factors, known as social determinants of health, and can be remedied by ensuring all individuals have the following basic needs met: Sufficient money and resources (including nutritious food and fresh fruits and vegetables) to meet life’s basic needs; access to quality education; access to quality healthcare; a safe living environment (for example, clean air and water); and supportive relationships free of discrimination or violence.

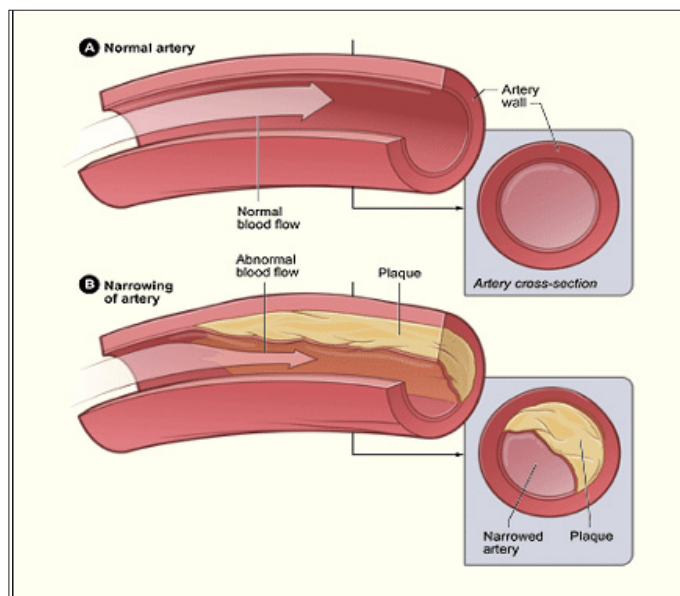
The Big Six

You just learned about the uncontrollable factors that may increase a person’s risk for developing heart disease so let’s circle back and talk about the things you can do to minimize your risk. As mentioned earlier, the American Heart Association focuses on six controllable risk factors for heart disease as follows:

1. Sedentary Lifestyle
2. Smoking
3. Obesity
4. High Blood Pressure
5. High Cholesterol
6. Diabetes



Having one or more of these risk factors helps to create clogged and hardened arteries, a condition known as atherosclerosis. Atherosclerosis occurs when a fat-like substance, known as plaque (made up of fats and cholesterol among other things) builds up on the walls of the arteries, thereby reducing the area available for blood flow, as seen in this diagram.



Cholesterol

It is important to know what cholesterol is, where it comes from, what it does, and why everyone is making such a big deal about it!

The human body manufactures cholesterol in the liver, producing approximately 1,000 milligrams per day. The only other source of cholesterol is found in animal products such as meat, dairy items, eggs, organ meats (liver, kidney,) and food items made with these products (like cookies, cake, and hot dogs). Considering that these products are common in the average American's daily diet, one can see how elevated cholesterol levels in the body can occur. Not so fast! You might be thinking that you can avoid a cholesterol problem by eating foods with little to no cholesterol, or those advertised as 'cholesterol-free', such as peanut butter, margarine, and cookies. For some, this strategy can make a difference, however the latest research shows that the type of fat you eat (saturated vs. unsaturated) has the biggest effect on the amount of cholesterol circulating in your bloodstream. High levels of cholesterol circulating in the blood can lead to plaque formation and the biggest culprit is a diet high in saturated fat.

Eat a healthy diet and enjoy some butter every now and then...unless you have high cholesterol. Individuals with high cholesterol levels should minimize both saturated fat and foods high in cholesterol.

Concerns about cholesterol stem from the fact that it can contribute dramatically to the development of heart disease. As previously mentioned, the deposit of cholesterol in the arteries decreases the pathway for blood. When a blood vessel becomes so clogged that blood flow becomes restricted or stopped altogether, a **heart attack, stroke, or angina** (pain in the chest, throat, back, or shooting pain down the arms) can result, often to a fatal degree.

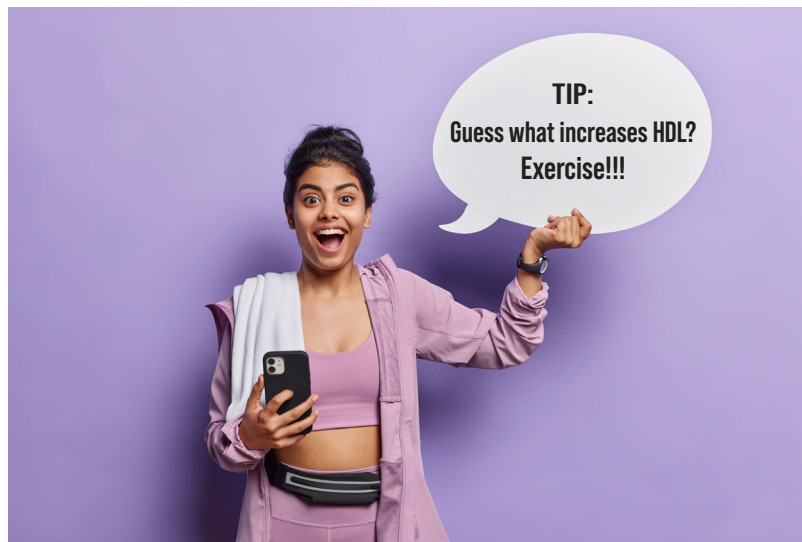
Transporting cholesterol through the body remains one of the most important factors in the development of atherosclerosis. To circulate cholesterol through the body via the bloodstream, the body wraps the cholesterol in special protein packages to form a substance known as **lipoprotein** (lipo is a generic term for fat and fat-like substances.) Not all these lipoprotein packages are alike, and each serves a very different purpose.

After being made in the liver, cholesterol is picked up for circulation by **Low Density Lipoprotein** - from here on referred to as **LDL**. The low-density label describes a lipoprotein that has a high percentage of cholesterol and a low percentage of protein, thus making it less dense. If more cholesterol is available than is needed by the body, then the LDL sometimes deposits excess cholesterol onto the walls of the coronary arteries (for reasons unknown). LDL is often referred to as the 'lousy' cholesterol which may have a ring of truth to it, but keep in mind that cholesterol has a waxy consistency, much like the wax found in the human ear. Given this characteristic it is easy to see how cholesterol can accumulate in the arteries. Have you ever gotten a waxy build-up in your ears? Just imagine that kind of stuff building up on the inside of your blood vessels!

A high number of LDL molecules in the blood means more cholesterol is picked up, and more is then deposited in the arteries. An easy way to remember that an excess of LDL is not desirable is to think of the 'L' in LDL as referring to a 'lazy' molecule that just lays around and clogs up everything!

Despite the nasty reputation cholesterol has earned over the past few years, it does play very crucial roles in the functioning of the human body. Cholesterol forms the backbone, so to speak, of the cell walls in the body. It provides substance to these cells and enables them to maintain their integrity while allowing the transport of materials in and out of cells through cell membranes. Cholesterol is also vital to the production of various hormones and steroids that regulate body processes. As you can see, we need cholesterol to sustain life, but in excessive amounts it can be a damaging factor in one's health. Because our livers produce more cholesterol than we need daily, we don't need to consume high doses of cholesterol through food. Concerns about cholesterol stem from the fact that it can contribute dramatically to the development of heart disease. As previously mentioned, the deposit of cholesterol in the arteries decreases the pathway for blood, which can result in angina, stroke or heart attack.

A different lipoprotein, **High Density Lipoprotein** (called **HDL** for short) performs the opposite task of LDL. 'High density' refers to the high amount of protein in relation to a smaller amount of cholesterol. HDL floats through the bloodstream, picks up excess cholesterol, and delivers it back to the liver. Here the cholesterol is repackaged as needed into lipoproteins and the excess is processed for excretion from the body. Considered the 'healthy' kind of cholesterol, HDL can remove cholesterol that has been deposited onto arterial walls, thus reducing the build-up that might occur from excess cholesterol in the system.



Desirable Cholesterol Levels

A simple blood test can indicate the amount of cholesterol present in your blood. The most accurate test requires a 12-hour fast prior to taking the test. Ideally, the results should report the total cholesterol level as well as a breakdown into separate LDL and HDL counts. The quick finger-prick test available at the local mall may not give a very accurate reading - because you haven't fasted and probably won't separate the results into LDL and HDL readings - but can give you a broad idea of your cholesterol count. Should you do the quick test and get a result that reflects high cholesterol, go get an accurate blood test. You can get tested for a minimal charge at the Grossmont College Health Office, located on campus in the east end of Griffin Center.

Cholesterol – What your numbers mean			
Desirable/Healthy levels	Anyone 19 or younger	Men aged 20 or older	Women aged 20 or older
Total Cholesterol	Less than 170mg/dL	125-200 mg/dL	125-200 mg/dL
HDL Cholesterol	≥ 45 mg/dL is desirable	40 mg/dL or higher	50 mg/dL or higher
LDL Cholesterol	< 100 mg/dL	< 100 mg/dL	< 100 mg/dL

source; National Heart, Lung and Blood Institute - NIH 2022

Scientists have found the optimal TC (total cholesterol) measurement to lie between 160 and 180 for good health and low risk of heart disease. Research has shown that individuals with cholesterol levels over 265 had four times the risk of heart disease than those with levels under 180. In 2010, over 13% of American adults had cholesterol above 200 mg/dL, and 21.3% had an HDL level of less than 40 mg/dL. The good news is, due to increased awareness and the use of medications like statins, these percentages have greatly reduced since 1999!

As you remember, the HDL carries cholesterol away from the arteries, so it makes sense that the higher the concentration of HDL, the lower your risk of atherosclerosis. Studies show those with a high HDL count suffer significantly fewer heart attacks than those with low HDL. An HDL of less than 40 mg/dL is considered a risk factor for heart disease. The measure of HDL is often expressed in a ratio of total cholesterol to HDL, with the recommended level being 3:1.

Factors Affecting Cholesterol Level

Heredity

Your genetic makeup is a major factor. Some studies have found families with fairly low cholesterol levels and high HDL counts, regardless of their diets. Other families had very strict low cholesterol/low fat diets and extremely high cholesterol levels—a genetic trait (their genetic blueprint includes a liver designed to generate lots of cholesterol!) If you have a history of heart disease in the family, you owe it to yourself to get a cholesterol check to see if you are at risk. Total cholesterol tends to increase with age, so just because you have a favorable count at this point doesn't mean you can ignore fat and cholesterol intake in your diet. Be good to yourself now and help ensure the quality of your life as you grow older.

Saturated fats

As a reminder, most saturated fat in our diet comes from meat, palm and coconut oil found in processed foods, and dairy products. Saturated fat is usually solid at room temperature (butter, lard, shortening) although some liquid vegetable oils (palm oil and coconut oil) are saturated as well.

Eating excess saturated fat **raises blood** cholesterol levels, yet scientists are unable to determine why this occurs. Research does show a clear link between a diet high in saturated fat and elevated cholesterol levels. When advertisers claim their product has no cholesterol, the item may still contain saturated fat. Margarine is a good example - many now advertise that their margarine contains no cholesterol but does contain saturated fat!



TIP:

Great sources of monounsaturated fats are avocado, olive oil, canola oil, peanut oil, sunflower oil and sesame oil. Other sources include peanut butter plus many nuts and seeds.

Unsaturated fats

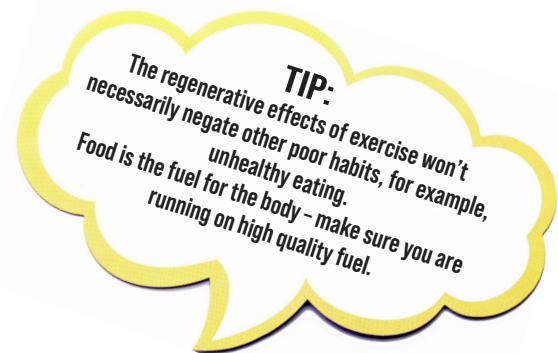
The two unsaturated fats (polyunsaturated and mono-unsaturated) have been associated with lower blood cholesterol levels. **Polyunsaturated** and **mono-unsaturated** fats come from vegetable sources and are liquid at room temperature. In addition to containing no cholesterol, these fats do not raise cholesterol in the body as do their saturated counterparts. Unsaturated fats may act to lower cholesterol by increasing HDL.

Regular aerobic exercise

Exercise has emerged as a favorable factor in increasing HDL (helpful cholesterol) levels in the bloodstream. In a study conducted at Stanford University, scientists found that long distance runners had amazingly high levels of HDL and significantly lower counts of LDL when compared to the national average. Another study showed that when a group of students began a regular aerobic exercise program, their HDL levels began to rise after only seven to ten weeks. Since aerobic exercise can increase HDL which maximizes the body's ability to get rid of cholesterol, it is important to stick to your aerobic exercise program!

Healthy Eating

Evidence clearly shows that a low cholesterol/low fat diet can reduce the risk of heart disease by helping keep cholesterol levels to a minimum. Avoid eating an excessive amount of animal products and cut down on the amount of saturated fat you eat. Read labels of all packaged foods you purchase, looking to see if the fat contained in the product is saturated or unsaturated.



Blood Pressure

A term referring to the pressure or force of blood in the arteries, **blood pressure** is expressed as a ratio, for example 118/72. **Systolic blood pressure** (118-first or top number) is the pressure when the heart beats, ejecting blood out of the heart so you can see why it needs to be high! **Diastolic blood pressure** (72-bottom number) is the pressure when the heart is relaxing and filling up with blood to get ready for the next contraction. Elevated blood pressure is termed **hypertension** and can only be diagnosed by a physician. The exact cause of most cases of hypertension is unknown, but researchers do know how to control it.

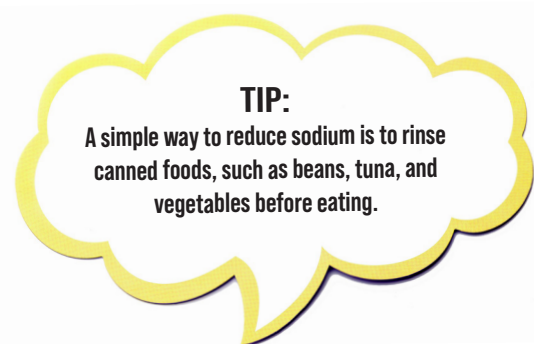
The chart below shows normal blood pressure values and the various values for blood pressure at each stage of hypertension. It's important to point out that hypertension is often called the "silent killer". This term is used because many people have high blood pressure without having any symptoms! In fact, nearly half of all American adults have high blood pressure and many of these individuals do not even know they have it. Routinely having your blood pressure checked is an important part of caring for your health. Untreated blood pressure can lead to stroke, heart attack and other serious health concerns.

Blood Pressure Classification for Adults over 18 yrs			
Category	Systolic		Diastolic
Normal	Less than 120	and	less than 80
Elevated	120-129	and	less than 80
Hypertension			
Stage 1	130-139	or	80-89
Stage 2	140 and above or	or	90 and above
Hypertensive Crisis*	180 and above and/or		120 and above

*A suddenly elevated bp that exceeds 180/120 - if remains elevated, seek immediate medical care
 Source: American Heart Association. (2019). Understanding blood pressure readings.
<https://www.heart.org/en/health-topics/high-blood-pressure/understanding-blood-pressure-readings>

Note: According to the Mayo Clinic, 77% of our sodium intake is from processed and prepared foods! The recommended daily intake of sodium per day is <2300 mg (about 1 teaspoon per day), yet the average American consumes **3400** mg! If you consume too much sodium, your kidneys can't eliminate the excess, so the sodium starts to accumulate in the blood. Because sodium attracts and holds water, your blood volume increases. Increased blood volume, in turn, makes your heart work harder to move more blood through your blood vessels, increasing pressure in your arteries, thus, high blood pressure! Your intake of sodium can quickly add up over the course of the day...look at the list of foods below include the foods that account for 40% of the sodium consumed by Americans. How many of the high sodium items below do you eat over the course of the day? What choices can you make to help you lower your sodium intake?

- Deli meat sandwiches
- Pizza
- Burritos and tacos
- Soups
- Savory snacks (eg. chips, crackers, popcorn)
- Poultry
- Pasta mixed dishes
- Burgers
- Egg dishes and omelets



Smoking and Vaping

Although the use of smoking tobacco is widely known as a dangerous and unhealthy activity, many people are really unaware how it affects the body and the role that exercise can play in helping to stop smoking. Did you know that smokers are 2-4 times more likely to develop heart disease than nonsmokers and 2-3 times more likely to die from it?

Smoking damages the brain, heart, and arteries—creating little nicks in the arterial lining, making it easy for cholesterol to attach and form plaque, which increases the likelihood of clot formations when the plaque breaks off. It elevates blood pressure and resting heart rate, making the heart work harder and increasing wear and tear. Smoking decreases the amount of oxygen carried by the blood by increasing carbon monoxide levels. It also decreases HDL levels.

Vaping has increased in popularity over the last decade and often acts as a gateway into smoking. Some individuals use vaping to try and reduce or quit cigarette smoking, however regardless of the reason it is used, vaping has similar health risks as smoking tobacco. Vaping increases your risk for asthma and other lung conditions, and chemicals used in some flavorings can cause lung scarring. Vape liquids also contain nicotine and have the same effects on the cardiovascular system as smoking tobacco products.

Exercise can help to exchange the unhealthy habit of smoking for a healthier one. It can help to reduce weight gain that is sometimes associated with smoking cessation. Getting in the exercise habit also helps to find other non-smokers to hang out with, rather than being tempted by smoking environments. Physical activity improves mood, reduces depression, decreases stress, and controls appetite!

Obesity

The National Institute of Health (NIH) reports that two-thirds of American adults are overweight or have obesity. In the history of human beings, we have never seen so many people carrying so much excess body fat – we’ve reached epidemic levels! Because most humans aren’t biologically built to store so much body fat, chronic conditions ensure increased risk for heart disease, hypertension, diabetes, some types of cancer, arthritis, and other musculoskeletal problems. Obesity (BMI ≥ 30) and overweight (BMI ≥ 25 to <30) can be prevented and reduced through regular exercise and a healthy eating plan.

Diabetes

When you eat food, the digestive system breaks it down into its smallest components and then transports the molecules (i.e. glucose) via the blood. **Insulin** is a hormone that signals cells to absorb glucose (blood sugar) for energy usage or storage. People with **Type 1** diabetes is an autoimmune disorder where the pancreas does not make enough insulin so cells can’t absorb sugar/glucose – individual need to inject insulin into their system. Type 1 diabetes is not related to lifestyle factors. **Type 2** diabetics can produce enough insulin, but their system has developed **insulin resistance**, which occurs when the cells don’t recognize insulin, thus, blood glucose levels stay high. Insulin resistance is caused by excess body fat (especially in the abdomen), inactive lifestyle, and a high-processed carbohydrate diet. Type 2 diabetes is a progressive disease. Most individuals will develop pre-diabetes before being diagnosed with type 2 diabetes. Having a family history of type 2 diabetes is an important risk factor for this disease. Exercise is an essential tool for diabetes management and prevention because it is one of the few interventions besides medication that increase the body’s sensitivity to insulin. While preventing diabetes through healthy lifestyle habits is always the best medicine, prioritizing change is important if your doctor informs you that your blood glucose levels are becoming elevated.

Take Charge of Your Health - Strategies to Prevent Heart Disease

Controllable Risk Factor	Stay on Top of Your Health	Positive Lifestyle Choices
Blood pressure	<p>Have your blood pressure checked at least once a year</p> <p>Maintain a BP ideally below 120/80</p> <p>Discuss medications with your healthcare provider, if needed</p>	<p>Keep sodium intake below 2,300 mg/day</p> <p>Be physically active Limit alcohol intake to 2 drinks/day for men and 1 drink per day to women, if any</p> <p>Control your body weight</p>
Cholesterol	<p>Have your cholesterol levels checked every 4-6 years; more often if you're at high risk</p> <p>Maintain an LDL of <100 mg/dL</p> <p>Discuss medications with your healthcare provider, if needed</p>	<p>Swap unsaturated fats (avocado oil, olive oil) for saturated fats (butter, lard)</p> <p>Limit dietary cholesterol if LDL is elevated</p> <p>Be physically active</p> <p>Limit alcohol intake to 2 drinks/day for men and 1 drink per day to women, if any</p>
Type 2 diabetes/ Blood glucose	<p>Have your blood glucose checked every 3 years; more often if you're at high risk</p> <p>Discuss medications with your healthcare provider, if needed</p>	<p>Control your body weight</p> <p>Avoid foods high in processed carbohydrates</p> <p>Be physical active</p>
Body weight	<p>Monitor your weight and BMI on a regular basis</p> <p>Aim to maintain a BMI below 25.0</p> <p>Talk with your doctor if you're concerned about your weight</p>	<p>Eat a diet high in fiber and low in saturated fats</p> <p>Center your meals around fruits, vegetables, lean proteins, and whole grains; Include healthy fats</p> <p>Be physically active</p>
Smoking and vaping	<p>Talk to your doctor about your smoking or vaping habit</p>	<p>Quit, reduce or avoid smoking - https://kickitca.org/</p> <p>Avoid secondhand smoke</p>
Sedentary lifestyle	<p>Talk to your doctor about starting a physical activity routine if you're currently inactive</p>	<p>Increase everyday activities like taking the stairs or parking further away</p> <p>Add activities that increase your heart rate to optimize heart health</p> <p>Prioritize physical activity throughout your lifetime</p>

Metabolic Syndrome

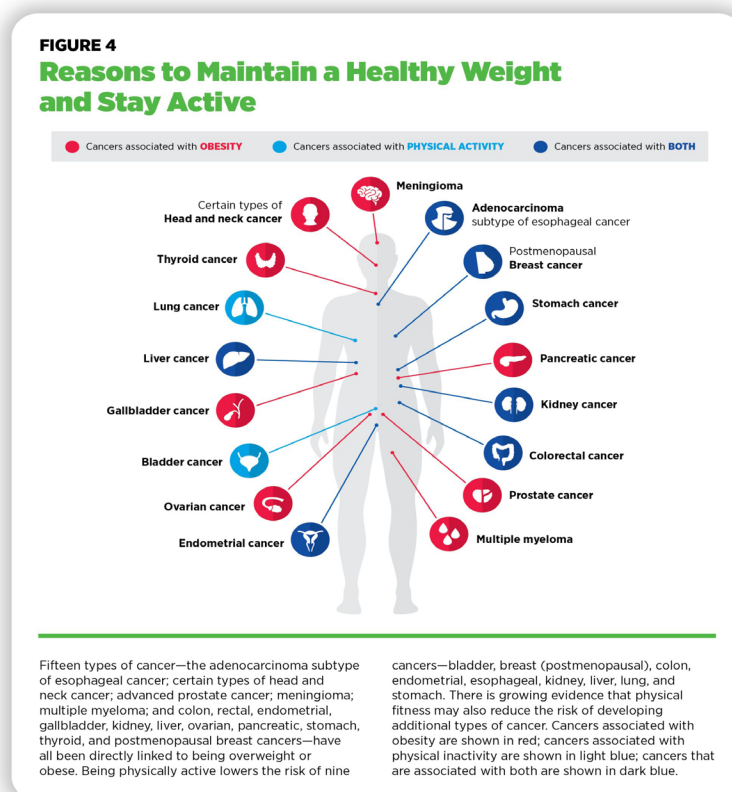
Each of the factors you have learned about can lead to heart disease when unchecked. They can also lead to other health issues when several of these factors are not controlled. Metabolic Syndrome, also known as insulin resistance syndrome, is a cluster of conditions that when present together increase your risk of heart disease, stroke, type 2 diabetes, and other serious health concerns. A person is considered to have metabolic syndrome when they have at least 3 of the following conditions:

- High abdominal fat (waist circumference)
- High blood pressure
- High blood sugar levels
- Low HDL cholesterol
- High blood triglycerides (fat found in your blood that can increase LDL cholesterol)

About [1 in 3 adults in the United States have metabolic syndrome](#) AND it can largely be prevented through adopting the healthy lifestyle habits of making healthful eating choices and by engaging in regular physical activity.

Exercise & Cancer Prevention

You've learned a lot about the importance of being physically active to prevent cardiovascular disease, type 2 diabetes, and obesity. The benefits of movement don't stop there! Regular physical activity can also help prevent several different types of cancer. The figure below shows the many types of cancer that are positively affected by engaging in regular physical activity as well as by maintaining a healthy body weight (which physical activity plays a role in achieving).



While it isn't entirely clear how exercise helps prevent cancer, some possible explanations include:

- Improving immune system functioning
- Keeping the keep moving through the digestive system which reduces the colons exposure to potential cancer-causing agents
- Reducing inflammation
- Lowering the levels of sex hormones (eg. estrogen) and growth factors circulating in the blood that are associated with cancers like those in the breast and colon
- Lowering high insulin levels in the blood that are associated with cancers (breast and colon)
- Preventing obesity

Recent research shows that more than 46,000 cases of cancer in the U.S. each year could possibly be avoided if adults met the recommended physical activity guidelines. While we have a way to go to meet this goal, the benefits of continuing to work towards an active society are immeasurable, especially as it relates to your quality of life.

Exercise & Mental Health

The benefits of physical activity don't stop with your physical health! One of the hottest areas of research of late has been the effect of exercise on our mental health and well-being. About 50% of Americans will be diagnosed with a mental health disorder during their lifetime with anxiety and depression being the most commonly diagnosed. Mental health conditions can make it challenging for people to prioritize healthy lifestyle behaviors like exercise but with support most people can get moving and quickly realize the benefits of exercise. The exciting news is that symptoms of anxiety and depression can be reduced by participating in physical activity.

When you exercise your body releases feel good chemicals called **endorphins** which elevate your mood. It also lowers **cortisol** (stress hormone) secretion by improving the functioning of the **hypothalamus-pituitary-adrenal (HPA) axis** of your brain. This axis is the area of your brain that regulates your body's reaction to stress. Exercise also increases levels of **brain derived neurotropic growth factor (BDNF)**, a protein that plays a role in forming memory, learning, and **brain plasticity** (your brain's ability to rewire and make new neural connections). This benefit of exercise is especially important in prevent cognitive decline that results from aging as well as delaying the onset and progression of disorders like Alzheimer's disease and Parkinson's disease.

Regular exercise supports mental health and well-being in various was including by:

- Improving sleep
- Increasing interest in sex
- Relieving stress
- Reducing tiredness and increasing mental alertness
- Improving self-esteem
- Improving quality of life
- Improved memory & cognition

Exercise is Medicine!

As you can now see, regular exercise really is medicine for the body and mind – if it could be packaged in a pill most people would take it daily! If you were to ask exercisers why they stick with their fitness plan, most would say that they like how they feel afterwards . . . they feel better! Regular exercisers aren't looking for a quick fix or a magic pill because they don't need it. An active, healthy lifestyle is a process, and the effects are far-reaching.

You now have more tools—knowledge and strategies— that can help you maximize your fitness and health.

By applying these basic principles and concepts to your daily life, you will add years to your life and life to your years! **Good luck from the faculty in the ESNH Department!**

If you would like more information about health and nutrition, visit our department webpage at <http://www.grossmont.edu/es> and click on the link to **Health-related web links**.

Appendix

Helpful Websites

- Exercise:
 - ACE Fitness Exercise Library: <https://www.acefitness.org/resources/everyone/exercise-library/experience/beginner/>
 - Exercise and Mental Health: <https://www.helpguide.org/articles/healthy-living/the-mental-health-benefits-of-exercise.htm>
 - Seated Exercise Workout: https://www.workingonwellnessfoundation.org/?gad_source=1&gclid=Cj0KCQjwGJyyBhCGARIsAK8LVLMY7EpwknjY18Kovejzrkchw4_vJSJ1qXGL7AonOsbJSbnDhyFklzgaAIX7EALw_wcB
 - Back Health Exercises: <https://www.webmd.com/back-pain/exercises-lower-back-pain>
 - Basic Anatomy (body parts and how they work): <http://www.getbodysmart.com/>
- Injury Prevention & Self-Treatment Strategies:
 - <https://diabetes.org/health-wellness/fitness/injury-free-exercise-11-quick-safety-tips>
 - <https://nismat.org/patient-care/patient-education/injury-prevention/>
 - <https://nismat.org/patient-care/patient-education/injury-evaluation-and-treatment/>
- Nutrition & Performance:
 - American Dietetic Association: <https://www.eatright.org/fitness/sports-and-athletic-performance>
 - Glycemic Index: <http://www.glycemicindex.com>
 - CalorieKing: <http://www.calorieking.com>

Making Sense of the Tanita Body Composition Analyzer Printout

A bioelectric impedance analyzer uses a minor electrical current to measure electrical resistance. The amount of electrical resistance is related to the amount of fat-free or lean body mass within the body. Muscle tissue acts as a conductor of the electrical current (due to its high-water content); adipose or fat tissue acts as a resistor.

Fat% = Percentage of total body weight that is fat

BMR = Basal Metabolic Rate is the total energy expended by the body while at rest. In other words, it is the number of calories needed by the body to maintain normal functions at rest, such as respiration, circulation, and maintaining body temperature. BMR is measured in kilocalories. This is only an estimated BMR measurement based on a calculation using your gender, height, weight and age.

Impedance = Resistance or impedance is measured in ohms (one ohm is the resistance value through which one volt will maintain a current of one amp.)

FFM = Fat Free Mass is lean body tissue which includes bone, muscle, organs, water and all other fat free mass in the body.

TBW = Total Body Water is the amount of water retained in the body. Water comprises between 50-70% of total body weight. Generally, men have a higher water weight than women due to greater amounts of muscle tissue.

Target Body Weight Calculation

Current body weight (lbs) x current percent fat in a decimal = fat weight (lbs)

Body weight – fat weight = fat free weight (lbs)

Fat free weight – (1 – desired percent fat in decimal form) = body weight at desired percent fat

For example: 150 lb person who is currently 30% fat and wants to take steps to be 22% fat:

$$150 \text{ lbs} \times .30 = 45 \text{ lbs}$$

$$150 - 45 \text{ lbs} = 105 \text{ lbs}$$

$$105 \text{ lbs} \div (1 - .22) = 134.6 \text{ lbs}$$

F.I.T.T. Summary Grid

This grid provides a summary of the minimum values for making the most of your exercise program!				
COMPONENTS OF PHYSICAL FITNESS	FREQUENCY	INTENSITY	TIME	TYPE
Cardiorespiratory Endurance (CRE)	3x/week	<ul style="list-style-type: none"> • Talk Test • RPE Scale • THR Zone 	20 minutes	Aerobic activities: i.e. brisk walk, swim, run, hike, bicycle, dance, jump rope. Interval activities are okay!
MUSCULAR STRENGTH & ENDURANCE (MSE)	2 x/week	<p><u>Generally:</u> Muscle fatigue</p> <p><u>Circuit:</u> 40-70% 10RM</p>	<p><u>Generally:</u> 1-2 sets of 8-12 reps</p> <p><u>Circuit:</u> 30-45 seconds</p>	Weight training, body weight exercises, tubing, other resistance material
FLEXIBILITY (FLEX)	3x/week	Point of tension	<p><u>Dynamic:</u> 10 reps</p> <p><u>Static:</u> >10 seconds</p> <p><u>Contract/Relax:</u> 5 seconds each</p>	<ul style="list-style-type: none"> • Dynamic for warm-up • Static for cool-down • Contract /relax
BODY COMPOSITION (BC)	5-7 x/week	<p>Moderate intensity initially</p> <p>Gradually progress to higher intensity</p>	45-60 minutes (200-300 minutes/week)	<p>↑ calories used (via general physical activity & planned exercise) and ↓ calories in (food portion & healthy choices). Create negative energy balance of 500-1000 kcal/day to ensure weight loss of 1-2 lbs/week.</p>

10-Second Heart Rate to BPM Conversion Chart

(Exercise HR x 6 seconds = beats per minute)

HR for 10 sec	BPM
8	48
9	54
10	60
11	66
12	72
13	78
14	84
15	90
16	96
17	102
18	108
19	114
20	120

HR for 10 sec	BPM
21	126
22	132
23	138
24	144
25	150
26	156
27	162
28	168
29	174
30	180
31	186
32	192
33	198

List of ESNH Current Courses

Check the current class schedule for meeting days and times – some classes are online!

ADAPTED COURSES

Adapted Physical Exercise – ES 001
Adv. Adapted Physical Exercise – ES 002
Adapted Yoga – ES 029

FITNESS COURSES

Fitness for the Newcomer – ES 004 A, B, C
Cardio Fitness & Resistance Training – ES 005 A, B, C
Fitness Circuit – ES 006 A, B, C
Aerobic Walking for Fitness & Wellness – ES 007 A, B, C
Aerobic Dance Exercise – ES 009 A, B, C
Trail Running – ES 016 A, B, C
Trail Hiking – ES 017 A, B, C
Total Body Conditioning – ES 022
Resistance Training – ES 023 A, B, C
Fitness Boot Camp – ES 024 A, B, C
Stress Reduction thru Movement and Mindfulness – ES 026
Yoga – ES 028 A, B, C

AQUATICS COURSES

Lap Swimming for Health and Fitness – ES 044 A, B, C

RACQUET SPORTS COURSES

Badminton – ES 060 A, B, C
Pickleball – ES 061 A, B, C
Tennis – ES 076 A, B, C

INDIVIDUAL SKILLS COURSES

Golf – ES 125 A, B, C
Tai Chi Chuan – ES 027 A, B, C

TEAM SPORTS COURSES

Basketball – ES 155 A, B, C
Softball – ES 171 A, B, C
Baseball – ES 172 A, B, C
Volleyball – ES 175 A, B, C

COMBATIVES COURSES:

Self Defense for Women – ES 195

INTERCOLLEGIATE ATHLETICS COURSES:

Intercollegiate Baseball, men – ES 203
Intercollegiate Basketball, men & women – ES 206
Intercollegiate Football, men – ES 212
Intercollegiate Softball, women – ES 215
Intercollegiate Soccer, women – ES 218
Intercollegiate Swimming, men & women – ES 221
Intercollegiate Tennis, women – ES 224
Intercollegiate Beach Volleyball, women – ES 228
Intercollegiate Volleyball, men & women – ES 230
Intercollegiate Water Polo, men & women – ES 233

CONDITIONING, STRATEGIES/TECHNIQUE COURSES FOR ATHLETICS:

Conditioning and Injury Prevention for Athletes – ES 200
Conditioning and Injury Prevention for Football – ES 201
Conditioning and Injury Prevention for Beach Volleyball – ES 202
Advanced Techniques and Strategies: Baseball – ES 204
Advanced Techniques and Strategies: Basketball – ES 207
Advanced Techniques and Strategies: Football – ES 214
Advanced Techniques and Strategies: Softball – ES 216
Advanced Techniques and Strategies: Soccer – ES 219
Advanced Techniques and Strategies: Swimming – ES 222
Advanced Techniques and Strategies: Tennis – ES 225
Advanced Techniques and Strategies: Volleyball – ES 231
Advanced Techniques and Strategies: Water Polo – ES 234
Concepts Intercollegiate Competition – ES 239
Analysis/Theory Football Offense – ES 262
Analysis/Theory Football Defense – ES 263
Analysis/Theory Intercollege Sport – ES 264

ES LECTURE/THEORY COURSES

Introduction to Kinesiology – ES 250
PE in the Elementary School – ES 253
Care and Prevention of Athletic and Recreation Injuries – ES 255
Sport and Society – ES 256
Teaching Techniques & Methods Exercise Science – ES 290 A, B, C

HEALTH COURSES

Keys for Successful Weight Control – HED 101
Health Education for Teachers – HED 105
Personal Health & Lifestyles – HED 120
Introduction to Public Health – HED 201

NUTRITION COURSES

Introduction to Nutrition – NUTR 155
Nutrition for Fitness & Sports – NUTR 158
Cultural Aspects of Food/Nutrition – NUTR 159
Science of Nutrition – NUTR 255

Academic and Career Pathways related to Exercise, Health & Nutrition

Our department offers the following degrees and certificates.

Please contact the ESNH Department Chair, [Randy Abshier](#), for more information.

- [A.S. Degree: Exercise Science & Wellness](#)
- [A.S. Degree: Nutrition](#)
- [AA-T Degree: Kinesiology for Transfer](#)
- A.A. Degree: General Studies – Wellness and Self-Development
- Certificate of Achievement: [Exercise Science & Wellness](#)
- Certificate of Achievement: [Nutrition](#)
- Certificate of Proficiency: [Fitness Specialist Certification](#) (on hold until Spring 2025)

Athletics Department

The [Athletics Department](#) is located next to the ESNH Department and serves the student-athletes of Grossmont College.

Athletic Director's Office: 41-124

Athletic Training Office: 41-119 - Provides services for intercollegiate student-athletes who require the attention of the athletic trainers, and is located on the north side of the building.

[Did you know we have 16 sports?!](#) You are encouraged to come watch, volunteer, cheer, wear your gear (hey, that rhymes!)

Frequently Asked Questions (FAQ's):

- Showers and Lockers: Bring your own lock and towel; showers and wall dryers are available. Lockers are to be used only during your class period and may NOT be kept for the entire semester. We have an extremely limited number of lockers available; any locks left overnight will be cut off and the contents removed. ** if you need a towel or feminine hygiene products, we have you covered! Please come to the ESNH Dept. office.
- Use of exercise facilities outside of classroom (track & field; only available during assigned time for registered students)
- Submit homework or messages for ESNH instructors: Leave homework or message for instructor (ESNH Dept or Mail Center)
- If Injured in Class: Injured in class - tell instructor immediately. Injured outside of class, see Student Health Services in Griffin Center (student-athletes should visit the Athletic Training Department)
- Equipment/Facility Issues: Let Instructor know if equipment is broken, needs attention or is not functioning properly

- Is the pool or weight/fitness room open for students? The track/field and tennis are generally open to the public (unless a class, athletic, or rental event is using the facility. All our instructional labs are used for classes and are not available for use outside class times – you can access these by signing up for a class.
- Where are ESNH faculty offices? We are inside the ESNH Department office – on the East side of building 41 just before going down the stairs towards the track and field.

Editorial Credits

Beth Kelley, Professor (2024 - 8th Edition)

Cheryl Kerns-Campbell (2024 - 8th Edition)

Michelle Snyder, Adjunct Instructor (2015 – 7th Edition)

Kathleen Aylward, Assistant Professor (2012 – 6th Edition)

Beth Kelley, Professor (2008 – 5th Edition)

Laura Sim (Burger), Professor (1994 – Original Edition; Revised periodically – Editions 2, 3, and 4)

References

- 1) Fahey, Insel & Roth (2005) *Fit & Well: Core Concepts & Labs in Physical Fitness and Wellness*, 6th Edition. New York, NY: McGraw-Hill.
- 2) ACSM (2006). *Guidelines for Exercise Testing & Prescription (7th Ed.)*. Philadelphia: Lippincott, Williams and Wilkins.
- 3) Gellish, R.L. et al. (2007) Longitudinal modeling of the relationship between age and maximal heart rate. *Med. Sci. Sports Exercise*, 39:822.
- 4) 3rd Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). National Cholesterol Education Program. 2002. NIH Publication No. 02-5215.
- 5) 7th Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7). National High Blood Pressure Education Program. 2003.
- 6) Nutrition and Athletic Performance : Medicine & Science in Sports & Exercise.” LWW. N.p., n.d. Web. 1 Nov. 2015
- 7) Assessing Vegetarian Athletes’ Needs.” *Assessing Vegetarian Athletes’ Needs*. N.p., n.d. Web. 19 Aug. 2015.
- 8) Yon, Marianne A., Suzanna L. Mauger, and Lucy C. Pickavance. “Relationships between Dietary Macronutrients and Adult Neurogenesis in the Regulation of Energy Metabolism.” *British Journal of Nutrition Br J Nutr* 109.09 (2013): 1573-589. Web.
- 9) If You Eat Tons of Protein, Will You Gain Muscle?” Nancy Clark RD RSS. N.p., 19 May 2014. Web. 19 Sept. 2015.
Schiff W. *Nutrition for Healthy Living*. 6th ed. New York NY: McGraw-Hill Education; 2022.
Kittler PG Sucher K Nahikian-Nelms M. *Food and Culture*. 7e ed. Boston MA: Cengage Learning; 2017.
Oldways.org. Traditional Diets. <https://oldwayspt.org/traditional-diets>

13. Javed Z, Haisum Maqsood M, Yahya T, et al. Race, racism, and cardiovascular health: Applying a social determinants of health framework to racial/ethnic disparities in cardiovascular disease. (<https://pubmed.ncbi.nlm.nih.gov/35041484/>) Circ Cardiovasc Qual Outcomes. 2022 Jan;15(1):e007917. Accessed 5/15/2022.
15. <https://www.nhlbi.nih.gov/health/coronary-heart-disease>
16. ACSM GETP11
17. Lindsay, A. & Byington, T. 2020, What Is Physical Literacy? | Early Start, Active for Life, Extension | University of Nevada, Reno, IP
18. <https://www.ahajournals.org/doi/full/10.1161/circulationaha.111.087213#:~:text=The%20basic%20components%20of%20energy,energy%20expenditure%2C%20and%20energy%20storage.&text=Body%20weight%20can%20change%20only,a%20given%20period%20of%20time.>
19. <https://www.natgeokids.com/uk/discover/science/general-science/15-facts-about-the-human-body/>
20. <https://www.nectarsleep.com/posts/fun-facts-about-the-human-body/>
21. <https://www.newsweek.com/mind-blowing-facts-about-your-body-human-1638872>
22. <https://www.mayoclinic.org/healthy-lifestyle/fitness/in-depth/exercise/art-20048389>

Griffin Fun Facts/G-Staff Says

- Self-report 4.7hrs/day sitting vs actual sitting = 7.7-8hrs/day (NHANES via ACSM)
- Ideas for name of this section: G-Staff Says
- Respiratory: Our nose is almost a superhero. It is a filter, heater, and also a humidifier. So, the nose is lined with small bone-like shelves known as turbinates, which contain blood vessels that can heat the air and goblet cells that help humidify the air. Finally, the air you breathe is filtered before it goes to the lungs. (20)
- Hydration: In a lifetime, a human produces 25,000 quarts of saliva, which is enough to fill almost two swimming pools. (20)
- Circulatory: Laid end to end, an adult's blood vessels could circle Earth's equator four times! (19)
- Your blood makes up about eight percent of your body weight. (19)
- Cardiovascular: The human heart beats more than three billion times in an average lifespan. (19)
- Digestive: A bond exists between the digestive system and your brain, known as the gut-brain axis. So any stress or brain disorders can affect the way your body digests food. Conversely, good company and laughter while eating can affect the way our body digests food. (20)
- Muscular: More than 40% of your body weight is made of muscles. (20)
- The human body is that it contains more than 600 muscles. (20)
- Muscles: The eye is the fastest muscle in your body – which is why we say when something happens quickly, “in the blink of an eye!” (21)
- Organs: The skin is our largest organ (21)
- Every second you produce 25 million new cells (21)
- You're Taller in the Morning than at night
- Where to find tampons, extra towel or shower supplies



Grossmont-Cuyamaca Community College District
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Governing Board Members:
Elena Adams, Debbie Justeson, Desiree Klaar, Brad Monroe, Julie Schorr
Student Members: Cesar Nuñez, Manuel Juarez Lopez
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