

Chichimed.com: Providing Medical Knowledge to Impoverished  
Families in Rural Guatemala

by

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## Dedication

This work is dedicated to Aselsi Ministries International and the individuals who serve tirelessly day in and day out to serve the people of Guatemala. Your efforts have not gone unnoticed, and your selfless ministry is changing lives around the world, including mine. May the Lord bless you and keep you always. This project is also dedicated to the millions of healthcare workers around the globe who have risked their lives and their families lives in the midst of the global COVID-19 pandemic. You are true heroes, and I thank you from the bottom of my heart for your service to God's people. May He forever protect you and give you peace.

“Therefore, go and make disciples of all nations, baptizing them in the name of the Father and of the Son and of the Holy Spirit, and teaching them to obey everything I have commanded you. And surely I am with you always, to the very end of the age.” - Matthew 28: 19-20.

## Acknowledgements

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My family and friends: Thank you for your endless support throughout my education and for the selfless love you have poured into my life. I hope you know how dearly I love each of you, and I want to thank you for teaching me what it means to follow the Lord.

## Abstract

This project involves the creation of chichimed.com, a website containing basic medical information to be referenced by individuals in Northern and Latin America, specifically targeted to individuals in rural Guatemala. The project includes the creation of six separate pages within one website, including common conditions, common medications, nutrition, first aid, organ systems, and a home page. The goal of this project is to provide individuals who may not have prior knowledge with basic medical information so that they can better care for themselves and their families and may ultimately live healthier lives. Chichimed.com was created using credible, reliable sources and is meant to be a valuable resource for beginning individuals wanting to know more about medicine and the human body.

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## **Chichimed.com: Providing Medical Knowledge to Impoverished Families in rural Guatemala**

Imagine approaching a shack made of wood with a dirt floor where a family of eight sleeps cramped every night. Imagine seeing six children caked in dirt and a mother with a chronic look of despair painted on her face. Imagine learning that they bathe simply by maneuvering into a dirt crawl space and letting steam cover them. No running water. No electricity. No hope of ever enjoying the comforts of life that we take for granted every day. This was the scene I witnessed two years ago in a rural Guatemalan town called Chichicastenango. The memory of that day will stick with me forever, and I desire to help those in need both in Guatemala and around the world by providing them access to basic medical information.

When I visited Chichicastenango, I had the pleasure of working with Aselsi Ministries International. Aselsi is a Christian organization that runs the Father's Heart Medical Clinic, which provides free health care to individuals who would otherwise be unable to receive medical attention. Annually, the clinic sees approximately twelve-thousand patients (Macario, 2020). Aselsi's endeavor to provide health care is especially necessary in the rural western highlands of Guatemala, the approximate location of Chichicastenango. In a report on the Guatemalan health care system, the U.S. Agency for International Development states, "In most rural areas, health care for underserved, vulnerable populations is offered largely through the public sector. However, limited resources, infrastructure, personnel, and inadequate supplies of medicines and materials pose profound challenges within the healthcare system, especially for more remote, rural indigenous areas" (United States Agency for International Development, 2018). This is exactly the demographic I intend to serve with this project.

The Centers for Disease Control and Prevention reports that only 54% of basic health and nutrition needs are met for those living in rural Guatemala (Centers for Disease Control and Prevention, 2017). In addition, the Pan American Health Organization notes significant rates of maternal mortality, child and infant mortality, and chronic diseases such as diabetes, cancer, and cardiovascular disease (Pan American Health Organization, 2020). However, one of the most shocking statistics from the Pan American Health Organization is that 46.5% of children under the age of five experienced stunting in their growth. These individuals need quality health care and nutrition to keep their families safe and healthy. As a student studying medicine, I intend to make sure they are informed on not only the medical conditions from which they are suffering but also on how to prevent those conditions before they become a problem.

To support these individuals, I have created a website containing basic medical information that can be easily accessed. I have included pages detailing first aid, nutrition, common medical conditions, and common medications along with a basic overview of each organ system to outline common issues associated with everyday life and simple ways to treat those conditions. These pages consist of writing, charts from a variety of sources (details in methodology section), and publicly available images. To obtain the information contained within chichimed.com, I have reviewed numerous government websites, trusted medical online sources, and a manual created by the American Academy of Emergency Physicians.

In 2017, approximately 65% of the Guatemalan population obtained access to the internet at some point during the year, which is six times as many people who accessed the internet in Guatemala in 2010 (Chevalier, 2020). Based on numbers in January, 2019,



there is an annual increase in Guatemalan web access of over 8% (Navarro, 2020). As the number of internet users in Guatemala increases, there is more of a need for medical information to be accessed via the Internet.

I have been working alongside Emmanuel Perez, the director of Aselsi Ministries International, and his team from a variety of disciplines to complete this project. He noted that the Guatemalan people tend to cope with medical issues until they are unavoidable rather than seeking preventative care or making changes to their lifestyle. This project allows individuals to obtain the information necessary to make those lifestyle changes without leaving the comfort of their own home, and it will also help Aselsi expand its influence to people outside of the surrounding geographic region. For those in rural areas without access to the internet, I have created a master booklet with pages that can be printed out as needed and given to individuals at the Father's Heart Medical Clinic. These pages contain the same images and information contained on the website.

The physicians at the Father's Heart Medical Clinic reported that chronic conditions such as hypertension, type II diabetes, and chronic kidney disease are especially prevalent among the patients they see on a daily basis. According to a study documented in the United States National Library of Medicine, cardiovascular disease, often influenced by chronic hypertension, is the second leading cause of death in the nation of Guatemala (Mendoza Montano, Fort, DeRamirez, Cruz, Ramirez-Zea, 2015). The authors also note that a significant amount of the health issues caused by cardiovascular disease could be prevented through interventions and changes in lifestyle. In addition, the Perelman School of Medicine states that more than 25% of Guatemala's

indigenous population suffers from type II diabetes (Penn Today Staff, 2018). I have addressed these chronic conditions, among others, along with their preventive measures.

My motivation for completing this project had been twofold. I have learned significantly about the field of medicine by performing diligent research in a variety of medical specialties. More importantly, however, I have had the opportunity to help Aselsi expand its ministry and Christian influence by providing individuals access to quality medical information. This project has certainly been part of my own ministry and pursuit to spread the Gospel of Jesus Christ.

To ensure one's physical, mental, and social health and to improve quality of life across the board, everyone needs access to health care (Office of Disease Prevention and Health Promotion, 2020). In the United States, we have relatively quick and easy access to health care compared to developing nations around the globe, and I believe this is something we often take for granted. When sick, most of us simply get in our car and drive to the doctor's office; in times of health, we see the doctor annually for a routine check-up. Unfortunately, many individuals around the globe do not have such easy access to health care, and this is especially the case in rural Guatemala. It is for this reason that I have created [chichimed.com](http://chichimed.com); my hope and prayer is that individuals around the globe may have greater access to medical information so that they may take care of themselves and their families in the best way possible and live long, happy, and healthy lives.

## **Thesis Statement and Rationale**

This creative thesis has resulted in a website containing medical information to be referenced by individuals located in rural Guatemala who may otherwise have no basic medical knowledge or access to health care. I have incorporated research from a variety of medical disciplines to ensure that impoverished families have the necessary information to care for themselves and those they love.

In a rural area such as Chichicastenango, many individuals do not have the resources to obtain knowledge of preventative care or to provide first aid to their loved ones. It has been my goal to help the medical professionals in the area provide working knowledge to the people so that they will be able to prevent common injuries and illnesses from becoming life-threatening scenarios and to help improve the quality of life for those individuals. Additionally, I have had the opportunity to help Aselsi expand access to medical information and to allow them a master booklet to hand out to patients as they are discharged. Essentially, I have had the opportunity to be of service to both Aselsi and the Guatemalan people all while learning significantly about the field of medicine.

## Methodology

To create chichimed.com, I have used Wix.com, an online web designer (See Appendix A). The website is linked to the Aselsi Ministries website and consists of multiple pages, including first aid, nutrition, common medical conditions, common medications, and organ systems. Organ systems include the cardiovascular system, respiratory system, nervous system, digestive system, musculoskeletal system, immune system, endocrine system, urinary system, reproductive system, and integumentary system.

These pages consist of research from government websites, trusted medical sources, and a first aid manual created by the American College of Emergency Physicians. In addition, I have reviewed certain You Tube videos and embedded them in chichimed.com where it is warranted, especially with certain first aid topics. I have also included charts, diagrams, and publicly available images to support the information contained in the website.

To provide information for individuals in rural areas without access to the internet, I have created a master copy of all the information published on the website to be handed out in the Father's Heart Medical Clinic as needed (See Appendix B). The staff at Aselsi may print out certain pages to hand out to patients as they are discharged. The master booklet has been printed in both English and Spanish.

I have used a variety of sources in the creation of chichimed.com. Namely, the most frequently used sources are Mayo Clinic, Centers for Disease Control and Prevention, The Cleveland Clinic, John Hopkins Medicine, Medline Plus (Sponsored by the U.S. National Library of Medicine), National Institutes of Health, and *First Aid*

*Manual* (created by the American College of Emergency Physicians) among multiple other minor sources.

In addition to conducting research for my website, I have incorporated knowledge I have obtained studying anatomy and physiology throughout my undergraduate academic career. I currently work in a hospital setting and see patients on a regular basis, which has helped sharpen my skills and knowledge of medicine.

Because of the demographic to whom my project is tailored, I had my project translated from English into Spanish, the official language of Guatemala. Because I do not have a significant background in Spanish myself, I created chichimed.com in English to be reviewed and then had it translated into Spanish by Dr. Alan Campbell, an assistant professor of Spanish at MTSU. For this translation, I have kindly received funding through both the MTSU College of Basic and Applied Sciences and the University Honors College. Aselsi's director, Emmanuel Perez, also informed me that they will translate any ads I create for my website into Quiche, a native Mayan language spoken by many inhabitants of Chichicastenango. This language, however, is an oral language rather than a formal written language, so it will not be possible to translate any written content into Quiche.

## **Evaluation**

To ensure that my research is in line with the needs of the Guatemalan people, I have been consistently in touch with the director of Aselsi. The physicians at Aselsi have also reviewed my content to ensure that it is accurate and relevant to their circumstances and their mission.

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doi:10.1093/heapro/dau117
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<https://www.statista.com/statistics/942376/number-internet-users-guatemala/>
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[https://www.paho.org/salud-en-las-americas-2017/?page\\_id=127](https://www.paho.org/salud-en-las-americas-2017/?page_id=127)
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- United States Agency for International Development. (2018, August 21). *Health and nutrition*. <https://www.usaid.gov/guatemala/health-nutrition>

## Appendix A

Links to Websites:

Chichimed.com - <https://www.chichimed.com/>

Chichimed.com (Spanish) - <https://www.chichimed-es.com/>



## **Appendix B**

Content of Chichimed.com to Be Provided to Aselsi Ministries International for Dispersal

Chichimed.com

Created by Grayson Garrette

Middle Tennessee State University

## **Common Conditions**

### **Attention Deficit Hyperactivity Disorder (ADHD)**

ADHD, which stands for attention deficit hyperactivity disorder, is a neurodevelopmental disorder that is often diagnosed in early childhood. Individuals with ADHD may have trouble paying attention, sitting still, or controlling impulsive behaviors. ADHD can affect individuals' lives from childhood to adulthood and may interfere with one's school, work, family, friendships, or all of the above. ADHD is diagnosed by medical professionals and most commonly treated with behavioral therapy and medication. ADHD is proven to occur more often in males than in females. ADHD is categorized in three different subgroups: Predominantly inattentive, predominantly hyperactive/impulsive, and combined presentation

### **Cause**

While the cause of ADHD is unknown, current research shows that genetics plays a significant role in the causation of ADHD. Additional risk factors include environmental toxin exposure during pregnancy (especially to lead), prenatal alcohol consumption, drug abuse, smoking, brain injury, low birthweight, and premature birth.

### **Symptoms**

Symptoms for ADHD include:

- Difficulty paying attention
- Inability to control impulses
- Daydreaming
- Frequent squirming or fidgeting
- Excessive talking
- Hyperactivity

### **Treatment**

ADHD is most commonly treated with behavioral therapy and psychostimulant medication. Individuals with ADHD can benefit from social skills training and talk

therapy with a trained health care professional, and parents and families can benefit from parenting skills training and family talk therapy. Close relationships with family and healthcare professionals are strongly advised.

### Prevention

ADHD can be minimized by mothers during pregnancy by avoiding any substance or activity harmful to the fetus, including pollutants and toxins such as cigarette smoke and lead paint, alcohol, tobacco, or recreational drugs. Eating a healthy diet, exercising daily, getting the recommended amount of sleep each night, and limiting screen time can also help prevent and manage ADHD.

### Resources

Centers for Disease Control and Prevention. (2021, January 26). *What is ADHD?*

<https://www.cdc.gov/ncbddd/adhd/facts.html>

Mayo Clinic Staff. (2019, June 25). *Attention-deficit/hyperactivity disorder (ADHD) in children*. Mayo Clinic.

<https://www.mayoclinic.org/diseasesconditions/adhd/symptoms-causes/syc-20350889>

## Anxiety/Depression

Anxiety and depression are two of the most common mental health disorders. Anxiety is associated with continuing or overwhelming feelings of worry or fear outside of normal life stress. Anxiety disorders can include generalized anxiety disorder, social anxiety disorder, panic disorder, or phobia related disorders. Clinical depression is characterized by significant ongoing feelings of sadness, hopelessness, and/or negativity. Different types of depression include major depression, persistent depressive disorder, psychotic depression, seasonal affective disorder, and bipolar disorder. Women also commonly experience depression before or after pregnancy and prior to menstruation. Most individuals are diagnosed with anxiety and depression in their teens, 20s, and 30s.

### Causes

Major life changes, physical illness, certain medications, biological or hormone imbalances, and significant levels of stress are often causes of anxiety and depression. Individuals with a family history of anxiety or depression, who abuse alcohol or drugs, or who have experienced childhood trauma or stress may be at a greater risk for anxiety or depression.

### Symptoms

Symptoms of anxiety include:

- Intense fear, worry, or dread
- Restlessness
- Irritability
- Difficulty sleeping
- Heart palpitations
- Headaches
- Fatigue
- Sweating
- Upset stomach

Symptoms of depression include...

- Sadness
- Anxiousness
- Feelings of hopelessness or emptiness
- Negativity
- Irritability
- Feelings of worthlessness or guilt
- Feelings of helplessness
- Fatigue
- Restlessness
- Difficulty concentrating
- Difficulty sleeping
- Excessive sleeping
- Changes in appetite
- Headaches
- Digestive issues
- Suicidal thoughts or impulses

For anyone having suicidal thoughts or impulses, he or she or a family member should contact emergency services and/or a medical professional immediately.

Philippians 4:6-8 - “Do not be anxious about anything, but in every situation, by prayer and petition, with thanksgiving, present your requests to God. And the peace of God, which transcends all understanding, will guard your hearts and your minds in Christ Jesus. Finally, brothers and sisters, whatever is true, whatever is noble, whatever is right, whatever is pure, whatever is lovely, whatever is admirable - if anything is excellent or praiseworthy - think about such things.”

## Treatment

Anxiety and depression are most often treated with counseling/talk therapy, medication, or a combination of the two. In severe cases, brain stimulation techniques may be required. Individuals with anxiety and depression often see gradual improvement over time rather than seeing immediate symptom relief. Individuals should work closely with a trained healthcare provider to develop the best strategy and should be diligent in following all treatment plans, especially maintaining a close relationship with a counselor, and taking all medication regularly.

## Prevention

To help prevent anxiety and depression, one should exercise regularly, confide in a close friend or family member, avoid alcohol and recreational drugs, eat a balanced diet, and refrain from becoming isolated.

## Resources

Mayo Clinic Staff. (2018, February 03). *Depression (major depressive disorder)*. Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/depression/symptoms-causes/syc-20356007>

Merz, B. (2017, January). *Six common depression types*. Harvard Health Publishing. <https://www.health.harvard.edu/mind-and-mood/six-common-depression-types>

National Alliance on Mental Illness. (2017, December). *Anxiety disorders*. <https://www.nami.org/About-Mental-Illness/Mental-Health-Conditions/Anxiety-Disorders/Treatment>

National Institute of Mental Health. (2018, February). *Depression*. National Institutes of Health. [https://www.nimh.nih.gov/health/topics/depression/index.shtml#part\\_145399](https://www.nimh.nih.gov/health/topics/depression/index.shtml#part_145399)

National Institute of Mental Health. (2018, July). *Anxiety disorders*. National Institutes of Health.

[https://www.nimh.nih.gov/health/topics/anxietydisorders/index.shtml#part\\_14533](https://www.nimh.nih.gov/health/topics/anxietydisorders/index.shtml#part_14533)

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## Alzheimer's/Dementia

Dementia is characterized by the deterioration of memory, judgement, and cognitive function outside of normal aging, which interferes with daily activities. Dementia is progressive and most commonly affects older adults. Dementia can be categorized into five different types: Alzheimer's Disease, frontotemporal disorders, Lewy Body Dementia, Vascular Dementia, and mixed-type dementia. Alzheimer's Disease is the most common type of dementia.

### Cause

Dementia is caused by damage or loss of brain cells, which interferes with cognitive function over time. Vascular Dementia is caused by damage to blood vessels supplying blood to the brain, and Lewy Body Dementia is caused by balloon-like clumping of certain proteins in the brain. In Alzheimer's Disease, proteins clump together to form what's known as amyloid plaques and tau tangles. Over time, these clumps prevent brain cells from working properly, which causes them to die. Ultimately, the brain begins shrinking over a period of time, resulting in cognitive decline. Brain tumors, diabetes, certain infections, emotional stress, thyroid disease, kidney disease, liver disease, excessive alcohol consumption, head injury, and/or certain medications can also play a role in the causation of Alzheimer's and dementia. Risk factors include aging, family history of dementia, poor dieting, poor exercise and social activity, obesity, poor sleep patterns, smoking, depression, high blood pressure, high cholesterol, heart disease, and vitamin and nutritional deficiencies.

### Symptoms

Symptoms of Alzheimer's and dementia include...

- Memory loss
- Confusion
- Repeating conversations
- Forgetfulness
- Irritability



- Changes in mood or personality
- Delusions
- Poor judgement
- Becoming lost in familiar surroundings
- Difficulty recognizing close friends and family

## Treatment

There is currently no known treatment for Alzheimer's or dementia; however, certain medications can help delay progression or improve symptoms. Many individuals with Alzheimer's enroll in clinical trials to help test developing treatment methods. The best option for treatment is for family members to find professional support and to plan safely for the future. Establishing routines is especially important. In some cases of dementia caused by external factors, medical treatment can reverse symptoms.

## Prevention

To help prevent Alzheimer's and dementia, individuals should be proactive in eating a healthy diet, exercising regularly, participating in social activities, engage in mind stimulating activities (puzzles, reading, memorizing, etc.), refrain from smoking or consuming excess amounts of alcohol, maintain healthy blood pressure, cholesterol, and blood sugar levels, maintain a healthy weight, and see a physician regularly to effectively treat all health conditions.

## Resources

Centers for Disease Control and Prevention. (2020, June 02). *Alzheimer's disease*.

<https://www.cdc.gov/aging/aginginfo/alzheimers.htm>

Mayo Clinic Staff. (2020, December 29). *Alzheimer's disease*. Mayo Clinic.

<https://www.mayoclinic.org/diseases-conditions/alzheimers-disease/symptoms-causes/syc-20350447>

Mayo Clinic Staff. (2019, April 19). *Dementia*. Mayo Clinic.

<https://www.mayoclinic.org/diseases-conditions/dementia/symptoms-causes/syc-20352013>

National Institute on Aging. (2017, December 31). *What is dementia? Symptoms, types, and diagnosis*. National Institutes of Health.

<https://www.nia.nih.gov/health/what-dementia-symptoms-types-and-diagnosis>

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## Asthma

Asthma is a condition caused by chronic inflammation of the airways and is characterized by coughing, wheezing, shortness of breath, and/or chest tightness. During an asthma attack, muscles lining the airway constrict, and the airway begins to swell and secrete mucus, which blocks air from effectively getting in and out of the lungs. Asthma can be categorized into four different types, including Exercise-Induced Asthma, Occupational Asthma, Childhood Asthma, and Allergic Asthma.

## Cause

Asthma is caused by a strong immune response to a foreign substance or allergen in the lungs. Asthma attacks are most commonly triggered by allergies, poor air quality, cold air, physical exertion, exposure to tobacco smoke, dust mites, pets, emotional stress, infections, certain medications, certain foods, exposure to chemicals, acid reflux, and exposure to pests such as cockroaches and mice. Risk factors for asthma include smoking/secondhand smoke exposure, obesity, family history of asthma, allergies, exposure to pollution or exhaust fumes, and respiratory infections.

## Symptoms

Symptoms of asthma include...

- Coughing (may be chronic)
- Wheezing
- Shortness of breath
- Chest pain or tightness
- Fatigue
- Difficulty eating in infants
- Difficulty sleeping due to coughing and wheezing

Asthma attacks often reoccur at similar times such as at night or early morning, during or following exercise, when laughing or crying, with certain seasons, and with exposure to

asthma triggers. Severe and sudden signs may be life threatening. If such occurs, seek emergency help, or see a doctor immediately.

## Treatment

Treatment for asthma often involves long-term medication prescribed by a doctor along with short-term relief inhalers such as albuterol. Those with Allergic Asthma may be treated with allergy shots over time. It is important for individuals with asthma to develop an asthma action plan that allows them to identify triggers, how to recognize and handle asthma attacks, when and what medications to take, when to contact emergency medical services, and who to contact in an emergency. It is also recommended to have a written plan for handling asthma, treat all attacks early, and take all medications consistently.

To see how to use an inhaler, watch the following videos:

<https://www.youtube.com/watch?v=BbONuRXJdr0>

<https://youtu.be/NdFstn28hWM>

[https://youtu.be/Lx\\_e5nXfi5w](https://youtu.be/Lx_e5nXfi5w)

<https://youtu.be/TFexVuJeJVk>

## Prevention

There is currently no preventative treatment for asthma, but to avoid and/or minimize symptoms, one should stay up to date on all vaccines (especially flu and pneumonia), avoid triggers, treat attacks early, maintain a healthy weight, avoid smoking, avoid chemical exposure or exposure to poor air quality, treat all allergies and medical conditions, and see a doctor on a regular basis.

## Resources

American Academy of Allergy, Asthma, and Immunology. (n.d.). *Asthma*.

<https://www.aaaai.org/conditions-and-treatments/asthma>

Centers for Disease Control and Prevention. (2019, September 06). *Learn how to control asthma*. <https://www.cdc.gov/asthma/faqs.htm>

Mayo Clinic Staff. (2020, August 11). *Asthma*. Mayo Clinic.

<https://www.mayoclinic.org/diseases-conditions/asthma/symptoms-causes/syc-20369653>

National Heart, Lung, and Blood Institute. (2020, December 03). *Asthma*. National Institutes of Health. <https://www.nhlbi.nih.gov/health-topics/asthma>

## Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is a developmental disorder involving behavioral and communication deficits. Individuals with ASD often have difficulty communicating and interacting in social situations. They are often very routine oriented and engage in repetitive behaviors. ASD is usually diagnosed at approximately two to three years of age. ASD has a wide spectrum of severity, ranging from gifted to severely challenged. Research shows that boys are four times more likely to develop ASD than girls.

### Cause

The cause for ASD is currently unknown, but research shows that genetics and environmental factors may play a role in the causation of ASD. Individuals who have a sibling with ASD, were born to older parents, have genetic conditions (Rett syndrome, Down syndrome, Fragile X syndrome, tubercolosis sclerosis), born before 26 weeks gestation, or born with low birthweight are at greater risk for ASD. Research also shows that taking valproic acid or thalidomide during pregnancy can increase the risk for ASD. Despite popular belief, vaccinations or poor parenting are NOT causes for ASD.

### Symptoms

Symptoms of ASD include...

- Little or no eye contact
- Trouble listening
- Difficulty socializing or reacting to social cues
- Difficulty communicating
- Difficulty empathizing or understanding others' feelings
- Slow response to name or verbal cues
- Talking at length without letting others respond
- Inappropriate situational reactions
- Repetitive speech or actions
- Intense interest in one subject or detail

- Disturbance by changes in routine
- Greater or diminished sensitivity to sensory input (light, noise, color, temperature, etc.)
- Losing skills or language he or she once had

### Treatment

While there is no medical cure for ASD, early intervention by family and healthcare professionals is important. ASD is most often treated with prescribed medication to help control symptoms, behavioral therapy, educational therapy, family therapy, or combination of all four. ASD is diagnosed by a healthcare professional analyzing an individual's behavior and development. Individuals with ASD may go on to live on their own and live relatively normal lives or may require lifetime care depending on the severity of their condition.

### Prevention

Due to the nature and unknown causation of ASD, there are no methods to prevent this disorder other than minimizing risk by maintaining a healthy diet and lifestyle, especially during pregnancy.

### Resources

American Psychiatric Association. (2018, August). *What is autism spectrum disorder?* <https://www.psychiatry.org/patients-families/autism/what-is-autism-spectrum-disorder>

Centers for Disease Control and Prevention. (2020, March 25). *What is autism spectrum disorder?* <https://www.cdc.gov/ncbddd/autism/facts.html>

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The National Institute of Mental Health. (2018, March). *Autism spectrum disorder*.

National Institutes of Health. [https://www.nimh.nih.gov/health/topics/autism-spectrum-disorders-asd/index.shtml#part\\_145438](https://www.nimh.nih.gov/health/topics/autism-spectrum-disorders-asd/index.shtml#part_145438)



## Coronary Artery Disease (CAD)

Coronary artery disease (CAD) is the damage, obstruction, or blockage of the coronary arteries, or the blood vessels that supply blood to the heart. Usually, coronary blockages are caused by atherosclerosis, or the buildup of plaque containing cholesterol and fatty deposits in the blood vessels. Plaque often builds up in the blood vessels over time, making CAD difficult to diagnose until a catastrophic event occurs such as a heart attack. Signs of CAD may include chest pain and/or shortness of breath.

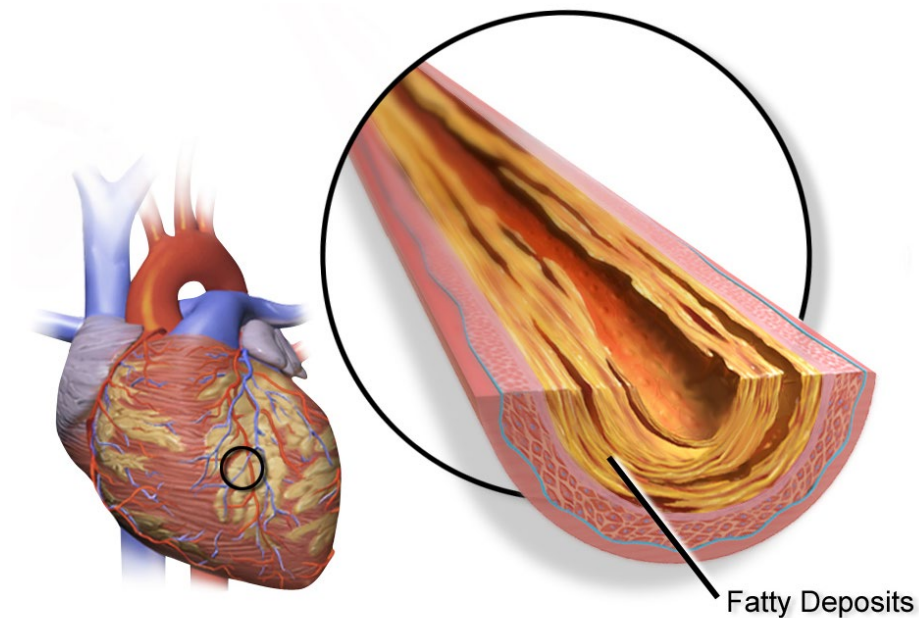


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## Cause

Coronary artery disease is caused by damage to the inner lining of the blood vessels that supply blood to the heart, sometimes as early as childhood. Over time, plaque progressively builds up in the coronary arteries, especially if there is any type of damage to the blood vessels. CAD can be either obstructive, meaning plaque buildup, or nonobstructive, meaning other problems with the coronary artery such as vasospasms. Risk factors for CAD include smoking or exposure to secondhand smoke, high blood pressure, high cholesterol, diabetes or insulin resistance, lack of physical exercise, unhealthy dieting, a diet high in saturated fats, family history of heart disease, high stress, exposure to air pollution, not getting enough sleep, and having certain underlying medical conditions. Men and older individuals are at greater risk for CAD.

## Symptoms

Coronary artery disease may lead to a heart attack if the coronary arteries are completely blocked or may lead to heart failure over time. Symptoms of coronary artery disease include...

- Chest pain, pressure, or tightness - may radiate into neck, shoulder, arms, back, or jaw
- Shortness of breath
- Weakness
- Lightheadedness
- Nausea
- Heart palpitations
- Fast heart rate
- Dizziness
- Sweating
- Fatigue
- Stomach Pains
- Sleep Disturbances

## Treatment

CAD can be treated with certain lifestyle changes (see prevention) and certain medications such as antiplatelets, antihyperlipidemics, and antihypertensives. In some cases, procedures may be performed such as angioplasty and stent placement to help increase blood flow through the coronary arteries or a coronary artery bypass graft to reroute blood flow around blockages. Managing previous and underlying health conditions and taking all medications as prescribed is important in treating CAD.

## Prevention

The best way to prevent coronary artery disease is to quit smoking, limit alcohol consumption, control all underlying conditions (especially high blood pressure, high cholesterol, and diabetes) by seeing a doctor regularly, maintain a healthy weight, stay physically active and get regular exercise, maintain healthy sleep patterns, reduce stress, and maintain a healthy diet low in fat, low in salt, and rich in fruits, vegetables, and whole grains.

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## Cancer

Cancer is a group of diseases characterized by abnormal cells that reproduce at a much faster rate than regular cells. Cancer cells often form tumors, or a congregated mass of cells. Cancerous tumors can be malignant, meaning they can spread throughout the body via the bloodstream, local invasion, or the lymphatic system. There are also benign tumors, meaning they do not spread throughout the body. Different types of cancer include carcinomas, sarcomas, leukemias, and lymphomas among others. Cancer is ranked in a series of stages ranging I-IV, I being mild and IV being severe. Most forms of cancer affect one of the following: colon, brain, lung, breast, prostate, testicles, blood cells, lymphatic system, nervous system, bones, ovaries, cervix, skin, kidneys, liver, pancreas, stomach, esophagus, mouth, or uterus.

## Cause

Cancer is caused by changes to the genes in DNA that regulate how cells grow and reproduce. Cancer cells have genes that cause them to replicate and grow at a much faster rate than regular cells. Risk factors for cancer include having a close family member with a history of cancer, tobacco use, obesity, lack of exercise, poor diet/high fat diet, exposure to toxins or chemicals (carcinogens), exposure to radiation (specifically UV radiation from the sun), hormone therapy (estrogen and progesterone for women), virus exposure (Example: human papilloma virus or HIV), and age (most cancer patients are 65 or older).

## Symptoms

Symptoms of cancer vary depending on the type of cancer. Common symptoms include...

- Significant pain to one area of the body
- Fatigue/weakness
- Unusual lumps in or under the skin
- Changes in urination or bowel movements
- Unusual bleeding, discharge, or bruising

- Chronic joint or muscle pain
- Chronic fever or night sweats
- Loss of appetite
- Weight loss
- Skin changes or sores not healing
- Moles or warts changing
- Chronic cough, hoarseness, or shortness of breath
- Indigestion or difficulty swallowing

## Treatment

Treatment for cancer may be an attempt to get rid of the cancer completely or to simply prolong life and minimize symptoms. Treatments may involve...

- Chemotherapy - Chemotherapy uses drugs that destroy cancer cells and good cells in hopes that the cancer cells will be killed off first. Chemotherapy can cause severe sickness.
- radiation therapy - Radiation therapy uses beams of high energy from a special machine to kill cancer cells.
- Surgery - Surgery can help remove cancerous tumors or cells, and in some cases surgeons can remove the part of the body that is infected with cancer
- Hormone therapy - Cancer patients can be given hormones to remove other hormones in the body that cause or worsen cancer
- Immunotherapy - Immunotherapy involves boosting the body's immune system to help fight cancer more efficiently through injections or substances introduced to the body
- Stem cell transplants - Stem cell transplants involve transplanting bone marrow from someone's own cells or from a donor's cells to replace diseased bone marrow or to allow doctors to treat cancer with higher doses of chemotherapy
- Drug therapy - Certain drugs can be helpful in fighting cancer cells

- Enrollment in clinical trials - Clinical trials are research that investigates new methods to treat cancer, and many clinical trials need cancer patients to participate.

## Prevention

The most effective measures that can be taken to avoid cancer are to avoid smoking or secondhand smoke exposure, stay up-to-date on all vaccines, have regular cancer screenings (especially a colonoscopy at age 50 or below), practice safe sex habits, drink alcohol in moderation or not at all, eat a healthy diet with plenty of fruits and vegetables, stay physically active and engage in regular exercise, avoid excessive exposure to the sun, chemicals, or radiation, maintain a healthy weight, and see a doctor regularly.

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## Congestive Heart Failure (CHF)

Congestive heart failure (CHF) is a chronic progressive disorder that occurs when the heart does not pump enough blood as it should to the rest of the body. This leads to a lack of oxygen and nutrients in the organs and extremities. CHF can be caused by chronic conditions such as high blood pressure, diabetes, and/or coronary artery disease and often involves swelling of the legs or feet. CHF typically progressively worsens over time. During CHF, the heart enlarges, builds more cardiac muscle, and pumps faster to accommodate the lack of power in each pump. CHF can involve one or both sides of the heart and can occur in adults and children. In some cases, CHF can lead to kidney failure. If you suspect you have CHF or are experiencing symptoms of CHF, seek medical attention immediately.

### Cause

Congestive heart failure is caused by the stiffening of the ventricles within the heart, or the chambers of the heart that pump blood. CHF can sometimes be caused by the inability to completely fill the heart with blood before pumping. Risk factors for CHF include coronary artery disease, high blood pressure, faulty heart valves, heart damage (cardiomyopathy), inflammation of the heart (myocarditis), genetic/congenital heart defects, arrhythmias, chronic diseases (diabetes, HIV, thyroid disease, iron or protein buildup), heart attacks, certain medications (nonsteroidal anti-inflammatory drugs, some hypertension medications, some diabetes medications, some cancer medications), sleep apnea, tobacco use, alcohol consumption, certain viruses, and obesity.

### Symptoms

Symptoms of CHF include...

- Shortness of breath
- Swelling in legs, ankles, or feet
- Weakness/Fatigue
- Rapid weight gain
- Increased heart rate

- Abdominal swelling/discomfort
- Nausea and lack of appetite
- Urinary frequency
- Coughing white or bloody phlegm
- Chest pain
- Difficulty lying flat due to shortness of breath
- Dizziness/confusion

### Treatment

To treat congestive heart failure, medical professionals often prescribe medication such as ACE inhibitors, angiotensin II inhibitors, beta-blockers, aldosterone antagonists, inotropes, digoxins, and angiotensin receptor neprilysin inhibitors. These medications often help blood flow more easily through the blood vessels and/or help the heart pump more efficiently. Procedures also may be performed, such as a coronary artery bypass graft, percutaneous coronary intervention, heart valve repair/replacement, pacemaker insertion, ventricular assist device insertion, heart transplant, or cardiac defibrillator implantation. Additionally, doctors may recommend lifestyle changes such as quitting smoking, losing or maintaining weight, limiting fluid intake, avoiding caffeine and alcohol, managing stress, eating a heart healthy diet, participating in daily exercise, getting adequate rest, avoiding sodium, and treating underlying conditions.

### Prevention

To best help prevent congestive heart failure, one should avoid smoking, avoid alcohol consumption, control all chronic conditions (hypertension, diabetes, etc.) and take all prescription medications, see a doctor regularly and follow all treatment plans, maintain a healthy weight, participate in daily exercise and physical activity, reduce stress, avoid illegal drugs, and eat a heart healthy diet (see heart healthy diet on nutrition page).

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## Chronic Kidney Disease (CKD)

Chronic Kidney Disease (CKD) is characterized by progressive loss of kidney function over a period of time. The kidneys filter toxins and waste out of the body, and over time CKD can cause fluid, electrolytes, and waste to build up in the body. CKD increases the risk for heart disease and blood vessel disease. Early detection of CKD is important to properly treat all symptoms and to prolong kidney function. Individuals with advanced CKD may require dialysis or kidney transplant. Some people with early CKD may have few or no symptoms. CKD is measured in stages 1 through 5, with 1 being the mildest and 5 being the worst.

### Cause

CKD is typically caused by underlying conditions, mostly diabetes and high blood pressure. CKD can also be caused by inflammation of the kidneys, polycystic kidney disease, obstruction of the urinary tract, urine backup into the kidneys, pyelonephritis, immune diseases such as Lupus, heart disease, and repeating UTIs. Risk factors for CKD include smoking, obesity, family history of kidney disease, genetic kidney defects/abnormalities, or being over the age of 60.

### Symptoms

Symptoms of CKD include...

- Nausea and vomiting
- Feet and ankle swelling
- Weakness/Fatigue
- Difficulty sleeping
- Muscular twitching/cramping
- Changes in urination/urinary frequency
- Chest pain and shortness of breath
- High blood pressure
- Difficulty concentrating
- Loss of appetite

- Puffiness around the eyes
- Dry or itchy skin
- Headache

## Treatment

While there is no formal cure for CKD, measures can be taken to treat symptoms and slow disease progression. This often involves medication prescribed by a medical professional, controlling underlying conditions such as high blood pressure and diabetes, and eating a low protein and kidney-healthy diet. In extreme cases, dialysis or kidney transplant may be required.

## Prevention

To help prevent CKD, one should exercise regularly, eat a healthy diet, limit alcohol consumption, avoid smoking, maintain a healthy weight, follow all instructions on over-the-counter medicine, see a doctor regularly, and follow treatment plans for all underlying conditions.

## Resources

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## Chronic Obstructive Pulmonary Disease (COPD)

COPD, which stands for chronic obstructive pulmonary disease, is a chronic progressive disorder that causes shortness of breath by obstructing airflow to and from the lungs.

COPD includes groups of lung diseases such as emphysema and chronic bronchitis.

COPD typically worsens over a period of time and is treatable and preventable. However, there is currently no cure for COPD.

### Cause

COPD is caused when the sacs that hold air in the lungs (alveoli) become inelastic, walls between alveoli get destroyed, walls between alveoli become thickened and inflamed, or with excessive mucus production. The most common cause of COPD is smoking cigarettes. Risk factors include exposure to pollutants such as dust, chemicals, or secondhand smoke exposure, exposure to fumes from burning fuel, and/or asthma or other childhood respiratory diseases.

### Symptoms

Individuals with COPD may have “exacerbations” where their symptoms are more intense for a period of time. Symptoms of COPD include...

- Shortness of breath (especially with exertion)
- Chest tightness
- Fatigue
- Wheezing
- Chronic cough
- Frequent respiratory illnesses
- Lower extremity swelling
- Mucus production
- Blueness of the lips or fingernail beds

## Treatment

COPD can be treated by quitting smoking and avoiding pollutants along with medication prescribed by a doctor or health professional such as bronchodilators, combined inhalers, steroids, and/or antibiotics. Supplemental oxygen or surgery such as lung volume reduction, lung transplant, and bullectomy may be required. Lifestyle changes such as exercising and eating a healthy diet coupled with pulmonary rehabilitation and exacerbation management can be helpful as well.

## Prevention

The best way to prevent COPD is to avoid or quit smoking since smoking is the number one cause of COPD. COPD can also be prevented by avoiding pollutant exposure, receiving regular vaccinations, exercising regularly, and eating a healthy diet.

## Resources

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## Diabetes

Diabetes is a chronic disease caused by excess sugar, or glucose, in the bloodstream. The pancreas produces a hormone called insulin to control the amount of sugar in the bloodstream. In individuals with diabetes, the body either does not produce enough insulin or cannot use insulin well, causing sugar to build up in the bloodstream. Diabetes can be classified as type I, type II, or gestational. In type I diabetes, the body does not produce enough insulin. In type II diabetes, the body cannot produce enough insulin or use insulin well enough. Type II diabetes is the most common type. Gestational diabetes is simply diabetes during pregnancy. Diabetes can cause damage to the eyes, kidneys, and nerves and can also put an individual at greater risk for heart disease or stroke. Individuals can also be diagnosed with prediabetes, meaning that their blood sugar is not high enough to be classified as diabetes but that they have an increased risk of developing type II diabetes. Individuals with diabetes have a difficult time healing from wounds and have a suppressed immune system.

Diabetes Risk Test - <https://www.diabetes.org/risk-test>

## Cause

Diabetes is caused when the pancreas cannot produce enough insulin or when the body cannot use insulin well enough to regulate blood sugar levels appropriately. Risk factors for diabetes include obesity, family history of diabetes, being older than age 45, cholesterol imbalances, hypertension, prediabetes, history of gestational diabetes, history of heart disease or stroke, history of depression, history of polycystic ovary syndrome, lack of exercise, smoking, history of acanthosis nigricans, or pancreatic injury.

## Symptoms

Symptoms of type I diabetes usually appear in children but can appear at any stage of life. Type II diabetes typically appears later in life (but can appear at any time) and is especially prevalent in individuals over the age of 40. Symptoms include...

- Increased Thirst

- Frequent Urination
- Fatigue
- Weight loss
- Extreme Hunger
- Blurred Vision
- Irritability
- Ketones in the urine
- Frequent infections
- Slow healing sores
- Numbness/tingling in the hands or feet
- Dry skin
- Nausea (type I)
- Vomiting (type I)
- Abdominal pain (type I)

#### Treatment

Diabetes can be treated to a diabetic meal plan, regular exercise, and oral medication prescribed by a healthcare professional. Some individuals require insulin to control blood sugar, especially those with type I diabetes. Doctors may also recommend continuous blood sugar monitoring. Normal blood sugar levels are between 80 and 130 mg/dL in the fasting state and less than 180 mg/dL 2 hours after a meal. To treat diabetes, it is always helpful to control blood pressure and cholesterol levels and to quit smoking and/or tobacco use.

#### Prevention

To help prevent diabetes, one should maintain a healthy weight, eat a healthy diet with less fats and sugars and more whole grains, fruits, and vegetables, exercise regularly, avoid smoking, limit alcohol intake, lower stress, get adequate sleep, control other health problems, and see a doctor regularly.

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## COVID-19

COVID-19, officially named SARS-CoV-2, is an infectious respiratory virus that can be spread from person to person through saliva droplets, respiratory droplets, and nasal discharge, especially with coughing, sneezing, and talking. COVID-19 belongs to a family of coronaviruses, including the common cold, SARS, and MERS. People with weakened immune systems and underlying health problems such as diabetes, cardiovascular disease, cancer, obesity, chronic kidney disease, liver disease, and chronic respiratory disease are more likely to have a severe case of COVID-19. Smokers are also apt to have a more severe case of COVID-19. Symptoms of COVID-19 typically appear within 2-14 days of exposure to the virus, and an infected individual can be contagious up to 2 days before symptoms appear. Individuals with COVID-19 typically remain contagious for 10-20 days after infection.

### Cause

COVID-19 infection is caused by the SARS-CoV-2 virus and is believed to have originated in Wuhan, China. Coronaviruses often live in animals but do not affect these animals; however, the infected animals can spread the disease to humans. COVID-19 is spread when an infected individual transmits droplets to another individual through coughing, sneezing, and/or talking, who then inhales the droplets containing the SARS-CoV-2 virus. COVID-19 is an airborne virus, meaning droplets can also linger in the air for minutes or hours after an infected person has been there. COVID-19 can also spread when an individual touches an infected surface and then touches their face, although this is more rare. Risk factors for COVID-19 include being in close contact with an infected individual, living in the same household as an infected individual, and being coughed or sneezed on by an infected individual.

### Symptoms

Symptoms of COVID-19 include...

- Fever or chills
- Shortness of breath

- Cough
- Fatigue
- Headache
- Diarrhea
- Nasal congestion or runny nose
- Sore throat
- Body aches
- Loss of taste and/or smell
- Nausea or vomiting
- Rash
- Pink eye (conjunctivitis)
- Chest pain/pressure

## Treatment

Because COVID-19 is such a new disease, there is no cure and few treatment options are available, especially outside of a hospital setting. Mild cases of COVID-19 can be treated with pain medicine such as ibuprofen and acetaminophen, cough medicine, rest, and fluid intake. In more severe cases, hospitalization may be required along with supplemental oxygen or mechanical ventilation. The FDA has given emergency approval to treat COVID-19 with drugs called Remdesivir and Baricitinib but only in hospital settings. Corticosteroids such as Dexamethasone may also be given. Convalescent plasma containing COVID-19 antibodies may also be given to patients in a hospital setting. If you are diagnosed with COVID-19 through a throat or nasopharyngeal swab, it is important to self-isolate to avoid spreading the disease to anyone else. It is also important to remember that some individuals can be asymptomatic carriers of the virus.

## Prevention

The best way to prevent COVID-19 is to avoid close contact with other individuals by maintaining a distance of at least 6ft, avoid touching your eyes, nose, and mouth, clean and disinfect surfaces daily, wash your hands with soap and water regularly for 40-60 seconds or use an alcohol rub that contains at least 60% alcohol, avoid large groups,

cover your mouth when coughing or sneezing, and to stay at home if you feel sick. It is also important to wear a mask or face covering when going out in public. To prevent COVID-19, you may also receive an FDA emergency approved vaccination such as Pfizer, Moderna, AstraZeneca, etc. Maintaining a healthy lifestyle and avoiding smoking is also important in preventing COVID-19.

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## Heart Attack

A heart attack, or myocardial infarction, is characterized by decreased oxygen and blood flow to the heart. Sometimes plaque builds up in the coronary arteries that supply blood to the heart in a process called atherosclerosis. When this plaque ruptures, a blood clot can form and block blood flow to the heart partially or completely. The more time that passes during a heart attack, the more damage done to the heart muscle. Within 30 minutes of a blockage, irreversible heart damage can occur. A heart attack can also cause potentially fatal arrhythmias, heart failure, and cardiac arrest.

## Cause

Heart attacks are most often caused by atherosclerosis and coronary artery disease, or the buildup of plaque within the coronary arteries that supply blood flow to the heart. Sometimes this plaque can rupture, causing a blood clot to form and subsequently block blood flow to the downstream region of the heart. In some cases, heart attacks can be caused by spasms of the coronary arteries. Risk factors include age, race, lack of exercise, hypertension, hyperlipidemia, diabetes, obesity, tobacco use, drug use, excessive alcohol consumption, metabolic syndrome, stress, family history of heart disease or heart attack, history of preeclampsia, gender (males or postmenopausal women), poor dieting, certain infections, or certain autoimmune conditions

## Symptoms

- Chest pain, pressure, or tightness (especially on the left side)
- arm/shoulder pain
- Radiation of pain to jaw, arms, shoulders, neck, abdomen, or back
- nausea/vomiting
- Shortness of breath
- Cold sweats
- Sudden weakness/fatigue
- Dizziness/Lightheadedness
- Rapid Pulse

## Treatment

Heart attacks are often treated with medications such as aspirin or nitroglycerin along with blood thinners, thrombolytics, pain medication, and/or other medications.

Surgically, a heart attack patient may undergo percutaneous coronary intervention, in which the Doctor inserts a small catheter through a vein in the wrist or groin and attempts to break up the clot blocking a coronary artery. Doctors may also place a cardiac stent during percutaneous coronary intervention to improve blood flow long-term. In some cases, a coronary artery bypass graft, which involves a more invasive surgery, may be required. Cardiac rehabilitation is often a significant part of treatment as well.

## Prevention

The best way to prevent heart attack is to maintain a healthy weight, eat a heart healthy diet, manage stress, get enough sleep, avoid smoking, control underlying conditions such as hypertension, diabetes, and hyperlipidemia, get regular exercise, see a doctor regularly, and take all medications prescribed by your doctor such as daily aspirin.

## Resources

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## Hyperlipidemia

Hyperlipidemia is a chronic condition caused by too much cholesterol in the bloodstream. Cholesterol is a waxy substance found in the blood that has a variety of functions within the body. There is good cholesterol, or HDL cholesterol, and there is bad cholesterol, or LDL cholesterol. Too much LDL cholesterol or too little HDL cholesterol can put individuals at increased risk for heart disease, vascular disease, pancreatitis, and/or stroke. When LDL cholesterol is too high, fatty deposits build up in the bloodstream and have the potential to cause blockages. Cholesterol levels can be controlled by medication, diet, and weight management.

### Cause

Hyperlipidemia can be caused by genetic or lifestyle factors or a combination of both. Risk factors for hyperlipidemia include eating a high fat diet, diabetes, lack of exercise, smoking, obesity, or family history of hyperlipidemia.

### Symptoms

There are no symptoms of hyperlipidemia. Bloodwork is the only way to diagnose the condition.

### Treatment

Hyperlipidemia can be treated through lifestyle changes or through medication, most commonly in the form of statins. Lifestyle changes include exercise, weight loss, quitting smoking, and managing conditions such as diabetes. Eating a healthy, low-fat diet rich in fruits, vegetables, whole grains, and fish is especially important in lowering cholesterol.

### Prevention

The most effective way to prevent hyperlipidemia is by exercising regularly, eating a low-fat, low-salt diet (especially avoiding saturated fats and trans-fats), maintaining a normal weight and body mass index, avoiding smoking, drinking alcohol in moderation, and managing stress.

## Resources

American Academy of Family Physicians. (2019, December 5). *High cholesterol*.

Familydoctor.org. <https://familydoctor.org/condition/cholesterol/>.

Hormone Health Network. (2020, October). *Hyperlipidemia*.

<https://www.hormone.org/diseases-and-conditions/hyperlipidemia>.

Mayo Clinic Staff. (2019, July 13). *High cholesterol*. Mayo Clinic.

<https://www.mayoclinic.org/diseases-conditions/high-blood-cholesterol/symptoms-causes/syc-20350800>.

Society for Vascular Surgery. (n.d.). *Hyperlipidemia*.

<https://vascular.org/patients/vascular-conditions/hyperlipidemia>.

Stanford Health Care. (2017, September 11). *Hyperlipidemia*.

<https://stanfordhealthcare.org/medical-conditions/blood-heart-circulation/vascular-disease/treatments/hyperlipidemia.html>.

## Hypertension

Hypertension, or high blood pressure, is a chronic condition caused when the blood exerts too much pressure on artery walls. Hypertension usually develops over time and can put an individual at increased risk for heart attack, stroke, kidney failure, vascular disease, aneurysms, heart failure, and vascular dementia. Hypertension can also affect the brain and eyes. Essentially, hypertension makes arteries less elastic over time. Blood pressure is measured with two numbers; the first number is systolic pressure, meaning the blood pressure while the heart is pumping, while the second number is diastolic pressure, meaning the blood pressure while the heart is at rest. Ideal blood pressure rests anywhere between 90/60mmHg and 120/80mmHg.

## Cause

Hypertension can be caused by underlying conditions such as kidney disease or thyroid disease. It can also be caused by certain medications or drug use, specifically cocaine or amphetamines. Risk factors for hypertension include family history of hypertension, age (over 65), race, obesity, lack of exercise, tobacco use, high sodium or low potassium diet, stress, kidney disease, diabetes, sleep apnea, excessive alcohol consumption, and/or inadequate sleep.

## Symptoms

Hypertension usually doesn't present with any symptoms except at severe, life-threatening blood pressure levels. The only way to be diagnosed with hypertension is by having your blood pressure taken at your local clinic or doctor's office. In severe cases, hypertension can cause headache, shortness of breath, or nosebleeds.

## Treatment

Hypertension can be treated to lifestyle changes and/or medication prescribed by a healthcare professional. Lifestyle changes include eating a heart healthy low-sodium diet, maintaining a healthy weight, getting regular exercise, quitting smoking, limiting alcohol consumption, managing stress, and monitoring blood pressure at home.

Healthcare professionals may also prescribe medication such as ACE inhibitors, beta-blockers, calcium channel blockers, or diuretics among others.

## Prevention

The best way to avoid hypertension is to maintain a healthy weight, exercise regularly, eat a heart healthy diet, manage stress, avoid excess alcohol consumption, avoid smoking, control underlying conditions, get an adequate amount of sleep, avoid excess caffeine, and visit a doctor regularly.

## Resources

Centers for Disease Control and Prevention. (2020, May 19). *High blood pressure symptoms and causes*. <https://www.cdc.gov/bloodpressure/prevent.htm>.

Mayo Clinic Staff. (2021, January 16). *High blood pressure (hypertension)*. Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/symptoms-causes/syc-20373410>.

National Health Service. (2019, October 23). *High blood pressure (Hypertension)*. <https://www.nhs.uk/conditions/high-blood-pressure-hypertension/>.

U.S. National Library of Medicine. (2017, February 28). *How to prevent high blood pressure*. MedlinePlus. <https://medlineplus.gov/howtopreventhighbloodpressure.html>.

## Influenza (Flu)

Influenza is a respiratory virus that attacks the nose, throat, and lungs. It is often called the “flu” and spreads through the air and on hard surfaces, especially through sneezing and coughing. Influenza is divided into type A influenza and type B influenza, and there is typically a flu season in the winter months when influenza spreads the most. Influenza can oftentimes be prevented by receiving an annual flu vaccine.

### Cause

Influenza is caused by the Influenza virus and spreads through tiny droplets transmitted through coughing, sneezing, or talking. Children are more likely to develop influenza than older individuals. People who are obese, native American, pregnant, have weakened immune systems, age 65 or older, newborn or under age 5, live in nursing homes, or have chronic illnesses such as asthma, COPD, and/or heart disease are more likely to develop complications from the influenza virus.

### Symptoms

Symptoms of Influenza include...

- Headache
- Muscle aches
- Sweats or chills
- Fever
- Cough
- Weakness/fatigue
- Shortness of breath
- Sore throat
- Runny nose/sneezing
- Nausea and vomiting (more common in children)
- Diarrhea (more common in children)
- Eye pain

## Treatment

Influenza is most often treated with antiviral medication prescribed by a healthcare professional. When diagnosed with Influenza, it is also important to treat symptoms with over-the-counter medications such as Tylenol. Additionally, it is crucial to get plenty of rest and drink plenty of clear fluids to avoid dehydration. The most common complication associated with Influenza is Pneumonia. If you suspect you have Influenza, stay at home to avoid spreading the virus unless you are traveling to see a healthcare professional. In that case, wear a mask to prevent infection. When diagnosed with Influenza, it is best to wait to leave your home until you are 24 hours fever free.

## Prevention

The best way to prevent Influenza is by receiving an annual flu shot. To avoid any kind of illness, including Influenza, it is always a good idea to wash your hands thoroughly and often, avoid touching your face, cover coughs and sneezes with an elbow, clean/disinfect surfaces often, keep distance between yourself and sick people, and avoid crowds.

## Resources

American Lung Association. (2020, October 27). *Influenza (flu)*.

<https://www.lung.org/lung-health-diseases/lung-disease-lookup/influenza>.

Centers for Disease Control and Prevention, & National Center for Immunization and Respiratory Diseases (NCIRD). (2021, May 7). *Influenza (flu)*.

<https://www.cdc.gov/flu/index.htm>.

John Hopkins Medicine. (n.d.). *Influenza*.

<https://www.hopkinsmedicine.org/health/conditions-and-diseases/influenza>.

Mayo Clinic Staff. (2020, December 19). *Influenza (flu)*. Mayo Clinic.

<https://www.mayoclinic.org/diseases-conditions/flu/symptoms-causes/syc-20351719>.

National Foundation for Infectious Diseases. (2020, November). *Flu (influenza)*.  
<https://www.nfid.org/infectious-diseases/influenza-flu/>.

U.S. National Library of Medicine. (2021, March 24). *Flu*. MedlinePlus.  
<https://medlineplus.gov/flu.html>.



## Kidney Stones

Kidney stones, or nephrolithiasis, are characterized by mineral, chemical, and salt deposits building up inside the kidneys and forming stones that block urine flow. There are four types of kidney stones: calcium oxalate stones, uric acid stones, struvite stones, and cystine stones. Kidney stones involve excruciating side/lower back pain and can range from the size of a grain of sand to the size of a golf ball. Kidney stones often travel from the kidneys to the bladder and can typically be excreted from the urine after a period of days to weeks.

### Cause

Kidney stones are caused by small crystalline buildup in the kidneys that is typically associated with low fluid intake. These crystals clump together and form a stone that may partially or fully block the passage of urine from the kidneys to the bladder. Risk factors for kidney stones include a high-protein and low fiber diet, sedentary lifestyle, previous history or family history of kidney stones, previous kidney infections/UTIs, obesity, dehydration/little water intake, certain medications and supplements, weight loss surgery, high sodium or high sugar diet, dehydration, and/or certain medical conditions such as polycystic kidney disease.

### Symptoms

Symptoms of kidney stones include...

- Low back/flank pain
- Pain/burning with urination
- Bloody urine
- Nausea and vomiting
- Difficulty urinating
- Urinary frequency/urgency
- Fever/chills
- Cloudy/foul-smelling urine
- Groin/testicular pain

- Sweating
- Diarrhea

## Treatment

The most preferable treatment option for kidney stones is to let them pass on their own while treating symptoms with over-the-counter medications. In some cases, other medications may be prescribed by a healthcare professional. It is always important to drink plenty of water when undergoing kidney stone treatment. In severe cases, surgery such as shockwave lithotripsy, ureteroscopy, and/or percutaneous nephrolithotomy may be required.

## Prevention

To prevent kidney stones, it is important to drink plenty of water every day, preferably approximately 64 ounces per day. It is also important to limit sodium intake, maintain a healthy weight, take all prescribed medications, and eat a healthy diet rich in calcium and low in oxalate, salt, and animal protein. It is always a good idea to see a doctor on a regular basis.

## Resources

American Kidney Fund. (2020, June 17). *Kidney stone causes, symptoms, treatments, & prevention*. <https://www.kidneyfund.org/kidney-disease/kidney-problems/kidney-stones/>.

Cleveland Clinic. (2021, May 3). *Kidney stones*. <https://my.clevelandclinic.org/health/diseases/15604-kidney-stones#symptoms-and-causes>

John Hopkins Medicine. (n.d.). *Kidney stones*. <https://www.hopkinsmedicine.org/health/conditions-and-diseases/kidney-stones>.

Mayo Clinic Staff. (2020, May 5). *Kidney stones*. Mayo Clinic.

<https://www.mayoclinic.org/diseases-conditions/kidney-stones/symptoms-causes/syc-20355755>.

National Health Service. (2019, April 30). *Overview - kidney stones*.

<https://www.nhs.uk/conditions/kidney-stones/>.

National Kidney Foundation. (2020, June 7). *Kidney stones*.

<https://www.kidney.org/atoz/content/kidneystones>.

Urology Care Foundation, & American Urological Association. (n.d.). *What are kidney stones?* <https://www.urologyhealth.org/urology-a-z/k/kidney-stones>.

## Obesity

Obesity is a preventable disease characterized by too much body fat. Obesity is different from being overweight, which is associated with weighing too much. Obesity is typically diagnosed when an individual's BMI, or body mass index, is 30 or higher while overweight is typically diagnosed when BMI is greater than or equal to 25 in adults. Obesity and overweight can affect both children and adults. Obesity does increase the risk of heart disease, high blood pressure, diabetes, stroke, high cholesterol, metabolic syndrome, sleep disorders, and certain cancers. Obesity may also lower quality of life and may cause certain issues such as depression, social isolation, shame, guilt, etc. Overweight and obesity is associated with more worldwide deaths than being underweight.

To calculate your BMI, click on the link below.

[https://www.nhlbi.nih.gov/health/educational/lose\\_wt/BMI/bmicalc\\_sp.htm](https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmicalc_sp.htm)

[https://www.nhlbi.nih.gov/health/educational/lose\\_wt/BMI/bmicalc.htm](https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmicalc.htm)

BMI (Body Mass Index)	Weight Status
Under 18.5	Underweight
18.5-24.9	Healthy Weight
25.0-29.9	Overweight
30 and above	Obese

Information from <https://www.mayoclinic.org/diseases-conditions/obesity/symptoms-causes/syc-20375742>

## Cause

Obesity is caused by a variety of environmental, genetic, and dietary factors. Genetic, hormonal, metabolic, and behavioral factors all have an influence on an individual's body weight. However, obesity is typically caused when an individual takes in more calories

than he or she uses. These excess calories get stored as fat. Risk factors for obesity include lack of physical activity, poor dieting (eating a diet with excess calories, saturated and trans-fats, and sugars), high stress levels, lack of sleep, low socioeconomic status, certain chemical exposures, family history of obesity, pregnancy, and recent attempts to quit smoking.

### Symptoms

The main symptoms of obesity include increased body mass index, increased waist circumference, and increased body fat.

### Treatment

Obesity is typically treated by health professionals who recommend weight loss and proper dieting. The goal in treating obesity is to help individuals reach and maintain a healthy weight. The initial goal is typically to reduce total weight by 5-10 percent, but the more weight lost, the better. Weight loss involves cutting calories and eating healthier foods while at the same time exercising regularly. Consistent dieting over time is the best way to lose weight and to maintain a healthy weight. Fad diets and quick fixes typically do not work as permanent solutions. The recommendation for weekly exercise is at least 150 minutes per week, but the more an individual exercises, the greater chance he or she has to lose weight. Children should get at least 60 minutes of exercise per day. Aiming to take at least 10,000 steps per day is a healthy goal to lose and maintain weight as well. To treat obesity and lose weight, certain medicines may be prescribed by a healthcare professional, and behavioral therapy such as counseling and support groups may be involved as well. In extreme cases, procedures such as gastric bypass, gastric sleeve, gastrectomy, etc. may be performed.

### Prevention

To help prevent obesity, it is important to exercise regularly, maintain a healthy diet and healthy eating patterns, monitor your weight regularly, get a healthy amount of sleep, and see a doctor on a regular basis.

## Resources

Centers for Disease Control and Prevention. (2021, March 23). *Overweight & obesity*.  
<https://www.cdc.gov/obesity/index.html>.

Mayo Clinic Staff. (2020, November 18). *Obesity*. Mayo Clinic.  
<https://www.mayoclinic.org/diseases-conditions/obesity/symptoms-causes/syc20375742>.

National Heart Lung and Blood Institute. (n.d.). *Overweight and obesity*. National Institutes of Health. <https://www.nhlbi.nih.gov/health-topics/overweight-and-obesity>.

U.S. National Library of Medicine. (2021, August 10). *Obesity*. MedlinePlus.  
<https://medlineplus.gov/obesity.html>.

World Health Organization. (2021, June 9). *Obesity and Overweight*.  
<https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>.

## Pneumonia

Pneumonia is characterized by infection of the lungs with associated fluid and pus buildup in the alveoli, or sacs within the lungs. When the alveoli fill with fluid or pus it may cause a productive cough or make breathing difficult. Pneumonia symptoms range from mild to severe, and certain types of pneumonia, such as bacterial and viral pneumonia, can be contagious.

### Cause

Pneumonia is caused by bacterial, viral, and fungal infections. Individuals are especially susceptible to pneumonia if they have had a recent infection such as cold or flu. In someone with pneumonia, the immune system causes inflammation in the alveoli, which in turn causes fluid and pus buildup in the lungs. Risk factors for pneumonia include smoking or secondhand smoke exposure, alcohol consumption, a weakened immune system, heart or lung disease such as CAD or COPD, hospitalization, toxic chemical exposure, pregnancy, and/or certain neurological conditions that cause difficulty coughing and swallowing. Individuals age 65 or older and individuals 2 years old or younger are also at greater risk for pneumonia.

### Symptoms

Symptoms of pneumonia include...

- Chest pain with breathing or coughing
- Productive cough
- Confusion
- Fever and chills
- Sweats
- Weakness and Fatigue
- Low body temperature
- Shortness of breath
- Nausea and vomiting
- Diarrhea

- Loss of appetite
- Rapid and shallow breathing
- Low oxygen levels (measured with a pulse oximeter)
- Blueish color of lips and fingernails
- Rapid pulse
- Headache
- Body aches

### Treatment

Pneumonia is treated depending on the specific type of pneumonia. For bacterial pneumonia, antibiotics are usually prescribed, and for viral pneumonia, antiviral medications may be prescribed. Likewise, fungal pneumonia is often treated with prescribed antifungal medications. Your doctor may also recommend treating your symptoms with over-the-counter medication such as Tylenol and Ibuprofen. Always ask your doctor before taking any over-the-counter cough medicine with pneumonia. In severe cases, hospitalization may be required so doctors can provide oxygen therapy and give IV fluids.

### Prevention

The best way to prevent pneumonia is to get the pneumococcal pneumonia vaccine if you are under age 5, over age 65, or are at increased risk for pneumonia. Staying up to date on all other vaccines, such as receiving an annual flu shot or vaccinating your children for Hib (*Haemophilus Influenzae* type b) is also important in preventing pneumonia. Practicing good hygiene is important as well, especially washing your hands often, avoiding touching your face, and using hand sanitizer when available. To prevent pneumonia, it is always a good idea to quit smoking and to maintain a healthy immune system by getting plenty of sleep, getting regular exercise, and eating a healthy diet.

### Resources



American Lung Association. (2020, October 23). *Learn About Pneumonia*. American Lung Association. <https://www.lung.org/lung-health-diseases/lung-disease-lookup/pneumonia/learn-about-pneumonia>.

Cleveland Clinic. (2020, June 15). *Pneumonia*. <https://my.clevelandclinic.org/health/diseases/4471-pneumonia#symptoms-and-causes>.

John Hopkins Medicine. (n.d.). *Pneumonia*. <https://www.hopkinsmedicine.org/health/conditions-and-diseases/pneumonia>.

Mayo Clinic Staff. (2020, June 13). *Pneumonia*. Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/pneumonia/symptoms-causes/syc-20354204>.

U.S. National Library of Medicine. (2021, January 4). *Pneumonia*. MedlinePlus. <https://medlineplus.gov/pneumonia.html>.

National Heart, Lung, and Blood Institute. (n.d.). *Pneumonia*. National Institutes of Health. <https://www.nhlbi.nih.gov/health-topics/pneumonia>.

World Health Organization. (2019, August 2). *Pneumonia*. <https://www.who.int/news-room/fact-sheets/detail/pneumonia>.

## Scabies

Scabies is an infectious skin condition caused by human itch mite infestation and characterized by itchiness and a pimple-like rash. Scabies can be spread from person to person by prolonged direct skin to skin contact with someone who has scabies. It can also spread through contact with infested clothes, bedding, and furniture. Scabies is especially prone to spread in families, childcare facilities, schools, hospitals, nursing homes, prisons, and anywhere close contact is inevitable. Crusted scabies, or Norwegian scabies, is simply a severe form of scabies in immunocompromised individuals, who may not show the characteristic skin rash associated with scabies.

## Cause

Scabies is caused by the human skin mite *sarcoptes scabiei*, which burrows into the top layer of human skin and lays its eggs. The larvae from the eggs then mature and spread to other individuals through prolonged skin to skin contact. The itching sensation associated with scabies is the body's allergic reaction to the skin mites, and anyone can be infected with scabies. Scabies does not typically spread through hugs or handshakes but rather through prolonged contact, such as adults participating in sexual intercourse.

## Symptoms

Symptoms of scabies include...

- Itching, especially at night
- Papular, pimple-like rash that may include blisters and scales
- Thick skin crusts (in patients with crusted scabies)
- Sores caused by scratching that may become infected

## Treatment

Scabies is typically treated with scabicides that kill the skin mites. Scabicides come in the form of creams and lotions and can only be prescribed by a doctor or other healthcare professional. The itching may continue for several weeks after treatment, and household contacts and recent sexual partners should also be treated for scabies preventatively. Your

doctor may also recommend soaking in cool water or using soothing lotion to reduce itching, and they may also prescribe an antihistamine to help with itchiness. It is also important to wash all clothes, bedding, and towels in hot water and in a hot dryer after a scabies infection. It is also important to vacuum your entire home if you or a member of your household have been infected with scabies.

## Prevention

To prevent scabies, it is important to wash all clothes, bedding, and furniture regularly, especially in hot water or in a hot dryer. It is also important to clean and vacuum your home on a regular basis.

## Resources

American Academy of Dermatology Association. (n.d.). *Scabies: Overview*.

<https://www.aad.org/public/diseases/a-z/scabies-overview>.

Centers for Disease Control and Prevention. (2020, September 1). *Scabies frequently asked questions (FAQs)*.

[https://www.cdc.gov/parasites/scabies/gen\\_info/faqs.html](https://www.cdc.gov/parasites/scabies/gen_info/faqs.html).

Mayo Clinic Staff. (2020, August 25). *Scabies*. Mayo Clinic.

<https://www.mayoclinic.org/diseases-conditions/scabies/symptoms-causes/syc-20377378>.

U.S. National Library of Medicine. (2020, September 29). *Scabies*. MedlinePlus.

<https://medlineplus.gov/scabies.html>.

## Seizures

There are many different types of seizures, but seizures typically involve jerking and shaking movements or temporary loss of awareness. Seizures can be grouped into two different categories. Focal, or partial, seizures affect only one side of the brain while generalized seizures affect the entire brain. Seizures are caused by electrical disturbances within the brain, and if a person has 2 or more seizures at least 24 hours apart, he or she may have a disorder called epilepsy. Most seizures last in between 30 seconds and 2 minutes.

## Causes

Seizures are caused by sudden electrical pulse disruptions within the brain. These disruptions may be caused by high fever, flashing lights or other verbal stimuli, menstrual periods, low blood sodium, lack of sleep, certain medications, head trauma, brain tumors, stroke, vascular abnormalities within the brain, certain autoimmune disorders, drug use, alcohol use, or COVID-19. Not everyone who has seizures has epilepsy, but risk factors for epilepsy include head injuries, stroke, vascular disease, age (children and older adults), family history, brain infections such as meningitis or encephalitis, and/or history of childhood seizures.

## Symptoms

Symptoms of seizures include...

- Temporary confusion
- Jerking movements, especially in the arms or legs
- Loss of consciousness
- Loss of awareness
- Staring spells
- Anxiety, fear, and/or déjà vu
- Tongue biting
- Bowel/Bladder incontinence

## Treatment

Seizures and epilepsy are most commonly treated with antiepileptic medication prescribed by a healthcare professional. In some cases, especially in children, doctors may recommend a ketogenic diet high in fats and low in carbohydrates and protein. This diet should only be followed when instructed by a healthcare professional due to the impending risks of a high-fat diet. In severe cases, surgery or electrical stimulation may be required.

## Prevention

The best way to prevent seizures is to manage all fevers with over-the-counter medication, take precaution to prevent head injuries, take adequate care of all infants, control underlying conditions such as diabetes and cardiovascular disease, and practice good hygiene.

## Resources

Mayo Clinic Staff. (2021, February 24). *Seizures*. Mayo Clinic.

<https://www.mayoclinic.org/diseases-conditions/seizure/symptoms-causes/syc-20365711>.

Mayo Clinic Staff. (2021, March 31). *Epilepsy*. Mayo Clinic.

<https://www.mayoclinic.org/diseases-conditions/epilepsy/symptoms-causes/syc-20350093>.

National Health Service. (2020, September 18). *Epilepsy*.

<https://www.nhs.uk/conditions/epilepsy/>.

U.S. National Library of Medicine. (2021, April 12). *Seizures*. MedlinePlus.

<https://medlineplus.gov/seizures.html>.

World Health Organization. (2019, June 20). *Epilepsy*. <https://www.who.int/news-room/fact-sheets/detail/epilepsy>.

## Strep Throat

Strep throat is a bacterial infection characterized by a sore or scratchy throat and is caused by group A streptococcus bacteria. Strep throat can spread easily from person to person and lives in the nose and throat area. This bacterial infection can cause rheumatic fever if left untreated, which may lead to further complications. Strep throat can be easily diagnosed within minutes with a simple throat swab.

## Causes

Strep throat is caused by Streptococcus A bacteria and is more common in children than it is in adults. People who are in close contact with someone who has strep throat are at greater risk of developing infection. Strep throat tends to spread more in winter and spring months and can be spread through droplets in the air, especially when someone with strep throat coughs or sneezes. Strep throat can also spread on hard surfaces.

## Symptoms

Symptoms of strep throat include...

- Sore throat
- Pain with swallowing
- Swollen cervical lymph nodes
- Fever
- Red, swollen tonsils sometimes with white spots or streaks
- Red spots on the roof of the mouth
- Headache
- Rash
- Nausea and vomiting (more in younger children)
- Body aches
- Loss of appetite
- Abdominal pain

## Treatment

Strep throat is typically treated with antibiotics such as penicillin and amoxicillin. It is also important to drink plenty of fluids that are soothing to the throat and to take over-the-counter medication such as ibuprofen or acetaminophen to treat symptoms of strep throat. When taking antibiotics, it is important to continue taking the medication for the full amount of time prescribed even if you feel better unless your doctor tells you to stop.

## Prevention

The best way to prevent strep throat is by practicing good hygiene and washing your hands often. It is always a good idea to cover your mouth with your elbow when you cough or sneeze and to use hand sanitizer when soap and water are not available.

## Resources

Centers for Disease Control and Prevention. (2021, January 12). *Strep throat: All you need to know*. <https://www.cdc.gov/groupastrep/diseases-public/strep-throat.html>.

Cleveland Clinic. (2019, September 18). *Strep throat*. <https://my.clevelandclinic.org/health/diseases/4602-strep-throat#outlook--prognosis>.

Mayo Clinic Staff. (2020, December 17). *Strep throat*. Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/strep-throat/symptoms-causes/syc-20350338>.

## Stroke

A stroke, or cerebrovascular accident, occurs when the blood supply to the brain is reduced or cut off. Without oxygen and nutrients, brain cells begin to die within minutes. Strokes can cause permanent disability, brain damage, and in some cases death. Strokes are emergencies and should be treated immediately for the best chance at survival. If you think yourself or someone around you is having a stroke, call emergency medical services immediately. There are three main types of strokes: ischemic strokes, hemorrhagic strokes, and transient ischemic attacks. Ischemic strokes (87% of strokes) occur when blood flow is cut off or reduced to the brain by some factor such as a blood clot. Hemorrhagic strokes occur when there is bleeding on the brain that causes neurological damage. Transient ischemic attacks, or “mini strokes,” involve only temporary loss of blood flow to the brain but may be a warning sign of a future stroke.

## Cause

Strokes are caused by either a blocked artery or leakage from a blood vessel in the brain. Risk factors for strokes include high blood pressure, obesity, smoking, hyperlipidemia, illegal drug use (such as cocaine and methamphetamine), sedentary lifestyle, heavy alcohol consumption, diabetes, cardiovascular disease (especially atrial fibrillation), history or family history of prior stroke, transient ischemic attack, or heart attack, and COVID-19. Individuals age 55 and older, African American and Hispanic individuals, men, individuals on birth control and/or hormone therapy, who eat an unhealthy diet, who have high red blood cell counts, and who are under a significant amount of stress are also at greater risk for stroke.

## Symptoms

Symptoms of stroke include...

- Difficulty speaking and understanding speech
- Vision changes
- Severe headache
- Paralysis/numbness on one or both sides of the face, arms, or legs



- Facial droop on one or both sides with smiling
- Difficulty walking/loss of balance
- Dizziness
- Slurred speech
- Confusion/memory loss
- Nausea and vomiting
- Fainting or seizures
- Difficulty swallowing

### Treatment

The type of treatment given for stroke depends on the type of stroke an individual is undergoing. In ischemic strokes, medication called tPA, or tissue plasminogen activator, may be given. Additionally, emergency endovascular procedures may be performed to break up a clot or prevent further blood clotting. In hemorrhagic strokes, medication may be given, but surgery is often required to reduce intracranial pressure or to clip an aneurysm in the brain. Depending on the case, other surgeries may be required for treatment or preventative measures. After a stroke, patients are often sent to stroke rehabilitation with different specialists to relearn basic skills and to help them recover in the best way possible.

### Prevention

To prevent stroke, it is important to control all underlying conditions such as hypertension, diabetes, obstructive sleep apnea, and heart disease and to eat a heart healthy diet high in fruits and vegetables and low in trans-fat, saturated fats, cholesterol, salt, and sugar. It is also important to maintain a healthy weight, avoid or quit tobacco use, avoid illegal drug use, limit alcohol consumption, get regular exercise, take all prescribed medications consistently, and see a doctor regularly. Certain surgical procedures may be required, such as a carotid endarterectomy or a carotid angioplasty and stent placement. Your doctor may also prescribe you certain anticoagulants (blood thinners) or antiplatelet medication.

## Resources

American Association of Neurological Surgeons. (n.d.). *Stroke*.

<https://www.aans.org/en/Patients/Neurosurgical-Conditions-and-Treatments/Stroke>.

American Diabetes Association. (n.d.). *Stroke*.

<https://www.diabetes.org/diabetes/complications/stroke>.

Centers for Disease Control and Prevention. (2021, May 25). *Types of stroke*.

[https://www.cdc.gov/stroke/types\\_of\\_stroke.htm](https://www.cdc.gov/stroke/types_of_stroke.htm).

John Hopkins Medicine. (n.d.). *Stroke*.

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## Congenital Defects

### Cleft Lip

A cleft lip involves a gap in the lip of an individual at birth while a cleft palate is a gap in the roof of the mouth at birth. These conditions can happen either separately or together. Cleft lip and cleft palate may involve difficulty speaking and feeding and can cause an individual to develop ear infections, hearing problems, and/or teeth problems. These conditions are caused when the tissue making up the lip or palate doesn't completely join in the mother's womb prior to birth. Cleft lip and cleft palate may be caused by a combination of genetic and environmental factors. Risk factors include smoking or drinking alcohol during pregnancy, family history of cleft lip or cleft palate, obesity during pregnancy, diabetes during pregnancy, lack of folic acid during pregnancy, and taking certain seizure medications or steroid tablets during pregnancy. Cleft lip with or without cleft palate is more common in males while cleft palate is more common in females. Cleft lip and cleft palate are most often treated with surgery during the infant and early childhood years. Further dental, orthodontic, speech therapy, ENT, or psychology follow-up may be required for patients with cleft lip and/or cleft palate.



Cleft Lip



Cleft Lip Repair

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## Spina Bifida

Spina bifida is a neural tube defect caused when the neural tube, which eventually becomes the brain and spinal cord, does not close properly during pregnancy. The most severe type of spina bifida is called myelomeningocele, but there are other less severe types of spina bifida such as meningocele and spina bifida occulta. In myelomeningocele, there is a fluid filled sac that protrudes through the baby's lower back containing damaged nerves and parts of the spinal cord. This can cause disabilities such as bladder and bowel dysfunction, hydrocephalus (excess cerebrospinal fluid on the brain), orthopedic malformations, sexual dysfunction, intellectual disability, development of a latex allergy, and paralysis/numbness in the lower extremities. The cause of spina bifida is thought to be both genetic and environmental. Risk factors include a family history of neural tube defects, folate deficiency, certain medications (anti-seizure meds such as Valproic Acid and Carbamazepine), obesity during pregnancy, diabetes during pregnancy, and fever during pregnancy. Women who take folic acid during and before pregnancy are much less likely to have a child with spina bifida. Spina bifida may be treated with prenatal and postnatal surgery and may involve ongoing treatment for complications such as bowel and bladder dysfunction, difficulty walking, or hydrocephalus. Many individuals with spina bifida require mobile assist devices to function properly.

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## Down Syndrome

Down syndrome, or trisomy 21, is a disorder from birth characterized by a flattened face, upward slanting eyes, tongue protrusion, low muscle tone, small hands and feet, and intellectual disability. Down syndrome is caused by an extra copy of chromosome 21, making for 3 copies of chromosome 21, whereas a normal body only has 2 copies. The older a woman is when she has a child, the more likely the child is to have down syndrome. Children with down syndrome may be at increased risk for heart defects, gastrointestinal problems, leukemia, dementia/Alzheimer's, obesity, immune disorders, spinal issues, sleep apnea, and/or other health problems. There are three different types of down syndrome: trisomy 21, mosaic down syndrome, and translocation down syndrome. Down syndrome is typically treated with routine medical care, speech therapy, occupational therapy, physical therapy, and behavioral therapy. It is also important to have a good support system of family and friends. Despite the many challenges, many people with down syndrome can live joyful and productive lives.





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## Common Medications

There are thousands upon thousands of prescription medications approved by the Federal Drug Administration. Most of them must be prescribed by a doctor, and one should be especially careful to follow all instructions recommended by a doctor or pharmacist when taking medication. Only take medication prescribed for you in the right dosage by a healthcare professional. Individuals must see a doctor to obtain any kind of prescription medication, so this page will focus on common over-the-counter medications that can help relieve everyday ailments such as headache, stomach pains, fever, etc. It is always important to talk to your doctor before taking any over-the-counter medication, especially if you have any questions or concerns. Always read the warning label and dosing on the packaging to know what to take and how much to take before consuming any over-the-counter medication. Before taking any medication, make sure the medication is not expired, is used for the condition being treated, is taken as advised, is taken in the recommended dose, and that all precautions are fully followed.

### Pain Relief and Fever

- Ibuprofen (Advil, Motrin, Ibu, Motrin IB)
- Acetaminophen (Tylenol, Paracetamol, Panadol, Aceta)
- Naproxen (Aleve, Anaprox, Naprosyn, Naproxen Sodium DS)

Aspirin (Acetylsalicylic Acid, Aspir 81, Ecotrin, Bayer Aspirin) **Warning - Do not give aspirin to children under the age of 16, for it may cause Reye's Syndrome.**

### Cough, Cold, and Allergy Relief

#### Decongestants

- Phenylephrine (Sudafed PE Congestion, Neo-Synephrine, Nasal Decongestant PE, Biorphen)
- Pseudoephedrine (Sudafed 12/24 Hour, Sudafed Congestion, SudoGest, Allegra-D (Combination Product))

#### Cough Suppressants

- Dextromethorphan (Delsym, Robitussin, Vicks 44)
- Guaifenesin (Mucinex, Robitussin, Vicks Dayquil)

#### Antihistamines

- Brompheniramine (Dimetapp Allergy, P-Text, Bromaphen, J-Tan PD)
- Chlorpheniramine (Chlor Trimeton, Aller-Chlor, Allergy Relief, Clorphen)
- Dimenhydrinate (Dramamine, Driminate, Triptone)
- Diphenhydramine (Benadryl, Banophen, ZzzQuil, Benadryl Allergy)
- Doxylamine (Sleep Aid, Nighttime Sleep Aid, Unisom Sleep Tabs, Equate Sleep Aid)
- Loratadine (Claritin, Alavert, Allergy Relief Tablets)
- Cetirizine (Zyrtec, Children's Zyrtec, Aller-Tec, Equate Allergy Relief)
- Fexofenadine (Allegra, Allegra Allergy, Allegra Hives, Mucinex Allergy)

#### Stomach Problems

##### Anti-diarrheals

- Loperamide (Imodium, Imodium A-D, Anti-Diarrheal, Diamode)
- Bismuth Subsalicylate (Kaopectate, Pepto-Bismol, Stomach Relief, Bismatrol)

##### Anti-nausea and vomiting

- Bismuth Subsalicylate (Kaopectate, Pepto-Bismol, Stomach Relief, Bismatrol)
- Dimenhydrinate (Dramamine, Driminate, Triptone)

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## **Organ Systems**

### **Cardiovascular System**

The cardiovascular system is composed of the heart and blood vessels, including the arteries, veins, and capillaries. The human heart is roughly the size of a man's closed fist. The arteries carry oxygen-rich blood from the heart to the rest of the body while the veins carry oxygen-poor blood from the body back to the heart. The capillaries are small blood vessels where oxygen and nutrient transport occur within the systemic circuit. There are capillaries in every cell and tissue of the human body. Blood is also part of the cardiovascular system and functions by delivering oxygen and nutrients to the body while removing waste and carbon dioxide. The heart functions as a pump and is composed of the following four chambers: right atrium, right ventricle, left atrium, left ventricle. The right atrium pumps blood through the tricuspid valve to the right ventricle, which pumps blood through the pulmonary artery to the lungs, where the blood is oxygenated. After the blood has been oxygenated, it flows from the lungs through the pulmonary veins and into the left atrium. The left atrium then pumps the blood through the bicuspid valve into the left ventricle, which pumps blood through the aorta and into the rest of the body, as shown below. The three layers of the heart include the epicardium, myocardium, and endocardium. The heart's conduction system sends electrical impulses from the brain to the heart to keep it pumping on rhythm, which keeps blood circulating in the most effective way. The cardiovascular system is sometimes called the circulatory system. The best way to keep the cardiovascular system healthy is to eat a heart healthy diet high in fruits, vegetables, and whole grains and low in salt/sodium, sugar, saturated fats, and trans-fats. It is also important to maintain 40 to 60 minutes of physical exercise daily,



avoid smoking and tobacco use, avoid excessive alcohol consumption, manage stress, get quality sleep, see a doctor regularly, manage all underlying conditions (hypertension, diabetes, hyperlipidemia), and maintain a healthy weight.

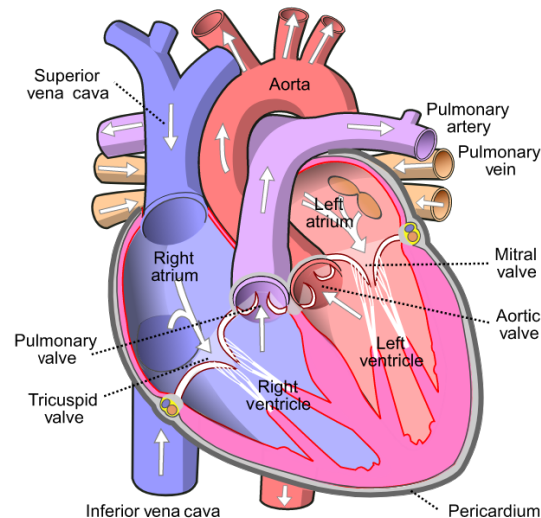


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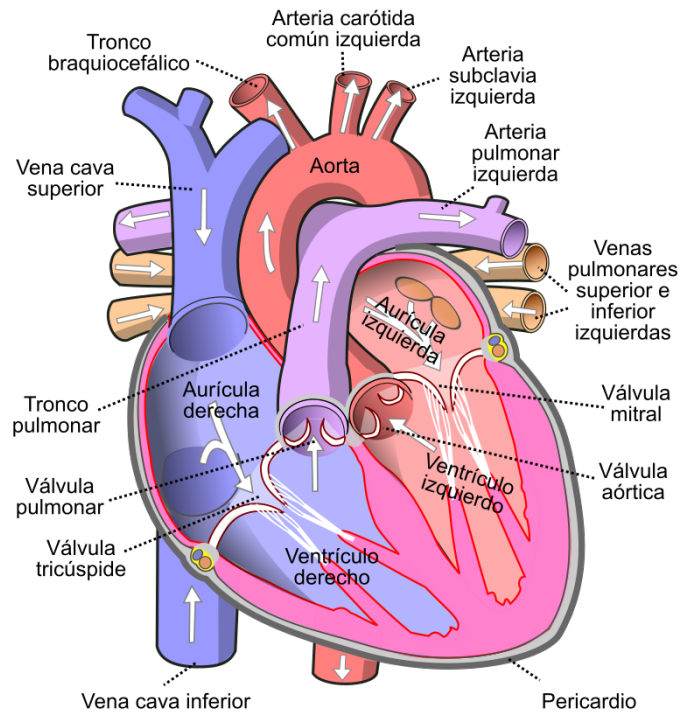


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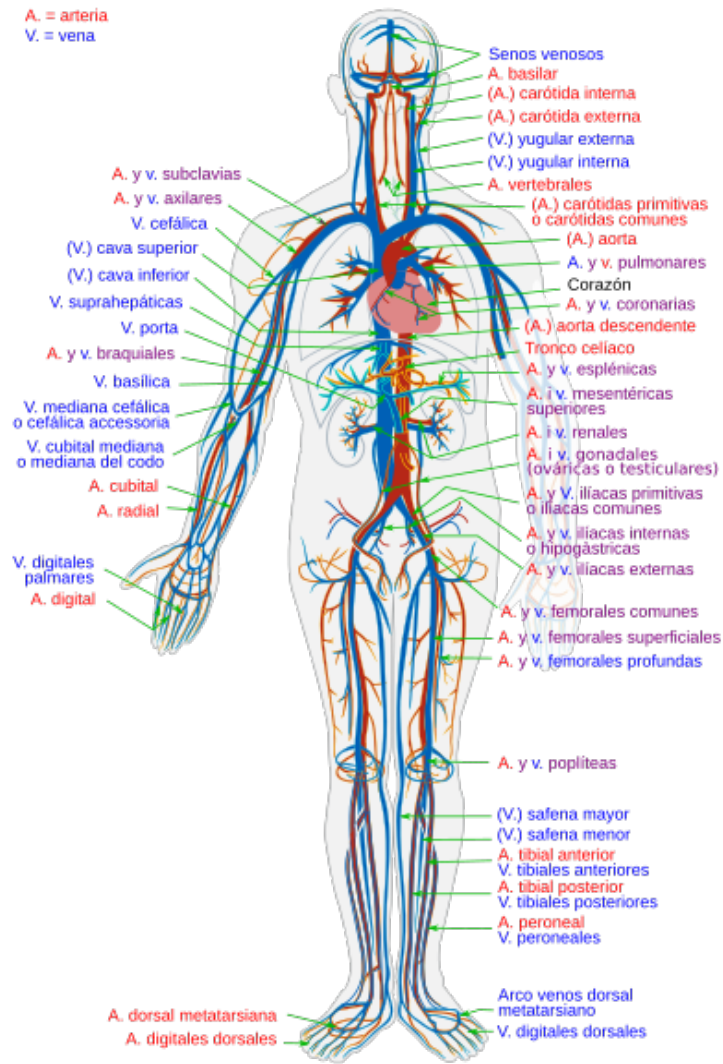


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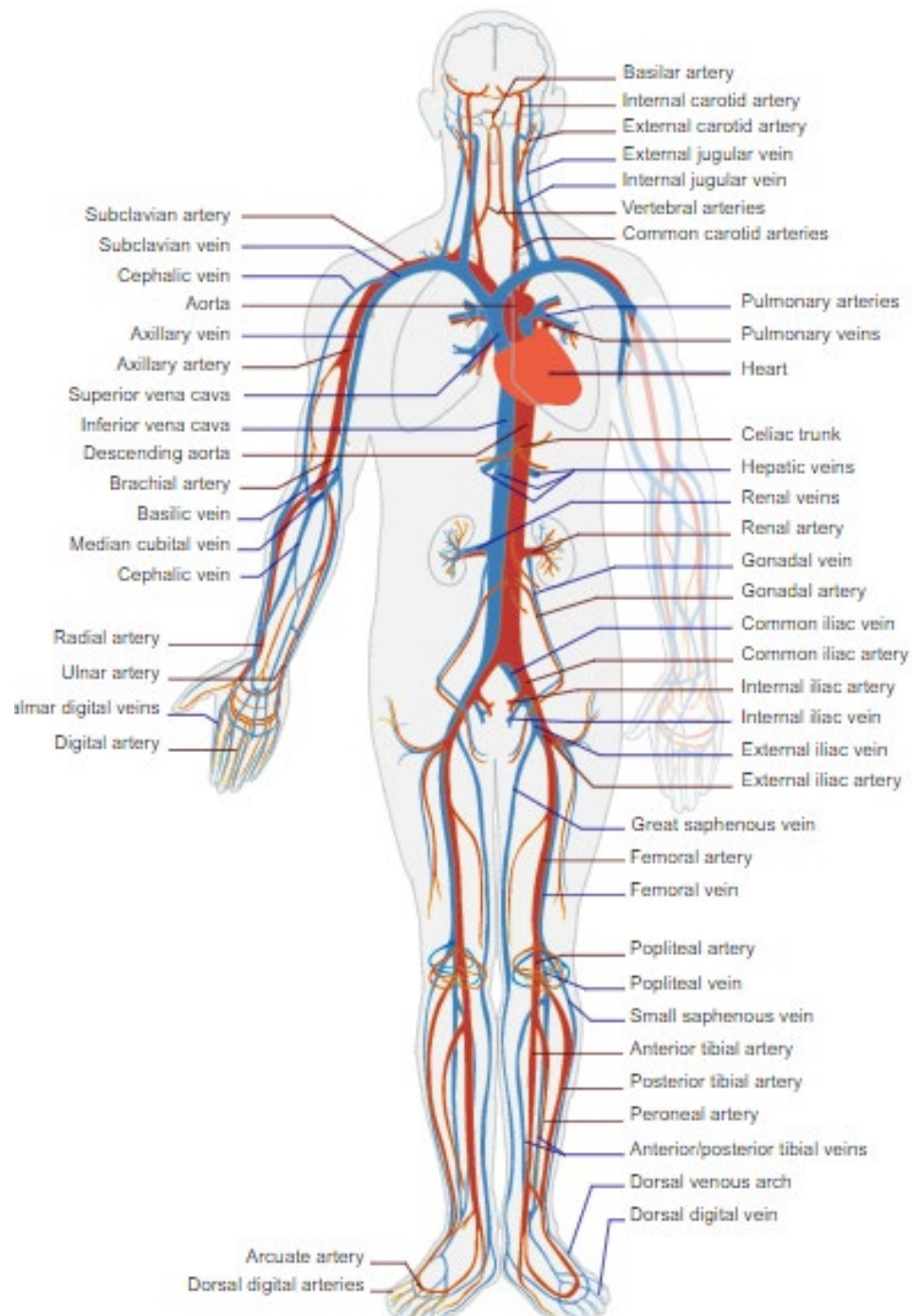


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## Respiratory System

The respiratory system is simply a network of tissues and organs that enables breathing, or ventilation, including inspiration and expiration of air from the lungs. The respiratory system enables ventilation by creating pressure differences that allow air to flow in and out of the lungs. These pressure differences occur when the diaphragm, a muscle in the chest, contracts and relaxes. The respiratory system allows atmospheric oxygen to be transported into human cells, which is crucial to everyday survival. Besides transporting oxygen, the respiratory system also removes waste products, such as carbon dioxide, from the body. The respiratory system is in charge of functions such as breathing, talking, smelling, protecting the airways, and regulating the temperature and humidity of the air that goes into the body. The respiratory system is composed of the mouth, nose, pharynx (throat), sinuses, trachea, bronchial tubes, alveoli, larynx (voice box), and lungs.

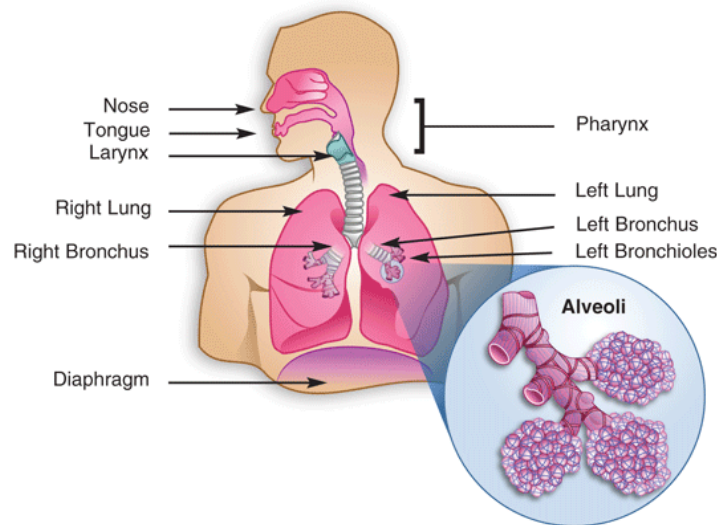


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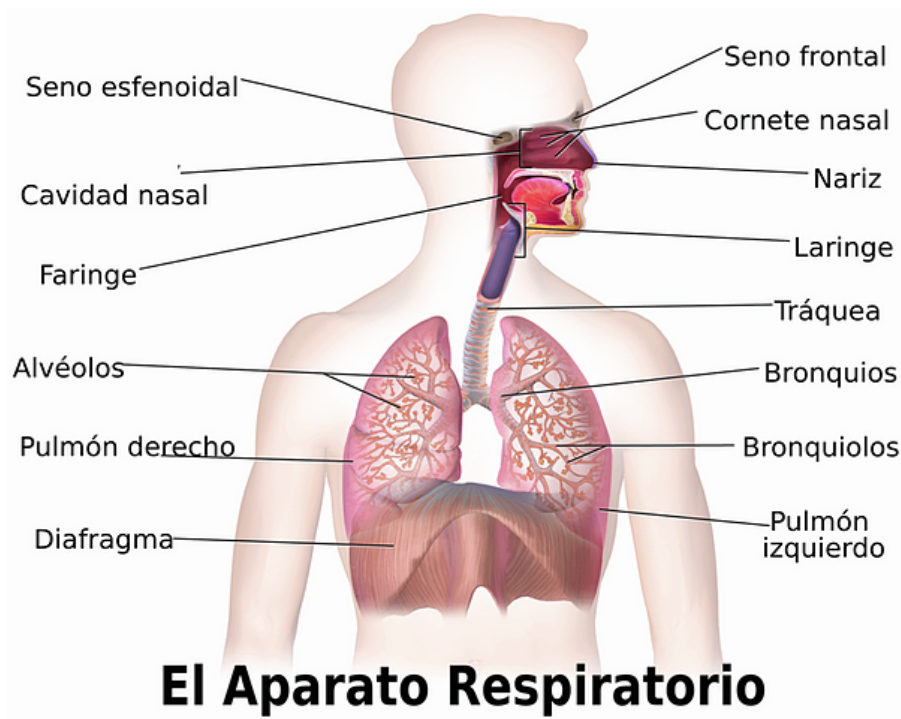


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## Nervous System

The nervous system is made up of the central nervous system and the peripheral nervous system. The central nervous system is made up of the brain and spinal cord while the peripheral nervous system includes all the nerves that extend from the spinal cord to the rest of the body. The nervous system can further be divided into the somatic nervous system, which controls voluntary movement, and the autonomic nervous system, which controls involuntary movements such as breathing. Within the nervous system, there are nerves, which are made up of neurons, that control motor movement and sensation. There are also glial cells within the nervous system that help support and nourish the neurons. The nervous system controls functions such as motor movement, sensation, breathing, heart contractions, thought, memory, vision, metabolism, and many others. The nervous system works by sending electrical and chemical signals through the nerves to and from the body's tissue.



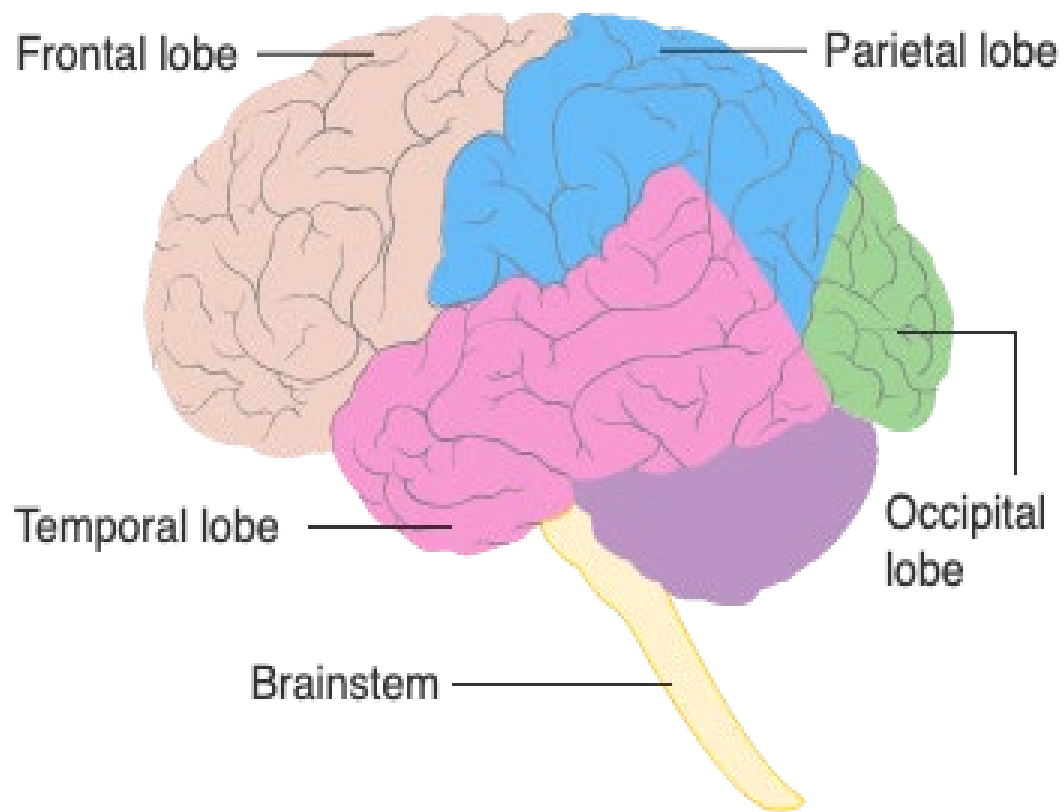


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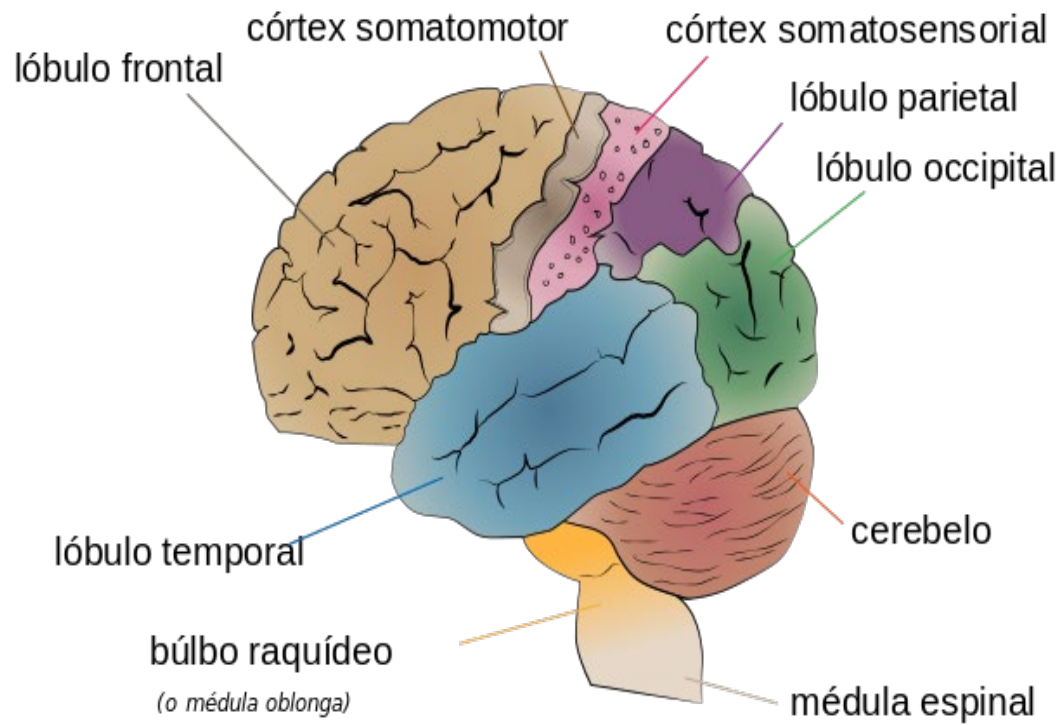


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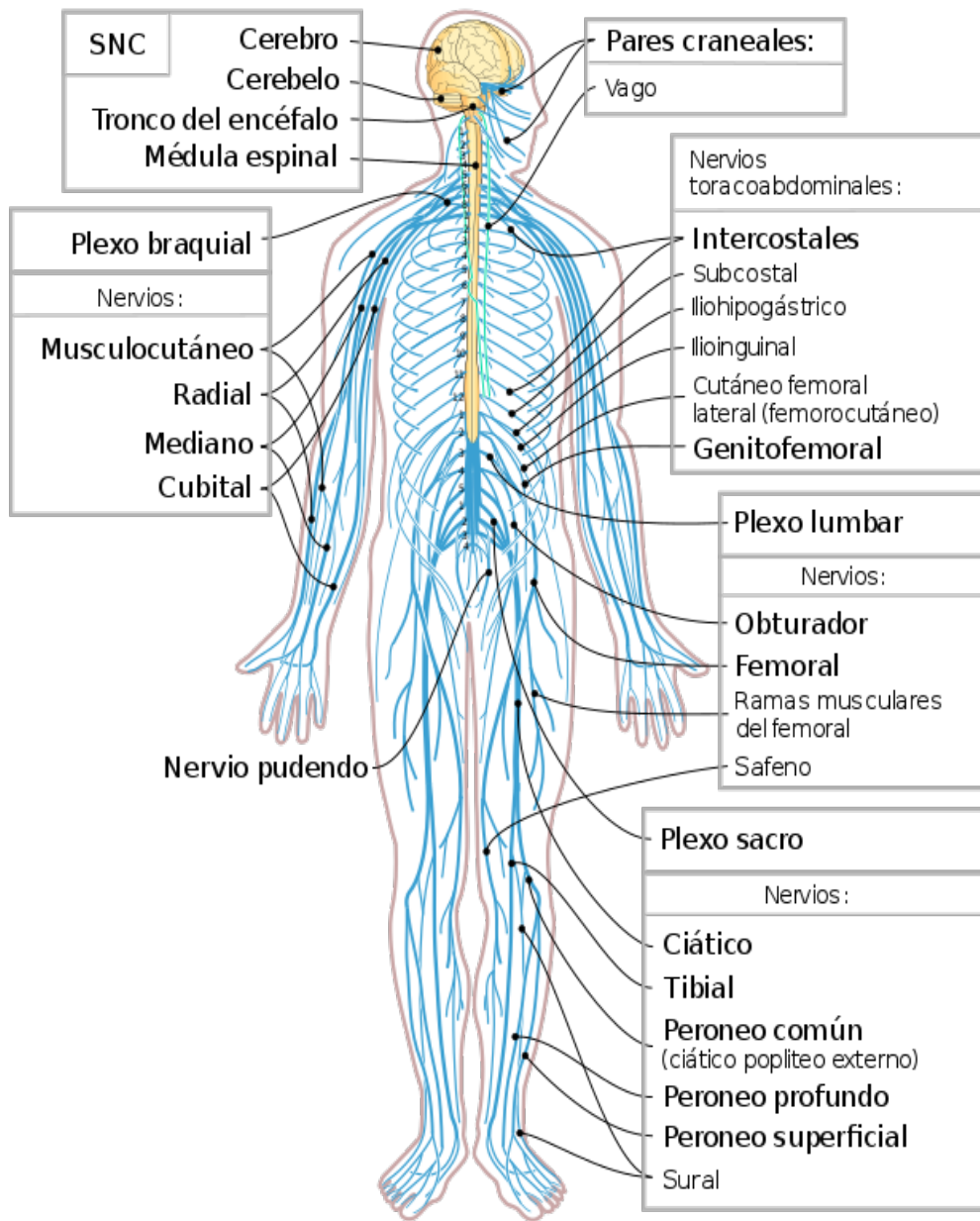


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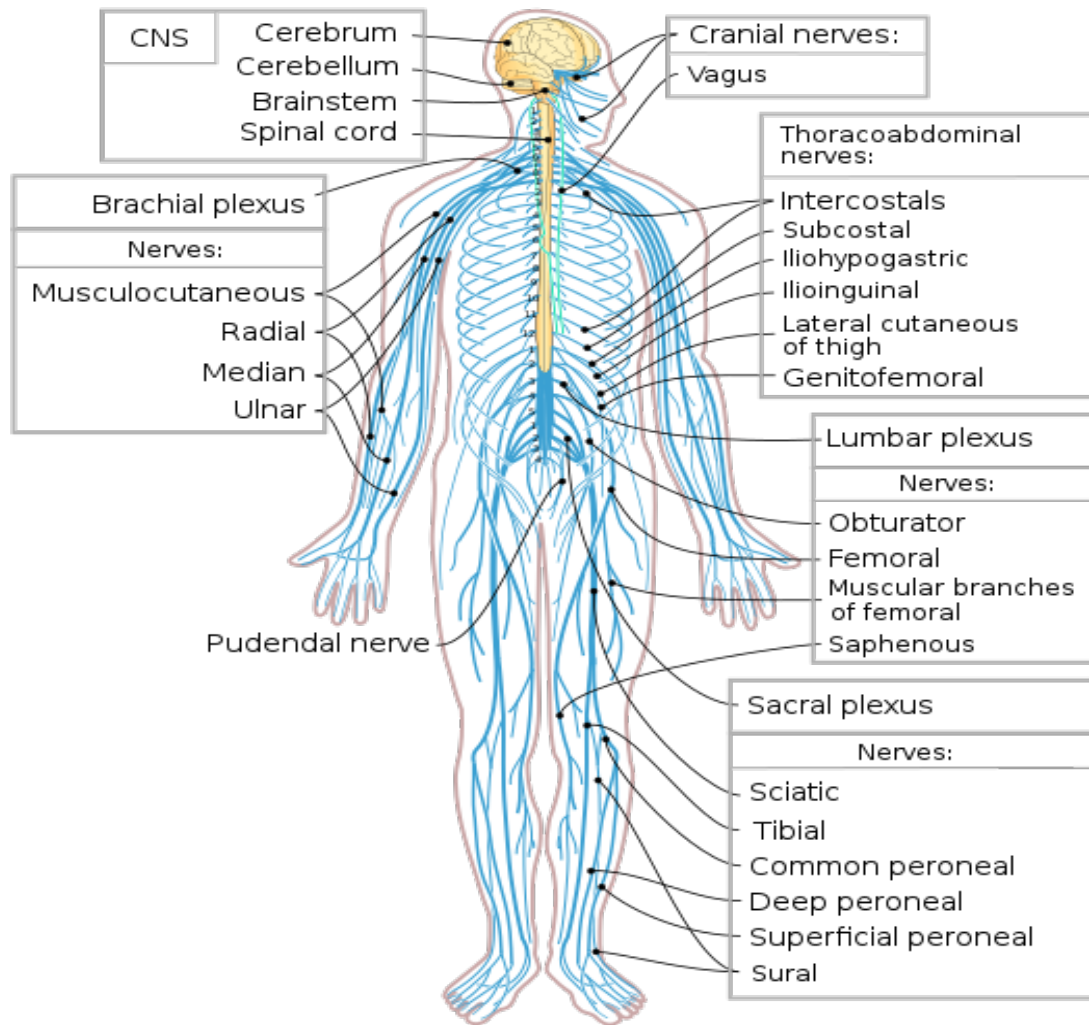


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## Digestive System

The digestive system is composed of the gastrointestinal tract and accessory organs. The digestive tract includes the mouth, pharynx (throat), esophagus, stomach, small intestines, large intestine, rectum, and anus while accessory organs include the liver, gallbladder, pancreas, and salivary glands. Overall, the function of the digestive tract can be broken down into 3 components: digestion, absorption, and elimination. Within the GI tract, there are many bacteria and enzymes that help break down food. The accessory organs help reduce and excrete these enzymes. Once food is broken down, it gets absorbed into the bloodstream, and nutrients get fed to the rest of the body. The gastrointestinal tract uses a process called peristalsis, which involves smooth muscle contractions, to move food through the hollow organs of the GI tract. After necessary nutrients are absorbed, waste products are released through defecation.

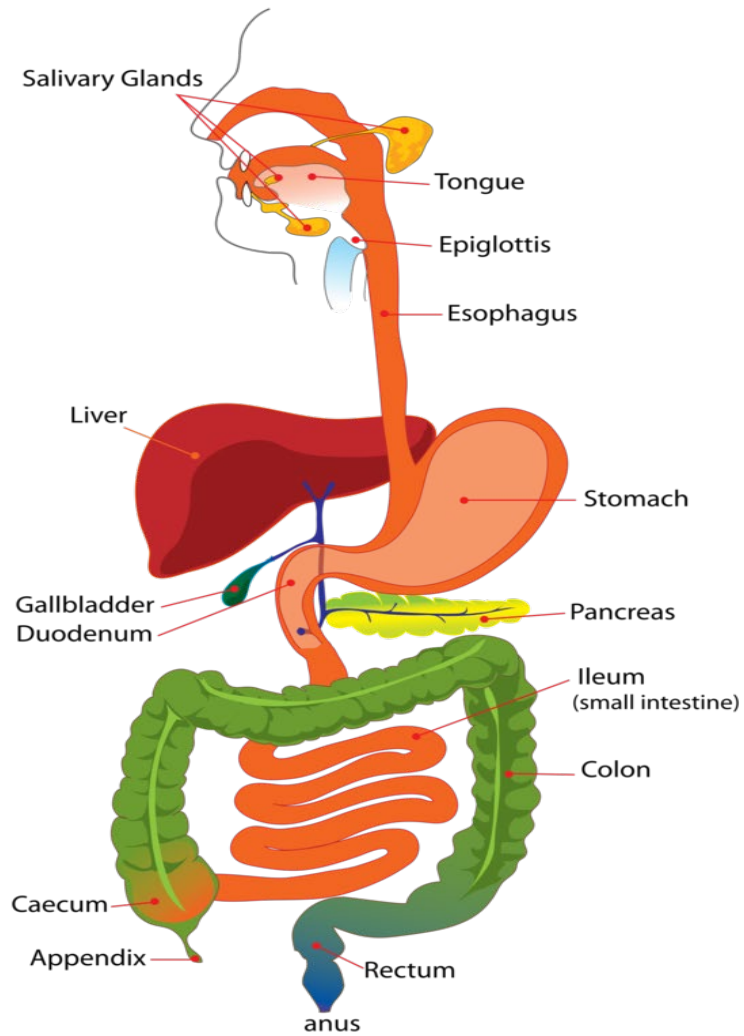


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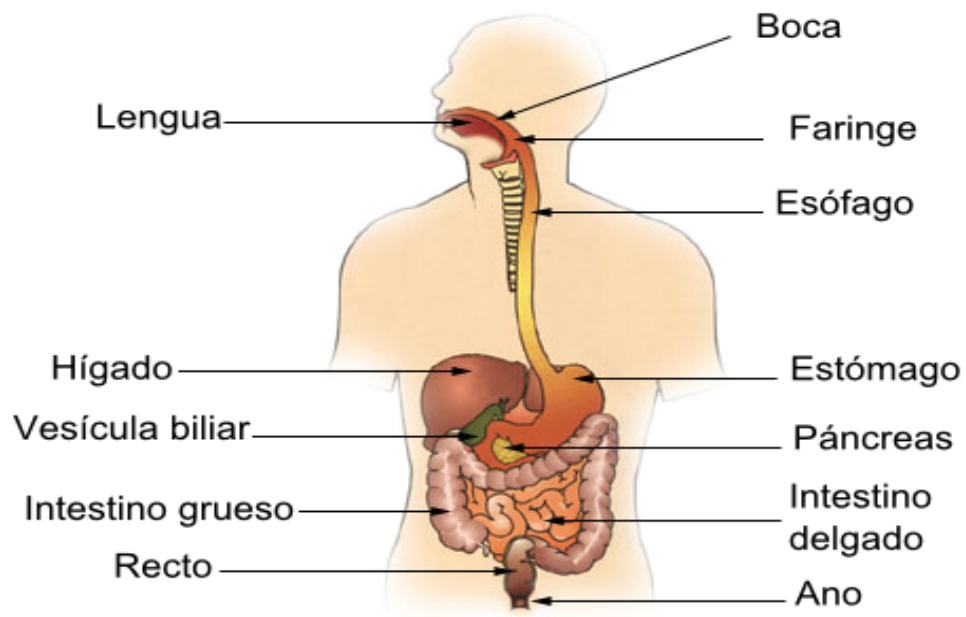


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## Musculoskeletal System

The musculoskeletal system is composed of human bones and skeletal muscle. The skeletal system is made up of all the bones in the human body and provides support and protection for the muscles and internal organs. The skeletal system also assists with the formation of blood cells, movement, and mineral storage. Within the skeletal system, there are long bones, short bones, flat bones, and irregular bones. The human body contains 206 bones and over 600 muscles. The main function of the muscular system is movement. Movement occurs when muscle fibers relax and contract, and virtually all movement within the human body is caused by muscle contraction. The muscular system also assists with heat production; muscle contraction is responsible for almost 85% of the heat produced in the human body. Muscle movement is controlled by nerve connections all throughout the body. Within the musculoskeletal system, tendons attach muscle to bone, and ligaments attach bone to bone. The musculoskeletal system also contains cartilage, which gives bones support inside joints and keeps the bones from rubbing against one another. Regular exercise is especially important in keeping the musculoskeletal system healthy.

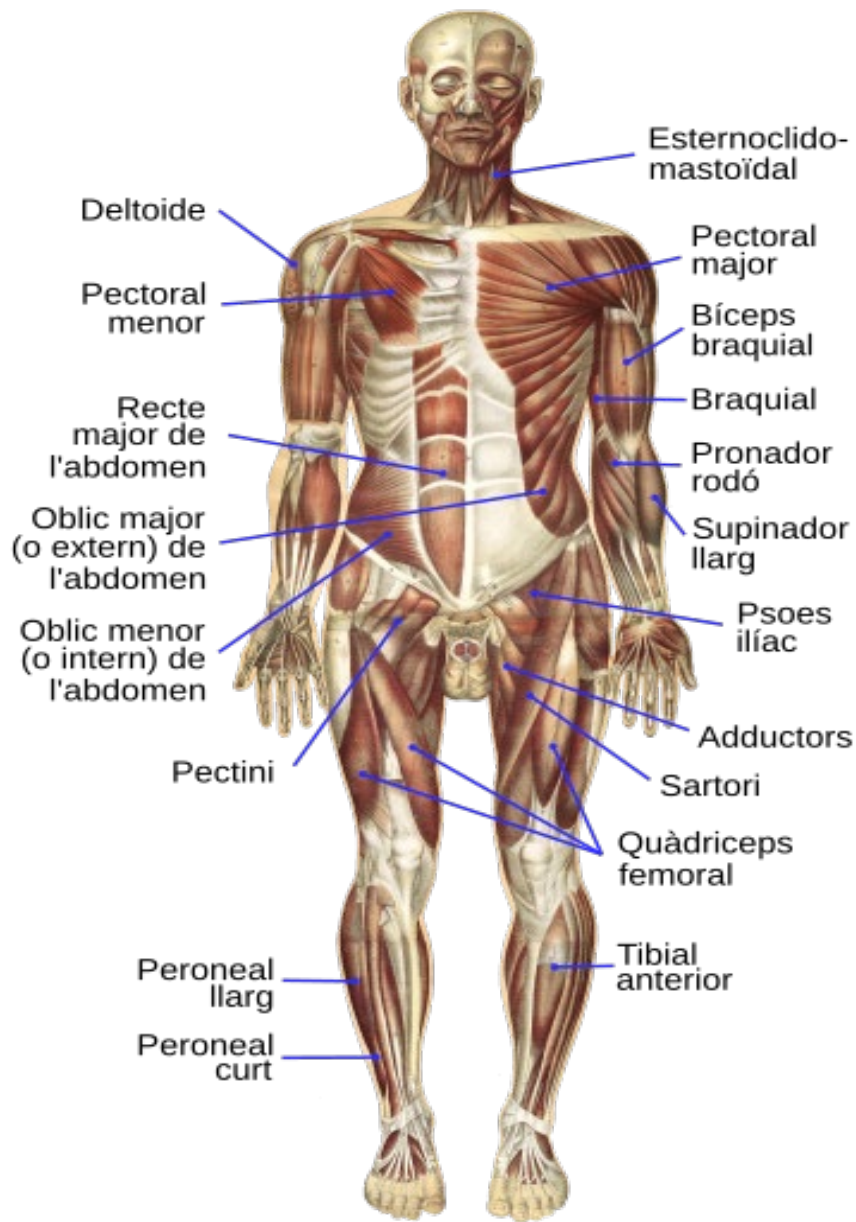


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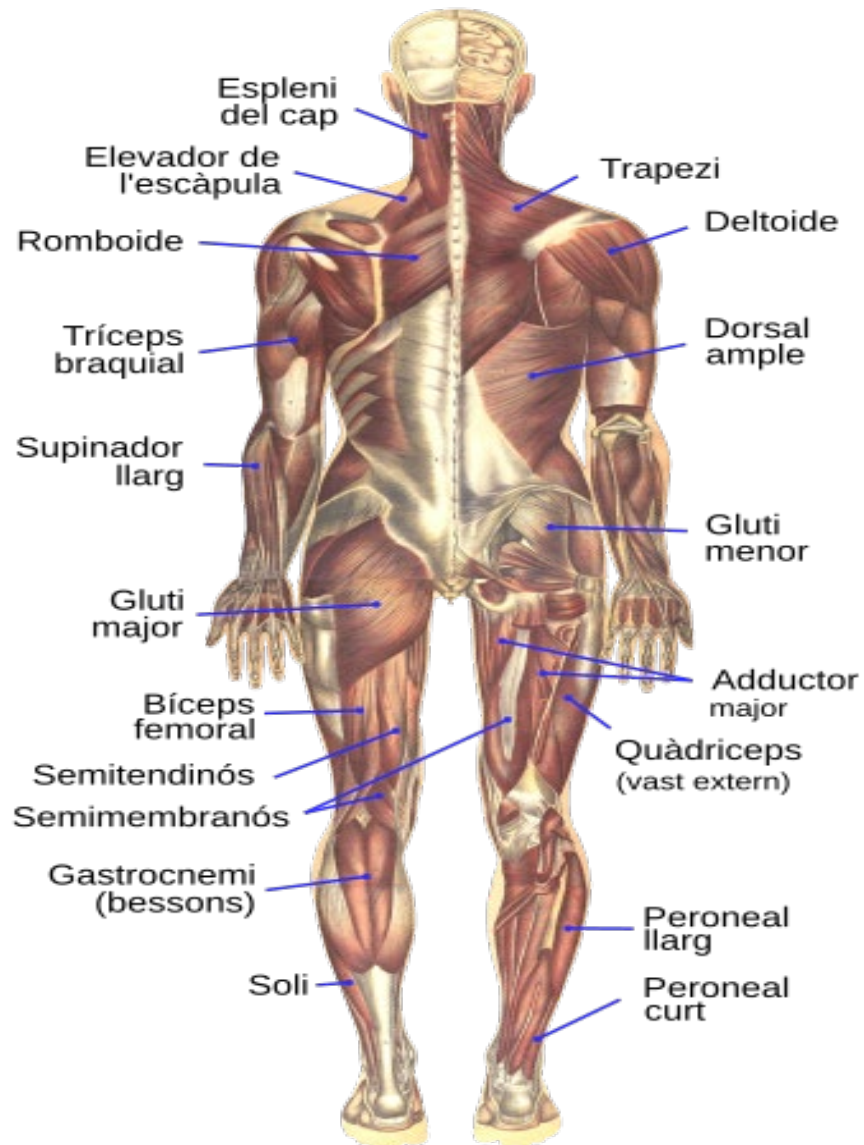


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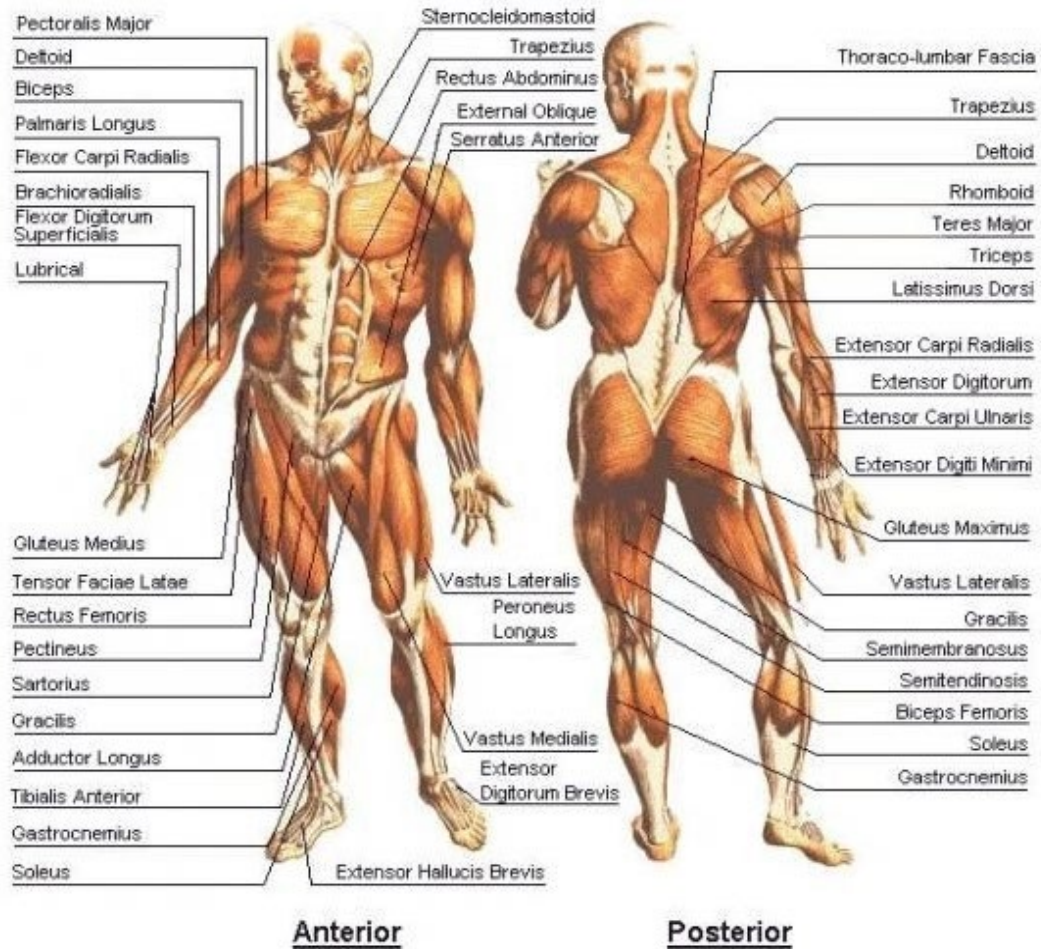


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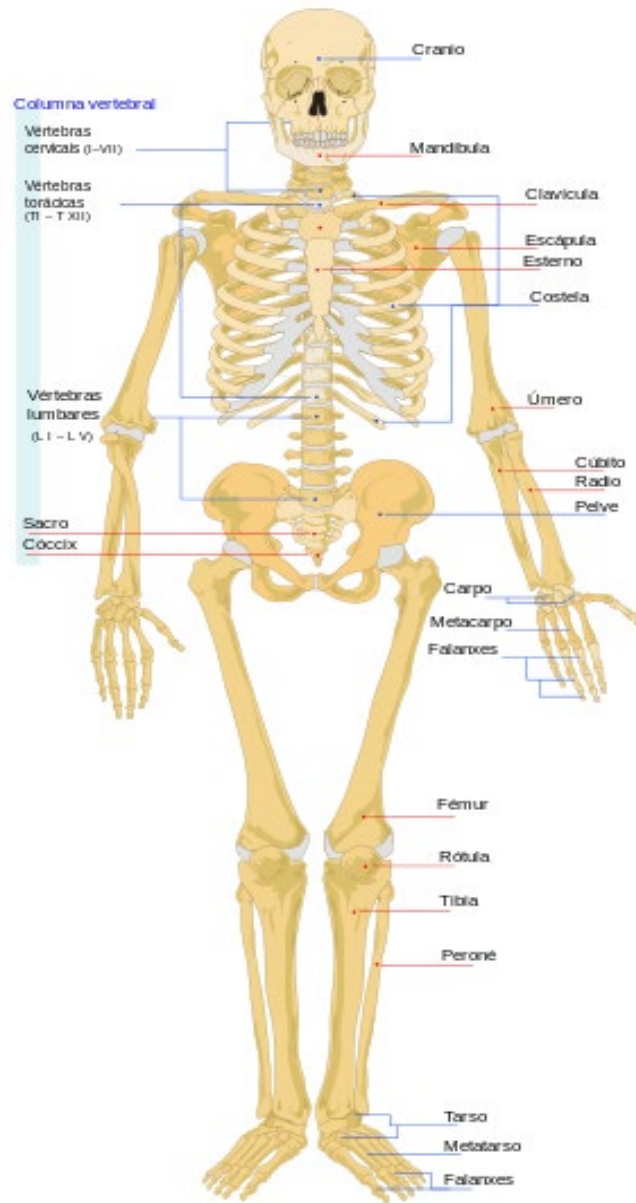


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## Immune System

The immune system protects the body from invading pathogens with the help of specialized cells called white blood cells. There are many different types of white blood cells, and each plays a specific role to protect against invaders. White blood cells, antibodies, skin, tonsils, mucous membranes, the complement system, the lymphatic system, the spleen, the bone marrow, and the thymus are all part of the immune system, and each part has a specialized function. When a pathogen attacks the body, certain white blood cells create antibodies to kill the pathogen, and other white blood cells attack the pathogen. There are 3 types of immunity within the immune system: innate immunity, active immunity, and passive immunity. Innate immunity is built-in protection you are born with, active immunity is developed when you are attacked by a pathogen, and passive immunity occurs when you receive antibodies from a different source, such as infants from their mother. The lymphatic system is also part of the immune system and involves a network of lymphatic vessels and lymph nodes that contain a clear fluid called lymph. Lymph helps return fluid to the blood to prevent swelling and to help regulate blood volume and blood pressure. There are clusters of white blood cells within each lymph node, and the lymph nodes become swollen when you fight sickness. When you are exposed to certain pathogens, your immune system remembers those pathogens and builds up antibodies to fight them in the future. From the smallest cut to the deadliest virus, your immune system helps keep you alive every day.



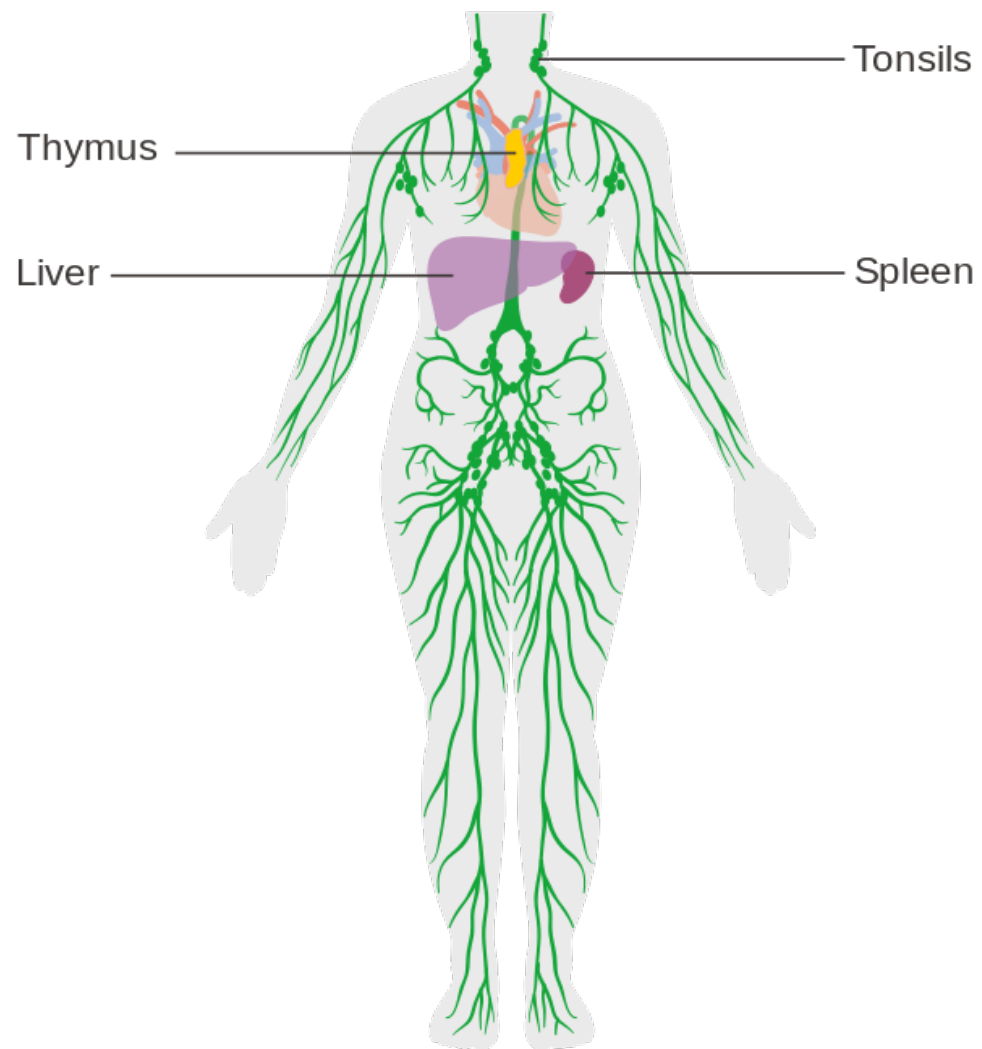


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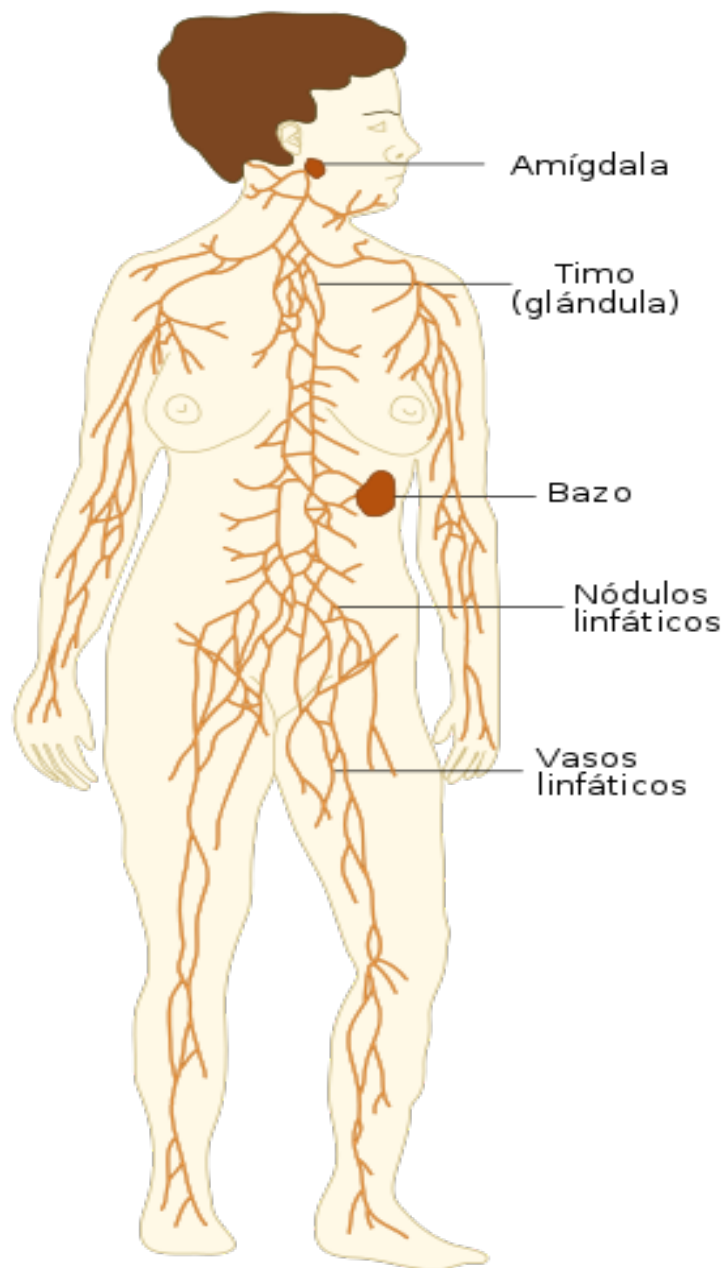


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## Endocrine System

The endocrine system is composed of organs called glands that produce chemical messengers called hormones. Hormones are released by glands directly into the bloodstream and latch onto certain receptors throughout the body to produce a response and control processes such as metabolism, sleep, blood pressure, emotions, growth/development, and sexual function and fertility. There are many different types of glands within the endocrine system, including the pituitary gland, thyroid gland, parathyroid glands, adrenal glands, pancreas, testes, ovaries, pineal gland, thymus, and hypothalamus. These glands are divided into exocrine glands and endocrine glands. Exocrine glands produce substances that are carried to the surface of the body and released while endocrine glands secrete hormones directly into the bloodstream.

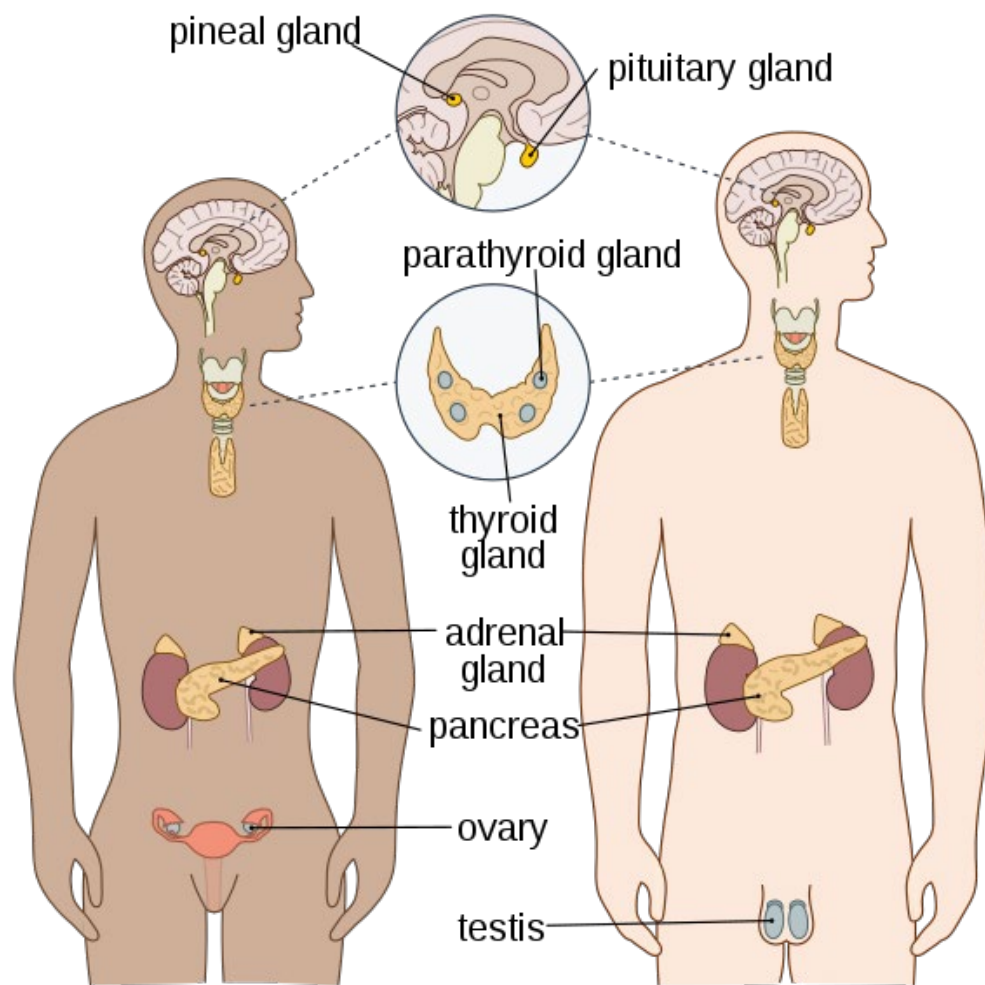


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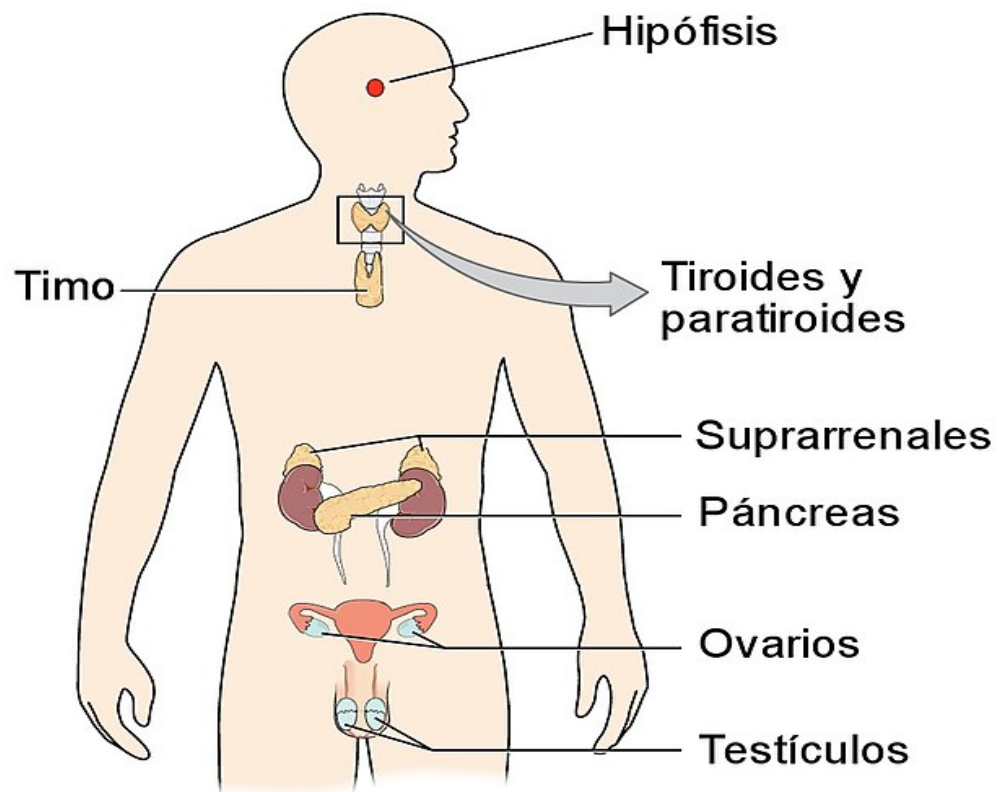


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## Urinary System

The urinary system is composed of the kidneys, ureters, bladder, sphincter muscles, and urethra. The urinary system filters blood through the kidneys to eliminate waste products such as toxins, salt, and water from the body in a substance called urine. Urine flows from the kidneys through the ureters, into the bladder, and out through the urethra. The sphincter muscles control when urine is able to travel from the bladder, through the urethra, and outside the body. Healthy urine is a pale/transparent yellow color while dark urine can be a sign of dehydration or liver problems. Pink or red urine can be a sign of hematuria, or blood in the urine. The kidneys also secrete hormones called erythropoietin, which plays a role in blood cell formation, and renin, which helps control blood pressure. The urinary system is also in charge of maintaining fluid volume and the composition of body fluids, maintaining electrolyte concentration within the body, and maintaining normal blood pH. To maintain a healthy urinary system, one should drink plenty of fluids, make healthy food and lifestyle choices, maintain regular bowel movements, urinate when the urge is felt, practice safe sex, urinate promptly after having sexual intercourse (for women), and practice pelvic floor, or Kegel, exercises.



## Male Urinary System

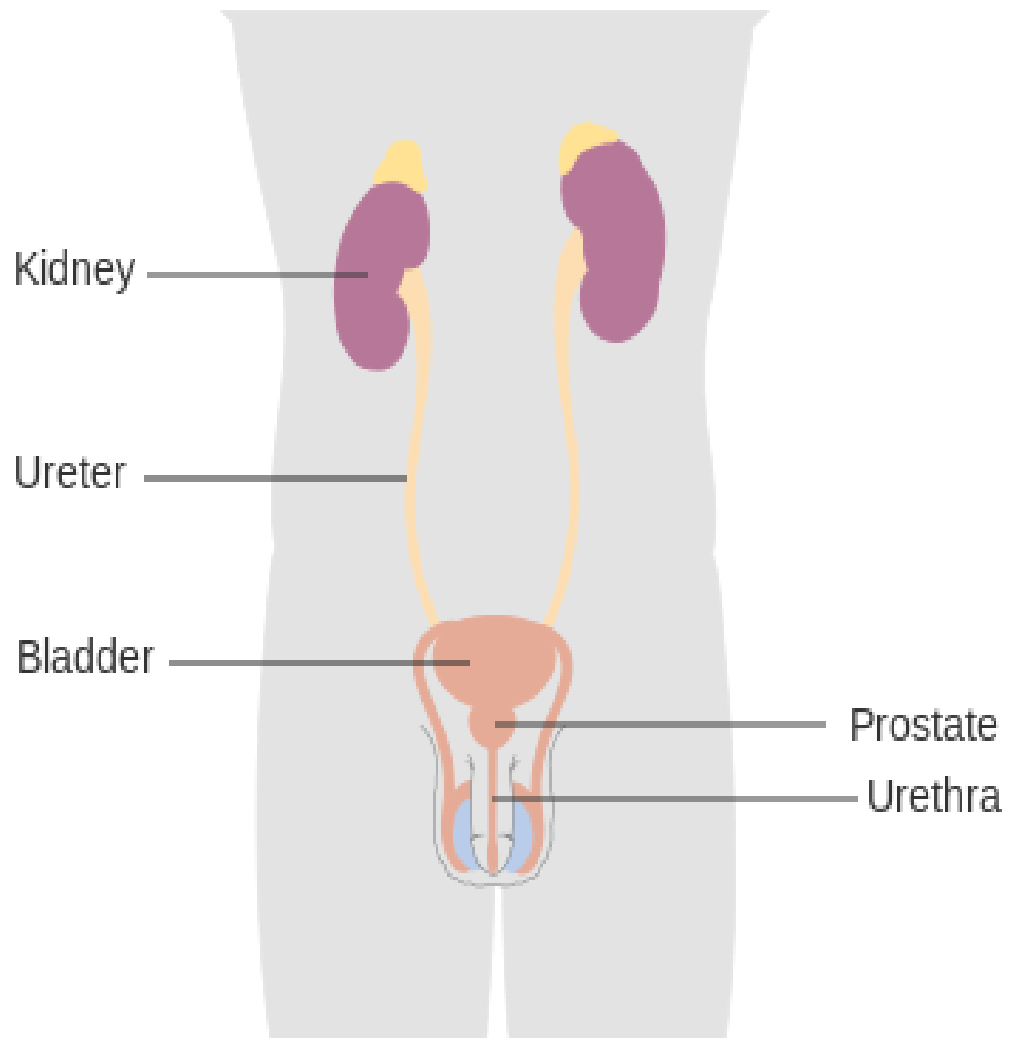


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## Female Urinary System

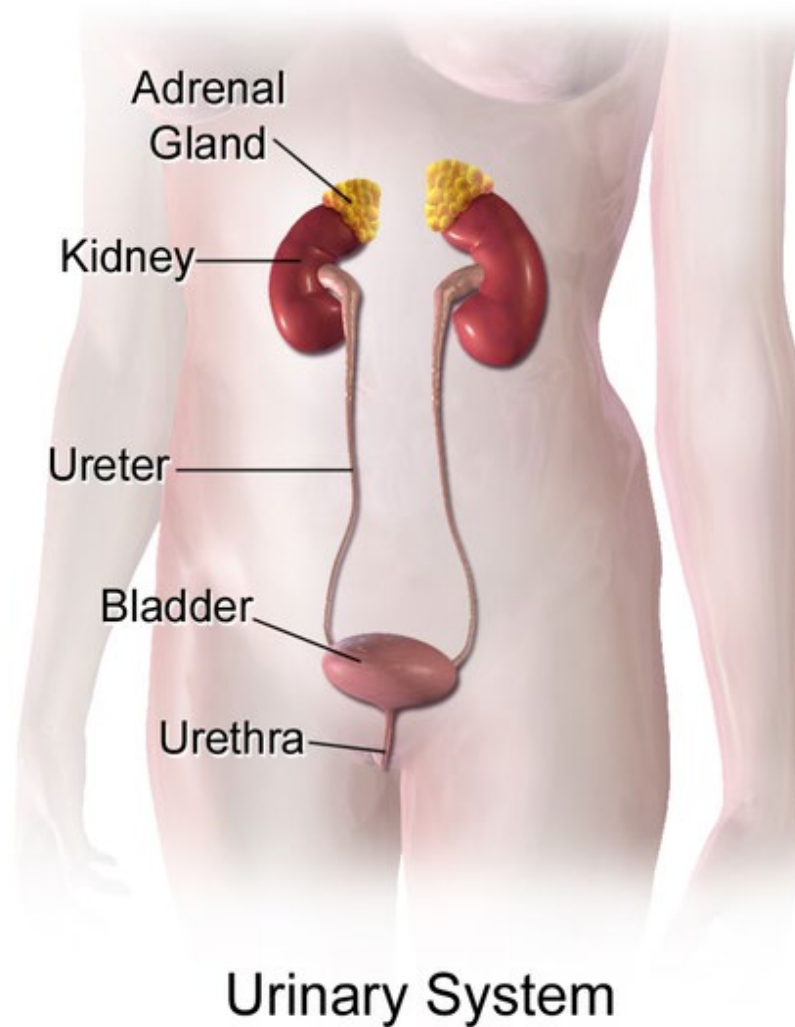


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## Reproductive System

The function of the reproductive system is to produce eggs and sperm while transporting and caring for egg and sperm cells, to nurture the developing offspring, and to produce hormones that regulate certain bodily functions. The reproductive system is different in males and females and contains different structures. Primary reproductive structures include the ovaries in females and the testes in males. These structures are responsible for egg production in women and sperm production in men, and both ovaries and testes secrete hormones that regulate reproductive function. Secondary reproductive structures include every other aspect of the reproductive system and are responsible for maintenance and transportation of egg and sperm cells among other functions. Female reproductive organs include the ovaries, fallopian tubes, uterus, cervix, vagina, accessory glands, external genitalia (clitoris, labia, urethral orifice), and mammary glands, which produce milk. The female reproductive system is also in charge of menstruation, which is the shedding of the uterine lining approximately every 28 days. Menstruation does not occur when the egg is fertilized and the female becomes pregnant. Menopause is the cessation of menstruation during middle age caused by the decreased production of certain hormones. Menopause is a healthy and normal part of aging in women. The male reproductive system includes the testes, penis, prostate gland, bulbourethral gland, seminal vesicle, bladder, and duct system, which contains the epididymis, ductus deferens, ejaculatory ducts, and urethra.

## Male Reproductive System

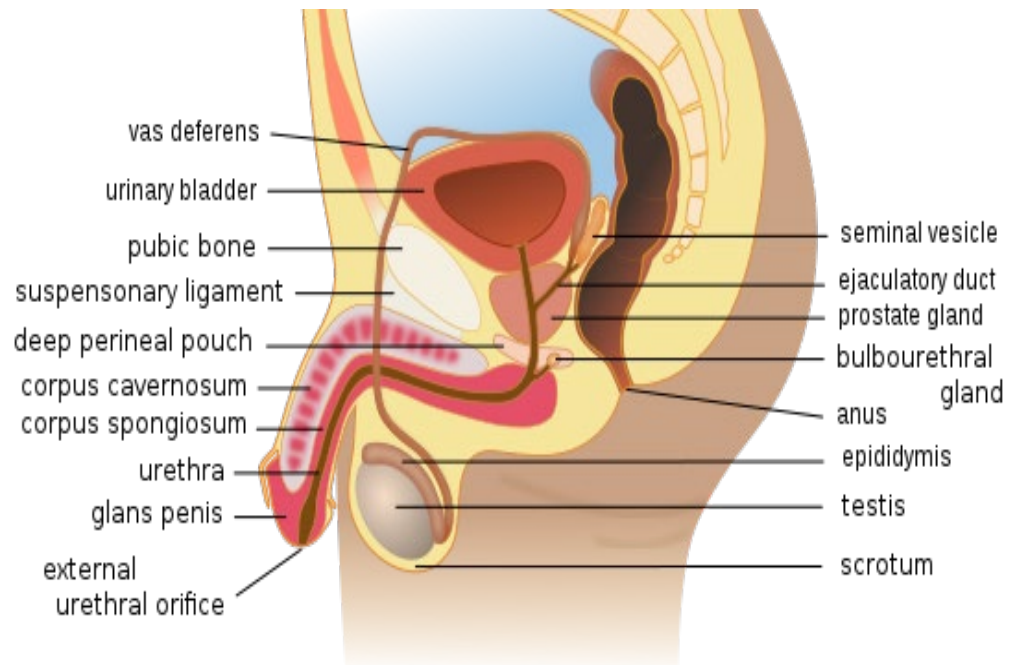


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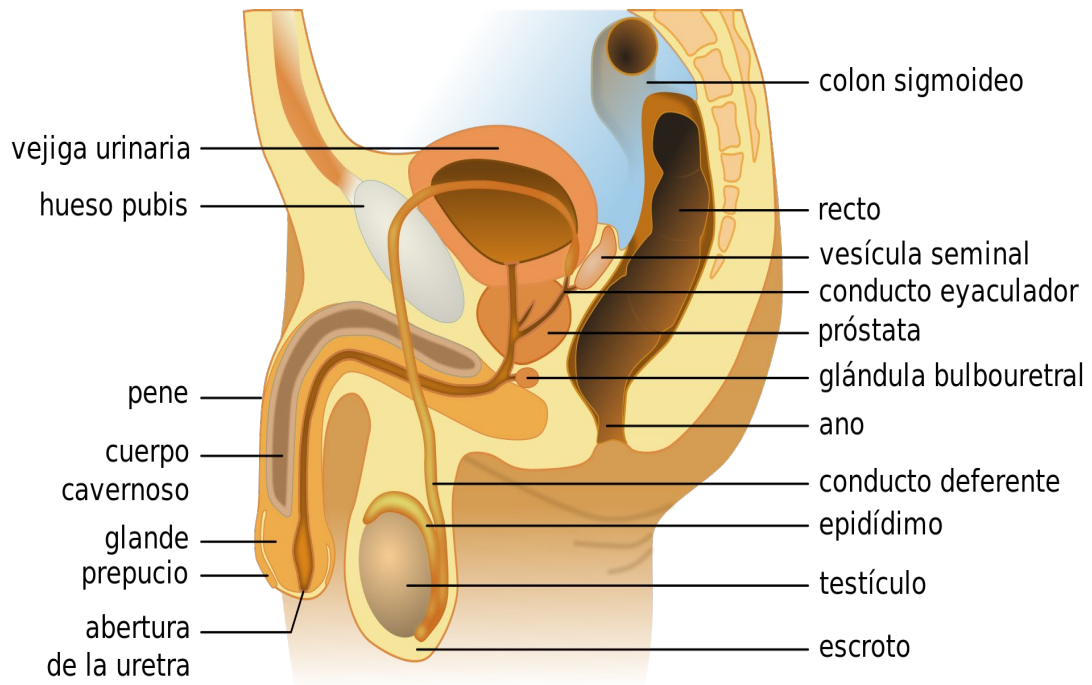


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## Female reproductive System

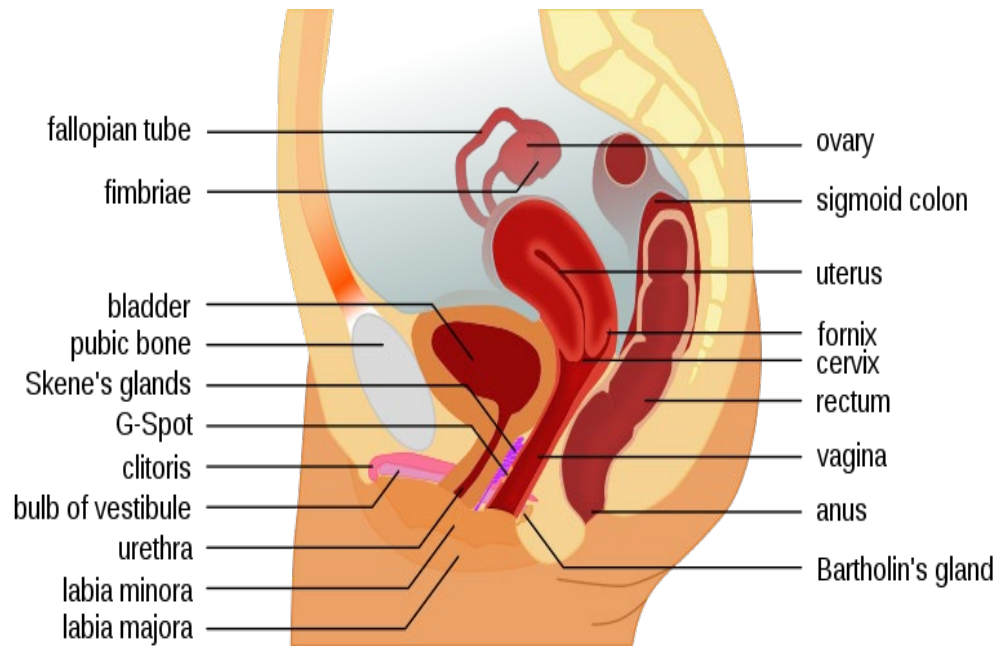


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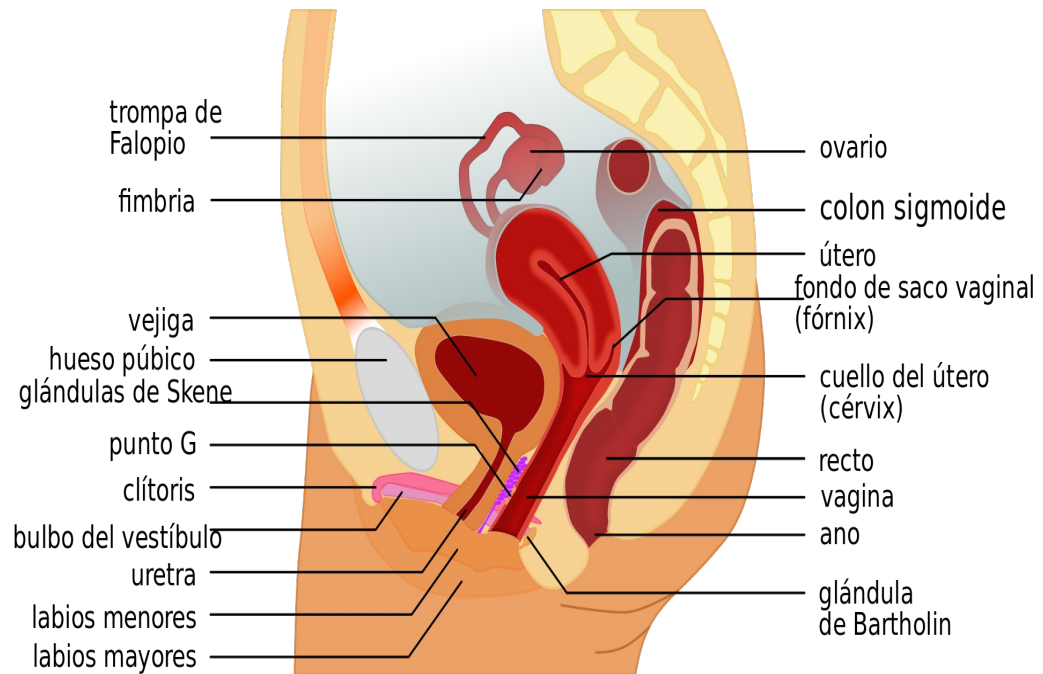


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## Integumentary System

The integumentary system is composed of the skin, hair, nails, and associated glands. The integumentary system is the largest organ in the body and serves as a barrier between the internal organs of the body and the outside world. Functions of the integumentary system include physical protection and immunity, wound healing, regulation of body temperature, sensation, and vitamin D synthesis. Skin, hair, and nails serve as a physical barrier to keep pathogens out and to keep internal organs inside the body. The skin is composed of 3 layers, including the epidermis, the dermis, and the hypodermis, while the nails are made up of a protein called keratin. In addition, there are many nerve cells within the skin, causing humans to experience pain, touch, temperature, etc. There are also many blood vessels running through the skin that help maintain body temperature. These vessels constrict to retain heat and dilate to release heat in processes called vasoconstriction and vasodilation. Additionally, four types of glands are found in human skin, including sudoriferous (sweat) glands, sebaceous glands, ceruminous glands, and mammary glands.

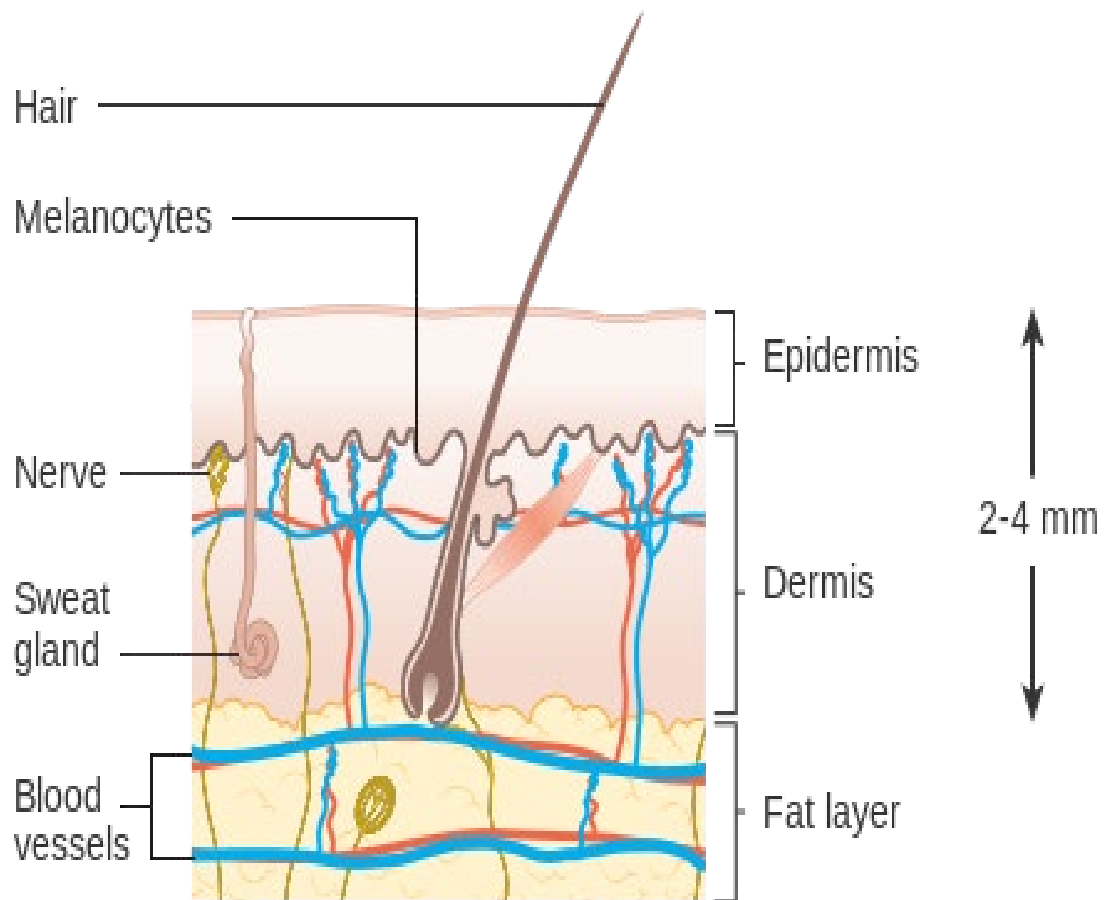


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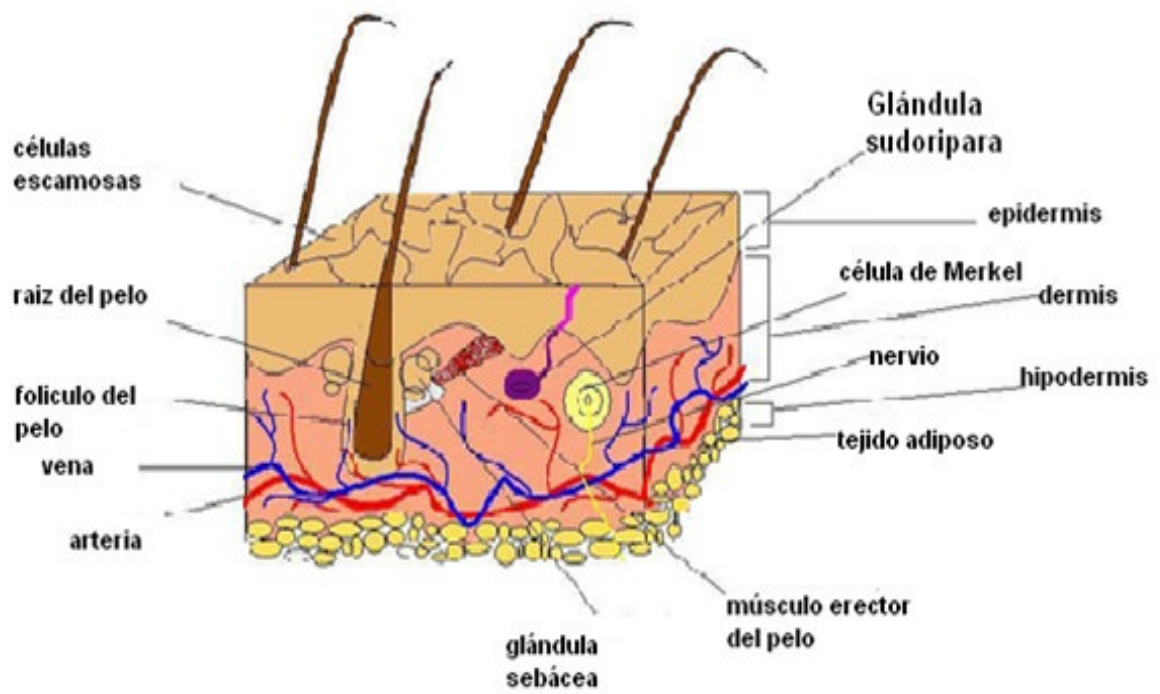


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## **Nutrition**

Nutrition is a crucial part of everyday health in addition to maintaining daily physical activity. It is important to eat a variety of fruits, vegetables, whole grains, proteins, and low-fat milk and dairy products along with healthy oils in moderation. Healthy oils include olive oil, canola oil, sunflower oil, corn oil, peanut oil, and soy oil. To maintain a healthy diet and a healthy weight, it is important to stay within your daily calorie needs. Daily calorie needs vary depending on one's age, height, weight, and amount of daily physical activity (click on the link below to determine your recommended daily caloric intake). It is also important to avoid foods high in saturated fats, trans-fats, cholesterol, sodium, and sugar. Unsaturated fats are typically considered healthy if eaten within recommended limits. To eat a balanced diet, approximately one-half of your plate should consist of fruits and vegetables, one-fourth of whole grains, and one-fourth of protein. Dairy is also an important component of a healthy diet. It is always important to contact your primary care physician if you have any questions or concerns about your nutrition needs.

To calculate your personal myplate plan, follow the links below.

<https://www.myplate.gov/es/myplate-plan>

<https://www.myplate.gov/myplate-plan>

## Fruits

Fruits are a crucial part of a healthy diet and occupy approximately one-fourth of a balanced diet. Fruits are low in fat, sodium, and calories and do not contain cholesterol. Conversely, certain fruits are high in potassium, fiber, folate, antioxidants, and vitamin C. Fruits that are rich in potassium include bananas, prunes, peaches, apricots, guava, kiwi, cantaloupe, honeydew, sapote, oranges, and jackfruit. Potassium plays an important role in helping to maintain blood pressure. Fruits are also rich in fiber, but only if eaten whole. In other words, fruit juice contains little to no fiber. Dietary fiber helps reduce blood cholesterol levels, reduce heart disease risk, and maintain healthy bowel movements. Vitamin C is important for healthy growth and tissue repair and also helps the body absorb iron more easily. Fruits containing vitamin C include strawberries, citrus fruits such as oranges, peppers, and blackcurrants. Citrus fruits are also high in folate, which is a B vitamin that plays a role in red blood cell formation, DNA production, protein creation and destruction, tissue growth, and cell function. Eating a healthy amount of fruit may help reduce the risk of cardiovascular disease, type 2 diabetes, stroke, kidney stones, and neural tube defects and may help protect against cell damage. Eating a balanced diet with plenty of fruits may also help reduce the risk for certain types of cancers.

## Daily Fruit Recommendations

Age	Daily Amount
Toddlers (12-23 months)	½ - 1 cup
Children (2-4 years)	1-1½ cups
Children (5-8 years)	1 - 2 cups
Girls (9-18 years)	1½ - 2 cups
Boys (9-13 years)	1½ - 2 cups
Boys (14-18 years)	2 - 2½ cups
Women (19-60+ years)	1½ - 2 cups
Men (19-59 years)	2 - 2½ cups
Men (60+ years)	2 cups

Information from <https://www.myplate.gov/eat-healthy/fruits>



## Vegetables

Vegetables are an essential part of a healthy diet and compose approximately one-fourth of a balanced diet. Vegetables are low in fat and calories, and certain vegetables contain potassium, fiber, vitamin A, vitamin C, vitamin E, and folate. Eating a healthy amount of vegetables may help reduce the risk of heart disease, type 2 diabetes, stroke, and/or cancer. Potassium plays an important role in helping to maintain blood pressure and can be found in sweet potatoes, white potatoes, tomato products, white beans, lima beans, beet greens, spinach, lentils, soybeans, yucca, kohlrabi, acorn squash, and kidney beans. Fiber helps reduce blood cholesterol levels and helps reduce heart disease risk.

Vegetables high in fiber include broccoli, green peas, brussel sprouts, turnip greens, sweet corn, potatoes, carrots, and cauliflower. Vitamin A is important in maintaining healthy eyes and skin and also helps protect against infection. Vitamin A can be found in leafy green, yellow, and red vegetables, including spinach, carrots, sweet potatoes, and red peppers. Vitamin C helps heal wounds and plays a role in helping the body to absorb iron as well as helping to protect tooth and gum health. Vegetables high in vitamin C include broccoli, brussel sprouts, and potatoes. Folate is a B vitamin that plays a role in red blood cell formation, DNA production, protein creation and destruction, tissue growth, and cell function. Leafy green vegetables are high in folate.

## Daily Vegetable Recommendations

Age	Daily Amount
Toddlers (12-23 months)	$\frac{2}{3}$ - 1 cup
Children (2-4 years)	1- 2 cups
Children (5-8 years)	1- $\frac{1}{2}$ - 2- $\frac{1}{2}$ cups
Girls (9-13 years)	1- $\frac{1}{2}$ - 3 cups
Girls (14-18 years)	2- $\frac{1}{2}$ - 3 cups
Boys (9-13 years)	2 - 3- $\frac{1}{2}$ cups
Boys (14-18 years)	2- $\frac{1}{2}$ - 4 cups
Women (19-30 years)	2- $\frac{1}{2}$ - 3 cups
Women (31-60+ years)	2 - 3 cups
Men (19-59 years)	3 - 4 cups
Men (60+ years)	2- $\frac{1}{2}$ - 3- $\frac{1}{2}$ cups

Information from <https://www.myplate.gov/eat-healthy/vegetables>

## Grains

Grains are another essential part of a healthy diet and make up approximately one fourth of a daily balanced diet. Grains are made from wheat, oats, rice, barley, and cornmeal and include foods such as bread, breakfast cereals, tortillas, pasta, grits, oatmeal, rice, and popcorn. There are two groups of grains, including whole grains and refined grains.

Whole grains are made from the entire grain kernel while refined grains have parts of the grain kernel removed to improve shelf life. Whole-grains should make up at least half of all grains consumed. Examples of refined grains include white bread, white rice, corn grits, and white flour while examples of whole grains include whole-wheat flour, oatmeal, whole-grain cornmeal, brown rice, and cracked wheat. Eating whole grains regularly may help reduce the risk of heart disease and support healthy digestion. Eating whole grains may also support weight management, and grains containing folate can help prevent neural tube defects, especially when consumed before and during pregnancy.

Grains contain nutrients such as complex carbohydrates, which are an important energy source. Grains also contain dietary fiber, which may help reduce blood cholesterol and reduce heart disease risk. Dietary fiber is also important in helping to maintain healthy bowel function. Many grains contain B vitamins such as thiamin, riboflavin, and niacin, which aid in metabolism. B vitamins are also important in helping to maintain a healthy nervous system. Certain grains may contain iron as well, which is an essential mineral in the human body. In addition, whole grains may contain magnesium and selenium, which are important minerals used to help build bones and release energy from muscles.

Selenium also helps protect against oxidation and helps maintain a healthy immune system.

## Daily Grain Recommendations

Age	Total Grain Amount Daily	Whole Grain Amount Daily
Toddlers (12-23 months)	1- $\frac{3}{4}$ - 3 ounces	1- $\frac{1}{2}$ - 2 ounces
Children (2-4 years)	3 - 5 ounces	1- $\frac{1}{2}$ - 3 ounces
Children (5-8 years)	4 - 6 ounces	2 - 3 ounces
Girls (9-13 years)	5 - 7 ounces	2- $\frac{1}{2}$ - 3- $\frac{1}{2}$ ounces
Girls (14-18 years)	6 - 8 ounces	3 - 4 ounces
Boys (9-13 years)	5 - 9 ounces	3 - 4- $\frac{1}{2}$ ounces
Boys (14-18 years)	6 - 10 ounces	3 - 5 ounces
Women (19-30 years)	6 - 8 ounces	3 - 4 ounces
Women (31-60+ years)	5 - 7 ounces	3 - 3- $\frac{1}{2}$ ounces
Men (19-30 years)	8 - 10 ounces	4 - 5 ounces
Men (31-59 years)	7 - 10 ounces	3- $\frac{1}{2}$ - 5 ounces
Men (60+ years)	6 - 9 ounces	3 - 4- $\frac{1}{2}$ ounces

Information from <https://www.myplate.gov/eat-healthy/grains>

## Proteins

Protein is an important part of a balanced diet and makes up approximately one-fourth of healthy daily consumption. Proteins are made up of building blocks called amino acids that are essential for bodily function. Proteins also play an important role in the building of muscles, bones, enzymes, hormones, vitamins, skin, cartilage, and blood. Protein can be found in foods such as chicken, beef, and other meats, seafood, nuts, seeds, beans, lentils, peas, eggs, and soy products. Dairy products such as milk, yogurt, and cheese also contain protein. These foods may also contain essential nutrients such as iron, zinc, vitamin E, magnesium, essential fatty acids (omega-3 and omega-6), and B vitamins such as niacin, thiamin, B6, and riboflavin. When choosing meats, it is important to choose lean meats (greater than 85% lean) low in saturated fats. Many meats such as hot dogs, bacon, bologna, salami, and ground beef can be high in unhealthy saturated fats, so it is important to be careful when choosing which protein to eat.

## Daily Protein Recommendations

Age	Daily Amount
Toddlers (12-23 months)	2 ounces
Children (2-4 years)	2 - 5 ounces
Children (5-8 years)	3 - 5-½ ounces
Girls (9-13 years)	4 - 6 ounces
Girls (14-18 years)	5 - 6-½ ounces
Boys (9-13 years)	5 - 6-½ ounces
Boys (14-18 years)	5-½ - 7 ounces
Women (19-30 years)	5 - 6-½ ounces
Women (31-60+ years)	5 - 6 ounces
Men (19-30 years)	6-½ - 7 ounces
Men (31-59 years)	6 - 7 ounces
Men (60+ years)	5-½ - 6-½ ounces

Information obtained from <https://www.myplate.gov/eat-healthy/protein-foods>

## Dairy

Dairy is an important part of a healthy diet and includes foods such as milk, yogurt, cheese, and soy milk. Dairy also contains high levels of protein, calcium, and vitamin D, which leads to improved bone health. Dairy also plays a role in decreasing blood pressure, reducing the risk of type 2 diabetes and cardiovascular disease, and improving digestive health. Dairy products may also contain nutrients such as magnesium, vitamin B12, riboflavin, vitamin A, choline, zinc, selenium, and potassium.

### Daily Dairy Recommendations

Age	Daily Amount
Toddlers (12-23 months)	1- $\frac{2}{3}$ - 2 cups
Children (2-3 years)	2 - 2- $\frac{1}{2}$ cups
Children (4-8 years)	2- $\frac{1}{2}$ cups
Girls (9-18 years)	3 cups
Boys (9-18 years)	3 cups
Women (19-60+ years)	3 cups
Men (19-60+ years)	3 cups

Information obtained from <https://www.myplate.gov/eat-healthy/dairy>

## Malnutrition

Malnutrition is characterized by a lack of dietary nutrients in an individual. Malnutrition involves growth stunting and unintentional weight loss and affects 462 million individuals worldwide, who are underweight. It is also possible to be overweight and nutrient deficient. Malnutrition is characterized by a BMI (body mass index) less than 18.5 and may involve...

- Weakness
- Fatigue
- Bloating
- Weakened immune system
- Lack of interest in eating and drinking
- Growth stunting or lack of weight gain in children
- Frequent illness
- Bruising easily
- Achy joints
- Dizziness
- Rashes
- Changes in skin pigmentation

Malnutrition can be caused by a variety of factors, including malabsorption syndromes, certain cancers, and low socioeconomic status. To treat and prevent malnutrition, it is important to eat a healthy, balanced diet containing fruits, vegetables, foods containing starch (bread, potatoes, pasta, rice), healthy milk and dairy products or non-dairy



alternatives, and healthy proteins such as meat, eggs, beans, and fish. In some cases, malnutrition may require additional supplements or nutritional drinks. For malnourished individuals, it is important to eat foods high in calories and protein, snack between meals, and consume healthy drinks with a significant amount of calories. In severe cases, malnutrition may require feeding intravenously or through a gastrointestinal tube.

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## **First Aid**

First aid is the immediate treatment given to a person who suddenly becomes ill or injured. Proper first aid can be the difference in saving someone's life and is most often performed by civilian bystanders on the scene of an incident. Everyone has needed some type of first aid at one point or another in their life. First aid can range from placing a Band-Aid on a cut to administering CPR in a life-threatening situation. There are many factors involved in first aid, but first and foremost one must be prepared for emergencies and have a willingness to help those in need around them.

The first component of first aid involves accessing the situation to see if there is any imminent danger present. A first aider should not enter the scene if it appears to pose more danger to themselves or the injured person. When providing first aid, it is also important to prevent cross-contamination by wearing proper PPE (personal protective equipment), including sterile latex-free exam gloves. It is of crucial importance to always wash your hands or use an alcohol-based hand sanitizer both before and after providing first aid to protect yourself and the injured person. When providing first aid, it is always important to remain calm, build an element of trust with the injured individual, and to provide comfort and reassurance.

The first step in providing first aid is to assess the injured person and evaluate what is wrong. This involves checking the ABCs (airway, breathing, and circulation) first. Assessing the patient also involves taking a history, including finding out what happened, what the individual's medical problems are, and what medications they are currently taking. It additionally includes asking about the patient's symptoms and evaluating the

patient for signs of injury. The next step is to treat all life-threatening injuries or illnesses before treating minor injuries. Finally, it is crucial to help determine the patient's next step in the caregiving process, which may include calling for emergency help from trained medical professionals.

## Anaphylaxis or Anaphylactic Shock

Anaphylaxis is a life-threatening allergic reaction that affects the entire body and can be fatal if left untreated. Anaphylaxis occurs within seconds to minutes after exposure to a trigger, usually an allergen. The most common triggers include medication, nuts, fish/shellfish, and insect stings (bees, wasps, hornets, yellow jackets, fire ants).

Anaphylaxis causes blood vessels to dilate and blood pressure to drop. Subsequently, airways narrow, making it difficult to breathe, and the tongue and throat may begin swelling, also making it difficult to breathe.

Symptoms of anaphylaxis include...

- Red, itchy rash or hives
- Swelling of the hands, feet, or face
- Red, itchy, and watery eyes
- Abdominal pain
- Nausea and vomiting
- Diarrhea
- Difficulty swallowing
- Difficulty breathing/wheezing or gasping
- Chest tightness
- Pale complexion
- Swelling of the tongue or throat
- Puffy eyes
- Terror, confusion, or agitation

- Weak, rapid pulse
- Loss of consciousness
- Dizziness/faintness
- Tingling mouth
- Difficulty talking/hoarse voice

If you experience any of these symptoms, seek emergency medical help immediately.

To treat anaphylaxis, take the following steps...

1. Call for emergency medical help; even if the person improves, continue to seek emergency medical assistance because symptoms of anaphylaxis can suddenly worsen.
2. If the individual has an epinephrine auto injector (Epi-pen), help them use it by pulling off the safety cap and pushing the tip of the pen firmly against the patient's thigh until it clicks. Hold the autoinjector in place for 10 seconds, remove the autoinjector, and massage the injection site for 10 seconds.

<https://youtu.be/K7QyCMNDHAs>

<https://youtu.be/2KzBX27PD-s>

3. Have the individual lie flat on his or her back and cover him or her with a blanket. Do not give the individual anything to drink. If they become pale or develop a weak pulse, have the individual lie down with his or her legs raised in the air.
4. If the individual begins vomiting or bleeding from the mouth, have him or her turn on his or her side to avoid choking.



5. If the individual stops breathing or ceases to have a pulse, begin CPR immediately until emergency medical help arrives.

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## Bandages and Dressings

Covering a wound with a bandage or dressing helps prevent infection. In cases of severe bleeding, a pressure dressing may be applied, which applies pressure to the wound and helps stop bleeding. Pre-packaged sterile dressings are the best type to use but any type of gauze or clean, non-fluffy material will work when applying a dressing. Small cuts may be dressed with a simple adhesive bandage and antibiotic ointment such as Neosporin. There are many different types of bandages and dressings, including sterile wound dressings, roller bandages, hand bandages, and triangular bandages.

Sterile wound dressings are to be used on open wounds. To apply a sterile wound dressing, take the following steps...

1. Wash your hands with soap and water and put on sterile, latex-free exam gloves.
2. Do not touch the area of the dressing that will cover the wound. Place the dressing pad directly on top of the wound, covering the entire wound, and apply gentle pressure to stop the bleeding.
3. If blood seeps through the dressing, do not remove the original dressing. Simply place another sterile dressing on top of the old one. If saturates both dressings, remove the saturated dressings and apply a fresh sterile wound dressing.
4. Check the circulation in the affected limb by checking the injured individual's pulse. If there is no pulse or a faint pulse, re-apply the dressing less tightly. You may also check capillary refill by pressing on the individual's fingernails. If the color does not return within 2 seconds, the dressing has been placed too tight and must be reapplied.
5. Dispose of used dressings in a plastic bag and remove gloves only after all soiled material is disposed of. Wash your hands with soap and water after removing gloves.

Roller bandages are to be used on elbow, knee, and ankle joints following strains or sprains. To apply a roller bandage, take the following steps...

1. Begin with the bandage on the inside just above the joint and support the injured limb.
2. Make one turn around the limb to secure the bandage and make another loop just below the joint.
3. Continue bandaging in a figure eight pattern both above and below the joint, covering approximately two-thirds of the previous bandaging with each turn.
4. Secure the end of the bandage with tape, a safety pin, or with the connected fastener.
5. Check the circulation in the affected limb by checking the injured individual's pulse. If there is no pulse or a faint pulse, re-apply the bandage less tightly. You may also check capillary refill by pressing on the individual's fingernails. If the color does not return within 2 seconds, the bandage has been placed too tight and must be reapplied.

A hand bandage may be used to hold a dressing in place on a hand or to support a wrist injury. To apply a hand bandage, take the following steps...

1. Wrap the bandage twice straight around the wrist below the base of the thumb.
2. Wrap the bandage diagonally across the back of the hand towards the pinky fingernail.
3. Wrap the bandage across the front of the hand in between the thumb and first finger.
4. Wrap the bandage straight around the wrist again and repeat steps 2, 3, and 4 until the bandage runs out.
5. Finish the bandage with 2 turns straight around the wrist and secure the end of the bandage.

See slings to learn how to apply a triangular bandage.



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## Bleeding

Severe bleeding can cause a person to go into shock, and if too much blood is lost, an injury can be fatal. It is always important to control bleeding as soon as possible when providing first aid. Never give a person who is severely bleeding anything to eat or drink, as they may need anesthetics later on. To best control severe external bleeding, take the following steps...

1. Have another bystander call for emergency medical help while you attend to the bleeding. If there are no other bystanders, call for emergency help yourself.
2. Put on sterile latex-free exam gloves.
3. Expose the wound by removing all clothing or jewelry in the area.
4. Place a sterile bandage or clean cloth directly on the wound, holding firm, constant pressure to control the bleeding. Never apply direct pressure on an eye or on an embedded object.
5. Have the injured individual lie down, ideally on a rug or blanket to prevent heat loss, with his or her legs in the air above heart level. If possible, elevate the injury above the level of the heart.
6. Once the bleeding stops, secure the dressing with firm pressure that does not impair circulation. If blood seeps through the original dressing, do not remove the dressing but place another dressing on top of the saturated one. If blood seeps through both dressings, remove the dressings and apply a fresh dressing.
7. Monitor vital signs and circulation in the injured area while you wait for help to arrive. Monitor the individual for signs of shock, including a pale complexion, shallow breathing, and/or fainting.

To treat a wound with an embedded object, take the following steps...

1. Do not put pressure directly on the embedded object and do not attempt to remove the object. Simply apply pressure on both sides of the object.
2. If possible, elevate the injury above heart level.
3. Place gauze gently over the object and apply padding on either side of the embedded object.

4. Check circulation, monitor vital signs, and treat for shock if necessary.

Even when blood is not visible, it is still possible for an individual to be suffering from internal bleeding. Signs of internal bleeding include..

- Pale, clammy, or cold skin
- Blue/gray colored skin
- Thirst
- Shallow, rapid breaths
- Fast and weak pulse
- Loss of consciousness
- Confusion, agitation, or restlessness
- Blood coming from body openings (vomiting blood, pooping blood, urinating blood, coughing up blood, etc.)
- Patterned bruising
- Pain (especially at injury site)
- Swollen or tight abdomen
- Nausea and vomiting
- Headache or Dizziness
- Mechanism of injury or recent illness consistent with internal bleeding (such as blunt force)

There is no first aid treatment for internal bleeding. However, if you suspect an individual is bleeding internally, take the following steps...

1. Call immediately for emergency medical assistance.
2. Have the individual lie down and elevate his or her legs above the heart.
3. Cover the individual with a blanket to keep them warm. Don't give anything to eat or drink.
4. Monitor vital signs and level of consciousness. If they become unconscious, lay them on their side. If breathing and circulation ceases, begin CPR immediately.

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## Blisters

Blisters occur when skin is rubbed against another surface, exposed to heat, or pinched significantly, which can come in the form of friction blisters, blood blisters, or heat blisters. When you get a blister, damaged tissue leaks fluid that collects under the top layer of skin. If you do get a blister, it is best to keep the blister protected and intact because it provides a natural barrier to germs and bacteria. To treat an intact blister, follow the steps below.

1. Wash your hands and wash the blister with soap and warm water. Pat dry with sterile gauze or a clean cloth.
2. Cover the blister with an adhesive bandage or blister bandage and change the dressing each day or when it gets wet or dirty.

Sometimes, if a blister is too painful, you may be required to drain it. To drain a blister, follow the steps below. Seek medical advice before draining a blister yourself if you have poor circulation or diabetes.

1. Wash your hands and the blister with soap and warm water, and swab the blister with iodine if available.
2. Sterilize a clean, sharp needle with rubbing alcohol.
3. Puncture the blister with the sterilized needle near the edges of the blister in several spots and let the fluid drain out. Leave the overlying skin in place.
4. Apply antibiotic ointment or petroleum jelly and cover with a non-stick gauze dressing. Stop using the ointment if a rash appears.
5. Check each subsequent day for infection, including redness, drainage, or increased warmth, pain, or swelling until the area is healed. Signs of infection may also include white or yellow drainage rather than clear or bloody drainage.

To prevent blisters, it is important to wear gloves when performing any kind of manual labor. It is also important to wear well-fitting shoes and clothing. Be alert when using tools that can pinch and always wear sunscreen when going outdoors for extended periods of time. Use caution when handling fire or hot items, and always wear weather

appropriate clothing. Stop any activity that causes pain, discomfort, or redness, which may turn into a blister.

### Friction Blister



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## Blood Blister



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## Heat Blister



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## Bruises

Bruises are caused by bleeding into the tissues underneath or into the skin and can appear immediately or even days after an injury. Bruises can be a sign of deep injury in certain cases, and it is important to note that individuals taking blood thinners bleed and bruise rather easily. To treat bruises, it is important to follow **RICE**...

1. **Rest** the injured area if possible
2. **Ice** the injured area for at least 10 minutes by administering ice wrapped in a towel or a cold compress
3. **Compress** the injured area if it is swelling by wrapping it in an elastic bandage
4. **Elevate** the injured area if possible.

Seek medical care if painful swelling continues, pain persists 3 days after a minor injury, you have frequent large or painful bruises (especially on your face, trunk, or back), you experience bleeding from other locations such as your nose or gums, you bruise easily or have a history of significant bleeding, a lump (hematoma) forms over the bruise, you acutely begin bruising without a prior history of bruising, or if you have a family history of easy bleeding or bruising. These symptoms could be indicators of a more serious health problem, such as a blood disease.



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## Burns

Burns are characterized by skin exposure to an extremely hot or cold substance that causes tissue damage. There are multiple types of burns and levels of burn severity. Types of burns include dry burns, scalding, electrical burns, radiation burns, and chemical burns. Burns can be superficial (affects only the outermost skin layer), partial thickness (affects the epidermis and forms blisters), and full thickness (affects all skin layers and may involve damage to muscles, nerves, or blood vessels). Most burns involve red and peeling skin, swelling, blisters, and white or charred skin in severe cases. Always seek medical care if an individual has a major burn or if you are in doubt about their condition.

### Characteristics of major burns...

- Deep injury
- Dry and leathery skin
- Charred, white, brown, or black patches of skin
- Burn diameter greater than 3 inches
- Burn that covers feet, hands, face, groin, buttocks, or major joint(s)

### Characteristics of minor burns...

- Pain
- Blisters
- Superficial redness (appears like a sunburn)
- Burn diameter less than 3 inches

### To treat major burns, follow the following steps...

1. Remove the injured person from the source of the burn and make sure he or she is breathing well. Have someone call for emergency medical help or call yourself.
2. Gently remove any jewelry, belts, clothing, etc. surrounding the burned area before swelling increases. Do not remove any clothing stuck to the burn itself.



3. Flood the burn with cool tap water for 10-20 minutes (at least 20 minutes for chemical burns); do not use ice or iced water. You may also cool the burn with a moist bandage or clean cloth. Do not let the burned area touch the ground and do not immerse the burned area in water because it may cause the injured person to become hypothermic, especially in small children or elderly individuals.
4. When the burn is cooled, cover the burned area with plastic wrap to prevent infection. If no plastic wrap is available, cover the burn with a loose fitting gauze or a sterile non-stick dressing.
5. Encourage the injured individual to take sips of cool water.
6. Monitor the injured individual's vital signs and monitor for signs of shock, including a pale complexion, shallow breathing, and/or fainting.

To treat minor burns, follow the following steps...

1. Remove the individual from the source of the burn.
2. Flood the burned area with cool water for 10-20 minutes. You may also use a cool wet compress. Do not use ice, ice water, creams, or greasy substances such as butter. Do not break any blisters that form.
3. Gently remove tight rings, clothing, etc. from the burned area before swelling increases.
4. Gently apply lotion such as aloe vera or moisturizing lotion to the burned area.
5. Cover the burned area with plastic wrap, a loose sterile dressing, or loose gauze.
6. Encourage the injured individual to take sips of cool water.
7. Take over-the-counter pain relievers such as ibuprofen or acetaminophen if necessary. Make sure to read all labels on medications, follow all instructions and precautions, and to not exceed the recommended dosages.
8. Seek medical care if the individual is a child or if you are in any doubt about the individual's condition.

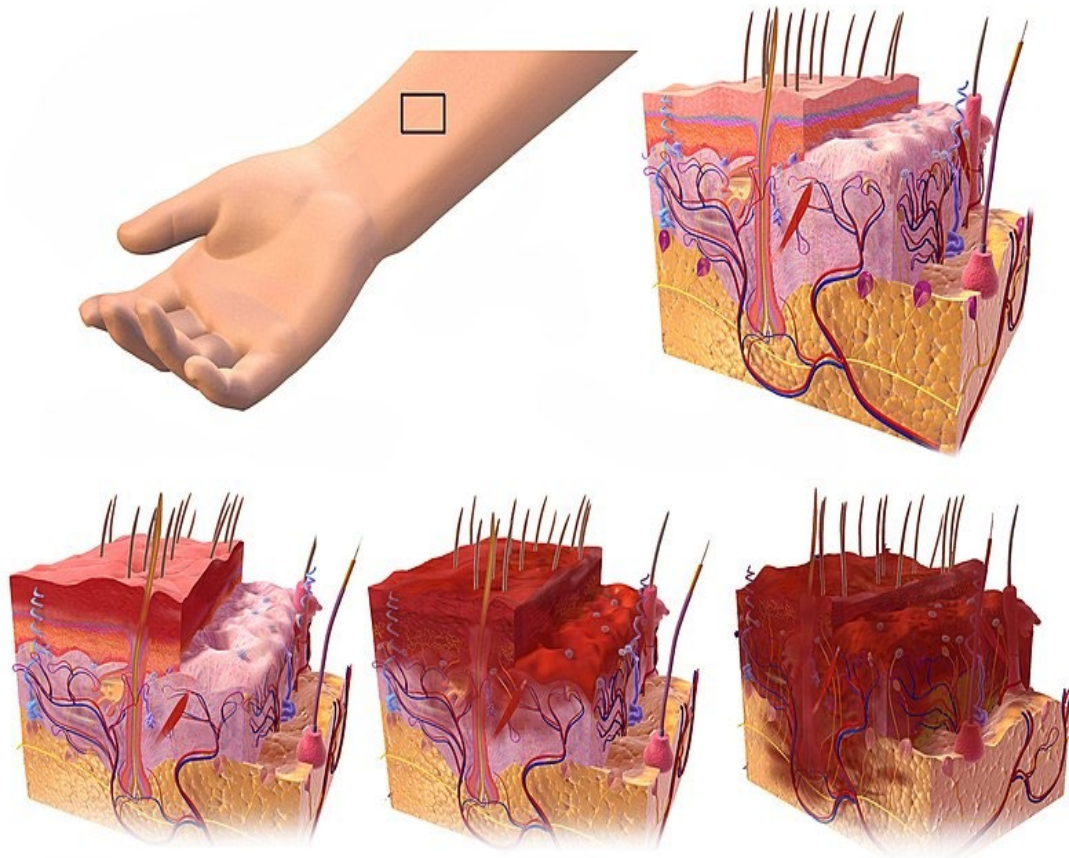


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## Superficial (1<sup>st</sup> Degree) Burn



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## Partial Thickness (Second Degree) Burn



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## Full Thickness (Third Degree) Burn



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## Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

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National Health Service. (2018, September 24). *Burns and scalds*. <https://www.nhs.uk/conditions/burns-and-scalds/>.

## Choking

Choking occurs when any kind of foreign object blocks an airway and is often caused by a piece of food in adults or a small object in children. Clutching the hands at the throat is the universal sign for choking. If a person is choking, encourage them to continue coughing and to spit the object out. Choking may cut off oxygen to the brain, so action should be taken immediately to remove the object from the choking person's airway.

Signs and symptoms of choking include...

- Difficulty breathing, noisy breathing, or squeaky breathing
- Inability to talk
- Cough
- Blue lips, skin, or nails
- Flushed skin
- Loss of consciousness

To help an adult or child over the age of 1 who is choking, take the following steps...

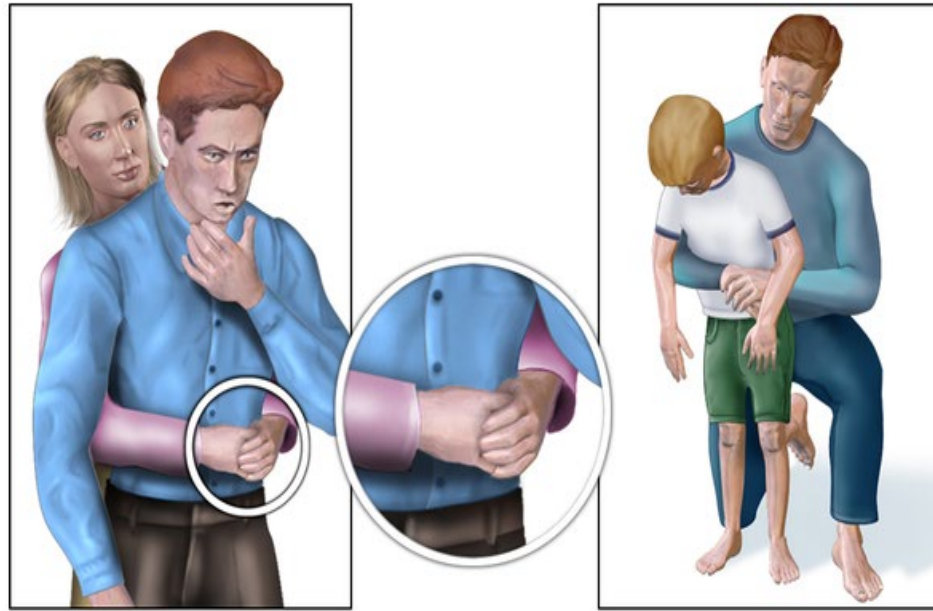
1. Have the person bend over at the waist with his or her body parallel to the ground and give 5 firm back blows between the shoulder blades with the heel of your hand.
2. Stand behind the person and place your fist just above the person's navel. Grab your fist with your other hand and firmly thrust upward 5 times.
3. Repeat back blows and abdominal thrusts until the object is dislodged.
4. If the individual becomes unconscious and ceases to breathe or have a pulse, call for emergency medical assistance and begin CPR and rescue breaths immediately.

To help an infant under the age of one who is choking, take the following steps...

1. Lay the infant face down along your forearm and give 5 gentle but firm back blows between the shoulder blades with the heel of your hand.
2. Turn the infant on its back and push on the infant's breast bone between the nipples with 2 fingers only. Give the infant 5 chest thrusts.
3. Repeat steps 1 and 2 until the object is dislodged.



4. If the infant becomes unconscious and has no pulse or signs of breathing, call for emergency medical assistance and begin infant CPR and rescue breathing immediately.



**Heimlich with Adult**

**Heimlich with Child**

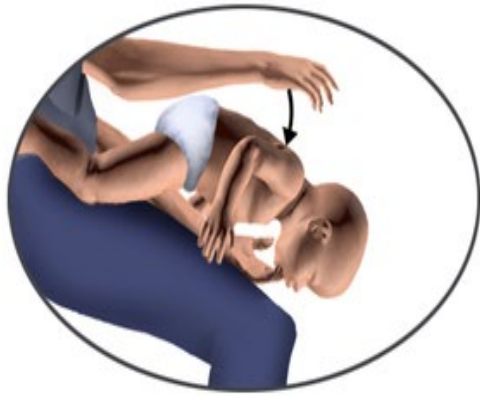
Image obtained from

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Back Blows



Chest Thrusts

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Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

Mayo Clinic Staff. (2020, October 14). *Choking: First aid*. Mayo Clinic. <https://www.mayoclinic.org/first-aid/first-aid-choking/basics/art-20056637>.

National Health Service. (2018, August 21). *What should I do if someone is choking?* <https://www.nhs.uk/common-health-questions/accidents-first-aid-and-treatments/what-should-i-do-if-someone-is-choking/>.

## Cold Compresses

Cold compresses and ice packs have the potential to reduce pain and swelling from injuries such as bruises and sprains. To create a cold compress, soak a clean cloth in cold water and apply it to the injured area for 10 minutes. You will need to re-soak in cold water every few minutes to keep the cloth cold. To create an ice pack, fill a plastic bag with ice, or use a package of frozen vegetables. Apply the ice pack to the injured area for no more than 10 minutes. You may need to apply the ice pack multiple times, but give the injured area 5 minutes in between each time you apply.

## Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

## CPR, AED, and Rescue Breathing

CPR stands for cardiopulmonary resuscitation and involves emergency chest compressions that allow the heart to continue to pump blood to the brain and the rest of the body. When the heart stops, blood no longer flows, which can cause brain damage within a matter of minutes. To administer CPR on an adult or child older than 1 year, take the following steps...

1. Call for emergency medical help, lay the person flat on his or her back, and check the person's radial or carotid pulse to see if his or her heart is still beating. At the same time, monitor the person's breathing by listening to his or her mouth and seeing if the chest rises and falls.
2. If there is no pulse and no breath sound, place one hand interlocked with the other on the center of the person's chest directly in between the nipples.
3. Press down over and over approximately 2 inches deep but no more than 2.4 inches deep at a rate of at least 100 beats per minute.
4. After 30 chest compressions, tilt the person's head back to open the airway and give two consecutive rescue breaths by placing your mouth fully and directly over their mouth and watching the chest rise and fall.
5. If available, use an Automated External Defibrillator (AED - see below).
6. Continue this process until the individual becomes responsive or until emergency medical help arrives and takes over.

To administer CPR to an infant less than 1 year, take the following steps...

1. Call for emergency medical help, lay the infant flat on its back, and check the infant's brachial pulse to see if its heart is still beating. At the same time, monitor the infant's breathing by listening to its mouth and seeing if its chest rises and falls.
2. With 2 fingers, press down on the center of the infant's chest in between the nipples over and over at a depth of 1.5 inches and at a rate of at least 100 beats per minute.

3. After 30 chest compressions, open the infant's airway by tilting the head back, and give 2 consecutive rescue breaths by placing your mouth fully over the infant's mouth, watching the chest rise and fall.
4. If available, use an AED (Automated External Defibrillator).
5. Continue this process until the infant becomes responsive or until emergency medical professionals take over.

For further CPR instruction, watch the videos below...

<https://youtu.be/1wj-zixnz2s>

<https://youtu.be/n65HW1iJUuY>

<https://youtu.be/5czZuGFC71c>

<https://youtu.be/CnbkWUGW4dQ>

An automated external defibrillator (AED) is a device that sends an electrical shock through the heart to try and get it beating normally again. AEDs are found in many public spaces. For instructions on how to use an AED, watch the video below.

[https://youtu.be/BAWGjNAj\\_vA](https://youtu.be/BAWGjNAj_vA)

<https://youtu.be/-7TRqOfDcbM>

For further instruction, you may also take a certification class in CPR/AED and rescue breathing.

## Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

Mayo Clinic Staff. (2021, May 1). *Cardiopulmonary resuscitation (CPR): First aid*. Mayo Clinic. <https://www.mayoclinic.org/first-aid/first-aid-cpr/basics/art-20056600>.

## Cuts and Scrapes

Most cuts and scrapes can be treated by following the 5 steps below. Seek medical care if the cut or scrape begins to show signs of infection such as redness, drainage, or increasing warmth, pain, or swelling. It is also important to seek medical care if the cut or scrape won't stop bleeding, if there is a foreign object embedded in the wound, if there is a wound inflicted by a dirty or rusty object, or if there is an infection risk from a human or animal bite.

1. Wash your hands, put on gloves, and stop the bleeding by applying gentle pressure with sterile gauze or a clean cloth. If possible, elevate the wound above the heart to help stop the bleeding.
2. Rinse the wound under clean running water while washing the area around the wound with soap and water (use alcohol free wipes when there is no running water available). Pat the area dry with sterile gauze or a clean cloth. Do not treat the wound with iodine or hydrogen peroxide.
3. Apply antibiotic ointment (such as Neosporin) or petroleum jelly to the wound, and cover the wound with an adhesive bandage or sterile gauze held in place with tape. If a rash appears, stop applying ointment. Minor scrapes or scratches may be left uncovered.
4. Change the dressing daily or especially when it becomes wet or dirty
5. Seek medical care to receive a tetanus shot if the wound appears deep or dirty.

## Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

Mayo Clinic Staff. (2019, October 29). *Cuts and scrapes: First aid*. Mayo Clinic. <https://www.mayoclinic.org/first-aid/first-aid-cuts/basics/art-20056711>.

## Dislocations

A dislocation involves partially or fully pulling a bone out of position, specifically at the location of joints, and is characterized by temporary deformity, immobilization, pain, and swelling. Dislocation most commonly occurs in the shoulders, hips, knees, thumb/fingers, elbow, and jaw. A dislocation can appear similar to a fracture; if in doubt, treat the injury like a fracture. To treat a dislocation, take the following steps...

1. Call for emergency medical assistance.
2. Immobilize the injured area (with a sling if it's a shoulder dislocation).
3. Place an ice pack or cold compress on the injured joint.
4. Monitor circulation in the injured area until help arrives.

## Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

Mayo Clinic Staff. (2020, June 3). *Dislocation: First aid*. Mayo Clinic. <https://www.mayoclinic.org/first-aid/first-aid-dislocation/basics/art-20056693>.



## Fractures

A fracture is simply a break or a crack in a bone. Fractures may come from twisting, wrenching, or receiving a heavy blow to one or more parts of the body. Fractures may occur more easily in old and diseased bones. Open fractures involve bone protruding through the skin's surface while closed fractures involve bone displacement and possible bleeding, but the bone does not protrude through the skin. Seek professional medical assistance if you observe or suspect the following...

- Unresponsiveness
- Deformity
- Pain with gentle pressure or movement
- Head, neck, or back fracture
- Bone piercing the skin
- Blue coloring to the tips of extremities

To treat a closed fracture, take the following steps...

1. Call for emergency medical assistance and keep the person still, especially keeping the injured area immobilized.
2. Place padding around the injury for extra support
3. Only if care is delayed, immobilize the injury with a sling (if the injury is to the arm), or gently tie one leg to the other (if the injury is to a leg).
4. Apply an ice pack or cold compress to the injured area.
5. Monitor vital signs, especially circulation near the injured area, and treat for shock if necessary.

To treat an open fracture, take the following steps...

1. Cover the wound with a sterile dressing and apply pressure around the injury. Never apply direct pressure to a protruding bone.
2. Place and secure another dressing on top of the previous one.
3. Immobilize the injury the same way as a closed fracture.

4. Monitor vital signs, especially circulation in the injured area, and treat for shock if necessary.

#### Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

Mayo Clinic Staff. (2020, June 26). *Fractures (broken bones)*. Mayo Clinic. <https://www.mayoclinic.org/first-aid/first-aid-fractures/basics/art-20056641>.

## Insect Bites and Stings

Insect bites and stings are common ailments, but they can carry dangerous diseases such as Lyme disease, malaria, or West Nile Virus. Insect bites and stings are typically characterized by a red, swollen, painful, and itchy lump and may involve nausea, vomiting, and headache. Also note that insect bites and stings can cause an allergic reaction or anaphylaxis in certain individuals. If you find a tick on you, remove the tick as soon as possible with a pair of tweezers, wash the area with soap and water, and apply antiseptic cream to the affected area. To treat mild insect bites, follow the steps below.

1. Wash your hands with soap and water and evaluate the wound to see if the stinger is still embedded in the skin. If so, remove the stinger by scraping it off with a card or even a fingernail. Do not pinch the stinger or use tweezers to remove it, as it may cause more venom to be released into the skin.
2. Wash the affected area with soap and water. To prevent infection, do not scratch the area or burst a blister.
3. Apply a cold compress or ice pack wrapped in a towel for at least ten minutes to prevent further swelling. Elevate the wound if possible.
4. Monitor vital signs, including responsiveness, breathing, and pulse, and monitor for signs of an allergic reaction, including wheezing or difficulty breathing.
5. Apply hydrocortisone cream or calamine lotion several times each day and take an over-the-counter antihistamine such as Benadryl to reduce itching and swelling. You may even take a pain reliever such as ibuprofen or acetaminophen if you feel it is needed. Make sure to read all labels on medications, follow all instructions and precautions, and to not exceed the recommended dosages.

Seek medical care immediately if you develop any of the following symptoms...

- Wheezing or difficulty breathing
- Swelling of the lips, throat, or eyelids
- Fast heart rate
- Faintness or dizziness
- Loss of consciousness

- Difficulty swallowing
- Hives
- Nausea or vomiting
- Cramping
- Symptoms don't improve or worsen after a few days
- You were stung near your mouth, throat, or eyes
- The area around the wound becomes red or swollen
- Fever, swollen glands, or flu-like symptoms
- The wound begins draining pus or becomes more painful, swollen, and red
- Seek medical care always if a child is stung by a scorpion

It is important to never give an individual something to drink if he or she is having an allergic reaction.

## Insect Bites



Image obtained from [https://commons.wikimedia.org/wiki/File:Bites\\_of\\_a\\_blood-sucking\\_insect\\_\(Tabanidae\)\\_on\\_the\\_shins\\_of\\_an\\_adult.\\_003.jpg](https://commons.wikimedia.org/wiki/File:Bites_of_a_blood-sucking_insect_(Tabanidae)_on_the_shins_of_an_adult._003.jpg)

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## Insect Stings



Image obtained from <https://commons.wikimedia.org/wiki/File:Bee-sting-piqure-abeille-scale-2.jpg>

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## Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

Mayo Clinic Staff. (2018, February 17). *Insect bites and stings: First aid*. Mayo Clinic. <https://www.mayoclinic.org/first-aid/first-aid-insect-bites/basics/art-20056593>.

National Health Service. (2019, July 8). *Insect bites and stings*. <https://www.nhs.uk/conditions/insect-bites-and-stings/>.

## Heat Exhaustion

Heat exhaustion is a condition that develops gradually with sustained exposure to a hot, humid environment. Heat exhaustion is caused when the body produces more heat than it is able to handle or when the body loses significant amounts of salt and water through excess sweating. A person is more at risk to develop heat exhaustion if he or she is engaging in physical activity in hot and humid conditions. Those who are ill or unwell are more likely to develop heat exhaustion. If left untreated, heat exhaustion can lead to a much more dangerous condition known as heat stroke. Symptoms of heat exhaustion include...

- Fatigue
- Rapid, weak pulse
- Cool, moist skin with goosebumps
- Dizziness/faintness/lightheadedness
- Heavy sweating
- Cramps
- Headache
- Nausea and vomiting
- Low blood pressure with standing
- Irritability
- Thirst

To help treat heat exhaustion, take the following steps...

1. Help the affected individual move to a cooler location - ideally shade or air conditioned indoors - and raise and support his or her legs above heart level.
2. Remove any heavy or tight clothing and give the individual plenty of cool water to drink.
3. Cool the person down by immersing them in an ice bath or by placing ice/cold wet towels on the head, neck, trunk, armpits, and groin. Use fans and spray with cool water if available.
4. Monitor vital signs and response level.



5. Call for emergency medical assistance if the person worsens or if their symptoms don't improve within 1 hour.

Always encourage the affected individual to seek medical assistance even if symptoms of heat exhaustion improve quickly. Seek emergency medical assistance if any of the following symptoms arise...

- Unconsciousness/fainting
- Confusion
- Agitation
- Inability to drink
- Slurred speech
- Seizures
- Body temperature equal to or greater than 104F.

#### Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

Mayo Clinic Staff. (2020, March 31). *Heat exhaustion: First aid*. Mayo Clinic. <https://www.mayoclinic.org/first-aid/first-aid-heat-exhaustion/basics/art-20056651>.

United States Department of Labor. (n.d.). *Heat-related illnesses and first aid*. Occupational Safety and Health Administration. <https://www.osha.gov/heat-exposure/illness-first-aid>.

## Heat Stroke

Heat stroke is associated with dangerous levels of overheating secondary to a high fever or sustained heat exposure, especially in a hot, humid environment. Heat stroke can follow heat exhaustion and typically involves a lack of sweating. Heat stroke is also exacerbated by exertion or by strenuous activity in the heat. An individual experiencing heat stroke may become unconscious within minutes of feeling unwell. Heat stroke can be life-threatening and can cause damage to the brain and vital organs.

Symptoms of heat stroke include...

- Fever greater than or equal to 104F
- Change in mental status such as confusion and agitation
- Slurred speech
- Fainting
- Hot and dry skin or heavy sweating
- Nausea and vomiting
- Headache
- Rapid pulse and breathing
- Flushed skin

To treat heat stroke most effectively, take the following steps...

1. Call for emergency medical assistance, move the individual to a cool place (ideally indoors), and remove as much outer clothing as possible.
2. Cool the individual by having them sit down, placing fans directly on them, and place ice packs on the neck, armpits, and groin. You may also place a cold, wet sheet over the individual, place them in a tub of cool water, or run them under a cool shower.
3. Have the individual drink cool water. Do not give sugary, caffeinated, or alcoholic drinks. Also, do not give very cold drinks.

4. Monitor vital signs and body temperature until help arrives. Repeat the cooling process if body temperature arises again. If the individual is unresponsive, not breathing, and has no pulse, begin CPR immediately.

#### Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

Australian Red Cross. (n.d.). *Heatstroke and heat exhaustion*.  
<https://www.redcross.org.au/get-help/emergencies/looking-after-yourself/heatstroke-and-heat-exhaustion>.

Mayo Clinic Staff. (2020, April 1). *Heatstroke: First aid*. Mayo Clinic.  
<https://www.mayoclinic.org/first-aid/first-aid-heatstroke/basics/art-20056655>.

## Hypoglycemia

Hypoglycemia is characterized by low blood sugar levels, typically less than 70 mg/dL. Hypoglycemia typically involves a decreasing level of responsiveness, and individuals who have diabetes are especially susceptible to hypoglycemic episodes. Hypoglycemia may involve impaired consciousness and may follow epileptic seizures, binge drinking, or the use of certain drugs.

Symptoms of hypoglycemia include...

- Irregular/fast heart rate
- Fatigue
- Anxiety
- Shakiness
- Pale skin
- Hunger
- Sweating
- Irritability
- Tingling/numbness of the lips, tongue, or cheek
- Confusion
- Abnormal behavior
- Visual changes (blurred vision)
- Loss of consciousness
- Seizure

To treat an individual with hypoglycemia, take the following steps...

1. Have the individual sit down, and give them approximately 10g of glucose; i.e. 8oz glass of fruit juice, 2 teaspoons of sugar, sugary candy, glucose tablets/gel, soft drink (non-diet), honey, etc.
2. If available, have the individual check their blood glucose with a glucose testing kit. If blood glucose is less than 70 mg/dL after 15 minutes, give approximately 15-20g more of sugary food/drink.

3. Monitor vital signs and call for emergency medical assistance if the individual's condition does not improve.
4. Have the individual eat a snack or a meal after they are feeling better to stabilize blood glucose levels.

#### Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

Mayo Clinic Staff. (2020, March 13). *Hypoglycemia*. Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/hypoglycemia/symptoms-causes/syc-20373685>.

## Hypothermia

Hypothermia is a condition that occurs when body temperature drops below 95F (35C) and is characterized by reduced systemic circulation. Hypothermia is associated with sustained exposure to cold. High wind chill or immersion in cold water significantly increases the risk of hypothermia. Hypothermia can also occur in poorly heated households, and infants, elderly individuals, the homeless, and thin and frail individuals are especially susceptible to hypothermia. Lack of activity, fatigue, dehydration, chronic illness, and alcohol and drug use may also increase the risk of developing hypothermia.

Symptoms of hypothermia include...

- Shivering
- Weak pulse
- Slurred speech/mumbling
- Slow and shallow breathing
- Clumsiness
- Confusion/memory loss
- Loss of consciousness
- Cold and bright red skin

To treat hypothermia, take the following steps...

1. Remove the affected individual from the cold and into a warm place if possible. If not, be sure to shield the person from the wind.
2. Remove wet clothing and cover the individual's head.
3. Cover the affected individual with blankets (preferably an electric blanket) and give them warm drinks, warm soup, and high energy foods such as chocolate.
4. Monitor vital signs.
5. Seek emergency medical assistance.

## Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

British Red Cross. (n.d.). *Learn first aid for someone who has hypothermia*. <https://www.redcross.org.uk/first-aid/learn-first-aid/hypothermia>.

Mayo Clinic Staff. (2020, April 15). *Hypothermia: First aid*. Mayo Clinic. <https://www.mayoclinic.org/first-aid/first-aid-hypothermia/basics/art-20056624>.

## Nosebleed

Nosebleeds most commonly occur when small blood vessels rupture inside the nostrils. Nosebleeds can occur after sneezing, nose picking, blowing the nose, or after a direct blow to the nasal area. They can also be caused by hypertension or the use of blood thinning medication. If there is severe blood loss, nosebleeds can be quite serious. Seek emergency medical care immediately if any of the following symptoms arise...

- Faintness/lightheadedness
- Bleeding lasts more than 30 minutes
- Bleeding follows a head injury and blood appears thin and watery
- Bleeding follows a head injury, accident, or fall
- Bleeding occurs while taking blood thinners (Eliquis, Plavix, Xarelto, Coumadin/Warfarin, Pradaxa, etc.)

To prevent nosebleeds, add a water-based lubricant to the nostrils or increase the humidity in your home with a humidifier. To treat nosebleeds and stop bleeding, take the following steps...

1. Sit down and tilt the head forward, breathing through the mouth. Do not tilt the head back, as blood may run down the throat.
2. Gently blow the nose to remove blood clots and spray Afrin in the nose if available. Try not to swallow, speak, cough, spit, or sniff.
3. Pinch the nose shut in the soft part just below the nasal bone for 10-15 minutes.
4. After 10-15 minutes, check to see if the bleeding has stopped. If not, repeat step 3 for 10-15 more minutes. If the bleeding has not stopped after more time, seek medical care.
5. When the bleeding has stopped, clean around the nose with lukewarm water.
6. Void picking the nose, blowing the nose, bending over, or exertion for several hours after a nosebleed.



## Resources

- Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.
- Mayo Clinic Staff. (2020, December 18). *Nosebleeds: First aid*. Mayo Clinic. <https://www.mayoclinic.org/first-aid/first-aid-nosebleeds/basics/art-20056683>.

## Seizure

Seizures are characterized by an electrical disturbance in the brain and typically involve involuntary muscle contractions. Seizures usually cause impaired consciousness and can lead to injuries or falls. Seizures are most typically caused by epilepsy, but they can be caused by head injuries, oxygen or glucose shortages, certain diseases, and certain toxins such as alcohol or drugs. Seizures may also be caused by a high fever, especially in children. An individual may have a brief warning before a seizure occurs such as a specific feeling or a certain smell or taste. If someone is having a seizure, do not move them unless they are vomiting or in immediate danger and do not put anything in their mouth. Do not attempt to restrain anyone having a seizure.

Seizure symptoms typically include...

- Sudden loss of consciousness
- Rigidity and arching of the back
- Convulsions
- Noisy or difficult breathing
- Foaming at the mouth
- Tongue biting
- Possible bowel/bladder incontinence

To help someone who is having a seizure, take the following steps...

1. Give the person space and remove any surrounding dangerous items. Ease the person to the floor and place them on their side. Record how long the seizure lasts.
2. Place soft material such as a rolled-up jacket under the head and neck and loosen tight clothing around the neck. If the person is having a febrile seizure, cool them by removing clothing and bedding and making sure there is a supply of fresh air.
3. When convulsions stop, check breathing and vital signs, and place the person on their side in the recovery position.
4. Monitor vital signs and call for emergency medical assistance if necessary.

Seek medical care if any of the following is true...

- The seizure lasts more than 5 minutes
- This is the individual's first seizure
- The individual has difficulty awaking or breathing after the seizure
- The individual has a second seizure following the first
- The person is injured
- The seizure occurs in water
- The person is pregnant or has a history of diabetes or heart disease

#### Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

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## Shock

Shock is a life-threatening condition characterized by deprivation of oxygen in vital organs such as the brain and heart. The most common cause of shock is from severe blood loss from either external or internal bleeding. Shock develops when an individual loses approximately 1.2 liters of blood. Shock can also result from severe fluid loss (diarrhea, vomiting, bowel obstruction, burns), trauma, heatstroke, allergic reactions (anaphylactic shock), infection (septic shock), poisoning, failure of the heart to pump blood (cardiogenic shock), or spinal cord injury (neurogenic shock).

Symptoms of shock include...

- Rapid or weak pulse
- Enlarged pupils
- Pale, cold, or clammy skin
- Sweating
- Weakness/dizziness
- Rapid, shallow breathing
- Gray/blue lips, skin, or fingernails
- Poor capillary refill (color does not return well when fingernails are pressed)
- Nausea or vomiting
- Thirst
- Yawning or gasping
- Restlessness, aggression, or anxiety
- Unconsciousness

To help treat shock, take the following steps...

1. Call for emergency medical assistance; identify and treat the cause of shock (severe external bleeding, anaphylaxis, etc.).
2. Have the person lie down and elevate their feet and legs above heart level.
3. Loosen any tight clothing, especially around the neck, chest, and waist. Cover the individual with a blanket to prevent chilling.

4. Don't give anything to eat or drink. If the person begins vomiting or bleeding from the mouth, turn them on their side to prevent choking.
5. Monitor vital signs and response level. If the person becomes unresponsive, is not breathing, and has no pulse, begin CPR and rescue breathing immediately.

#### Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

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## Slings

A sling is a device used to immobilize an injured arm. It is most typically used when an arm is fractured or when a shoulder is dislocated. A sling holds the injured arm in a slightly raised and horizontal position.

To apply a basic sling, take the following steps...

1. Find a triangular bandage or a piece of cloth. Have the individual hold the injured arm horizontally against the body and support the injured arm with the other healthy arm. Slide the triangular bandage or cloth in between the injured arm and body.
2. Place one end of the bandage around the opposite healthy shoulder, wrap the bandage around the injured arm, and connect the end of the bandage around the neck with the bandage hanging from the healthy shoulder. Tie a square knot.
3. Twist the fabric hanging around the injured elbow until it is snug and tie a knot or tuck the excess fabric into the sling.
4. Bind the sling around the body with another triangular bandage, and check circulation.
5. Seek medical care.

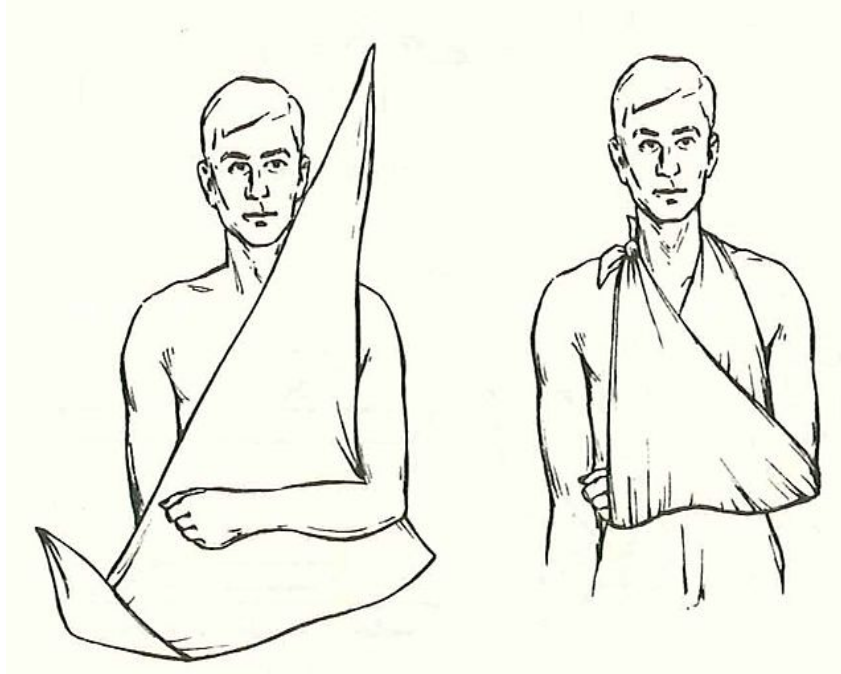


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## Resources

Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.

U.S. National Library of Medicine. (2021, August 5). *How to make a sling*. MedlinePlus. <https://medlineplus.gov/ency/article/000017.htm>.

## Strains and Sprains

Strains and sprains are both soft tissue injuries, typically involving muscles, tendons, or ligaments. A strain involves overstretching a muscle or tendon while a sprain is characterized by the stretching or tearing (partially or completely) of a ligament.

Ligaments connect bone to bone while tendons connect muscle to bone. Strains and sprains are often associated with playing sports. Typically, strains and sprains involve pain, swelling, bruising, and/or immobility.

Seek medical care immediately if any of the following symptoms arise...

- Inability to bear weight on the injured area
- Instability or numbness in a joint
- Pain directly over bone
- Redness or spreading red streaks
- The injured area has previously been injured

To treat a strain or a sprain, follow RICE, which stands for rest, ice, compression, elevation. Thus, take the following steps...

1. Have the injured person sit down and rest the injured area.
2. Apply a cold compress or ice pack to the injured area for 10-15 minutes four to eight times per day until swelling improves. Do not use ice too long.
3. Compress the injured area with an elastic wrap or a bandage. Check circulation after applying.
4. Elevate the injured area above heart level.
5. Use over-the-counter pain medication such as ibuprofen or acetaminophen if you feel it is necessary. Make sure to read all labels on medications, follow all instructions and precautions, and to not exceed the recommended dosages.



## Resources

- Austin, M., Crawford, R., & Armstrong, V. J. (2014). *First aid manual*. (G. M. Piazza, Ed.) (5th ed.). DK Publishing. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>.
- Mayo Clinic Staff. (2020, June 6). *Sprain: First aid*. Mayo Clinic. <https://www.mayoclinic.org/first-aid/first-aid-sprain/basics/art-20056622>.