

I'm not a robot





























When we get a cut, sprain, or broken bone, our bodies have an amazing ability to heal themselves. This process is a complex interplay of various biological processes and can take anywhere from a few days to several weeks or even months, depending on the severity of the injury. In this post, we'll explore the science behind healing and offer tips for supporting the body's natural healing process. The Role of Inflammation in Healing One of the first steps in the healing process is inflammation. When we're injured, our bodies release a cascade of chemicals that cause blood vessels to dilate, allowing immune cells to reach the site of injury. These immune cells help to remove damaged tissue and fight off any potential infections. Although inflammation can be uncomfortable and even painful, it's a necessary part of the healing process. The Stages of Healing After the initial inflammatory response, the body enters the proliferative stage of healing. During this stage, cells begin to divide and new tissue is formed to replace the damaged tissue. This stage can last several weeks and is followed by the remodeling stage, during which the new tissue matures and strengthens. This final stage can take several months to complete. Supporting the Healing Process There are several things you can do to support your body's natural healing process. First and foremost, it's important to get plenty of rest and to avoid putting too much stress on the injured area. You may also want to apply ice or heat to reduce inflammation and relieve pain. Eating a healthy diet that's rich in nutrients can also support the healing process, as can staying hydrated and getting plenty of sleep. In some cases, supplements and other natural remedies may also be helpful. For example, omega-3 fatty acids have been shown to reduce inflammation and promote healing, while curcumin, found in turmeric, has been shown to have anti-inflammatory and pain-relieving effects. Talk to the Experts The body's ability to heal itself after an injury is truly remarkable. By understanding the science behind healing and taking steps to support the healing process, we can help our bodies recover from injuries more quickly and effectively. If you're ever in doubt about the best course of action for an injury, contact our Foothill Ranch Physical Therapy, Placentia Physical Therapy, Mission Viejo Physical Therapy, or Lake Forest Physical Therapy locations. Have you ever wondered how a simple cut on your finger can heal itself over time? The human body is equipped with an extraordinary ability to heal, showcasing the intricate interplay of biology and chemistry. From the moment an injury occurs to the full restoration of tissue, our bodies engage in a complex healing process. This blog post will delve into the fascinating mechanisms behind self-healing, offering you a fresh perspective on the incredible resilience of the human body. The Healing Process: An Overview The healing process can be broadly categorized into three primary phases: inflammation, tissue formation, and remodeling. Each phase plays a crucial role in restoring the body's integrity. 1. Inflammation: The Body's Alarm System When an injury occurs, the body initiates an inflammatory response. This phase is characterized by vasodilation: Blood vessels expand to increase blood flow to the area, bringing essential nutrients and immune cells. Swelling and Redness: Increased blood flow leads to swelling and redness, which helps the body fight potential infections. Pain Signals: Nerve endings become more sensitive, signaling pain to prevent further injury. 2. Tissue Formation: Building Blocks of Recovery Once the initial inflammatory response subsides, the body shifts focus to tissue formation. Key processes include: Cell Proliferation: New cells begin to multiply, filling the wound. Stem cells play a significant role here, differentiating into various cell types needed for repair. Extracellular Matrix (ECM) Formation: This matrix provides a scaffold for new cells to grow and organize, ensuring proper tissue structure. Granulation Tissue Development: New tissue, known as granulation tissue, forms beneath the surface, aiding in the healing of deeper layers. 3. Remodeling: Fine-Tuning the Repair The final phase is remodeling, which can last for months or even years. During this stage: Collagen Reorganization: Collagen fibers are realigned to strengthen the tissue, improving its tensile strength. Scar Maturation: The appearance of scars changes over time as blood vessels diminish and the tissue becomes more resilient. Restoration of Function: The body works to restore normal function in the affected area, driven by the nervous system and muscle coordination. Your body is a marvel of resilience. From paper cuts to broken bones, your biology is equipped with an astonishing ability to repair itself. Healing is not a mere patchwork process—it's a complex, dynamic, and precisely coordinated ballet of cellular signals, molecular mechanisms, and regenerative strategies honed by millions of years of evolution. You might not notice it, but every moment of every day, your body is performing microscopic miracles to keep you alive, functional, and thriving. When tissues are damaged—whether by injury, disease, or daily wear and tear—the body doesn't simply stop working. Instead, it springs into action with a well-orchestrated plan of defense, repair, and renewal. But what exactly happens inside your body when you get hurt? How does a wound close, a bone knit back together, or an organ recover from inflammation? What makes some tissues heal quickly while others lag behind—or never regenerate at all? In this deep dive into the biology of healing, we'll unravel the mysteries of how your body repairs itself. From the instant response of immune cells to the long-term remodeling of tissues, we'll explore every step of the journey from damage to recovery. Along the way, you'll discover that healing isn't just a passive process—it's a biological masterpiece powered by sophisticated cellular intelligence. The biology of healing begins the moment damage occurs. Whether you've scraped your knee, burned your hand, or twisted your ankle, your body's first reaction is rapid and decisive: inflammation. Often misunderstood as harmful, inflammation is actually a vital, life-saving response—a call to arms for your immune system. When tissue is injured, blood vessels in the area dilate in a process called vasodilation, allowing increased blood flow to the damaged site. The blood becomes rich with white blood cells, platelets, and various proteins, each playing critical roles in containment and cleanup. The damaged cells release chemical signals like histamine, bradykinin, and prostaglandins, which increase vascular permeability. This allows immune cells to slip through the vessel walls and flood the tissue. You might recognize this response as redness, warmth, swelling, and pain—the classic signs of inflammation. These symptoms, although uncomfortable, are evidence that your body is mobilizing its internal army. Immune cells, particularly neutrophils and macrophages, are the first responders. Neutrophils swarm the area, engulfing bacteria and cellular debris in a process called phagocytosis. Macrophages follow, not only cleaning up the mess but also releasing cytokines that recruit and instruct other cells to join the healing effort. This phase is chaotic yet purposeful—a battlefield that must be cleared before reconstruction can begin. While immune cells wage war on infection and debris, your blood is undergoing its own transformation. The goal is clear: stop the bleeding and seal the wound. This is where platelets, the tiny disc-shaped cells in your blood, spring into action. Upon encountering a damaged blood vessel, platelets stick to the exposed collagen and begin aggregating. They release signals like thromboxane and ADP, which recruit more platelets to form a temporary plug. Meanwhile, a complex cascade of enzymes activates fibrinogen, a soluble protein, converting it into fibrin, which forms a sticky meshwork that solidifies the clot. This mesh traps red blood cells and reinforces the seal, creating what we see as a scab on the surface of a wound. This clot is more than a plug—it's a biochemical scaffold. It not only prevents further blood loss and infection but also serves as a temporary matrix where cells can migrate and organize during the next phases of repair. Underneath the scab, your body is already preparing the ground for rebuilding. Once the battlefield is stabilized and the danger contained, your body shifts into repair mode. This is the proliferative phase, characterized by rapid cell growth, tissue formation, and new blood vessel development. The goal now is to replace the damaged or destroyed tissue with fresh cells and restore function as efficiently as possible. Central to this process are fibroblasts, specialized cells that migrate into the wound site. They begin producing collagen, the primary structural protein in the body, which forms the framework of the new tissue. Collagen fibers are laid down in an organized manner to provide strength and elasticity. This new tissue is called granulation tissue, and it's rich in both collagen and newly formed capillaries. Angiogenesis—the formation of new blood vessels—is a key feature of this phase. Oxygen and nutrients are essential for healing, and endothelial cells sprout from existing vessels, guided by growth factors like VEGF (vascular endothelial growth factor). These vessels ensure that the regenerating tissue is nourished and can continue to rebuild. Meanwhile, epithelial cells at the wound edges begin to migrate across the wound bed in a process known as re-epithelialization. They cover the wound surface, creating a barrier against infection and dehydration. If the wound is shallow, this can occur quickly. Deeper injuries take longer, as more layers of tissue must be reconstructed. Even after a wound has closed, healing is not complete. The final phase, remodeling, can last weeks, months, or even years, depending on the severity and location of the injury. During this phase, the temporary tissue built during proliferation is replaced with more permanent, organized tissue that better matches the original structure. Fibroblasts continue to reshape the collagen matrix. Initially, the collagen laid down is type III collagen, which is later replaced with the stronger, more organized type I collagen. This transformation enhances the tensile strength of the repaired tissue, making it more durable. Capillaries that are no longer needed regress, and the overall cellularity of the tissue decreases. The scar matures, becoming flatter, paler, and more aligned with surrounding tissue. Although scars rarely match the strength or flexibility of original skin, they are functional and protective. In organs like the liver, heart, or lungs, remodeling takes on a more complex character. The outcome may be regeneration, in which the original tissue is fully restored, or fibrosis, in which scar tissue replaces functional cells. The extent of regeneration versus scarring depends on the tissue type and the context of the injury. Bone is one of the few tissues in the body that can heal without forming a scar, returning to its original state. The process of bone repair is both robust and fascinating, involving distinct phases that mirror soft tissue healing but with added complexity. After a fracture, the body initiates an inflammatory response. Blood vessels rupture, forming a hematoma at the fracture site. This is followed by the recruitment of osteoprogenitor cells, which differentiate into bone-producing cells. The next phase involves the formation of a soft callus composed of cartilage and fibrous tissue. Over time, this is replaced by a hard callus made of woven bone, produced by osteoblasts. Finally, the bone undergoes remodeling, during which the woven bone is replaced by lamellar bone, the strong, well-organized tissue typical of healthy bone. Remarkably, once the healing process is complete, the bone can regain its full strength and function—often without any trace of the original break. The skin, your largest organ, is constantly under assault—from cuts and scrapes to burns and bruises. It responds with incredible efficiency, often healing itself within days or weeks. But skin healing varies depending on the depth and severity of the injury. Superficial wounds that affect only the epidermis heal through the rapid division of basal keratinocytes, which migrate to cover the wound. Partial-thickness wounds, which extend into the dermis, trigger inflammation, fibroblast migration, and angiogenesis. Full-thickness wounds, which damage all skin layers, require complete regeneration of tissue architecture and are more likely to result in scarring. In rare cases, skin can regenerate completely, particularly in younger individuals or with the help of advanced medical treatments. Stem cells in hair follicles and sweat glands contribute to this regenerative capacity, acting as reservoirs for new skin cells. Some organs have an extraordinary ability to regenerate. Chief among them is the liver. It can regenerate up to 70% of its mass following injury or surgical removal. This regenerative power comes from hepatocytes, the liver's primary cells, which re-enter the cell cycle and proliferate in response to damage. Supporting cells and growth factors orchestrate this regenerative symphony, restoring both form and function. Skeletal muscle also has regenerative capabilities, thanks to satellite cells, a type of stem cell residing in muscle tissue. These cells activate in response to injury, proliferate, and fuse to form new muscle fibers. This process is vital for muscle repair after strenuous exercise, trauma, or disease. However, not all tissues regenerate well. The heart, for example, has very limited regenerative ability. After a heart attack, damaged muscle is often replaced by scar tissue, which impairs the organ's ability to pump effectively. Research into stimulating heart regeneration is ongoing, with stem cells and genetic therapies offering new hope. Neural tissue is notoriously poor at regenerating. In the central nervous system (CNS)—the brain and spinal cord—neurons rarely regenerate after injury. Factors like the presence of inhibitory molecules, the lack of regenerative support cells, and the complexity of neural connections hinder recovery. However, in the peripheral nervous system (PNS), nerves can regenerate to some extent. Schwann cells, which form the myelin sheath around peripheral nerves, help guide regrowth. Axons can sprout new growth cones and follow these pathways back to their targets—though the process is slow and often incomplete. Recent research into neural regeneration, including the use of stem cells, growth factors, and even 3D-printed scaffolds, is opening new avenues for restoring function after spinal cord injuries and neurodegenerative diseases. Stem cells are at the heart of your body's regenerative capacity. These undifferentiated cells capable of becoming various specialized cell types. They can be found in many tissues, including bone marrow, fat, muscle, and the skin. In response to injury, stem cells are activated to divide and differentiate into the necessary cell types. Hematopoietic stem cells in bone marrow give rise to immune cells; mesenchymal stem cells can become bone, cartilage, or fat cells. Neural stem cells, though rare, have the potential to replace neurons and glial cells. The promise of stem cells in medicine is enormous. From growing new organs in the lab to regenerating damaged tissues, stem cells could one day revolutionize how we treat injury, aging, and disease. Despite the body's impressive healing abilities, not all wounds heal properly. Chronic wounds—such as diabetic ulcers or pressure sores—remain stuck in a prolonged inflammatory phase. Poor circulation, infection, or underlying diseases can impair the delivery of oxygen, nutrients, and immune cells. Other factors such as age, nutrition, smoking, and stress also affect healing. Older individuals tend to heal more slowly due to reduced cell proliferation and weakened immune responses. Malnutrition deprives the body of essential proteins, vitamins, and minerals needed for repair. Understanding these limits helps clinicians develop better therapies, from advanced wound dressings and skin grafts to stem cell injections and growth factor treatments. Your body's ability to heal is nothing short of a biological miracle. From the smallest paper cut to the trauma of surgery or disease, an intricate network of cells, signals, and strategies swings into action to restore what's been lost. Healing is not just about recovery—it's a story of adaptation, resilience, and biological intelligence. It's a reminder that life is constantly renewing itself, not just in moments of crisis, but every moment you breathe, move, and live. Whether through clotting blood, regenerating liver tissue, or mending broken bones, your body is always working to maintain the harmony of health. Understanding the biology of healing not only deepens our appreciation for the complexity of life but opens doors to new medical frontiers where science may one day fully unlock the secrets of regeneration. If you get sick or incur an injury, your body naturally responds by healing itself. There are numerous processes that go into effect to heal the sick or injured area and restore your body to its normal, healthy self. Stem cells play a significant role in the body's natural healing process and are essential to your body's ability to recover from illness and injury. The Function of Stem Cells Unlike any other type of cell in the body, stem cells can regenerate into other types of cells. Stem cells can create bone cells, muscle cells, blood cells, brain cells, etc. This makes stem cells invaluable in repairing diseased or damaged tissue throughout the body. Embryonic stem cells form the essential cell types for fetal development. Adult stem cells remain after the embryonic stem cells are gone. While adult cells diminish as we age, they help the body heal itself throughout our lives. When illness or injury damages cells, adult stem cells regenerate, creating healthy cells to replace the damaged ones. This allows your body to heal from various injuries and medical conditions. Stem Cell Therapy To Boost Healing Stem cell therapy provides additional stem cells to an area of damaged tissue to facilitate the healing process. The stem cells provided in stem cell therapy bolster the body's natural healing process for a faster recovery. Stem Cells in Orthopaedic Treatment When stem cells are injected into the body during stem cell therapy, the stem cells are activated to develop healthy tissue and restore the damaged tissue. We provide stem cell therapy to aid patients' recovery from degenerative joint conditions and various soft tissue problems. If you're struggling with an orthopaedic injury or condition, stem cell therapy could be a beneficial regenerative treatment option for you. Contact us today to learn if you could be a good candidate for stem cell therapy. When we get a cut, sprain, or broken bone, our bodies have an amazing ability to heal themselves. This process is a complex interplay of various biological processes and can take anywhere from a few days to several weeks or even months, depending on the severity of the injury. In this post, we'll explore the science behind healing and offer tips for supporting the body's natural healing process. The Role of Inflammation in Healing One of the first steps in the healing process is inflammation. When we're injured, our bodies release a cascade of chemicals that cause blood vessels to dilate, allowing immune cells to reach the site of injury. These immune cells help to remove damaged tissue and fight off any potential infections. Although inflammation can be uncomfortable and even painful, it's a necessary part of the healing process. The Stages of Healing After the initial inflammatory response, the body enters the proliferative stage of healing. During this stage, cells begin to divide and new tissue is formed to replace the damaged tissue. This stage can last several weeks and is followed by the remodeling stage, during which the new tissue matures and strengthens. This final stage can take several months to complete. Supporting the Healing Process There are several things you can do to support your body's natural healing process. First and foremost, it's important to get plenty of rest and to avoid putting too much stress on the injured area. You may also want to apply ice or heat to reduce inflammation and relieve pain. Eating a healthy diet that's rich in nutrients can also support the healing process, as can staying hydrated and getting plenty of sleep. In some cases, supplements and other natural remedies may also be helpful. For example, omega-3 fatty acids have been shown to reduce inflammation and promote healing, while curcumin, found in turmeric, has been shown to have anti-inflammatory and pain-relieving effects. Talk to the Experts The body's ability to heal itself after an injury is truly remarkable. By understanding the science behind healing and taking steps to support the healing process, we can help our bodies recover from injuries more quickly and effectively. If you're ever in doubt about the best course of action for an injury, contact our Foothill Ranch Physical Therapy, Placentia Physical Therapy, Mission Viejo Physical Therapy, or Lake Forest Physical Therapy locations. Did you know your physical body can heal itself on its own? Your own body's ability to heal itself will certainly surprise you! Everyone that has ever learned about the Placebo effect, knows that the human body has the incredible capacity to heal itself. Under most circumstances, self-healing occurs daily when it comes to fighting off illnesses and infections. However, this isn't always the case. Sometimes we lack certain elements from our diet or our environment that could be a much greater influence on our body's ability to heal itself. There are several things we can do to help our body's healing process. How does the body heal itself from injury & illness? The cells found in our physical bodies can heal themselves when they start getting damaged or unhealthy. They replicate to become new cells once they replace the damaged or destroyed cells. Using broken bones as an example, your body will immediately begin to produce new cells to heal all the damage that's been done. When your skin is cut, platelets in your blood clot to stop all the bleeding by forming a scab over the wound. White blood cells remove all the dead and injured cells while the healthy new cells repair the damaged tissue around the wound. This is one of the most important functions in our body! Could you imagine what life would be like if the daily cuts and bruises we experience never healed? Our bodies are always in a constant state of removing damaged cells and producing new, healthy tissue. How does the human body healing process work? As your body engages in wound healing, a wonderful process occurs throughout each of the systems that comprise your body. According to a study published in the World Journal of Surgery, there are six wound healing stages, each of which relies on one another to completely close a wound. Knowing what each step involves is crucial to developing a complete plan. 1. Rapid hemostasis This refers to the body's ability that stops a wound from bleeding. Most of the time, your body will accomplish this through a process called vasoconstriction, in which blood vessels are closed off. It's similar to how you might turn a level to stop a leaky faucet. 2. Inflammation Inflammation is your body's way of alerting you to an injury. Beyond that, it helps dictate where the next barrage of healthy cells should be headed. As such, inflammation is vital in the wound care process, but if it goes on for too long, it can prevent regeneration. 3. Proliferation and migration When inflammation occurs, the body releases several kinds of cells, including those that are responsible for migration and proliferation. The former function refers to the movement of the cells, a carefully coordinated process that involves cells moving in a specific order. Meanwhile, proliferation is similar to hemostasis, as cells work to further constrict your blood vessels. 4. Angiogenesis Once the bleeding is under control, the body then begins the process of rebuilding tissue. Angiogenesis, as it's called, involves the formation of new blood vessels. This process occurs when your body's cells begin to replace the veins and arteries that were damaged, either creating new sections or adding onto existing portions. It's a decidedly complex endeavor, with many chemicals activating to facilitate these all-new veins. 5. Reepithelialization Once your body has begun to regrow veins, it's time to begin regrowing damaged skin. Your epidermis is comprised of cells called keratinocytes, and during the reepithelialization process, your body has to begin forging these chemical components. The process involves the creation of several layers, each working in tandem to offer protection and prevent fluid loss. 6. Synthesis Though it's seen as the last step, synthesis often happens almost simultaneously. In this process, certain proteins form blood clots, which helps further prevent bleeding as new skin and veins are formed. There are several proteins at play, and certain people lack those necessary proteins to form blood clots. What Hinders the Immune System & Our Body's Natural Self-Healing Abilities? Many factors can inhibit a body's natural self-healing functions. Some of these factors are obvious ones, such as an unhealthy environment and diet, while there are several other factors that we are still learning about. We all know our bodies need adequate exercise, high-quality sleep, healthy food, clean water, and a bit of good old-fashioned sunlight. Drastically limiting any one of those things can greatly influence your health. Various types of emotional stress, poor diet, as well as environmental contaminants and toxins, all can greatly damage our body's natural healing processes. Even your general mindset can greatly impact your health! How the Human Body Gets Damaged Over Time Poor Diet: Thanks to many decades of research, we now know that our diet is one of the key influencers of our health. A poor diet that lacks nutrition can wreak havoc on the body. This is why a nutrient-rich diet is needed for everyone's optimum development. Not only that, unless you eat exclusively organic, it's also a major source of environmental toxins. These toxins build up in your body and put an enormous amount of strain on your entire system. They can also cause inflammation and contribute to digestive disorders. Lack of Exercise: An exercise routine is essential for everyone's health and well-being. A sedentary lifestyle is one of the fastest ways the body falls apart. It doesn't have to be strenuous, aerobic exercise. Even something as simple as going for a walk can have incredible healing power. That's because it stimulates your blood flow, thus meaning it combats heart disease and improves heart rate. It brings oxygen and nutrients to your cells while carrying toxins away. It helps you burn calories, sleep better, and improves your overall mindset while reducing any emotional stress you may be feeling. Free radicals are another important factor in poor health. They play an important role in eliminating waste from damage inside the cell. However, inflammation, stress, and infection increase free radical production. When your body produces too many free radicals, it results in oxidative stress which causes disease and damages cells and DNA. In the same vein (pun intended) you can look into DNA activation symptoms and benefits. Stem Cells: After a while, when our stem cells get worn out, our body becomes less able to heal itself and regenerate. With time, their ability to replicate and regenerate new tissue becomes more and more difficult. Scientists are still researching why stem cell numbers and efficiency decreases with age. Many believe stem cells are the key to longevity and longer life spans. How to Heal Your Body Naturally Yes, you really can heal your body's ability to naturally heal itself! Making sure you're getting the correct amount of high-quality sleep is crucial. An enormous portion of the repair and regeneration work your body does is done while you are fast asleep. Not getting adequate sleep not only decreases the amount of time that your body is most effective at healing but it also greatly weakens your immune system. A weakened immune system makes the human body much more susceptible to illness, which requires your body to direct its healing processes toward beating the illness, rather than repairing damage from your natural daily activities. How the Body Can Heal Itself Faster: Regenerative Medicine: The National Institutes of Health (NIH) states that "Regenerative medicine is the process of creating living, functional tissues to repair or replace tissue or organ function lost due to age, disease, damage, or congenital defects." The greatest benefit of this treatment is that you're treating illness and injury in such a way that the body is being restored. Regenerative Medicine is still very young, with thousands of areas of research being studied. A variety of regenerative treatment methods have already been proven to be effective for many conditions. Homeopathic Medicine: Homeopathy is our oldest form of natural medicine. It's currently used by over 200 million people worldwide to treat both chronic and acute health conditions. Homeopathic medicines – commonly known as remedies – are made from various natural substances such as plants and minerals. Prepared in licensed laboratories, under strict control, they are usually taken as a tablet but are also available as liquids, powder or creams. These remedies are specifically designed to help stimulate the body's natural healing ability. Most people will tell you that doctors don't know much about nutrition. It's true. And I should know. I'm a doctor and I received almost no education about the impact of food on health when I went to medical school. But that has to change because we now know that food can boost our body's own defenses systems against disease. This means that we can eat to beat disease. I've always been fascinated with the body's incredible ability to heal and repair itself. When you skin your knee, for example, you get to witness the body's healing process in real time. First, the body clots, the formation of a scab, then blood vessels bringing oxygen for healing, and finally the formation of new skin. It's frankly amazing how the body can heal itself without any help from the outside. I've spent decades studying how this happens. Here's what's important to know: health is achieved when the body is able to protect itself against imbalances, breakdowns, and foreign invaders. The human body has evolved powerful defense systems that help it maintain optimal physical, mental and emotional states. Research is revealing clear links between our innate health defense systems and specific foods that activate them. My quest has led me to focus on key defense systems in the body like angiogenesis, stem cells, immunity, microbiome, and DNA protection. Angiogenesis is the process by which the body grows new blood vessels. It's our body's ability to maintain good circulation. (Watch my TED Talk to learn more about angiogenesis and how you can eat to starve cancer. Stem cells, or our body's ability to regenerate, is important for the health of all our tissues and organs from our brains to our hearts to our skin. Immunity is paramount. It's all about how efficiently our body can fight infection and cancer. Having a strong immune system is everything. The microbiome is our bacteria selves. There are 37 trillion bacteria living in our bodies and we're learning that not only are these bacteria are not dangerous like we once thought (germs = bad), but also that they actually help our bodies achieve health. DNA protection is critical for health. We have 60,000 mutations in our DNA every day. Why aren't we getting cancer more often? Well, our DNA can fix itself – and there are foods that can help boost those repair mechanisms. My approach isn't about finding and touting a superfood – it's much more powerful: I delve into what we can eat to capitalize on the body's amazing defense systems and its ability to heal itself. This is truly using food as our medicine. To learn more about using food to amplify your body's natural ability to heal itself, please pre-order my new book EAT TO BEAT DISEASE today. Written by Daria Sysyeva and Edited by Olivia Cooper Inage by Hans Braxmeier from Pixabay "Some wounds never heal". This is especially true with improperly healed wounds, which can cause life-threatening infections, painful ulcers, and illness. To avoid these, the body quickly responds to injury, even the smallest of cuts cause an army of immune cells and blood cells to rush to the injury site. This marks the beginning of the healing process, which is divided into four stages: hemostasis, inflammation, proliferation, and healing [1]. During the hemostasis stage, blood vessels constrict so less blood reaches the injury site and the bleeding slows. Next, blood platelets rush to the wound and begin forming a clot that blocks blood flow. Once the bleeding is effectively stopped, inflammation occurs. In this stage, the wounded tissue and the newly formed clot signal for the release of proinflammatory cells such as neutrophils, macrophages, and lymphocytes, which will attack any pathogen or item that is foreign to the body [1]. These three types of cells are sent by the immune system to help protect the wound from infection. Neutrophils clear the injury site of cellular debris and foreign microorganisms, while macrophages activate proinflammatory proteins and destroy dead cells. The role of lymphocytes differ based on their type and the stage of life of the cell, but data suggest that they overall help control inflammation, protect the wound from infection, and may aid in scar formation [1]. The construction of new tissue begins simultaneously during the proliferation stage. First, a disorganized layer of collagen, a protein that maintains structure, is put down, and then several new blood vessels are constructed so that the new tissue receives proper nourishment. Finally, the remodeling stage occurs when the collagen matures into an orderly layer of interwoven fibers. This orderly construction is necessary for proper scar formation and for the skin to regain its strength [2]. Sometimes, there can be challenges to the healing process that prolong the healing or cause complications. These challenges are caused by either local factors around the wound site or systemic factors regarding the overall health of the body. For example, infection is a local factor that may set back the healing process. Microorganisms that reside on the surface of the skin can enter the cut and replicate, causing an infection. Furthermore, diabetes, a disease that prevents the body from properly regulating blood sugar, is an example of a systemic factor that can also set back the healing process. Diabetic patients typically have reduced immune system function, which may cause a delayed response of immune cells during the inflammatory stage and leave the wound vulnerable to infection for a longer period of time [1]. To make sure that wounds heal properly and prevent complications, people should have a nutritious diet, exercise regularly, and get proper sleep. Vitamin A and Vitamin C, sourced from vegetables and fruit, and zinc, found in whole grains, are among the major vitamins and minerals that keep the skin strong and healthy, help tissue repair, and fight infection [3]. In terms of exercise, physical activity improves immune function by circulating anti-inflammatory factors and blood throughout the body. Exercise also promotes oxygen flow to the entire body, which protects the wound against hypoxia, or oxygen deprivation. Lastly, sleep is crucial for the healing process because it allows for the regeneration of healthy tissues. While the body sleeps, the brain signals for hormones that trigger tissue and blood vessel repair [4]. By adopting these healthy habits, we can help our bodies heal us. References: Guo, S., DiPietro, L.A. (2010). Factors Affecting Wound Healing. Journal of Dental Research, 89:219-229. Velnar, T., Bailey, T., Smrkolj, V. (2009). The wound healing process: an overview of the cellular and molecular mechanisms. Journal of International Medical Research, 37:1528-1542. "Nutrition Guidelines to Improve Wound Healing." Cleveland Clinic. ve.wound-healing. Accessed 20 Oct. 2020. Adam, C., Oswald, I. (1994). Sleep helps healing. British Medical Journal, 289:1400-1401. The more you know about how your body works, the better able you are to make the choices necessary to enhance both the quantity and quality of your life! Hygiene is defined in the dictionary as the science of health and its preservation. But what does that really mean? Science, the dictionary tells us, is "the systematic observation of natural phenomena for the purpose of discovering laws governing those phenomena." Put more simply, science is the process we use to figure out how things work. Health is defined as "a state of optimal physical, mental, and social well-being." With these definitions in mind, it is easy to see that Hygiene is neither a dietary system, a therapeutic system, nor a religious or belief system. Hygiene is the science of health. It encompasses a broad body of knowledge about the natural laws that determine health and numerous techniques that enable you to use this information to maximize your health potential. Knowledge is power The more you learn about how your body works, the better prepared you will be to make the choices necessary to enhance both the quantity (longevity) and quality of your life. The optimum state of function that we call health is spontaneously generated by the human organism when it is provided with the requirements of health. The requirements of health can be conveniently classified into four general categories: Diet – a plant-based diet of whole natural foods that meets your individual nutritional needs; Environment – getting fresh air, pure water, and appropriate sunshine, and avoiding environmental stressors such as air and water pollution, and excess exposure to dust, pollen, chemicals, and noise; Activity - engaging in regular aerobic exercise and getting adequate rest and sleep; and Psychology - engaging in productive activity and developing the interpersonal social skills necessary for a successful life. When the requirements of health are appropriately provided, the self-healing mechanisms of the body attempt to restore and/or optimize health. Your body's ability to do this is only limited by your inherent constitution (genetics) and the amount of use and abuse that has taken place. Hygienic physicians have always emphasized the concept that health and disease are not antagonists. Disease processes such as diarrhea, fever, and inflammation are not only natural, but are necessary attempts by the body to regain optimum health. Attempts to suppress these adaptive and eliminative processes with drugs and other invasive treatment may create problems by interfering with the body's self-healing mechanisms. Natural immunity It is important that you know how extraordinarily capable and complex your immune system is. Your body is constantly exposed to chemicals, toxins, pollutants, and other stressors. In addition, simple organisms such as viruses, bacteria, fungi, and parasites are capable (under certain circumstances) of invading the human body and using it as a source of nourishment. Fortunately, the healthy human body has defenses against these organisms. These defenses comprise the immune system. The immune system can be thought of as having two divisions: the general or non-specific immune system and the adaptive or specific immune system. Your non-specific immune system First let's take a look at the non-specific division of the immune system. The largest organ in the human body is not the heart or liver; it is the skin. The skin and its components form a very important part of the non-specific immune system. Most potentially pathogenic organisms and agents are prevented from interfering with normal function because of the barrier that the skin creates. The openings into the body, such as the mouth and nose, however, are not covered with skin, but with mucus membrane. This membrane can secrete various substances and is usually moist. In these moist secretions are other defense mechanisms, including chemicals such as lysozyme and C reactive protein, which can kill invading bacteria. Mucus itself can trap invading organisms, and cilia (little hairlike projections in the lungs, bronchi, and throat) can push those invaders back out of the body as long as they are working properly. It has been shown that in tobacco and marijuana smokers the cilia become paralyzed and destroyed. This is one of the reasons that smokers have such an increased incidence of respiratory and other infections. The acid in the stomach, vagina, and other organs also can act as part of the non-specific immune system by creating an environment in which potentially invasive organisms cannot survive. Look who's coming for dinner The next components of the non-specific division of the immune system are the phagocytic or "cell-eating" cells. These phagocytes can engulf and destroy most invading organisms. Phagocytes are a type of white blood cell found in the bloodstream as well as in various organs such as the lungs, liver, and intestinal tract. People with malfunctioning phagocytes are subject to recurrent infections. In rare cases, this malfunctioning is a genetic defect. More commonly, it arises from poor health practices which overwhelm the ability of the phagocyte to act. Smoking, for example, in addition to paralyzing cilia, can kill macrophages, the phagocytes that live in the lungs. Natural born killers Another type of white blood cell, called the "natural killer" cell, can recognize cells that have been invaded by viruses. The killer cells can bind to these infected cells and destroy them. Cells that are infected by viruses help the killer cells by producing chemicals called interferons, which activate the killer cells. The body also is capable of producing special proteins during an infection. These proteins coat the invading organisms, especially certain bacteria, and make it easier for the phagocytes to destroy them. But this only works if the invading organisms have some general chemical markers that the non-specific division of the immune system can identify. Some like it hot When an infection or injury takes place, the body produces a reaction called inflammation. Inflammation serves to direct the elements of the immune system to the site of infection or injury. Inflammation consists of three parts-increased blood supply to the infected area; increased permeability of the small blood vessels permitting large molecules to leave the bloodstream and reach the infection; and increased migration of phagocytes toward the site of infection. Inflammation causes the infected area to look red, become swollen, and feel hot and painful. The non-specific division of the immune system, including skin, mucus, cilia and phagocyte can take care of a my of infections and potential infections. Problems arise when phagocytes lack the ability to identify things that bypass the non-specific division of the immune system's defenses. Your specific immune system Fortunately, the immune system has another division called the adaptive, or specific, division. Unlike the non-specific division, the specific division of the immune system is capable of producing particles called antibodies. These tiny antibodies have two ends. One is a receptor that can recognize a specific organism or substance. The other end is a marker that fits in the general receptors of the phagocytes. When an antibody attaches its specific end to an invading organism or foreign substance, it tags the invader in such a way that the phagocytes of the non-specific division of the immune system can recognize and destroy it. These antibodies made by the specific division of the immune system are produced by white blood cells called B lymphocytes. B lymphocytes come in thousands of varieties, each capable of recognizing one specific marker or antigen. The number of lymphocytes that can recognize any particular marker or antigen is very small. When the right B lymphocyte finds the antigen of the invader, it binds to it. This stimulates the lymphocyte to quickly redivide into more B lymphocytes of exactly the same type. With the help of a complex signaling system, the new B cells are ordered to the site of the antigen, and the phagocytes are ordered to attack the antigen. So, the phagocytes destroy the antigen. So, the new B cells make it easier for the phagocytes to destroy them. But this only works if the invading organisms have some general chemical markers that the non-specific division of the immune system can identify. Some like it hot When an infection or injury takes place, the body produces a reaction called inflammation. Inflammation serves to direct the elements of the immune system to the site of infection or injury. Inflammation consists of three parts-increased blood supply to the infected area; increased permeability of the small blood vessels permitting large molecules to leave the bloodstream and reach the infection; and increased migration of phagocytes toward the site of infection. Inflammation causes the infected area to look red, become swollen, and feel hot and painful. The non-specific division of the immune system, including skin, mucus, cilia and phagocyte can take care of a my of infections and potential infections. Problems arise when phagocytes lack the ability to identify things that bypass the non-specific division of the immune system's defenses. Your specific immune system Fortunately, the immune system has another division called the adaptive, or specific, division. Unlike the non-specific division, the specific division of the immune system is capable of producing particles called antibodies. These tiny antibodies have two ends. One is a receptor that can recognize a specific organism or substance. The other end is a marker that fits in the general receptors of the phagocytes. When an antibody attaches its specific end to an invading organism or foreign substance, it tags the invader in such a way that the phagocytes of the non-specific division of the immune system can recognize and destroy it. These antibodies made by the specific division of the immune system are produced by white blood cells called B lymphocytes. B lymphocytes come in thousands of varieties, each capable of recognizing one specific marker or antigen. The number of lymphocytes that can recognize any particular marker or antigen is very small. When the right B lymphocyte finds the antigen of the invader, it binds to it. This stimulates the lymphocyte to quickly redivide into more B lymphocytes of exactly the same type. With the help of a complex signaling system, the new B cells are ordered to the site of the antigen, and the phagocytes are ordered to attack the antigen. So, the phagocytes destroy the antigen. So, the new B cells make it easier for the phagocytes to destroy them. But this only works if the invading organisms have some general chemical markers that the non-specific division of the immune system can identify. Some like it hot When an infection or injury takes place, the body produces a reaction called inflammation. Inflammation serves to direct the elements of the immune system to the site of infection or injury. Inflammation consists of three parts-increased blood supply to the infected area; increased permeability of the small blood vessels permitting large molecules to leave the bloodstream and reach the infection; and increased migration of phagocytes toward the site of infection. Inflammation causes the infected area to look red, become swollen, and feel hot and painful. The non-specific division of the immune system, including skin, mucus, cilia and phagocyte can take care of a my of infections and potential infections. Problems arise when phagocytes lack the ability to identify things that bypass the non-specific division of the immune system's defenses. Your specific immune system Fortunately, the immune system has another division called the adaptive, or specific, division. Unlike the non-specific division, the specific division of the immune system is capable of producing particles called antibodies. These tiny antibodies have two ends. One is a receptor that can recognize a specific organism or substance. The other end is a marker that fits in the general receptors of the phagocytes. When an antibody attaches its specific end to an invading organism or foreign substance, it tags the invader in such a way that the phagocytes of the non-specific division of the immune system can recognize and destroy it. These antibodies made by the specific division of the immune system are produced by white blood cells called B lymphocytes. B lymphocytes come in thousands of varieties, each capable of recognizing one specific marker or antigen. The number of lymphocytes that can recognize any particular marker or antigen is very small. When the right B lymphocyte finds the antigen of the invader, it binds to it. This stimulates the lymphocyte to quickly redivide into more B lymphocytes of exactly the same type. With the help of a complex signaling system, the new B cells are ordered to the site of the antigen, and the phagocytes are ordered to attack the antigen. So, the phagocytes destroy the antigen. So, the new B cells make it easier for the phagocytes to destroy them. But this only works if the invading organisms have some general chemical markers that the non-specific division of the immune system can identify. Some like it hot When an infection or injury takes place, the body produces a reaction called inflammation. Inflammation serves to direct the elements of the immune system to the site of infection or injury. Inflammation consists of three parts-increased blood supply to the infected area; increased permeability of the small blood vessels permitting large molecules to leave the bloodstream and reach the infection; and increased migration of phagocytes toward the site of infection. Inflammation causes the infected area to look red, become swollen, and feel hot and painful. The non-specific division of the immune system, including skin, mucus, cilia and phagocyte can take care of a my of infections and potential infections. Problems arise when phagocytes lack the ability to identify things that bypass the non-specific division of the immune system's defenses. Your specific immune system Fortunately, the immune system has another division called the adaptive, or specific, division. Unlike the non-specific division, the specific division of the immune system is capable of producing particles called antibodies. These tiny antibodies have two ends. One is a receptor that can recognize a specific organism or substance. The other end is a marker that fits in the general receptors of the phagocytes. When an antibody attaches its specific end to an invading organism or foreign substance, it tags the invader in such a way that the phagocytes of the non-specific division of the immune system can recognize and destroy it. These antibodies made by the specific division of the immune system are produced by white blood cells called B lymphocytes. B lymphocytes come in thousands of varieties, each capable of recognizing one specific marker or antigen. The number of lymphocytes that can recognize any particular marker or antigen is very small. When the right B lymphocyte finds the antigen of the invader, it binds to it. This stimulates the lymphocyte to quickly redivide into more B lymphocytes of exactly the same type. With the help of a complex signaling system, the new B cells are ordered to the site of the antigen, and the phagocytes are ordered to attack the antigen. So, the phagocytes destroy the antigen. So, the new B cells make it easier for the phagocytes to destroy them. But this only works if the invading organisms have some general chemical markers that the non-specific division of the immune system can identify. Some like it hot When an infection or injury takes place, the body produces a reaction called inflammation. Inflammation serves to direct the elements of the immune system to the site of infection or injury. Inflammation consists of three parts-increased blood supply to the infected area; increased permeability of the small blood vessels permitting large molecules to leave the bloodstream and reach the infection; and increased migration of phagocytes toward the site of infection. Inflammation causes the infected area to look red, become swollen, and feel hot and painful. The non-specific division of the immune system, including skin, mucus, cilia and phagocyte can take care of a my of infections and potential infections. Problems arise when phagocytes lack the ability to identify things that bypass the non-specific division of the immune system's defenses. Your specific immune system Fortunately, the immune system has another division called the adaptive, or specific, division. Unlike the non-specific division, the specific division of the immune system is capable of producing particles called antibodies. These tiny antibodies have two ends. One is a receptor that can recognize a specific organism or substance. The other end is a marker that fits in the general receptors of the phagocytes. When an antibody attaches its specific end to an invading organism or foreign substance, it tags the invader in such a way that the phagocytes of the non-specific division of the immune system can recognize and destroy it. These antibodies made by the specific division of the immune system are produced by white blood cells called B lymphocytes. B lymphocytes come in thousands of varieties, each capable of recognizing one specific marker or antigen. The number of lymphocytes that can recognize any particular marker or antigen is very small. When the right B lymphocyte finds the antigen of the invader, it binds to it. This stimulates the lymphocyte to quickly redivide into more B lymphocytes of exactly the same type. With the help of a complex signaling system, the new B cells are ordered to the site of the antigen, and the phagocytes are ordered to attack the antigen. So, the phagocytes destroy the antigen. So, the new B cells make it easier for the phagocytes to destroy them. But this only works if the invading organisms have some general chemical markers that the non-specific division of the immune system can identify. Some like it hot When an infection or injury takes place, the body produces a reaction called inflammation. Inflammation serves to direct the elements of the immune system to the site of infection or injury. Inflammation consists of three parts-increased blood supply to the infected area; increased permeability of the small blood vessels permitting large molecules to leave the bloodstream and reach the infection; and increased migration of phagocytes toward the site of infection. Inflammation causes the infected area to look red, become swollen, and feel hot and painful. The non-specific division of the immune system, including skin, mucus, cilia and phagocyte can take care of a my of infections and potential infections. Problems arise when phagocytes lack the ability to identify things that bypass the non-specific division of the immune system's defenses. Your specific immune system Fortunately, the immune system has another division called the adaptive, or specific, division. Unlike the non-specific division, the specific division of the immune system is capable of producing particles called antibodies. These tiny antibodies have two ends. One is a receptor that can recognize a specific organism or substance. The other end is a marker that fits in the general receptors of the phagocytes. When an antibody attaches its specific end to an invading organism or foreign substance, it tags the invader in such a way that the phagocytes of the non-specific division of the immune system can recognize and destroy it. These antibodies made by the specific division of the immune system are produced by white blood cells called B lymphocytes. B lymphocytes come in thousands of varieties, each capable of recognizing one specific marker or antigen. The number of lymphocytes that can recognize any particular marker or antigen is very small. When the right B lymphocyte finds the antigen of the invader, it binds to it. This stimulates the lymphocyte to quickly redivide into more B lymphocytes of exactly the same type. With the help of a complex signaling system, the new B cells are ordered to the site of the antigen, and the phagocytes are ordered to attack the antigen. So, the phagocytes destroy the antigen. So, the new B cells make it easier for the phagocytes to destroy them. But this only works if the invading organisms have some general chemical markers that the non-specific division of the immune system can identify. Some like it hot When an infection or injury takes place, the body produces a reaction called inflammation. Inflammation serves to direct the elements of the immune system to the site of infection or injury. Inflammation consists of three parts-increased blood supply to the infected area; increased permeability of the small blood vessels permitting large molecules to leave the bloodstream and reach the infection; and increased migration of phagocytes toward the site of infection. Inflammation causes the infected area to look red, become swollen, and feel hot and painful. The non-specific division of the immune system, including skin, mucus, cilia and phagocyte can take care of a my of infections and potential infections. Problems arise when phagocytes lack the ability to identify things that bypass the non-specific division of the immune system's defenses. Your specific immune system Fortunately, the immune system has another division called the adaptive, or specific, division. Unlike the non-specific division, the specific division of the immune system is capable of producing particles called antibodies. These tiny antibodies have two ends. One is a receptor that can recognize a specific organism or substance. The other end is a marker that fits in the general receptors of the phagocytes. When an antibody attaches its specific end to an invading organism or foreign substance, it tags the invader in such a way that the phagocytes of the non-specific division of the immune system can recognize and destroy it. These antibodies made by the specific division of the immune system are produced by white blood cells called B lymphocytes. B lymphocytes come in thousands of varieties, each capable of recognizing one specific marker or antigen. The number of lymphocytes that can recognize any particular marker or antigen is very small. When the right B lymphocyte finds the antigen of the invader, it binds to it. This stimulates the lymphocyte to quickly redivide into more B lymphocytes of exactly the same type. With the help of a complex signaling system, the new B cells are ordered to the site of the antigen, and the phagocytes are ordered to attack the antigen. So, the phagocytes destroy the antigen. So, the new B cells make it easier for the phagocytes to destroy them. But this only works if the invading organisms have some general chemical markers that the non-specific division of the immune system can identify. Some like it hot When an infection or injury takes place, the body produces a reaction called inflammation. Inflammation serves to direct the elements of the immune system to the site of infection or injury. Inflammation consists of three parts-increased blood supply to the infected area; increased permeability of the small blood vessels permitting large molecules to leave the bloodstream and reach the infection; and increased migration of phagocytes toward the site of infection. Inflammation causes the infected area to look red, become swollen, and feel hot and painful. The non-specific division of the immune system, including skin, mucus, cilia and phagocyte can take care of a my of infections and potential infections. Problems arise when phagocytes lack the ability to identify things that bypass the non-specific division of the immune system's defenses. Your specific immune system Fortunately, the immune system has another division called the adaptive, or specific, division. Unlike the non-specific division, the specific division of the immune system is capable of producing particles called antibodies. These tiny antibodies have two ends. One is a receptor that can recognize a specific organism or substance. The other end is a marker that fits in the general receptors of the phagocytes. When an antibody attaches its specific end to an invading organism or foreign substance, it tags the invader in such a way that the phagocytes of the non-specific division of the immune system can recognize and destroy it. These antibodies made by the specific division of the immune system are produced by white blood cells called B lymphocytes. B lymphocytes come in thousands of varieties, each capable of recognizing one specific marker or antigen. The number of lymphocytes that can recognize any particular marker or antigen is very small. When the right B lymphocyte finds the antigen of the invader, it binds to it. This stimulates the lymphocyte to quickly redivide into more B lymphocytes of exactly the same type. With the help of a complex signaling system, the new B cells are ordered to the site of the antigen, and the phagocytes are ordered to attack the antigen. So, the phagocytes destroy the antigen. So, the new B cells make it easier for the phagocytes to destroy them. But this only works if the invading organisms have some general chemical markers that the non-specific division of the immune system can identify. Some like it hot When an infection or injury takes place, the body produces a reaction called inflammation. Inflammation serves to direct the elements of the immune system to the site of infection or injury. Inflammation consists of three parts-increased blood supply to the infected area; increased permeability of the small blood vessels permitting large molecules to leave the bloodstream and reach the infection; and increased migration of phagocytes toward the site of infection. Inflammation causes the infected area to look