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What does a management information systems major do

Photo Courtesy: visualspace/E+/Getty Images You might already know that our immune systems play an integral role in fighting off sickness and infection, but they actually do much more than that. Your immune system is a quite complex and highly important part of your body that's constantly working to keep you in optimum health. The more you know about your immune system and how it works, the more capable you'll be when it comes to keeping it in top shape and ensuring that you stay healthy for years to come. To get started, learn about the different parts of your immune system, how it works, how to keep it working properly — and what happens with a disordered immune system.

Parts of Your Immune System There's a variety of subsystems making up your overall immune system, and they all work together to protect your body from illness. The first layers of defense are the physical barriers that separate your inner organs from the outside world. These include your skin, the walls of your gut and the linings of your lungs. Often these barriers are toxic to microorganisms or too difficult for pathogens to penetrate. Various secretions, such as mucus, tears, stomach acid and sweat, also have antimicrobial properties, ridding your body of germs before they have a chance to get inside. Photo Courtesy: Jose Luis Pelaez Inc/DigitalVision/Getty Images Your body also produces physiological phenomena such as coughing and sneezing, which are primitive reflexes that act to forcefully expel irritants from your body. Diarrhea in response to an ingested pathogen is your body's way of rapidly getting rid of the offending organism. The Innate Immune System This system is the first layer of defense that comes into play when a pathogen (such as a bacteria, virus or fungus) penetrates the physical barriers and enters your body. This system acts within hours to recruit immune cells to the site of intrusion via specific chemical messengers. This activates arriving immune cells to remove foreign substances and activate your adaptive immune system. The cells involved in the innate immune response include phagocytes. These are specialized cells that recognize patterns that are common to pathogens, known as "antigens." Phagocytes engulf the offending intruder, killing it off using a process of digestion. Once the pathogen has been killed off or "neutralized," the phagocyte often displays little bits of the offender on its surface to alert other immune cells. Neutrophils are another type of white blood cell that contain toxic granules. They're "recruited" to the site of infection, where they bind to and kill off pathogens by releasing their toxic granules. Neutrophils are the most abundant white blood cell, and your body produces over 100 billion of them every day. A system known as the complement system is a series of chemical reactions that can "tag" pathogens for destruction, recruit more immune cells to the site, directly kill pathogens and remove dead cells. The innate immune system acts rapidly, but it does not form a memory of the pathogen. The chemicals, called cytokines, released during the immune response are responsible for the characteristic signs of inflammation: heat, redness, swelling and pain. They also raise your body temperature in an attempt to make your body less hospitable to pathogens. The Adaptive Immune System Your adaptive immune system produces a stronger and more specialized response. However, it relies on other cells "tagging" or "presenting" foreign or harmful microbes to it in order to function. Thus, it takes this system a little more time to kick in. The main cells in the adaptive immune system are lymphocytes — B cells and T cells — which only recognize an intruder as harmful if it has been properly "presented" to them. When they do recognize a harmful pathogen, they undergo rapid expansion, producing thousands and thousands of the same cell. T cells are known for rapidly attacking pathogens and releasing cytokines. This process contributes to overall control of the rest of your immune system. B cells notably produce antibodies, which are matched to specific pathogens. Antibodies lock onto those harmful cells when detecting them. This alerts other immune cells to the pathogens and signals that the pathogens are something that should be destroyed. Once the infection has been cleared, some of the B and T cells persist as memory cells. These keep looking for that same pathogen and will react rapidly to fight it off if they ever encounter it again. Most of this immune activity is carried out in particular organs, such as your lymph nodes and spleen. Immune cells also travel around your body, carrying out their duties by way of your lymphatic system. This is a network of vessels around your whole body. Immune cells also tend to congregate in glands such as your tonsils, where they work together to eliminate infection. This is the reason you often get swollen glands when you have an infection; these glands are full of immune cells working hard to eliminate the threat.

Natural vs. Acquired Immunity Also coming into play with these responses is the difference between natural and acquired immunity. Natural immunity accounts for the types of diseases and infections that we're innately immune to. For instance, humans can't catch the virus that causes leukemia in cats. Some of these natural immunities, like immunity to feline leukemia, are found in all humans. Other natural immunities are passed on during pregnancy or breastfeeding. Photo Courtesy: Luis Alvarez/DigitalVision/Getty Images With acquired immunity, the exposure to a certain virus or infection allows your body to build up immunity to that pathogen. This is also the type of immunity that doctors take advantage of when giving vaccinations. By exposing people to a controlled amount of a virus or infection, their bodies are able to build up immunity to it and produce those all-important memory cells.

Keeping a Healthy Immune System Because your immune system is so vital to your health, it's important to take steps to ensure this system is functioning at optimum levels. Here are a few easy tips for keeping your immune system healthy: Photo Courtesy: Taiyou Nomachi/DigitalVision/Getty Images Eat foods with vitamin C, vitamin E and probiotics to boost your immune system. Get plenty of rest. Get enough protein in your diet. Drink lots of water. Avoid too much sugar and caffeine. Get some exercise every day. Avoid unhealthy habits that weaken your immune system, like smoking and drinking excess alcohol. Immune System Disorders There are several disorders of the immune system that can impact your health. Some occur naturally, while others arise due to certain health circumstances. The following are the most common types of immune system disorders. Photo Courtesy: bluecinema/E+/Getty Images Allergies: Allergic reactions result from an error in your immune system's response. These reactions arise when your immune system mistakes a harmless substance, such as pet dander or certain food particles, as a threat to your body and starts to attack it. Allergies are characterized by high levels of a particular type of white blood cells called eosinophils. Primary Immunodeficiency Disorders: These develop when a part of your immune system isn't working correctly or isn't present at all. Primary immunodeficiency disorders occur from birth. The most common primary immunodeficiency is IgA deficiency, in which people's bodies don't produce enough of a type of immunoglobulin called IgA. This deficiency makes them more susceptible to colds, respiratory infections and allergies. Severe Combined Immunodeficiency (SCID): A much more serious, but incredibly rare, primary immunodeficiency disorder is SCID. In this condition, both B and T cells are missing, making it nearly impossible to fight off infections or viruses. This deficiency became known as "bubble boy disease" after a boy in Texas with SCID lived in a bubble to prevent infection and disease. Secondary Immunodeficiency Disorders: These types of immunodeficiency disorders are acquired at some point in an individual's life. Acquired immunodeficiency disorders usually develop as a result of a person contracting a disease, but other medical issues may contribute to them as well. Acquired immunodeficiency syndrome (AIDS) is the most well-known secondary immunodeficiency disorder. It's caused by the human immunodeficiency virus (HIV), which attacks a person's T cells. Autoimmune Disorders: An autoimmune disorder occurs when a person's immune system mistakes normal organs and tissues in their body for potential health threats and attacks those tissues accordingly. Lupus, scleroderma and Type 1 diabetes are just a few examples of this type of immune system disorder. If you have any concerns about your immune system, including questions about vaccinations and allergies, it's helpful to schedule an appointment with your primary care doctor to get answers. Resource Links: [MORE FROM SYMPTOMFIND.COM](#)

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