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Elevated white cell count

White blood cells, also known as leukocytes, are the part of the serum that forms the immune system and protects against disease and foreign invaders. There are five types of white blood cells: neutrophils, lymphocytes, eosinophils, monocytes, and basophils. Each type of white blood cell has a unique function. For example, neutrophils help rid the body of bacteria and fungi, while basophils combat inflammation. A normal white blood cell count for an adult ranges between 3,500 and 10,500 blood cells per microliter (mL) of blood. 1. 1. Symptoms of Abnormal White Blood Cell Count Symptoms of a low white blood cell count include general fatigue, body aches, fever, chills, and headaches. With a low white blood cell count, cuts and bruises may not heal as quickly and are more likely to become infected. Conversely, high white blood cell levels are generally asymptomatic. cgtoolbox / Getty Images The human body requires the right balance of red blood cells, white blood cells, platelets, and plasma to survive. One way in which this balance can become disrupted is when there is an increase of white blood cells, a condition called leukocytosis. 1. Causes of Leukocytosis Leukocytosis can be caused by a range of illnesses, most commonly an infectious or inflammatory disease. Cancers such as leukemia and certain lymphomas can also cause leukocytosis. Certain medications, such as steroids, can also lead to an increase in white blood cells. In some people, leukocytosis is the result of a spleen removal. SDI Productions / Getty Images A lowered level of immunity is called immunosuppression. Certain diseases, including cancer, and certain treatments, including chemotherapy and radiation therapy, can cause some people to have immunosuppression. This is usually referred to as having a low white blood cell count, but you might hear other words to describe it too. What is neutropenia? Neutropenia is defined as a lower than normal number of neutrophils (a type of white blood cells). White blood cells are part of the immune system. There are different types of white blood cells, and they each have a key role in the body's defense against germs: Neutrophils Lymphocytes (which include T-lymphocytes and B-lymphocytes) Monocytes Macrophages Neutrophils are key infection-fighters Neutrophils form a very important defense against most types of infection. Normally, most of our white blood cells are neutrophils. In patients with cancer, neutropenia is usually caused by treatment. When looking at your risk of getting an infection, doctors look at the number of neutrophils you have. If your neutrophil count is low, the doctor may say you are neutropenic. For most people with cancer, having a low neutrophil count is the biggest risk factor for getting a serious infection. Ask your doctor if your cancer treatment will cause your neutrophil count to drop. Lymphocytes can mark, signal, and destroy germs Some treatments, most often those given during a bone marrow (stem cell) transplant, can cause a shortage of lymphocytes. B and T lymphocytes help fight viruses, but have different jobs: B-lymphocytes make special proteins called antibodies that recognize and kill certain germs. They also can mark germs to be destroyed by other cells. T-lymphocytes make signaling substances called cytokines that tell other cells what to do. They also destroy cells infected by viruses. Monocytes and macrophages help recognize invaders They help lymphocytes recognize germs. They can surround and digest germs that have been coated by antibodies (the proteins made by B-lymphocytes). They help fight bacteria, fungi, and parasites. What is an absolute neutrophil count (ANC)? You might hear your doctor or nurse talk about your absolute neutrophil count or ANC. This is the number of neutrophils you have in a certain amount of blood. Your health care team will use your ANC to get an idea of how well your immune system might work during treatment. A blood test called a complete blood count (CBC) is used to see how well your immune system is working. It measures your white blood cells (WBCs), and your cancer care team is able to figure out your ANC from your WBC count. Your cancer care team will use your ANC to get an idea of how well your immune system is affected by treatment and how well it is working to protect you from infection. As the ANC gets lower, the usual signs of infection, such as fever, pus, pain, swelling, and redness, may not show up when an infection starts. This is because these signs are caused by neutrophils fighting off germs, and if you don't have enough neutrophils to fight infection, you won't produce the signs. This can make it hard to know if you have an infection. The good thing is that another WBC, called the monocyte, can still cause signs of infection in a person who has neutropenia. Sometimes in people with severe neutropenia a fever may be the only sign of an infection. The lower your ANC is and the longer it stays low, the higher your risk of infection will be. Ask your doctor if your cancer treatment might cause your neutrophil count to drop. Your cancer care team will help you find the ANC on your lab results and can help explain more about it. What can cause or increase the risk for neutropenia? Some types of chemotherapy Radiation therapy Bone marrow or stem cell transplant Steroids Symptoms of neutropenia Fever Chills Mouth sores Cough Difficulty breathing Abdominal or rectal pain Problems neutropenia might cause Increased risk for infection In a person with a healthy immune system, the usual signs of infection may include fever, pus, pain, swelling, and redness. As the ANC gets lower, many of these signs may not show up when an infection starts. This is because these signs are caused by neutrophils fighting off germs, and you don't have enough neutrophils to produce the signs. Your cancer care team may have to delay your treatment or reduce your dose to prevent further neutropenia Treatment of neutropenia Treatment may include one or a combination of the following: Myeloid growth factors: These are proteins that stimulate the bone marrow to produce more white blood cells to help the body fight infections. They are also known as growth factors or colony-stimulating factors (CSFs). Examples of drugs to increase growth factors include filgrastim (Neupogen), tho-filgrastim (Granix), and pegfilgrastim (Neulasta) Antibiotics may be given in certain instances to help prevent infection Cancer treatment may be delayed to give your body enough time to make more white blood cells and recover your ANC. Talk to your cancer care team about what to watch for. Call your doctor if you have a fever (your cancer care team will let you know what temperature they consider a fever) or any other symptoms of neutropenia. OverviewWhite blood cells are an important part of your body's immune system. They're responsible for protecting your body against infections and invading organisms. You have five types of white blood cells: neutrophilslymphocytesmonocyteseosinophilsbasophilsEach of these can be affected in different ways if you have a particular condition or disease.A white blood cell (WBC) count measures the number of white blood cells in your blood, and a WBC differential determines the percentage of each type of white blood cell present in your blood. A differential can also detect immature white blood cells and abnormalities, both of which are signs of potential issues.A WBC count can also be called a leukocyte count, and a WBC differential can also be called a leukocyte differential count.Read more: WBC (white blood cell) count »Your doctor may request a WBC count and differential if they suspect you have one of several conditions, including:Both tests can help your doctor determine if your symptoms are due to high or low WBC levels, which will help them understand what condition you may have. WBC counts can also be used to monitor certain disease processes and illnesses. No special preparation is necessary for a WBC count or differential. Your doctor may ask you to stop taking certain medications, including over-the-counter supplements or vitamins, for several days before the sample collection occurs. Medicines, both prescription and over-the-counter, can affect white blood cell counts.To conduct a WBC count and differential, your doctor will need to collect a blood sample from you. Blood is typically drawn from a vein either the bend of your arm or in your hand. Once the blood is collected, it's sent to a lab for analysis.WBC count and differential tests have very few risks. Apart from bruising or soreness at the puncture site, this test shouldn't cause any problems or complications. Some people may feel moderate pain and a stinging sensation during the blood draw, and some people may feel sick or lightheaded during or after the blood draw. If you do, let your doctor or nurse know and remain seated until the feeling has passed.Although rare, some people who have blood drawn can develop a hematoma — an accumulation of blood directly under the skin. Some people may also develop an infection in the skin at the collection site, but this is also extremely rare. Depending on which tests your doctor ordered, you may have to wait several days for results. A single WBC count or differential test doesn't tell the whole story of what's going on in your body. However, both tests are important tools that help your doctor find out what might be causing your symptoms. Differential results may indicate certain conditions, which are discussed below.An increase in neutrophils in your blood may be caused by:acute stressinfectiongoutrheumatoid arthritisthyroiditistraumapregnancyA decrease in neutrophils in your blood may be caused by:An increase in lymphocytes in your blood may be caused by:A decrease in lymphocytes may be caused by:chemotherapyHIV infectionleukemiasepsisradiation exposure, either accidental or from radiation therapyAn increase in monocytes may be caused by:chronic inflammatory diseasetuberculosisviral infection, such as measles, mononucleosis, and mumpsA decrease in monocytes may be caused by:bloodstream infectionchemotherapybone marrow disorderskin infectionsAn increase in eosinophils may be caused by:an allergic reactionparasitic infectionA decrease in basophils may be caused by acute allergic reaction>Your doctor will go over the test results with you and, if need be, come up with a treatment plan suited specifically for you. You may need to have more tests performed to confirm a diagnosis, and you may need to get another WBC count and differential in the near future. Medically reviewed by Suzanne Falck, M.D., FACP — Written by Lori Smith, BSN, MSN, CRNP on November 21, 2018TypesCausesOther imbalancesSymptoms and diagnosisWhite blood cells are vital components of the blood. Their role is to fight infection, and they are essential for health and well-being. A high white blood cell count may indicate that the immune system is working to destroy an infection. It may also be a sign of physical or emotional stress. People with particular blood cancers may also have high white blood cell counts.A low white blood cell count can signal that an injury or condition is destroying cells faster than they are being made, or that the body is producing too few of them.White blood cells make up around 1 percent of all blood cells, and they are essential to regular function in the immune system. White blood cells are also known as leukocytes.The bone marrow continuously produces white blood cells. They are stored within the blood and lymphatic systems until they are necessary for fighting an infection or disease in the body.White blood cells are components of the blood that protect the body against disease and foreign invaders.Several types of white blood cell serve different functions.Most people will produce around 100 billion white blood cells every day.There are normally between 4,000 and 11,000 cells in every microliter of blood, although this can vary according to race.There are several different types of white blood cells, each with varying responsibilities:Lymphocytes: These are vital for producing antibodies that help the body to defend itself against bacteria, viruses, and other threats.Neutrophils: These are powerful white blood cells that destroy bacteria and fungi.Basophils: These alert the body to infections by secreting chemicals into the bloodstream, mostly to combat allergies.Eosinophils: These are responsible for destroying parasites and cancer cells, and they are part of an allergic responseMonocytes: These are responsible for attacking and breaking down germs or bacteria that enter the body.When necessary, monocytes travel to other organs, such as the spleen, liver, lungs, and bone marrow, where they transform into a cell called a macrophage.A macrophage is responsible for many functions, including removing dead or damaged tissue, destroying cancer cells, and regulating the immune response. An increase in white blood cells is known as leukocytosis. It typically occurs in response to the following conditions: Infectionimmunosuppressionmedications, including corticosteroidsa bone marrow or immune disordercertain cancers, such as acute or chronic lymphocytic leukemiaInflammationinjuryemotional stresslaborpregnancysmokingallergic reactionsexcessive exercise Certain respiratory illnesses, such as a whooping cough or tuberculosis, may cause the levels of white blood cells to increase. In some cases, all white blood cells are affected. However, some people have a specific disease in which only one type of white blood cell is affected. If levels of one particular type of white blood cell increase, this may be due to a specific trigger. Monocytes: High levels of monocytes may indicate the presence of chronic infection, an autoimmune or blood disorder, cancer, or other medical conditions.Lymphocytes: If there is an elevation in the level of lymphocytes, the condition is known as lymphocytic leukocytosis. This may occur as a result of a virus or an infection, such as tuberculosis. It may also be linked to specific lymphomas and leukemias.Neutrophils: Increased levels of neutrophils in their body lead to a physical state known as neutrophilic leukocytosis. This condition is a normal immune response to an event, such as infection, injury, inflammation, some medications, and certain types of leukemia.Basophils: Rising levels of basophils may occur in people with a history of underactive thyroid disease, known as hypothyroidism, or as a result of certain other medical conditions.Eosinophils: If a person registers high levels of eosinophils, the body might be reacting to a parasitic infection, allergen, or asthma. There is, on occasion, no identifiable cause for the increase in white blood cells. This is known as idiopathic hyper eosinophilic syndrome. It can lead to serious complications, such as damage to the heart, lung, liver, skin, and nervous system. Those affected by idiopathic hyper eosinophilic syndrome may experience symptoms such as: weight lossfeversnight sweatsfatiguecoughingchest painswellingstomach acheskin rashpainweaknessconfusioncomaA doctor may use a blood test to determine levels of white blood cells.If levels of white blood cells are lower than usual, this may be a sign that the person has reduced immune activity.This can occur as a result of conditions similar to HIV or immunosuppressant medications.A deficiency of white blood cells is why people with diseases or medications that suppress the immune system face an increased risk of infection.Abnormal blood cell production is also a feature of some cancers, such as leukemia and lymphoma.A number of conditions, collectively known as myeloproliferative disorders, can occur in the bone marrow.These develop when too many immature blood cells are produced, leading to an imbalance. Myeloproliferative disorders are rare conditions that may or may not become malignant. The exact effects of a high white blood cell count depend on the condition or factor causing them.Fluctuations in blood cell count might not cause any symptoms at all.After noting any symptoms, the doctor can use a blood test to assess the white blood cell count, and further tests and examinations will often be necessary for pinpointing the exact cause of the problem. Read the article in Spanish. Last medically reviewed on November 21, 2018

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