I'm not a robot

Written by: Bronwen Watson Reviewed by: Dr Tamlyn Maree Of the many types of anaemia, the condition is typically broken down into three major type classifications. Anaemia is classified according to the size of RBCs in the body. This ultimately ties in with underlying causes, types and reasons for the malfunction. The three main type classifications are: Microcytic anaemia: RBCs are smaller than normal in size and are caused by low levels of iron in the system. This often results in conditions such as iron-deficiency anaemia and inherited disorders of haemoglobin, such as thalassemia. Normocytic anaemia: RBCs are normal in size but are lacking in the number produced to replenish older cells ultimately excreted from the body. This type is commonly associated with chronic conditions such as kidney disease. Macrocytic anaemia: RBCs are larger in size than is normal. Often, excessive alcohol consumption is an underlying factor and results secondary to conditions, such as pernicious anaemia. Macrocytic anaemia occurs when there is a deficiency of vitamin B12 or folate. What causes anaemia? Essentially, anaemia is as a result of one of three things: The body isn't producing enough RBCs for healthy function (i.e. the body is lacking in RBC's and therefore has low haemoglobin) RBCs are being lost (old cells) at a faster rate than they are being produced in the bone marrow, usually due to bleeding in the body The body is actively destroying RBCs due to a deficiency or illness From the type classifications and fundamental causes, anaemia can be broken down into more specifically labelled type groups. Some of the main cause types include: Iron-deficiency anaemia: An insufficient amount of iron in the body (sometimes due to an iron-poor diet, commonly seen in infants, young children, teens, vegetarians and vegans) causes a decreased production of RBCs. This type is common worldwide and is often diagnosed in women who experience heavy menstrual bleeding during their reproductive years, and others suffering bleeding from ulcers, cancer, haemorrhoids, gastritis or use of medications, such as aspirin and ibuprofen, and other over-the-counter pain relievers relievers (these cause anaemia by perpetuating gastritis or peptic ulcers). Bleeding during childbirth and sometimes multiple pregnancies (due to increased metabolic demands in the body) and breastfeeding (which may deplete a woman's iron levels) can bring about anaemia as well. Those who donate blood frequently or place their bodies through endurance fitness training (endurance sports) may be at risk of this type of anaemia. Vitamin-deficiency anaemias: A lack of vitamin B-12 and folate can also hinder healthy RBC production. It may be that a person is not getting enough of these key nutrients in their diet or their body is having trouble processing these vitamins. Common variations of this type include pernicious anaemia (poor vitamin B-12 absorption), megaloblastic anaemia (deficiency in vitamin B-12 or folate, or both). Those who eat little or no meat in their diets may lack vitamin B-12 which can cause this type of anaemia. Vegetables which are overcooked or not consumed often enough can also lead to a deficiency of folate in the system. If pregnant and lacking folate (folic acid), a developing baby runs the risk of neural tube defects, such as spina bifida. Chronic disease anaemia: Chronic diseases can also have an impact on the sufficient production of RBCs and by association then cause a type of anaemia. Conditions such as cancer, rheumatoid arthritis, HIV-AIDS, kidney disease, hypothyroidism, lupus, diabetes and Crohn's disease are some that can interfere with the RBC production process. Anaemia associated with bone marrow disease: Diseases that affect RBC production in the bone marrow include leukaemia and myelofibrosis. Cancer (metastatic cancer cells) and cancer-like conditions range from mild to life-threatening and cause malfunctions in the bone marrow that ultimately have a domino effect of deficiency throughout the body. Rare, but life-threatening, aplastic anaemia occurs when the body is incapable of producing enough RBCs. The condition typically occurs as a result of infections (such as hookworm), existing autoimmune diseases, exposure to toxic chemicals and as an adverse reaction to medications. The bone marrow may also be affected by exposure to lead, which is toxic for the system. Poisoning can lead to anaemia affecting the bone marrow's normal functionality. Haemolytic anaemias: This group type relates to a high number of RBCs that are destroyed at a faster rate than the bone marrow can replenish with new cells. This group type is often inherited, but can also develop at a later stage in life if a person falls ill with a blood disease that increases the RBC destruction rate, causing an imbalance. Also known as sickle cell disease, sickle cell anaemia is one such inherited condition that causes an irregularity in the way RBCs are formed. A defective form of haemoglobin causes the shape of cells produced to 'sickle' (creating a banana or crescent moon shape) instead of the normal round shape, which causes them to experience difficulty in travelling through the bloodstream. Often, these cells are prematurely destroyed which causes a chronic shortage of RBCs (both normal and sickle) in the bloodstream. Other underlying causes for haemolytic anaemias include infection stressors (snake or spider venom, infections or drugs, medications or condition treatments such as chemotherapy), toxins associated with advanced kidney or liver disease, vascular grafts, prosthetic heart valves, severe burns, tumours, exposure to chemicals, clotting disorders, severe hypertension and an enlarged spleen (rare). Loss of blood escaping from the circulatory system "Hemorrhage" and "Haemorrhage" redirect here. For the song by Fuel, see Hemorrhage (In My Hands). For the band, see Haemorrhage (band). For the voluntary extraction of blood, see Bloodletting. For other uses, see Bleeding (disambiguation). This article about biology may be excessively human-centric. Please improve coverage for other species and discuss this issue on the talk page. (Learn how and when to remove this message) Medical conditionBleedingOther namesHemorrhaging, haemorrhaging, blood lossA bleeding wound in the fingerSpecialtyEmergency medicine, hematologyComplicationsExsanguination, hypovolemic shock, coma, shock Bleeding, hemorrhage, haemorrhage or blood loss, is blood escaping from the circulatory system from damaged blood vessels. Bleeding can occur internally, or externally either through a natural opening such as the mouth, nose, ear, urethra, vagina, or anus, or through a puncture in the skin. Hypovolemia is a massive decrease in blood volume, and death by excessive loss of blood is referred to as exsanguination.[1] Typically, a healthy person can endure a loss of 10–15% of the total blood volume without serious medical difficulties (by comparison, blood donation typically takes 8–10% of the donor's blood volume).[2] The stopping or controlling of bleeding is called hemostasis and is an important part of both first aid and surgery. Upper head Intracranial hemorrhage — bleeding in the skull. Cerebral hemorrhage — a type of intracranial hemorrhage, bleeding within the brain tissue itself. Intracerebral hemorrhage — bleeding in the brain caused by the rupture of a blood vessel within the head. See also hemorrhagic stroke. Subarachnoid hemorrhage (SAH) implies the presence of blood within the subarachnoid space from some pathologic process. The common medical use of the term SAH refers to the nontraumatic types of hemorrhages, usually from rupture of a berry aneurysm or arteriovenous malformation (AVM). The scope of this article is limited to these nontraumatic hemorrhages. Eyes Subconjunctival hemorrhage — bloody eye arising from a broken blood vessel in the sclera (whites of the eyes). Often the result of strain, including sneezing, coughing, vomiting, or other kind of strain Nose Epistaxis — nosebleed Mouth Tooth eruption — losing a tooth Hematemesis — vomiting fresh blood Hemoptysis — coughing up blood from the lungs Lungs Pulmonary hemorrhage Hemothorax Gastrointestinal Upper gastrointestinal bleed Lower gastrointestinal bleed Occult gastrointestinal bleed Urinary tract Hematuria — blood in the urine from urinary bleeding Gynecologic Vaginal bleeding Postpartum hemorrhage Breakthrough bleeding Ovarian bleeding — This is a potentially catastrophic and not so rare complication among lean patients with polycystic ovary syndrome undergoing transvaginal oocyte retrieval.[3] Anus Melena — upper gastrointestinal bleeding Hematochezia — lower gastrointestinal bleeding or brisk upper gastrointestinal bleeding Vascular Ruptured aneurysm Aortic transection Iatrogenic injury See also: Wound Bleeding arises due to either traumatic injury, underlying medical condition, or a combination. Traumatic bleeding is caused by some type of injury. There are different types of wounds which may cause traumatic bleeding. These include: Abrasion — Also called a graze, this is caused by transverse action of a foreign object against the skin, and usually does not penetrate below the epidermis. Excoriation — In common with abrasion, this is caused by mechanical destruction of the skin, although it usually has an underlying medical cause. Hematoma — Caused by damage to a blood vessel that in turn causes blood to collect in an enclosed area. Laceration — Irregular wound caused by blunt impact to soft tissue overlying hard tissue or tearing such as in childbirth. In some instances, this can also be used to describe an incision. Incision — A cut into a body tissue or organ, such as by a scalpel, made during surgery. Puncture Wound — Caused by an object that penetrated the skin and underlying layers, such as a nail, needle, or knife. Contusion — Also known as a bruise, this is caused by a blunt trauma damaging tissue under the surface of the skin. Crushing Injuries — Caused by a great or extreme amount of force applied over a period of time. The extent of a crushing injury may not immediately present itself. Ballistic Trauma — Caused by a projectile weapon such as a firearm. This may include two external wounds (entry and exit) and a contiguous wound between the two. The pattern of injury, evaluation, and treatment will vary with the mechanism of the injury. Blunt trauma causes injury via a shock effect; delivering energy over an area. Wounds are often not straight and unbroken skin may hide significant injury. Penetrating trauma follows the course of the injurious device. As the energy is applied in a more focused fashion, it requires less energy to cause significant injury. Any body organ, including bone and brain, can be injured and bleed. Bleeding may not be readily apparent; internal organs such as the liver, kidney, and spleen may bleed into the abdominal cavity. The only apparent signs may come with blood loss. Bleeding from a bodily orifice, such as the rectum, nose, or ears may signal internal bleeding, but cannot be relied upon. Bleeding from a medical procedure also falls into this category.[citation needed] "Medical bleeding" denotes hemorrhage as a result of an underlying medical condition (i.e. causes of bleeding that are not directly due to trauma). Blood can escape from blood vessels as a result of 3 basic patterns of injury: [citation needed] Intravascular changes — changes of the blood within vessels (e.g. ↑ blood pressure, ↓ clotting factors) Intramural changes — changes arising within the walls of blood vessels (e.g. aneurysms, dissections, AVMs, vasculitides) Extravascular changes — changes arising outside blood vessels (e.g. H pylori infection, brain abscess, brain tumor) The underlying scientific basis for blood clotting and hemostasis is discussed in detail in the articles coagulation, hemostasis, and related articles. The discussion here is limited to the common practical aspects of blood clot formation which manifest as bleeding. Some medical conditions can also make patients susceptible to bleeding. These are conditions that affect the normal hemostatic (bleeding-control) functions of the body. Such conditions either are, or cause, bleeding diatheses. Hemostasis involves several components. The main components of the hemostatic system include platelets and the coagulation system. Platelets are small blood components that form a plug in the blood vessel wall that stops bleeding. Platelets also produce a variety of substances that stimulate the production of a blood clot. One of the most common causes of increased bleeding risk is exposure to nonsteroidal anti-inflammatory drugs (NSAIDs). The prototype for these drugs is aspirin, which inhibits the production of thromboxane. NSAIDs (for example Ibuprofen) inhibit the activation of platelets, and thereby increase the risk of bleeding. The effect of aspirin is irreversible; therefore, the inhibitory effect of aspirin is present until the platelets have been replaced (about ten days). Other NSAIDs, such as ibuprofen (Motrin) and related drugs, are reversible and therefore, the effect on platelets is not as long-lived.[citation needed] There are several named coagulation factors that interact in a complex way to form blood clots, as discussed in the article on coagulation. Deficiencies of coagulation factors are associated with clinical bleeding. For instance, deficiency of Factor VIII causes classic hemophilia A while deficiencies of Factor IX cause "Christmas disease"(hemophilia B). Antibodies to Factor VIII can also inactivate the Factor VII and precipitate bleeding that is very difficult to control. This is a rare condition that is most likely to occur in older patients and in those with autoimmune diseases. Another common bleeding disorder is Von Willebrand disease. It is caused by a deficiency or abnormal function of the "Von Willebrand" factor, which is involved in platelet activation. Deficiencies in other factors, such as factor XIII or factor VII are occasionally seen, but may not be associated with severe bleeding and are not as commonly diagnosed. In addition to NSAID-related bleeding, another common cause of bleeding is that related to the medication warfarin ("Coumadin" and others). This medication needs to be closely monitored as the bleeding risk can be markedly increased by interactions with other medications. Warfarin acts by inhibiting the production of Vitamin K in the gut. Vitamin K is required for the production of the clotting factors, II, VII, IX, and X in the liver. One of the most common causes of warfarin-related bleeding is taking antibiotics. The gut bacteria make vitamin K and are killed by antibiotics. This decreases vitamin K levels and therefore the production of these clotting factors. Deficiencies of platelet function may require platelet transfusion while deficiencies of clotting factors may require transfusion of either fresh frozen plasma or specific clotting factors, such as Factor VIII for patients with hemophilia. Infectious diseases such as Ebola, Marburg virus disease, and yellow fever can cause bleeding.[4] See also: Wound assessment Dioxaborolane chemistry enables radioactive fluoride (18F) labeling of red blood cells, which allows for positron emission tomography (PET) imaging of intracerebral hemorrhages.[5] A subconjunctival hemorrhage is a common and relatively minor post-LASIK complication. Micrograph showing abundant hemosiderin-laden alveolar macrophages (dark brown), as seen in a pulmonary hemorrhage. H&E stain. Hemorrhaging is broken down into four classes by the American College of Surgeons' advanced trauma life support (ATLS).[6] Class I Hemorrhage involves up to 15% of blood volume. There is typically no change in vital signs and fluid resuscitation is not usually necessary. Class II Hemorrhage involves 15–30% of total blood volume. A patient is often tachycardic (rapid heart beat) with a reduction in the difference between the systolic and diastolic blood pressures. The body attempts to compensate with peripheral vasoconstriction. Skin may start to look pale and be cool to the touch. The patient may exhibit slight changes in behavior. Volume resuscitation with crystalloids (Saline solution or Lactated Ringer's solution) is all that is typically required. Blood transfusion is not usually required. Class III Hemorrhage involves loss of 30–40% of circulating blood volume. The patient's blood pressure drops, the heart rate increases, peripheral hypoperfusion (shock) with diminished capillary refill occurs, and the mental status worsens. Fluid resuscitation with crystalloid and blood transfusion are usually necessary. Class IV Hemorrhage involves loss of >40% of circulating blood volume. The limit of the body's compensation is reached and aggressive resuscitation is required to prevent death. This system is basically the same as used in the staging of hypovolemic shock. Individuals in excellent physical and cardiovascular shape may have more effective compensatory mechanisms before experiencing cardiovascular collapse. These patients may look deceptively stable, with minimal derangements in vital signs, while having poor peripheral perfusion. Elderly patients or those with chronic medical conditions may have less tolerance to blood loss, less ability to compensate, and may take medications such as betablockers that can potentially blunt the cardiovascular response. Care must be taken in the assessment.[citation needed] Although there is no universally accepted definition of massive hemorrhage, the following can be used to identify the condition: "(i) blood loss exceeding circulating blood volume within a 24-hour period, (ii) blood loss of 50% of circulating blood volume within a 3-hour period, (iii) blood loss exceeding 150 ml/min, or (iv) blood loss that necessitates plasma and platelet transfusion."[7] The World Health Organization made a standardized grading scale to measure the severity of bleeding.[8] Grade 0 no bleeding; Grade 1 petechial bleeding; Grade 2 mild blood loss (clinically significant); Grade 3 gross blood loss, requires transfusion (severe); Grade 4 debilitating blood loss, retinal or cerebral associated with fatality Main article: Emergency bleeding control § Wound management For the long process of regeneration of the body tissues, see Wound healing and Wound bed preparation. Acute bleeding from an injury to the skin is often treated by the application of direct pressure.[9] For severely injured patients, tourniquets are helpful in preventing complications of shock.[10] Anticoagulant medications may need to be discontinued and possibly reversed in patients with clinically significant bleeding.[11] Patients that have lost excessive amounts of blood may require a blood transfusion.[12] The use of cyanoacrylate glue to prevent bleeding and seal battle wounds was designed and first used in the Vietnam War.[13] Skin glue, a medical version of "super glue", is sometimes used instead of using traditional stitches used for small wounds that need to be closed at the skin level.[14] The word "Haemorrhage" (or hæmorrhage; using the æ ligature) comes from Latin haemorrhagia, from Ancient Greek αἱμορραγία (haimorrhagía, "a violent bleeding"), from αἱμορραγής (haimorrhagḗs, "bleeding violently"), from αἷμα (haîma, "blood") + -ραγία (-ragía), from ῥηγνύναι (rhēgnúnai, "to break, burst").[15] Aneurysm Autohemorrhaging Anemia Coagulation Contusion Exsanguination Hematophagy Hemophilia Hematoma Istihadha ^ "Dictionary Definitions of Exsanguination". Reference.com. Archived from the original on 2007-07-11. Retrieved 2007-06-18. ^ "Blood Donation Information". UK National Blood Service. Archived from the original on 2007-09-28. Retrieved 2007-06-18. ^ Liberty G, Hyman JH, Eldar-Geva T, Latinsky B, Gal M, Margalioth EJ (December 2008). "Ovarian hemorrhage after transvaginal ultrasonographically guided oocyte aspiration: a potentially catastrophic and not so rare complication among lean patients with polycystic ovary syndrome". Fertil. Steril. 93 (3): 874–879. doi:10.1016/j.fertnstert.2008.10.028. PMID 19064264. ^ Perdomo-Celis F, Salvato MS, Medina-Moreno S, Zapata JC (January 2019). "T-Cell Response to Viral Hemorrhagic Fevers". Vaccines. 7 (1): 11. doi:10.3390/vaccines7010011. PMC 6466054. PMID 30678246. ^ Wang, Ye; An, Fei-Fei; Chan, Mark; Friedman, Beth; Rodriguez, Erik A; Tsien, Roger Y; Aras, Omer; Ting, Richard (2017-01-05). 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Retrieved 2022-12-10. ^ "Hemorrhage Origin". dictionary.com. Archived from the original on 20 July 2015. Retrieved 16 July 2015. Retrieved from " Anemia is a health condition that occurs when you don't have enough red blood cells or when the red blood cells in your body are unable to function properly. Anemia can cause symptoms like fatigue, dizziness, and shortness of breath.There are many types of anemia, including:iron-deficiency anemiasideroblastic anemiathalassemialead toxicity anemiaanemia of chronic disease (ACD)blood loss anemiahemolytic anemiaaplastic anemiaanemia from bone marrow infiltrative disorderssickle-cell anemiamegaloblastic anemianon-megaloblastic anemiaSome can be treated easily and resolved quickly. Other types require more intensive, possibly lifelong treatment. This article looks at the different types of anemia, their causes, and treatment options.Although all anemia types are characterized by low red blood cell levels or red blood cells that don't work as they should, there can be significant differences in each type's causes, severity, and treatment. Anemia is typically diagnosed with blood tests that examine the number, shape, and health of red blood cells. If you receive a diagnosis of anemia, treatment depends on the type.Anemia typically has three main types, each of which can have different causes:Microcytic: With microcytic anemia, red blood cells don't have enough hemoglobin, so they are smaller than normal.Normocytic: In normocytic anemia, there aren't enough red cells to meet your body's needs. Normocytic anemia tends to accompany certain chronic diseases.Macrocytic: Macrocytic anemia happens when bone marrow makes red blood cells that are larger than normal. The symptoms of all types of anemia can be similar and may include:fatigueshortness of breathdizzinesspallor Let's take a closer look at these three types of anemia in more detail. In microcytic anemia, red blood cells are smaller than they should be. This happens because your red blood cells don't have enough hemoglobin, a protein in red blood cells that helps carry oxygen through your bloodstream and throughout your body.Types of conditions that can cause microcytic anemia include: Iron-deficiency anemia: Iron-deficiency anemia is the most common cause of microcytic anemia, and it happens when your body doesn't have sufficient iron to make hemoglobin. Without enough hemoglobin, your red blood cells have a harder time delivering oxygen throughout your body. As a result, you may feel tired and out of breath. Common causes of iron deficiency anemia include: Sideroblastic anemia: In sideroblastic anemia, your bone marrow is unable to make enough healthy red blood cells. Depending on the cause, sideroblastic anemia can be microcytic (red blood cells are too small) or macrocytic (red blood cells are too large). You can be born with this condition, or it may develop due to certain medications or exposure to some types of toxins and chemicals. Thalassemia: Thalassemia is a blood disorder caused by inherited genes. If you have thalassemia, your body makes an abnormal form of hemoglobin. There are different types of thalassemia, and each type can affect your red blood cells differently. Lead toxicity: High levels of lead exposure may also cause a disruption to how your body produces hemoglobin and red blood cells. The treatment of microcytic anemia depends on the underlying cause. For instance:With normocytic anemia, red blood cells are all the same size, but there aren't sufficient circulating red blood cells to meet the body's needs. Normocytic anemia most often results from an underlying chronic illness. Less frequently, you may be born with it, or it can be a side effect of a medication. The most common conditions that can affect red blood cell production and lead to normocytic anemia include: Anemia of chronic disease (ACD): Diseases that cause inflammation are the underlying cause of ACD. Inflammation can reduce the production of red blood cells or cause weaker red blood cells to be produced that die more quickly. Many types of chronic diseases that cause inflammation can lead to ACD, including: Blood loss: Losing too much blood because of an injury, heavy periods, surgery, or bleeding in the gastrointestinal tract can all lead to normocytic anemia. Hemolytic anemia: Hemolytic anemia causes red blood cells to break down and die too rapidly. Sometimes the condition is mild and doesn't need treatment. Often, doctors can treat this type of anemia successfully once the cause is determined. Hemolytic anemia can have multiple causes, including: Aplastic anemia: Aplastic anemia occurs when the stem cells in the bone marrow aren't able to make enough red blood cells. This anemia is often a result of the body's immune system attacking bone marrow stem cells, and it can also occur after: a severe viral infectiontreatment with radiationexposure to toxic chemicalsBone marrow infiltrative disorders: Red blood cells live for about 120 days. Once red blood cells die off, they're replaced by new red blood cells in the bone marrow. Some types of diseases can affect the bone marrow and make it harder for red blood cells to be produced. This includes conditions such as: The treatment of normocytic anemia depends on the underlying cause.With macrocytic anemia, the bone marrow makes red blood cells that are larger in size than typical red blood cells. This type of anemia can develop if the body lacks certain nutrients. There are two kinds of macrocytic anemia: megaloblastic anemia and nonmegaloblastic anemia.Megaloblastic anemia happens when you don't get enough vitamin B12 or folate. If your body doesn't have enough of these nutrients, the bone marrow has a hard time making healthy red blood cells. Treatment of megaloblastic anemia may include taking vitamin B12 and folate supplements and increasing your dietary intake of these vitamins.Some people have an autoimmune condition called "pernicious anemia" that prevents their bodies from absorbing vitamin B12. If untreated, pernicious anemia can cause irreversible damage to the nervous and digestive systems. Treating pernicious anemia usually involves vitamin B12 injections, which are given daily or weekly until B12 levels are within a healthy range.With nonmegaloblastic anemia, certain medical conditions may affect how easily the body absorbs nutrients needed for healthy red blood cell production. The most common conditions that can cause nonmegaloblastic anemia include:If you have nonmegaloblastic anemia from an underlying chronic condition, doctors usually focus on treating the underlying disease.Some types of anemia, including inherited types, can't be prevented. However, some steps to help reduce the risk of other types of anemia. Steps for prevention can include:eating a healthy diet containing iron-rich foods such as shellfish, poultry, and beefeating vegetables to help your body absorb irongetting enough folate and B12 in your diet or taking supplements talking with a doctor about hormonal therapy if you have heavy menstrual bleedingAnemia is a health condition that occurs when you don't have enough red blood cells or your red blood cells can't function properly. It can cause symptoms such as:lightheadednessfatigueweaknessshortness of breathThe different types of anemia share similar symptoms but have different causes, treatments, and severity. Some anemias, such as megaloblastic anemia, can be treated with dietary changes. Other anemias, such as sickle cell anemia, are chronic and inherited.You can't prevent inherited types of anemia, but you can take steps to help your body get the nutrients it needs to prevent anemias caused by a lack of iron, B12, or folate. Anemia is a health condition that occurs when you don't have enough red blood cells or when the red blood cells in your body are unable to function properly. Anemia can cause symptoms like fatigue, dizziness, and shortness of breath.There are many types of anemia, including:iron-deficiency anemiasideroblastic anemiathalassemialead toxicity anemiaanemia of chronic disease (ACD)blood loss anemiahemolytic anemiaaplastic anemiaanemia from bone marrow infiltrative disorderssickle-cell anemiamegaloblastic anemianon-megaloblastic anemiaSome can be treated easily and resolved quickly. Other types require more intensive, possibly lifelong treatment. 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There are two kinds of macrocytic anemia: megaloblastic anemia and nonmegaloblastic anemia.Megaloblastic anemia happens when you don't get enough vitamin B12 or folate. If your body doesn't have enough of these nutrients, the bone marrow has a hard time making healthy red blood cells. Treatment of megaloblastic anemia may include taking vitamin B12 and folate supplements and increasing your dietary intake of these vitamins.Some people have an autoimmune condition called "pernicious anemia" that prevents their bodies from absorbing vitamin B12. If untreated, pernicious anemia can cause irreversible damage to the nervous and digestive systems. Treating pernicious anemia usually involves vitamin B12 injections, which are given daily or weekly until B12 levels are within a healthy range.With nonmegaloblastic anemia, certain medical conditions may affect how easily the body absorbs nutrients needed for healthy red blood cell production. The most common conditions that can cause nonmegaloblastic anemia include:If you have nonmegaloblastic anemia from an underlying chronic condition, doctors usually focus on treating the underlying disease.Some types of anemia, including inherited types, can't be prevented. However, some steps to help reduce the risk of other types of anemia. Steps for prevention can include:eating a healthy diet containing iron-rich foods such as shellfish, poultry, and beefeating vegetables to help your body absorb irongetting enough folate and B12 in your diet or taking supplements talking with a doctor about hormonal therapy if you have heavy menstrual bleedingAnemia is a health condition that occurs when you don't have enough red blood cells or your red blood cells can't function properly. It can cause symptoms such as:lightheadednessfatigueweaknessshortness of breathThe different types of anemia share similar symptoms but have different causes, treatments, and severity. Some anemias, such as megaloblastic anemia, can be treated with dietary changes. Other anemias, such as sickle cell anemia, are chronic and inherited.You can't prevent inherited types of anemia, but you can take steps to help your body get the nutrients it needs to prevent anemias caused by a lack of iron, B12, or folate. Illustration of Anemia Anemia describes a condition in which the number of red blood cells in the blood is low. For this reason, doctors sometimes describe someone with anemia as having a low blood count. A person who has anemia is called an anemic. Blood is comprised of two parts: a liquid called the plasma and a cellular part. The cellular part contains several different cell types. One of the most important and numerous cell types is red blood cells. The other cell types are white blood cells and platelets. Only red blood cells are discussed in this article. The purpose of the red blood cell is to deliver oxygen from the lungs to other parts of the body. Red blood cells are produced through a series of complex and specific steps. They are made in the bone marrow (the inner part of the femur and pelvic bones that make most of the cells in the blood), and when all the proper steps in their maturation are complete, they are released into the bloodstream. The hemoglobin molecule is the functional unit of the red blood cells and is a complex protein structure that is inside the red blood cells. Contrary to most cells in the human body, red blood cells do not have a nucleus (metabolic center of a cell). Even though the red blood cells (or RBCs) are made within the bone marrow, many other factors are involved in their production. For example, iron is a very important component of the hemoglobin molecule; erythropoietin, a molecule secreted by the kidneys, promotes the formation of red blood cells in the bone marrow. The following are some key points summarizing anemia and red blood cells: Having the correct number of red blood cells and prevention of anemia requires cooperation among the kidneys, the bone marrow, and nutrients within the body. If the kidneys or bone marrow are not functioning, or the body is poorly nourished, then normal red blood cell count and function may be difficult to maintain. Anemia is a sign of a disease process rather than bringing a disease itself. It is usually classified as either chronic or acute. Chronic anemia occurs over a long period. Acute anemia occurs quickly. Determining whether anemia has been present for a long time or whether it is something new, assists doctors in finding the cause. This also helps predict how severe the symptoms of anemia may be. In chronic anemia, symptoms typically begin slowly and progress gradually; whereas in acute anemia symptoms can be abrupt and more distressing. Red blood cells live about 100 days, so the body is constantly trying to replace them. In adults, red blood cell production occurs in the bone marrow. Doctors try to determine if a low red blood cell count is caused by increased blood loss of red blood cells or from decreased production of them in the bone marrow. Knowing whether the number of white blood cells and/or platelets has changed also helps determine the cause of anemia. In the United States, 2% to 10% of people have anemia. Other countries have even higher rates of anemia. Young women are twice as likely to have anemia than young men because of regular menstrual bleeding. Anemia occurs in both young people and old people, but anemia in older people is more likely to cause symptoms and be related to serious, underlying conditions. In general, there are three major types of anemia, classified according to the size of the red blood cells: If the red blood cells are smaller than normal, this is called microcytic anemia. The major causes of this type are iron deficiency (low-level iron) anemia and thalassemia (inherited disorders of hemoglobin). If the red blood cell size is normal in size (but low in number), this is called normocytic anemia, such as anemia that accompanies chronic disease or anemia related to kidney disease. If red blood cells are larger than normal, then it is called macrocytic anemia. Major causes of this type are pernicious anemia and anemia related to alcoholism. Many medical conditions cause anemia. Common causes of anemia include the following: Anemia from active bleeding: Loss of blood through heavy menstrual bleeding or wounds can cause anemia. Gastrointestinal ulcers or cancers such as cancer of the colon may slowly ooze blood and can also cause anemia. Iron deficiency anemia: The bone marrow needs iron to make red blood cells. Iron (Fe) plays an important role in the proper structure of the hemoglobin molecule. If iron intake is limited or inadequate due to poor dietary intake, anemia may occur as a result. This is called iron deficiency anemia. Iron deficiency anemia can also occur when there are stomach ulcers or other sources of slow, chronic bleeding (colon cancer, uterine cancer, intestinal polyps, hemorrhoids, etc). In these kinds of scenarios, because of ongoing, chronic slow blood loss, iron is also lost from the body (as a part of the blood) at a higher rate than normal and can result in iron deficiency anemia. Anemia of chronic disease: Any long-term medical condition can lead to anemia. The exact mechanism of this process is unknown, but any long-standing and ongoing medical condition such as a chronic infection or cancer may cause this type of anemia. Anemia related to kidney disease: The kidneys release a hormone called erythropoietin that helps the bone marrow make red blood cells. In people with chronic (long-standing) kidney disease (CKD or end-stage renal disease (ESRD), the production of this hormone is diminished, and this, in turn, diminishes the production of red blood cells, causing anemia. This is called anemia related to or anemia of chronic kidney disease. Anemia related to pregnancy: Water weight and fluid gain during pregnancy dilute the blood, which may be reflected as anemia since the relative concentration of red blood cells is lower. Anemia related to poor nutrition: Vitamins and minerals are required to make red blood cells. In addition to iron, vitamin B12 and folate (or folic acid) are required for the proper production of hemoglobin (Hgb). Deficiency in any of these may cause anemia because of the inadequate production of red blood cells. Poor dietary intake is an important cause of low folate and low vitamin B12 levels. Strict vegetarians who do not take sufficient vitamins are at risk to develop vitamin B12 deficiency. Pernicious anemia: There also may be a problem in the stomach or the intestines leading to poor absorption of vitamin B12. This may lead to anemia because of vitamin B12 deficiency known as pernicious anemia. Sickle cell anemia: In some individuals, the problem may be related to the production of abnormal hemoglobin molecules. In this condition, the hemoglobin problem is qualitative, or functional. Abnormal hemoglobin molecules may cause problems in the integrity of the red blood cell structure and they may become crescent-shaped (sickle cells). There are different types of sickle cell anemia with different severity levels. This is typically hereditary and is more common in those of African, Middle Eastern, and Mediterranean ancestry. People with sickle cell anemia can be diagnosed as early as childhood depending on the severity and symptoms of their disease. Thalassemia: This is another group of hemoglobin-related causes of anemia. There are many types of thalassemia, which vary in severity from mild (thalassemia minor) to severe (thalassemia major). These are also hereditary, but they cause quantitative hemoglobin abnormalities, meaning an insufficient amount of the correct hemoglobin molecules is made. Thalassemia is more common in people from African, Mediterranean, and Southeast Asian ancestries. Alcoholism: Poor nutrition and deficiencies of vitamins and minerals are associated with alcoholism. Alcohol itself may also be toxic to the bone marrow and may slow down red blood cell production. The combination of these factors may lead to anemia in alcoholics. Bone marrow-related anemia: Anemia

failure, however, then it most likely will require long-term monitoring and treatment. In general, young people recover from anemia more quickly than older people do. Younger people also tolerate symptoms of anemia better than elderly people. Effects of anemia on elderly people tend to be more significant because of more underlying chronic medical problems. Anemia makes almost any medical problem worse. Medically reviewed by Joseph Palermo, DO, American Osteopathic Board Certified Internal Medicine REFERENCE: Fauci, Anthony S., et al. Harrison's Principles of Internal Medicine. 17th ed. United States: McGraw-Hill Professional, 2008. Anaemia is a very common condition where the number of red blood cells or the amount of haemoglobin in red blood cells is less than normal. Iron deficiency anaemia is a specific type of anaemia caused by a lack of the mineral iron in the body. Iron is important in the formation of haemoglobin so a reduced iron level causes a reduced haemoglobin level in the blood.Red blood cells contain haemoglobin, which is the substance that makes blood red. Its main purpose is to carry oxygen around the body. If the body does not receive enough oxygen, various symptoms occur. These include tiredness, weakness and lack of energy. If the anaemia becomes more severe, it can become life threatening.There are many other types of anaemia that affect children, other than iron deficiency anaemia, some of which are extremely rare and explained further in our rare anaemias information. Iron deficiency anaemia is the most common form of anaemia. Iron is present in many foods that we eat, such as red meat, fish and leafy green vegetables. If someone’s diet does not contain enough of these foods, they can develop iron deficiency anaemia.It can also be caused if the body does not absorb iron from the food that we eat for example, this can occur if someone drinks a lot of cow’s milk as this blocks iron absorption. It can also develop because of long-term blood loss such as might occur in some girls when they start to have periods if they cannot replace the iron lost in periods. Some children with mild anaemia do not show any symptoms at all, but common signs and symptoms include pale skin, lack of energy and breathlessness. Iron deficiency anaemia is usually diagnosed using blood tests. The doctors will take a small sample of blood and send it to a laboratory. The test will count the number of each type of blood cell present in a sample (full blood count) and then check how much haemoglobin is contained in the red blood cells.They may also carry out other tests to see how much iron is contained in the haemoglobin. All of these test results provide information to the doctor about whether anaemia is present and if so, how severe it is.If a child has anaemia, further tests may be needed to work out what is causing the anaemia if iron deficiency anaemia is unlikely. Rarely, a sample of bone marrow may be taken to see if red blood cells are forming as they should. The most common treatment is a course of iron tablets or liquid to be taken by mouth. Although iron is best absorbed on an empty stomach, taking it this way commonly causes a feeling of sickness. This can be prevented by taking it with some food and vitamin C (for example in orange juice) which increases the absorption. Iron absorption is reduced by milk, tea, coffee and certain medicines, which should not be taken at the same time. Children taking iron supplements will have black stools.There are ways to increase the amount of iron in the diet as well as medication. Foods rich in iron include:MeatBeans and lentilsEggsFishApricots, prunes and raisinsLeafy green vegetablesOatmealTunaGiving young children fortified formula and/or cereal is also a useful way of boosting iron intake. If you have any questions about how to improve your child’s iron intake, you could ask for a referral to a dietician either in your local community or at your local hospital. Iron deficiency anaemia is usually short lived with haemoglobin levels usually returning to normal within a month or two. Doctors will usually advise continuing to give your child iron medication for a few more months to make sure that blood levels remain stable and the body builds up a ‘store’ of iron for the future. The Haematology department in collaboration with the Child and Family Information Group