

Blood Test Results: CBC Explained

Complete Blood Count (CBC)

Definition: Measures essential components of the blood

Substance	What It Is	Reference Ranges *			What a Low Number May Mean	What a High Number May Mean
		USA	UK/EU	Australia/Canada		
White blood cell count (WBC)	Measures the total number of white blood cells, which defend the body against infection; there are several different types of white blood cells: lymphocytes, monocytes, neutrophils, eosinophils, and basophils	4,500-10,000 cells/mCL			Autoimmune diseases, immunosuppression, bone marrow failure, chemotherapy, viral infections	Infection, inflammation, leukemia, intense exercise, stress, corticosteroids
Lymphocytes, absolute (LY, abs) or percentage (LY, pct)	Measures the number or percentage of lymphocytes, which are white blood cells that include B-cells, T-cells, and natural killer cells	800-5,000 cells/mCL (abs) 18-45 (pct)			Immunosuppression, HIV-AIDS, bone marrow failure, chemotherapy	Viral infections, leukemia, lymphoma
Monocytes, absolute (MO, abs) or percentage (MO, pct)	Measures the number or percentage of monocytes, which are white blood cells that move out of the circulating blood and into the tissues, where they mature into macrophages	400-1,000 cells/mCL (abs) 1-10 (pct)			Immunosuppression, bone marrow failure, chemotherapy	Chronic infections, autoimmune diseases, leukemia
Granulocytes, absolute (GR, abs) or percentage (GR, pct)	Measures the number or percentage of white blood cells with granules in their cytoplasm and two or more lobes in their nuclei; an inclusive term for neutrophils, basophils, and eosinophils, although neutrophils are by far the most abundant	1,800-8,300 cells/mCL (abs) 45-75 (pct)			Immunosuppression, bone marrow failure, chemotherapy	Infection, inflammation, leukemia, intense exercise, stress, corticosteroids
Neutrophils, absolute (NE, abs) or percentage (NE, pct)	Measures the number or percentage of neutrophils, which are normally the most abundant circulating white blood cells and respond quickly to infection	1,800-8,300 cells/mCL (abs) 45-75 (pct)			Immunosuppression, bone marrow failure, chemotherapy	Infection, inflammation, leukemia, intense exercise, stress, corticosteroids
Eosinophils, absolute (EOS, abs) or percentage (EOS, pct)	Measures the number or percentage of eosinophils, which combat parasitic infections and are involved in asthma or allergy responses	0-800 cells/mCL (abs) 0-7 (pct)			Generally not a concern	Parasitic infections
Basophils, absolute (BAS, abs) or percentage (BAS, pct)	Measures the number or percentage of basophils, which are involved in allergy responses	0-100 cells/mCL (abs) 0-0.5 (pct)			Generally not a concern	Active allergic response
Red blood cell count (RBC)	Measures the number of red blood cells, which pick up oxygen from the blood and deliver it to tissues throughout the body	Male: 4.7-6.1 million/mCL Female: 4.2-5.4 million/mCL			Iron, vitamin B12, or folate deficiency; bone marrow damage; leukemia or lymphoma; acute or chronic blood loss; red blood cell hemolysis	Dehydration, renal problems, pulmonary disease, congenital heart disease, polycythemia vera
Reticulocytes	Measures the percentage of circulating immature red blood cells	0.5-2.0%			Generally not a concern	Anemia, recent blood loss, red blood cell hemolysis
Hemoglobin (Hgb)	Oxygen-carrying pigment in red blood cells	Male: 13.8-17.2 g/dL Female: 12.1-15.1 g/dL			Iron, vitamin B12, or folate deficiency; bone marrow damage; leukemia or lymphoma; acute or chronic blood loss; red blood cell hemolysis	Dehydration, renal problems, pulmonary disease, congenital heart disease, polycythemia vera
Hematocrit (HCT)	The percentage of red blood cells	Male: 40.7%-50.3% Female: 36.1%-44.3%			Iron, vitamin B12, or folate deficiency; bone marrow damage; leukemia or lymphoma; acute or chronic blood loss; red blood cell hemolysis	Dehydration, renal problems, pulmonary disease, congenital heart disease, polycythemia vera
Mean corpuscular volume (MCV)	Average size of red blood cells	80-95 fL			Iron deficiency	Vitamin B12 or folate deficiency
Mean corpuscular hemoglobin (MCH)	The amount of hemoglobin per red blood cell	23-31 pg			Iron deficiency	Vitamin B12 or folate deficiency
Mean corpuscular hemoglobin concentration (MCHC)	The average concentration of hemoglobin in a given volume of red blood cells	32-36 g/dL			Iron deficiency	Sickle cell disease, hereditary spherocytosis
Red cell distribution width (RDW)	A measurement of the variation in red blood cell size	11-15%			Generally not a concern	Iron deficiency, vitamin B12 or folate deficiency, recent blood loss
Platelet count (PLT)	Measures the number of platelets, which are important for blood clotting	150-400 Thousand/mCL			Bone marrow failure, chemotherapy, viral infections, lupus, pernicious anemia (due to vitamin B12 deficiency), leukemia or lymphoma, sequestration in the spleen, certain medications	Leukemia, myeloproliferative disorders (which cause blood cells to grow abnormally in bone marrow), inflammatory conditions
Mean platelet volume (MPV)	The average volume of a platelet; newer platelets tend to be larger than older ones	7.0-11.0 fL			Aplastic anemia, thrombocytopenia	Certain inherited disorders

* Reference ranges can vary by age, sex, methods of testing, and other factors. There are no nationally established reference ranges for CMP and CBC values; instead, each laboratory tests a population and establishes its own reference ranges. Therefore, the reference ranges quoted are only approximate.

KEY

mg: milligram g: gram mmol: millimole mEq: milliequivalent dL: deciliter
 IU: international unit L: liter mCL: microliter pg: picogram fL: femtoliter
 m: meter mL: milliliter