

Complete Blood Count

Why am I having this test?

A complete blood count (CBC) is a blood test that measures the cells of your blood. The types of cells are red blood cells (RBCs), white blood cells (WBCs), and blood cell fragments that help with clotting (*platelets*). Changes in these cells can warn your health care provider about many conditions, including anemia, infection, inflammation, bleeding, and blood-related cancer.

You may have this test:

- As part of a routine physical exam.
- To help your health care provider diagnose certain health conditions.
- To help your health care provider monitor known health conditions or treatments.

What is being tested?

A CBC measures your RBCs, WBCs, platelets, and their different components. RBCs are made in the tissue inside your bones (*bone marrow*) and released into your blood. These cells contain a protein that carries oxygen in your blood (*hemoglobin*). CBC testing of RBCs includes:

- RBC count. This is the total number of RBCs.
- Hemoglobin (Hb). This is the total amount of hemoglobin.
- Hematocrit (Hct). This is the percentage of space that red blood cells take up in your blood.
- Mean corpuscular volume (MCV). This is the average size of red blood cells.
- Mean corpuscular hemoglobin (MCH). This is the average amount of hemoglobin inside each red blood cell.
- Mean corpuscular hemoglobin concentration (MCHC). This is the average concentration of hemoglobin inside each red blood cell.
- Red blood cell distribution width (RDW). This may be included to measure the variation in the size of red blood cells.

WBCs are also made in your bone marrow. They are part of your body's disease-fighting system (*immune system*). CBC testing of WBCs includes:

- WBC count. This is the total number of WBCs.
- A count of the five types of WBCs:
 - Neutrophils.
 - Lymphocytes.
 - Monocytes.
 - Eosinophils.
 - Basophils.

Platelets are cell fragments that are important for blood clotting. A CBC measures:

- Total platelet count.
- Mean platelet volume (MPV).

What kind of sample is taken?

A blood sample is required for this test. It is usually collected by inserting a needle into a blood vessel.



How are the results reported?

Your test results will be reported as values. Your health care provider will compare your results to normal ranges that were established after testing a large group of people (*reference ranges*). Reference ranges may vary among labs and hospitals. Reference ranges for a CBC usually apply only to people who are older than 18. For this test, common reference ranges for people older than 18 may be:

Red blood cells

- RBC count
 - Men: 4.7–6.1
 - Women: 4.2–5.4
- Hb
 - Men: 14–18
 - Women: 12–16
- Hct
 - Men: 42–52%
 - Women: 37–47%
- MCV: 80–95
- MCH: 27–31
- MCHC: 32–36
- RDW: 11–14.5%

White blood cells

- WBC count: 5,000–10,000
- Neutrophil count: 2500–8000 or 55–70%
- Lymphocyte count: 1000–4000 or 20–40%
- Monocyte count: 100–700 or 2–8%
- Eosinophil count: 50–500 or 1–4%
- Basophil count: 25–100 or 0.5–1%

Platelets

- Platelet count: 150,000–400,000
- MPV: 7.4–10.4

What do the results mean?

Results that are outside the reference ranges may indicate that you have an infection or other health condition.

Red blood cells

- RBC count, Hb, and Hct
 - Results lower than the reference ranges may indicate anemia. Anemia may be caused by several conditions, such as iron deficiency anemia.
 - Results higher than the reference ranges may indicate polycythemia. This may be caused by several conditions, such as chronic obstructive pulmonary disease (COPD).
- MCV, MCH, MCHC, and RDW
 - Results outside the reference ranges may indicate a condition that causes anemia.

White blood cells

- WBC count
 - Results lower than the reference range may indicate an infection or a condition that keeps your bone marrow from making new WBCs.
 - Results higher than the reference range may indicate an infection, a condition that causes inflammation (*autoimmune disease*), or a blood-related cancer.
- Neutrophils, lymphocytes, and monocytes
 - Results outside the reference ranges may indicate an infection, an autoimmune disease, or certain types of cancer.
- Eosinophils and basophils
 - Results outside the reference ranges may indicate an allergy, an inflammatory condition such as asthma, or blood cell cancer.

Platelets

- Platelet count
 - Results lower than the reference range may indicate an infection or blood cell cancer.
 - Results higher than the reference range may indicate certain types of anemia, an autoimmune disease, or certain cancers.
- MPV
 - High or low results may indicate a bone marrow abnormality.

Talk with your health care provider about what your results mean.

Questions to ask your health care provider

Ask your health care provider or the department that is doing the test:

- When will my results be ready?
- How will I get my results?
- What are my treatment options?
- What other tests do I need?
- What are my next steps?

Summary

- A CBC is a routine blood test that measures the cells in your blood.
- Changes in these cells can indicate many conditions, including anemia, infection, inflammation, and blood cell cancer.
- A health care provider will collect a sample of your blood for this test by inserting a needle into a blood vessel.
- Talk with your health care provider about what your results mean.

This information is not intended to replace advice given to you by your health care provider. Make sure you discuss any questions you have with your health care provider.