

Hemoglobin Levels (cont.)

- What is hemoglobin?

Hemoglobin (sometimes abbreviated as Hb) is complex protein found in red blood cells that contains an iron molecule. The main function of hemoglobin is to carry oxygen from the lungs to the body tissues, and to exchange the oxygen for carbon dioxide, and then carry the carbon dioxide back to the lungs and where it is exchanged for oxygen. The iron molecule in hemoglobin helps maintain the normal shape of red blood cells.

- How is hemoglobin measured?

Hemoglobin is routinely measured as part of a routine blood test termed blood count (CBC). A complete blood count is one of the most common tests doctors order for a patient.

- What are normal hemoglobin values?

Normal hemoglobin values are related to the person's age and sex. Normal values may vary slightly between test systems, and which groups of doctors have determined "normal values" for their group of patients; however, the value ranges are close (vary by about 0.5 g/dl) for almost every group. An example of normal ranges that is widely accepted by Family Practice physicians is as follows:

- Birth: 13.5 to 24.0 g/dl (mean 16.5 g/dl)
- Age <1 month: 10.0 to 20.0 g/dl (mean 13.9 g/dl)
- Age 1-2 months: 10.0 to 18.0 g/dl (mean 11.2 g/dl)
- Age 2-6 months: 9.5 to 14.0 g/dl (mean 12.6 g/dl)
- Age 0.5 to 2 years: 10.5 to 13.5 g/dl (mean 12.0 g/dl)
- Age 2 to 6 years: 11.5 to 13.5 g/dl (mean 12.5 g/dl)
- Age 6-12 years: 11.5 to 15.5 g/dl (mean 13.5)
- Female
 - Age 12-18 years: 12.0 to 16.0 g/dl (mean 14.0 g/dl)
 - Age >18 years: 12.1 to 15.1 g/dl (mean 14.0 g/dl)
- Male
 - Age 12-18 years: 13.0 to 16.0 g/dl (mean 14.5 g/dl)
 - Age >18 years: 13.6 to 17.7 g/dl (mean 15.5 g/dl)

- What does low hemoglobin mean?

Low hemoglobin means that a person's hemoglobin level when measured, is below the lowest limits of normal for their age and sex (see above normal range of values). For example, a 19 year old male would have low hemoglobin if the detected blood value was below 13.6 g/dl. Another term frequently used in place of low hemoglobin is anemia, or the person is described as being anemic. Some of the more common causes of anemia are as follows:

Nutritional (iron, folic acid, or vitamin B 12 deficiency [pernicious anemia]); Gastrointestinal blood loss (ulcers, colon cancer); Kidney problems; Blood loss (from trauma or surgery); Red Blood cell synthesis problems (bone marrow disorders, genetic disorders such as sickle cell anemia); Bone marrow suppression by chemotherapy or radiation exposure

- What does high hemoglobin mean?

High hemoglobin levels mean that measured hemoglobin levels are above the upper limits of normal for the age and sex of the person (see above normal values). For example, a 19 year old that has a detected hemoglobin level of above 17.7 g/dl would have a high hemoglobin level.

Some causes for high hemoglobin levels are as follows:

Living at a high altitude; Lung disease (emphysema, COPD); Cancer; Tobacco smoking; Bone marrow disorders (polycythemia vera); Overdose or inappropriate use of the drug epoetin alfa (Epoen, Procrit); Blood doping (adding RBC's by IV to the bloodstream).