

REPORT: Abnormally Low Hemoglobin A1C

By Dan Purser MD

An abnormally low Hemoglobin A1C (typically below 4.0%) usually stems from either conditions that shorten the lifespan of red blood cells—causing a artificially low lab result—or underlying medical issues causing true chronic hypoglycemia.

Accelerated Red Blood Cell Turnover (Falsely Low Results)

Because the A1C test measures glucose attached to red blood cells over their typical 120-day lifespan, anything that destroys or replaces red blood cells early leaves less time for sugar to bind, lowering the score:

- **Hemolytic Anemia:** Rapid destruction of red blood cells leaves a higher proportion of young cells in circulation.
- **Recent Blood Loss or Transfusion:** Heavy blood loss triggers the bone marrow to flood the system with fresh red blood cells. Transfusions dilute the proportion of glycated hemoglobin.
- **Hemoglobin Variants:** Structural variations in hemoglobin (such as sickle cell trait or thalassemia) can interfere with standard laboratory assays.
- **Enlarged Spleen (Splenomegaly):** An overactive or enlarged spleen traps and destroys red blood cells prematurely.

True Chronic Hypoglycemia

Sometimes the reading reflects genuinely low blood glucose levels over an extended period:

- **Medication Side Effects:** Overuse or incorrect dosing of insulin or sulfonylureas in people managing diabetes.
- **Hormonal Deficiencies:** Conditions like adrenal insufficiency (Addison's disease) lower cortisol, a key hormone needed to maintain blood sugar levels.
- **Severe Liver Disease:** Advanced liver damage impairs the body's ability to produce and release stored glucose.
- **Insulinoma:** A rare tumor of the pancreas that secretes excessive amounts of insulin.

Other Factors

- **Pregnancy:** Increased red blood cell turnover and heightened glucose uptake during the first two trimesters naturally lower normal baseline A1C values.
- **Severe Malnutrition:** Chronic starvation or heavy alcohol use depletes liver glycogen stores and suppresses glucose production.
- **High-Dose Supplements:** Large doses of Vitamin C or E can artificially alter test results depending on the specific lab method used.

Are you reviewing a specific lab result for yourself, or are you experiencing symptoms like frequent shakiness, dizziness, or sweating?