

Insulin-Like Growth Factor 1 (IGF-1)

MDL Test Number: 660

Methodology: Immunoassay

CPT Codes: 84305



Specimen Collection Platform:

Serum in Serum Separator Tube (SST)

Turnaround Time:

24 - 72 hours

Stability:

Room temperature

Test Additions*:

30 days to add tests

Specimen Collection:



1. Immediately after blood collection, invert the tube(s) gently 5 times to ensure mixing of clot activator.



2. Allow the tube to rest upright for at least 30 minutes after collection to ensure proper clotting.



3. Centrifuge for at least 15 minutes at 2200-2500 RPM within one hour of collection.



4. Do not remove the stopper or pour off serum.



What is IGF-1?

Insulin-like growth factor 1 (IGF-1) is a hormone made mainly by the liver in response to growth hormone from the pituitary, a small gland at the base of the brain. Almost all of it travels through the blood attached to carrier proteins rather than free, which keeps the level steady

through the day. Growth hormone itself is released in short bursts, and a single measurement of it says very little, so IGF-1 is measured instead: one sample reflects what the pituitary has been doing over days.

IGF-1 changes with age. It rises through childhood, peaks in adolescence, and then falls steadily through adult life, so a value that is ordinary at 25 would be high at 65. Nutrition, liver function, thyroid status, and estrogen taken by mouth also move it without growth hormone having changed at all. This is why a result is read against the range for the patient's own age rather than against a single adult figure.

Why test for IGF-1?

IGF-1 is measured as a stable window onto growth hormone in adults:

- **To assess suspected growth hormone deficiency in an adult**, most often after pituitary surgery, radiation, or a pituitary tumor. A normal result is strong evidence against it.
- **After a difficult delivery with heavy blood loss**. Sheehan syndrome damages the pituitary at the time of birth, and growth hormone is usually the first of its hormones to fail.
- **To investigate suspected acromegaly**, the condition caused by excessive growth hormone in adult life. Because the physical changes accumulate gradually, recognition is characteristically delayed by several years, and IGF-1 is the practical initial measurement where growth hormone itself is unsuitable.
- **To follow acromegaly after treatment**, where the aim is to bring IGF-1 back within the range for the patient's age.
- **Alongside IGFBP-3, the carrier protein to which most IGF-1 is attached**. Because the two are made together under growth hormone control, an unexpectedly low IGF-1 with a preserved IGFBP-3 points somewhere other than the pituitary.
- **To assess nutritional status**, since IGF-1 declines when intake is inadequate, in malabsorption such as celiac disease, and after weight-loss surgery, it recovers again as nutrition improves.
- **In chronic liver disease**, where IGF-1 runs persistently low for the straightforward reason that the organ responsible for producing it is no longer functioning normally.



A MEMBER OF GENESIS BIOTECHNOLOGY GROUP™

Medical Diagnostic Laboratories
www.mdlab.com • 877.269.0090



IH0340 Rel.: 9.2026

Special Instructions:

- **Estrogen taken by mouth:** Estrogen tablets, whether a combined contraceptive or menopausal hormone therapy, lower IGF-1 because they pass through the liver before reaching the rest of the body. Estrogen given through the skin as a patch or gel does not do this. Tell the ordering provider which form is being used and when it started.
- **Other things that move the result:** Thyroid disease, liver disease, poorly controlled diabetes, and any period of poor nutrition change IGF-1 without growth hormone having changed. List current medications and any recent weight loss or illness on the request.
- **Age is part of the result:** The expected range narrows and falls decade by decade, so the number alone means little. Make sure the date of birth on the request is correct, because the result is compared against the band for that age.
- **Comparing results over time:** Different IGF-1 methods do not give the same number: the manufacturer compared this test against another commercial IGF-1 method and found it reads consistently lower, by enough to move a result into a different age band. Serial results should therefore be run by the same laboratory on the same method.

Limitations:

Every laboratory test has limits. For IGF-1, the main ones are:

- The test reports results from 15 to 1000 nanograms per milliliter, but the lowest value it can measure reliably is closer to 25. Results at the very bottom of the range should be read as low rather than as exact numbers, and small differences between two low results should not be taken as a change. This matters because low IGF-1 is a finding in growth hormone deficiency and in older adults.
- A normal IGF-1 is strong evidence against growth hormone deficiency in an adult, but a low one does not confirm it, because a low result indicates the need for further investigation rather than settling the question.
- IGF-1 reflects more than growth hormone. The liver makes it, nutrition drives it, and several hormones and medicines change it, so a low result in someone who is unwell or undernourished may say nothing about the pituitary at all.
- Heterophilic antibodies — antibodies against animal proteins that some people carry — are more common in people routinely exposed to animals or animal products, and can produce an odd result. Asfotase alfa, a manufactured form of alkaline phosphatase used to treat hypophosphatasia, interferes with tests that detect using alkaline phosphatase. The manufacturer directs that samples from patients taking it be run by a different method.
- An IGF-1 result is one piece of a larger picture. It is meant to be read together with the patient's symptoms, medical history, and other test results — never on its own.

Reference Range(s):

Results are reported in nanograms per milliliter (ng/mL). There is no single adult range. The manufacturer publishes the adult interval in thirteen five-year age bands from 19 to 90 years, because IGF-1 declines steadily with age, and it does not separate them by sex. Four of those bands are shown below as examples of the pattern; a result should be read against the band matching the patient's own age. The bands are also wide: the published interval for someone in their early fifties spans roughly fourfold. A value sitting inside the range is therefore not by itself evidence that growth hormone production is appropriate for that individual.

- **19 to 21 years:** median 207, **117 to 323 ng/mL**
- **30 to 34 years:** median 136, **71 to 234 ng/mL**
- **50 to 54 years:** median 108, **48 to 209 ng/mL**
- **70 to 79 years:** median 92, **35 to 216 ng/mL**

A result outside these ranges is not automatically a problem, and a result inside them does not rule one out. Only the ordering provider can interpret what a given number means for a given patient. Patients should always go by the reference range printed on their own laboratory report.

Analyte	Disorder	Expected Value*
IGF-1	Acromegaly	↑↑
IGF-1	Hypopituitarism (e.g. Sheehan)	↓
IGF-1	Chronic liver disease	↓
IGF-1	Type 2 diabetes	↓/V
IGF-1	Postmenopause	↓

*↓ – Decreased, ↓/V – Decreased or Variable, ↑↑ – Markedly Increased.

What are some references that discuss the medical necessity of testing IGF-1?

1. Melmed S. Pathogenesis and diagnosis of growth hormone deficiency in adults. *N Engl J Med*, **380**, 2551–2562 (2019).
2. Yuen KC, J. et al. American Association of Clinical Endocrinologists and American College of Endocrinology guidelines for management of growth hormone deficiency in adults and patients transitioning from pediatric to adult care. *Endocr Pract*, **25**, 1191–1232 (2019).
3. Giustina A, et al. Consensus on criteria for acromegaly diagnosis and remission. *Pituitary*, **27**, 7–22 (2024).
4. Karaca Z, et al. Sheehan syndrome. *Nat Rev Dis Primers*, **2**, 16092 (2016).
5. Cappola AR, et al. Hormones and aging: an Endocrine Society scientific statement. *J Clin Endocrinol Metab*, **108**, 1835–1874 (2023).
6. Vongpatanasin W, et al. Differential effects of oral versus transdermal estrogen replacement therapy on C-reactive protein in postmenopausal women. *J Am Coll Cardiol*, **41**, 1358–1363 (2003).



A MEMBER OF GENESIS BIOTECHNOLOGY GROUP™

Medical Diagnostic Laboratories
www.mdlab.com • 877.269.0090

