

Follicle-Stimulating Hormone (FSH)

MDL Test Number: 610

Methodology: Immunoassay

CPT Codes: 83001 x 1



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 Follicle-Stimulating Hormone (FSH)?

Follicle-stimulating hormone, or FSH, is a messenger hormone made by the pituitary gland — a small gland at the base of the brain that directs much of the body's hormone activity. FSH travels through the blood to the ovaries, carrying instructions from the brain. It is almost always measured alongside a second pituitary hormone called LH, because the two work as a pair and are far more informative together than either is alone.

FSH does what its name suggests: it starts the growth and ripening of follicles, the small fluid-filled sacs in the ovary that each contain a developing egg. Working alongside LH, it also drives the ovary's production of estrogen. Men make FSH as well, where it supports sperm production.

FSH levels are set by a feedback loop. When the ovaries are working well, the hormones they produce signal back to the pituitary to ease off, keeping FSH in check. When the ovaries slow down or stop responding, that signal fades, and the pituitary pushes harder — so FSH climbs. This is why FSH rises so sharply after menopause, and why a high FSH is one of the most useful signs that the ovaries themselves are the source of a problem.

Why test for Follicle-Stimulating Hormone (FSH)?

FSH is measured to check how well the pituitary gland and the ovaries are working together. Because FSH is the instruction and the ovarian hormones are the response, comparing the two tells a provider where a problem is coming from:

- **High FSH with low estrogen** usually points to the ovaries themselves. The pituitary keeps signaling harder and harder, but the ovaries cannot respond.
- **Low or normal FSH with low estrogen** usually points to the pituitary gland or the brain region above it. The signal itself is not being sent.

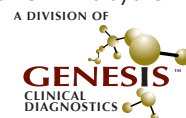
Common reasons a provider orders this test include:

- **Periods that are irregular, infrequent, or have stopped, and difficulty getting pregnant**
- **Estimating ovarian reserve**, approximately how many eggs remain available, using a sample drawn early in the cycle
- **Confirming the menopausal transition**, or ovaries that cease functioning earlier than expected, a condition called primary ovarian insufficiency
- **Evaluating polyendocrine metabolic ovarian syndrome (PMOS/PCOS)**, where FSH is usually normal or low compared with LH
- **In men, evaluating low testosterone and impaired sperm production**, and whether the cause lies in the testes or in the pituitary
- **Monitoring fertility medications** that act on this system



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Special Instructions:

- **Use the right tube:** Serum is required for this test. Lavender-top (EDTA) tubes must not be used, EDTA markedly lowers the measured result. Let the sample clot completely before spinning it, especially for patients on blood thinners, since incomplete clotting can cause errors.
- **Timing and cycle day:** Because FSH is released in bursts, a single random sample may not represent a patient's average level; note the time of the draw and the day of the menstrual cycle. To estimate ovarian reserve or establish where a patient is in her cycle, a sample drawn early in the cycle, day 2 or 3, counting the first day of the period as day 1, is preferred. FSH is most useful when interpreted together with LH and estradiol.
- **Hormonal contraceptives:** Combined birth control pills, patches, and rings quiet the pituitary signal, so FSH is usually low while a patient is using one. A result drawn during hormonal contraception cannot be used to estimate ovarian reserve or to confirm the menopausal transition. The ordering provider may want the patient off hormonal contraception before the draw.
- **Biotin supplements:** Biotin (vitamin B7) is found in many over-the-counter hair, skin, and nail supplements, and it can interfere with this test and give an incorrect result. Patients should stop taking biotin at least 72 hours (3 days) before the blood draw. It is worth asking every patient about it, since many people do not think of supplements as medication.

- **Comparing results over time:** Different laboratories and different instruments can produce somewhat different FSH numbers from the same sample. When results are being tracked over time, use the same test at the same laboratory each time so the comparison is meaningful.

Limitations:

Every laboratory test has limits. For FSH, the main ones are:

- Two samples taken from the same patient on the same day can differ noticeably and still both be normal. This is the natural burst pattern of FSH release, not a mistake by the laboratory. It does mean a single result can be hard to interpret on its own.
- Patients previously treated with fertility medications containing gonadotropins can develop antibodies directed against FSH itself. These antibodies interfere directly with the test and may compromise accurate measurement.
- A small number of patients carry natural antibodies in their blood — often people who work closely with animals or who have received certain antibody-based treatments — that can interfere with the test and produce an unexpected result.
- An FSH result is one piece of a larger picture. It is meant to be read together with LH, the patient's symptoms and medical history, and other test results — never on its own.

Reference Range(s):

FSH is measured in milli-international units per milliliter (mIU/mL). Expected levels depend on where a patient is in her menstrual cycle, and rise sharply after menopause:

Adult female, by menstrual-cycle phase:

- **Follicular phase** (first half of the cycle, before an egg is released): **2.8 – 11.3 mIU/mL**
- **Early-follicular, cycle days 2–3** (the window used for ovarian reserve): **3.0 – 14.4 mIU/mL**
- **Mid-cycle** (around the time an egg is released): **5.8 – 21 mIU/mL**
- **Luteal phase** (second half of the cycle, after an egg is released): **1.2 – 9.0 mIU/mL**
- **Postmenopausal:** **21.7 – 153 mIU/mL**

Adult male: 0.7 – 11.1 mIU/mL

Levels rise sharply after menopause, which is why the postmenopausal range sits so far above the others — a high FSH is expected at that stage, not a cause for concern on its own. 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*
FSH	PCOS / PMOS	N
FSH	Functional hypothalamic amenorrhea	↓
FSH	Perimenopause	V
FSH	Postmenopause (natural)	↑↑
FSH	Primary ovarian insufficiency (POI)	↑↑

*N – Normal Range, V – Variable, ↑↑ – Markedly Increased, ↓ – Decreased.

What are some references that discuss the medical necessity of testing Follicle-Stimulating Hormone (FSH)?

1. Teede HJ, et al. Recommendations from the 2023 International Evidence-based Guideline for the Assessment and Management of Polycystic Ovary Syndrome. *J Clin Endocrinol Metab*, **108**, 2447–2469 (2023).
2. Bulun SE, Babayev E. Physiology and pathology of the female reproductive axis. In *Williams Textbook of Endocrinology* 15th edn (eds Melmed, S. et al.) Ch. 15 (Elsevier, Philadelphia, 2025).
3. Practice Committee of the American Society for Reproductive Medicine. Testing and interpreting measures of ovarian reserve: a committee opinion. *Fertil Steril*, **114**, 1151–1157 (2020).
4. Harlow SD, et al. Executive summary of the Stages of Reproductive Aging Workshop +10: addressing the unfinished agenda of staging reproductive aging. *J Clin Endocrinol Metab*, **97**, 1159–1168 (2012).
5. Nelson LM. Clinical practice. Primary ovarian insufficiency. *N Engl J Med*, **360**, 606–614 (2009).



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