

## Luteinizing Hormone (LH)

### WHAT IS LUTEINIZING HORMONE?

Luteinizing hormone (LH) is a hormone produced in the pituitary gland in both males and females. In females, an "LH surge" (acute rise for 24-48 hours) triggers ovulation and the conversion of the residual follicle into a corpus luteum. In males, LH stimulates the production of testosterone (1).

LH levels fluctuate during each menstrual cycle in women of reproductive age. Basal levels in reproductive age women are typically less than 20 IU/L, with much higher levels observed during the "LH surge". LH levels typically remain high in menopause.

Males generally have LH levels between 0.5 and 12.1 IU/L (2). Normally children have low LH levels until they reach puberty. Children with early puberty may have LH levels in the reproductive range (3).

### PURPOSE OF AN LH TEST

LH tests are useful for the evaluation of infertility in both females and males, as LH levels can influence egg supply in females and sperm count in males. LH tests are also beneficial for the evaluation of menstrual problems (e.g., irregular menstruation), to determine if a woman has gone through menopause, and to check for response to medicines that are given to stimulate ovulation.

### ABNORMAL LH LEVELS

Relatively high LH levels are frequently detected in the females with polycystic ovary syndrome, but usually still remain within the normal reproductive range (4). Persistently high LH levels in females may be a sign of premature menopause, or Turner syndrome (3, 5). Persistently high LH levels in males can occur in Klinefelter syndrome, castration, or testicular failure (6). High LH levels in both genders may be indicative of gonadal dysgenesis or congenital adrenal hyperplasia (3).

Elevated LH levels have been associated with a reduced fertilization rate in a variety of studies (7, 8), as well as increased risk of miscarriage (9).

Diminished LH levels can lead to hypogonadism (gonadal function failure), which can cause low sperm production in males and amenorrhea (absence of menstruation) in females. Various conditions can contribute to abnormally low LH, including Pasqualini syndrome, Kallmann syndrome, hypothalamic suppression, hypopituitarism, eating disorders, and hyperprolactinemia (3).

### TEST PROCEDURE

Correct specimen collection and handling is required for optimal assay performance. Samples should be collected on the third day of your menstrual cycle (third day of menstruation) for optimum results.

This test requires a blood sample from a finger prick. All supplies for sample collection are provided in this kit. First wash and dry hands. Warm hands aid in blood collection. Clean the finger prick site with the alcohol swab and allow to air dry. Use the provided lancet to puncture the skin in one quick, continuous and deliberate stroke. Wipe away the first drop of blood (as it may be contaminated with tissue fluid or skin debris). Massage finger to increase blood flow at the puncture site and hold in a position that gravity facilitates the collection of blood on the fingertip. Transfer the blood to the blood collection card or blood collection tube (microtainer).

Avoid squeezing or 'milking' the finger excessively. If blood flow stops, perform a second skin puncture on another finger if more blood is required.

Dispose of all sharps safely and return sample to the laboratory in the provided prepaid return shipping envelope.

Upon receipt at the laboratory, the blood sample is analyzed by the fully automated Alinity i LH chemiluminescent microparticle immunoassay on the Alinity ci series analyzer. This assay measures LH levels by binding to monoclonal anti- $\beta$  LH-coated microparticles. The amount of LH in the blood sample is measured in relative light units by a chemiluminescent reaction. This assay has a precision value of <5 %CV.

### SPECIAL INSTRUCTIONS

For fertility testing in females, the samples should be collected on the third day of the menstrual cycle (third day of menstruation) for optimum results.

### TEST INTERPRETATION

This assay will provide accurate LH values for the tested specimen. This value is to be used in conjunction with other clinical and laboratory information for analyses of men's and women's health, fertility, and IVF.

### DISCLAIMERS/LIMITATIONS

Certain medications (e.g., birth control pills and seizure medications), hormone therapy, recent test using a radioactive substance (e.g., bone scan), obesity, hyperthyroidism, and liver disease may affect LH test results. In addition, LH levels fluctuate throughout each menstrual cycle in reproductive age females, so the timing of sample collection may influence the interpretation of the LH level.

These results should be interpreted in conjunction with other laboratory and clinical information.

Assay interference may occur in specimens from individuals routinely exposed to animals or to animal serum products. Additional clinical or diagnostic information may be required for these specimens.

Additional testing is recommended if LH results are inconsistent with clinical evidence.

False results may occur in specimens from individuals that have received preparations of mouse monoclonal antibodies for diagnosis or therapy. Additional clinical or diagnostic information may be required for these specimens.

Correct specimen collection and handling is required for optimal assay performance. The assay is unaffected ( $\leq 10\%$  interference) by hemoglobin (500 mg/dL), bilirubin (20 mg/dL), triglycerides (3000 mg/dL), and protein (12 g/dL).

## REFERENCES

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