GENETRACK Diagnostics

Dehydroepiandrosterone Sulfate (DHEA-S)

WHAT IS DHEA-S ?

Dehydroepiandrosterone sulfate (DHEA-S) is the most abundant adrenal androgen, and is an excellent indicator of adrenal hormone production (1).

PURPOSE OF A DHEA-S TEST

DHEA-S testing is usually conducted along with analyses of other hormone levels (e.g., testosterone and estrogen). DHEA-S testing is useful for:

- Investigating the cause of male characteristics in females
- Diagnosing polycystic ovary syndrome in females
- Evaluating adrenal gland function
- Diagnosing tumors in an adrenal gland, testicles, or ovaries
- Evaluating congenital adrenal hyperplasia and infertility

ROLES OF DHEA-S

Although DHEA-S itself only has weak hormonal activity, it can be metabolized into more active androgens (e.g. testosterone) and estrogens (e.g. estradiol). DHEA-S also has neurosteroid activity, meaning it can influence brain function (1).

REFERENCE RANGES FOR DHEA-S

Plasma levels of DHEA-S are 5-10 times higher than cortisol levels, 100-500 times higher than testosterone levels and 1,000-10,000 times higher than estradiol levels (2). Levels are higher in males and vary by age with low levels during early childhood. A marked increase begins around 6-8 years of age, with peak DHEA-S levels occurring at 20-30 years of age, followed by a gradual decrease until they can be as 80-90% lower by 80 years of age (3).

	Female (µg/dL)	Male (µg/dL)
18 – 30 years	45 – 380	125 – 619
31 – 50 years	12 – 379	5 – 532
51 – 60 years	30 – 260	20 – 413
61 – 83 years	30 – 260	10 – 285

*Reference ranges are from Rifai N, Horvath AR, & Wittwer C. (2018). Tietz textbook of clinical chemistry and molecular diagnostics (Sixth edition.). St. Louis, Missouri: Elsevier.

ELEVATED DHEA-S

Elevated DHEA-S can occur due to tumours of the adrenal gland, (both benign and malignant), enlargement of the adrenal gland (adrenal hyperplasia), or due to polycystic ovary syndrome in females. The symptoms associated with elevated DHEA-S can include early puberty in young boys, and an absence of menstruation, development of masculine features, acne, and excess hair in females (4). Often high DHEA-S does not cause any noticeable symptoms in adult men.

REDUCED DHEA-S

DHEA-S levels naturally decrease with age, but abnormally low DHEA-S levels can also be due to adrenal dysfunction, such as occurs in Addison disease, when the body's own immune system damages the adrenal glands. Reduced DHEA-S is associated with decreased muscle size, decreased libido, chronic fatigue, and rapid aging. It is also increases the risk of diabetes, osteoporosis, and dementia (5).

TEST PROCEDURE

Correct specimen collection and handling is required for optimal assay performance.

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 DHEA-S chemiluminescent microparticle immunoassay on the Alinity ci series analyzer.

This assay measures DHEA-S levels by binding to anti-DHEA-S coated microparticles. The amount of DHEA-S in the blood sample is measured in relative light units by a chemiluminescent reaction.

TEST INTERPRETATION

This assay will provide accurate DHEA-S values for the tested specimen. This value is to be used in conjunction with other clinical and laboratory information for analyses of men's health.

DISCLAIMERS/LIMITATIONS

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

Certain medications and supplements (e.g., antidepressants, corticosteroids, and DHEA supplements), a recent test using a radioactive substance (e.g., bone scan), and recent intense exercise may affect DHEA-S test results.

Additional testing is recommended if DHEA-S 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.

Heterophilic antibodies present in the tested blood sample may interfere with this DHEA-S assay.

Elevated DHEA-S levels may occur in individuals with adrenal tumours or congenital adrenal hyperplasia.

Rheumatoid factor present in the blood sample may interfere with this assay.

Correct specimen collection and handling is required for optimal assay performance. The assay is unaffected (≤10% interference) by hemoglobin (500 mg/dL), bilirubin (20 mg/dL), triglycerides (5000 mg/dL), and protein (12 g/dL).

REFERENCES

(1) Prough RA, Clark BJ, Klinge CM. (2016). Novel mechanisms for DHEA action. *J Mol Endocrinol. 56* (3), R139-55.

(2) Walter KHK. (2008). Plasma DHEA-S levels in adult men and women are 100-500 times higher than those of testosterone and 1000-10000 times higher than those of estradiol. *Cutaneous Manifestations of Endocrine Diseases*. Springer Science & Business Media.

(3) Harris PE, Bouloux P-MG. (2014). *Endocrinology in Clinical Practice, 2nd Ed.* CRC Press.

(4) Hoffman DI, Klove K, Lobo RA. (1984) The prevalence and significance of elevated dehydroepiandrosterone sulfate levels in anovulatory women. *Fertil Steril.* 42 (1), 76-81.

(5) Hillen T, et al. (2000). DHEA-S plasma levels and incidence of Alzheimer's disease. *Biologic Psychiat.* 47 (2), 161-176.