



TEST: TESTOSTERONE, TOTAL WITH FREE ANDROGEN INDEX

PRINCIPLE:

Free Androgen Index (FAI) or the Free Testosterone Index (FTI) is an indirect method used to determine androgen status. FAI is used to assess circulating physiologically active testosterone which includes “unbound free testosterone” and albumin-bound “bioavailable” testosterone. Testosterone that is bound to Sex Hormone Binding Globulin (SHBG), >50% of circulating testosterone, is not bio-active due to the high binding affinity of SHBG. Therefore, higher amounts of circulating SHBG reduce the levels of bio-active testosterone. Calculating the FAI requires the measurement of total testosterone and SHBG concentrations. The FAI is calculated using the equation: $(\text{Testosterone, Total ng/mL} * 3.47) / \text{SHBG nmol/L}$. See laboratory information sheets for *Testosterone, Total* and *SHBG* regarding specific information for these analytes.

The FAI is generally considered useful in estimating free testosterone in women with hirsutism or hyperandrogenism. FAI may correlate better with clinical symptoms in comparison to total testosterone alone.

SPECIMEN REQUIREMENTS:

2ml collected in a serum separator tube (gel barrier). Separate serum from cells ASAP or within 2 hours of collection by centrifugation. Stability after separation from cells: Ambient: 48 Hours; Refrigerated: 1 week; Frozen: 1 year (avoid repeated freeze/thaw cycles).

REJECTION CRITERIA: Plasma or other body fluids. Gross hemolysis

METHOD: Enhanced Chemiluminescence

REFERENCES:

1. Himoto et al. Clinical efficacy of free androgen index, a surrogate hallmark of circulating free testosterone level, in male patients with HCV-related chronic liver disease. *J Clin Biochem Nutr*. 2018 Nov;63(3):238-245.
2. Wilke et al. Total testosterone, free-androgen index, calculated free testosterone, and free testosterone by analog RIA compared in hirsute women and in otherwise-normal women with altered binding of sex-hormone-binding globulin. *Clin Chem*. 1987 Aug;33(8):1372-5.
3. Miller et al. Measurement of Free Testosterone in Normal Women and Women with Androgen Deficiency: Comparison of Methods. *J Clin Endocrinol Metab*. 2004 Feb;89(2):525-33.

Note: This test includes reported measurements for Testosterone, total and SHBG.

Normal Range:

Normal Males (age 20 - 50): 24.3 - 110.2 % nmol/L

Normal Females (age 20 - 46): 0.65 - 10.93 % nmol/L

Post-menopausal Females (age 47-91): 0.23 - 6.80 % nmol/L

Turnaround Time: 3 business days