

1. Why is LabCorp changing the testosterone reference interval?

A: LabCorp is changing to the recently standardized reference interval for adult males based upon testosterone assays standardized to the CDC reference method. This change was driven by the consensus effort for accurate testosterone testing, which was endorsed by a group of professional associations, government agencies, and commercial entities in 2010.¹

One of the objectives outlined within the consensus statement was to establish standardized testosterone reference intervals by age and gender:¹ Travison et al.² published a population-based study at the beginning of 2017 which:

- Evaluated more than 9,000 adult male patients from different geographic regions of the United States and Europe
- Included 1,185 adult males younger than 40 years of age, with a BMI less than 30
- Utilized testosterone assays harmonized to the CDC reference method
- Standardized testosterone reference interval for nonobese adult males (19-39 years of age, BMI <30) was calculated as 264 – 916 ng/dL

2. Why is LabCorp's reference interval changing to a lower numeric range?

A: LabCorp's previous reference interval was adopted from a 2011 study that included a population of lean healthy males and utilized a testosterone LC/MS-MS assay prior to the introduction of the CDC standardization protocol. The previous reference interval was based on the Framingham Heart Study population analyzed by Bhasin et al.,³ and was the only comprehensive total testosterone reference interval study available at that point in time. LabCorp adopted this reference interval for testosterone result interpretation and reporting.

In early 2017, Travison, et al. demonstrated that obesity is directly associated with lower testosterone levels in male patients, and the new standardized reference interval established included adult males between 19 and 39 years old with a BMI less than 30.² The lower numeric range in the new standardized reference interval reflects a difference in average subjects with higher BMIs as well as harmonization to the CDC reference method.

3. What are the benefits of using LabCorp's testosterone assays?

A: LabCorp offers a comprehensive menu of testosterone methods to meet the testing needs for various patient conditions. In addition to a next-generation direct immunoassay from Roche (ECLIA), LabCorp also offers a highly sensitive and specific high-pressure liquid chromatography and tandem mass spectrometry (LC/MS-MS) method recommended for use in females, children, and hypogonadal males. The LC/MS-MS method is currently certified by the CDC Hormone Standardization Program (HoSt), and has maintained continuous certification since certificates were first issued in 2011.

4. What is the change to LabCorp's testosterone reference interval, and when will this change occur?

A: Effective July 17, 2017, LabCorp will change from the current adult male testosterone reference interval to the new standardized adult male reference interval. The new reference intervals will apply to all total testosterone assays performed by LC/MS-MS and ECLIA, as well as profiles that contain these tests. The ECLIA assay is sufficiently sensitive and accurate for use as an aid in screening for androgen dysfunction in adult males; in addition, the LC/MS-MS assay can aid in the diagnosis of androgen dysfunction in females and children as well as for monitoring male patients diagnosed with hypogonadism.⁴ Therefore, the standardized adult male reference interval is relevant for both testosterone assays.

Previous LabCorp Reference Interval

Adult Male >18 years:
348 – 1197 ng/dL

Comment: Adult male reference interval is based on a population of lean males up to 40 years old.

New LabCorp Reference Interval (effective July 17, 2017)

Adult Male >18 years:
264 – 916 ng/dL

Comment: Adult male reference interval is based on a population of healthy nonobese males (BMI <30) between 19 and 39 years old.

5. Is LabCorp's testosterone method changing?

A: LabCorp's current methodologies for testosterone will remain the same. Current reference intervals for females and children will remain the same. The only change is for the adult male reference interval.

6. When should patients be drawn for testosterone testing?

A: It is suggested that the initial diagnostic test is a total testosterone level collected between 8:00AM and noon,⁶ measured using a reliable assay.⁵ In addition, the Endocrine Society recommends confirmation of a testosterone deficiency in men by repeating measurement of total testosterone after an interval of at least one week.⁶

7. What additional testing may be available for adult male patients that may require further evaluation?

A: In some men with testosterone concentrations near the lower limit of the normal range and where alterations of SHBG are suspected, the Endocrine Society suggests measurement of free or bioavailable testosterone level using an accurate and reliable assay.⁵ In addition, the Endocrine Society recommends measurement of serum LH and FSH levels to distinguish between primary (testicular) and secondary (pituitary-hypothalamic) hypogonadism. For men with secondary hypogonadism, further evaluation may be suggested to identify the etiology of the dysfunction. This evaluation may include measurements of serum prolactin, iron saturation, and pituitary function testing. In men with primary testicular failure of unknown etiology, karyotype testing may be suggested.⁵

8. Whom should a physician contact to request a technical consultation regarding patient results?

A: Please contact your LabCorp sales representative or LabCorp customer service to request additional information. In addition, LabCorp's Endocrine Hotline (877-436-3056) is available to request a technical consultation.

References

1. Rosner W, Vesper H; Endocrine Society, et al. Toward excellence in testosterone testing: A consensus statement. *J Clin Endocrinol Metab.* 2010 Oct; 95(10):4542-4548. PubMed 20926540
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3. Bhasin S, Bencina M, Jasuja GK, et al. Reference ranges for testosterone in men generated using liquid chromatography tandem mass spectrometry in a community-based sample of healthy nonobese young men in the Framingham Heart Study and applied to three geographically distinct cohorts. *J Clin Endocrinol Metab.* 2011 Aug; 96(8):2430-2439. PubMed 21697255
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5. Bhasin S, Cunningham GR, Hayes FJ, et al. Testosterone therapy in men with androgen deficiency syndromes: An endocrine society clinical practice guideline. *J Clin Endocrinol Metab.* 2010 Jun; 95(6):2536-2559. PubMed 20525905
6. Dean JD, McMahon CG, Guay AT, et al. The International Society for Sexual Medicine's process of care for the assessment and management of testosterone deficiency in adult men. *J Sex Med.* 2015 Aug; 12(8):1660-1686. PubMed 260816806



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