

# DIAGNOSING TESTOSTERONE DEFICIENCY

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FREE T, SHBG, AND WHAT THE GUIDELINES ACTUALLY SAY.

## A NORMAL NUMBER CAN STILL MEAN DEFICIENT.

For anyone confused by a testosterone lab result, or wondering why different doctors seem to use different rules for the same diagnosis.



TESTOSTERONE INTELLIGENCE · THE PAPERS  
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TESTOSTERONE INTELLIGENCE · THE PAPERS

# DIAGNOSING TESTOSTERONE DEFICIENCY

Free T, SHBG, and What the Guidelines Actually Say

Before any conversation about whether testosterone therapy is safe, there is a logically prior question: how do you actually know a man has testosterone deficiency in the first place? The measurement is messier than a single blood draw suggests, and the major medical societies do not fully agree on the answer.

**There is no T concentration threshold that reliably distinguishes those who will respond to treatment from those who will not.**

2016 INTERNATIONAL EXPERT CONSENSUS RESOLUTIONS, PRAGUE

## PART ONE

### NINE POINTS OF INTERNATIONAL AGREEMENT

In 2015, an international consensus conference in Prague brought together urologists, endocrinologists, diabetologists, and researchers, with a nonvoting observer from the European Medicines Agency. Their nine unanimous resolutions include: testosterone deficiency is a well-established, clinically significant condition affecting sexuality, reproduction, general health, and quality of life; there is no single testosterone threshold that reliably predicts who will respond to treatment; there is no scientific basis for any age-specific recommendation against therapy; and the evidence does not support increased cardiovascular or prostate cancer risk with treatment, both stated years before TRAVERSE and the modern prostate data would formally confirm them.

## PART TWO

### WHY A NORMAL TOTAL TESTOSTERONE CAN STILL MEAN DEFICIENCY

Most circulating testosterone is bound, tightly to sex hormone binding globulin (SHBG) or loosely to albumin, with only about 2 to 5 percent circulating free and biologically active. Most guidelines default to total testosterone as the first test, checking free testosterone only for borderline cases.

A study of 3,334 community-dwelling men found a specific group with normal total testosterone but low free testosterone, who were older, in poorer health, and reported more symptoms than men with both values normal, despite a standard test looking unremarkable. Their conclusion: free testosterone should be checked more broadly than current practice allows, because total testosterone alone can genuinely miss real deficiency.

Compounding this, SHBG itself varies enormously. A study of 1,000 men at a single practice found a nearly 20-fold range, 6 to 109 nmol/L, with mean SHBG significantly higher in men over 55 than younger men. Two men with identical total testosterone can have meaningfully different free testosterone depending entirely on

their SHBG.

#### How Free Testosterone Gets Measured, and Why It Matters Which Method

- Equilibrium dialysis is the gold standard but costly, manual, and available at only a few reference labs
- Calculated free testosterone and radioimmunoassay both correlate strongly with the gold standard, but calculated free T consistently overestimates it, and the raw numbers between methods are not interchangeable, each needs its own reference range

### PART THREE

## TIMING, AND WHY MORNING TESTING MATTERS MOST NEAR THE THRESHOLD

Healthy young men show a clear diurnal rhythm, testosterone highest in the morning, which is why guidelines require morning blood draws. But a 24-hour study of young men with confirmed deficiency found something notable: the normal group showed a 15 percent morning-to-afternoon decline, while the deficient group showed almost none, a nonsignificant 4 percent. Once deficiency is established, the normal daily rhythm essentially disappears, meaning strict morning-only testing matters most for confirming a borderline diagnosis, not for men already clearly deficient.

### PART FOUR

## WHAT THE GUIDELINES AGREE ON, AND WHERE THEY DIVERGE

The Endocrine Society, the American Urological Association, the European Association of Urology, and the Lisbon International Consultation for Sexual Medicine all agree diagnosis requires both symptoms and confirmed low testosterone, not lab values alone. But they diverge on specifics.

The Lisbon 2018 recommendations are notably more permissive: symptomatic men under 350 ng/dL total or 65 to 100 pg/mL free testosterone may reasonably start a trial of therapy, and an empirical 6-month trial may even be considered above those thresholds in strongly symptomatic men. A separate survey of international experts, conducted outside the formal guideline process, found all but one would consider a therapy trial in a symptomatic man whose total testosterone fell within the normal range, a more flexible real-world stance than guideline text alone suggests.

A related distinction matters increasingly in practice: classical hypogonadism, with a clear anatomical or hormonal cause, versus functional hypogonadism, low testosterone without a discrete structural cause, often tied to obesity or metabolic disease. A 9-year registry of 650 patients found testosterone therapy improved weight and waist circumference in both groups, with functional hypogonadism responding at least as robustly despite lacking the traditionally required anatomical cause.

### PART FIVE

# THE OTHER SIDE: HAS PRESCRIBING GOTTEN AHEAD OF THE EVIDENCE?

Not every voice in this field agrees that diagnostic flexibility is the right direction. A pointed 2013 critique described testosterone prescribing as irrational exuberance, citing a 10-fold increase in US prescriptions and 40-fold increase in Canada over recent decades, a roughly two billion dollar annual market, a 100-fold increase over three decades, growth its author argues is inexplicable given the absence of any proven new indication or well-controlled trial that would justify it.

## A Genuine, Published Tension

- The critique targets testosterone marketed as a general tonic for fatigue or aging rather than treatment for confirmed deficiency, and notes most unjustified prescribing occurs through physicians not subject to third-party formulary scrutiny
- This is not an argument that therapy is unsafe when properly indicated. It is an argument that diagnostic looseness and commercial pressure risk expanding use beyond what the evidence actually supports, worth weighing honestly alongside the consensus resolutions above

This resource is an educational overview of the diagnostic literature and major clinical guidelines on testosterone deficiency, with balancing caveats. Guidelines genuinely differ on specific thresholds. It does not replace an individualized evaluation. Always consult your provider about testing and diagnosis before starting, adjusting, or stopping any hormone therapy.