Casual Friday Series

When Testosterone Tanks

A Biogenetix Clinical Presentation

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Disclaimer

- *Information in this presentation is not intended, in itself, to diagnose, treat, reverse, cure, or prevent any disease. While this presentation is based on medical literature, findings, and text, The following statements have not been evaluated by the FDA.*
- *The information provided in this presentation is for your consideration only as a practicing health care provider. Ultimately you are responsible for exercising professional judgment in the care of your own patients.*

Low T: What your patients will read…

In adult males, hypogonadism can alter certain masculine physical characteristics and impair normal reproductive function. Early signs and symptoms might include:

- Decreased sex drive
- Decreased energy
- Depression

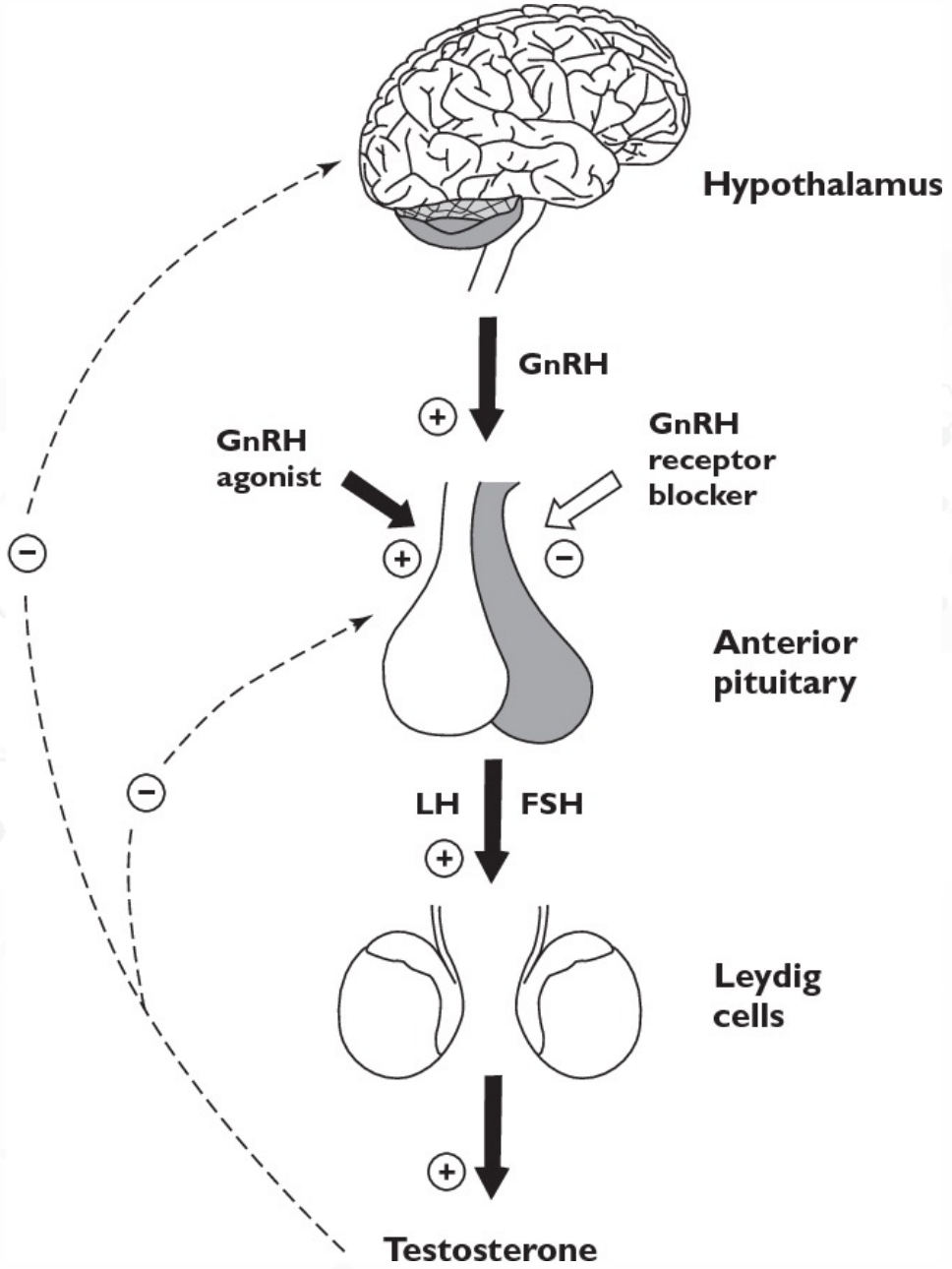
Over time, men with hypogonadism can develop:

- Erectile dysfunction
- Infertility
- Decrease in hair growth on the face and body
- Decrease in muscle mass
- Development of breast tissue (gynecomastia)
- Loss of bone mass (osteoporosis)

Severe hypogonadism can also cause mental and emotional changes. As testosterone decreases, some men have symptoms similar to those of menopause in women. These can include:

- Difficulty concentrating
- Hot flashes

https://www.mayoclinic.org/diseases-conditions/male-hypogonadism/symptoms-causes/syc-20354881



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Low T: What your patients will read…cont’d

Male hypogonadism means the testicles don't produce enough of the male sex hormone testosterone. There are two basic types of hypogonadism:

•**Primary.** This type of hypogonadism — also known as primary testicular failure — originates from a problem in the testicles.

•**Secondary.** This type of hypogonadism indicates a problem in the hypothalamus or the pituitary gland — parts of the brain that signal the testicles to produce testosterone. The hypothalamus produces gonadotropin-releasing hormone, which signals the pituitary gland to make follicle-stimulating hormone (FSH) and luteinizing hormone (LH). Luteinizing hormone then signals the testes to produce testosterone.

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Minerva Endocrinol. Author manuscript; available in PMC 2013 Jan 17.
PMCID: PMC3547681
Published in final edited form as:
NIHMSID: NIHMS403039
Minerva Endocrinol. 2010 Jun; 35(2): 109–125.
PMID: 20595939

Glucocorticoids, Stress, and Fertility

Shannon Whirledge and John A. Cidlowski*

Modifications of the hypothalamo-pituitary-adrenal axis and associated changes in circulating levels of glucocorticoids form a key component of the response of an organism to stressful challenges. Increased levels of glucocorticoids promote gluconeogenesis, mobilization of amino acids, and stimulation of fat breakdown to maintain circulating levels of glucose necessary to mount a stress response. In addition to profound changes in the physiology and function of multiple tissues, stress and elevated glucocorticoids can also inhibit reproduction, a logical effect for the survival of self. Precise levels of glucocorticoids are required for proper gonadal function; where the balance is disrupted, so is fertility. Glucocorticoids affect gonadal function at multiple levels in hypothalamo-pituitary-gonadal axis: 1) the hypothalamus (to decrease the synthesis and release of GnRH); 2) the pituitary gland (to inhibit the synthesis and release of LH and FSH); 3) the testis/ovary (to modulate steroidogenesis and/or gametogenesis directly). Furthermore, maternal exposure to prenatal stress or exogenous glucocorticoids can lead to permanent modification of hypothalamo-pituitary-adrenal function and stress-related behaviors in offspring. Glucocorticoids are vital to many aspects of normal brain development, but fetal exposure to superabundant glucocorticoids can result in life-long effects on neuroendocrine function. This review

PLoS One. 2016; 11(9): e0162480.
Published online 2016 Sep 21. doi: 10.1371/journal.pone.0162480
PMCID: PMC5031462
PMID: 27655114

Treatment of Men for "Low Testosterone": A Systematic Review

Samantha Huo,[1] Anthony R. Scialli,[2,3] Sean McGarvey,[2] Elizabeth Hill,[2] Buğra Tügertimur,[4] Alycia Hogenmiller,[2] Alessandra I. Hirsch,[5] and Adriane Fugh-Berman[2,*]

Testosterone products are recommended by some prescribers in response to a diagnosis or presumption of "low testosterone" (low-T) for cardiovascular health, sexual function, muscle weakness or wasting, mood and behavior, and cognition. We performed a systematic review of 156 eligible randomized controlled trials in which testosterone was compared to placebo for one or more of these conditions. We included studies in bibliographic databases between January 1, 1950 and April 9, 2016, and excluded studies involving bodybuilding, contraceptive effectiveness, or treatment of any condition in women or children. Studies with multiple relevant endpoints were included in all relevant tables. Testosterone supplementation did not show consistent benefit for cardiovascular risk, sexual function, mood and behavior, or cognition. Studies that examined clinical cardiovascular endpoints have not favored testosterone therapy over placebo. Testosterone is ineffective in treating erectile dysfunction and controlled trials did not show a consistent effect on libido. Testosterone supplementation consistently increased muscle strength but did not have beneficial effects on physical function. Most studies on mood-related endpoints found no beneficial effect of testosterone treatment on personality, psychological well-being, or mood. The prescription of testosterone supplementation for low-T for cardiovascular health, sexual function, physical function, mood, or cognitive function is without support from randomized clinical trials.

Arch Pharm Res. 2008 Jan;31(1):83-7. doi: 10.1007/s12272-008-1124-7.

trans-Resveratrol relaxes the corpus cavernosum ex vivo and enhances testosterone levels and sperm quality in vivo

We examined the effects of trans-resveratrol on male reproductive functions; ex-vivo penile erection and in-vivo sperm counts and quality. For the ex-vivo study, the relaxation effects of resveratrol on isolated New Zealand white rabbit corpus cavernosum, precontracted by phenylephrine (5x10(-5) M) were measured. The in-vivo study measured reproductive organ weights, blood testosterone levels, testicular histopathology, sperm counts, as well as the epididymal sperm motility and deformity of male ICR mice given an oral dose of resveratrol (50 mg/kg) for 28 days. Resveratrol elicited a concentration-dependent relaxing effect on corpus cavernosum, leading to a median effective concentration (EC50) of 0.29 mg/mL. Repeated treatment with resveratrol (50 mg/kg) did not cause an increase in body weight, reproductive organ weight or testicular microscopic findings; however, resveratrol did elicit an increase in blood testosterone concentration, testicular sperm counts and epididymal sperm motility by 51.6%, 15.8% and 23.3%, respectively, without influence on sperm deformity. In conclusion, we propose that resveratrol has a positive effect on male reproductive function by triggering a penile erection, as well as enhancing blood testosterone levels, testicular sperm counts, and epididymal sperm motility.

Turk J Urol. 2020 Nov; 46(6): 442–448.
Published online 2020 Aug 20. doi: 10.5152/tud.2020.20296
PMCID: PMC7608537
PMID: 32833620

Do antioxidants improve serum sex hormones and total motile sperm count in idiopathic infertile men?

Barış Saylam[1] and Selahittin Çayan[2]

Of the 100 infertile men, 50 received oral antioxidant supplements once a day for 6 months and were considered as the treatment group, and 50 received no treatment and were considered as the control group. The antioxidant supplement (Promenk ACT, Neupharma, İzmit-Kocaeli, Turkey; produced in La Rioja, Spain) content included L-carnitine (1 g), L-arginine (0.3 g), vitamin E (100 mg), vitamin C (250 mg), coenzyme Q (100 mg), glutathione (75 mg), beta-carotene (2.5 mg), magnesium (60 mg), vitamin B12 (10 g), zinc (7.5 mg), vitamin A (500 µg, vitamin B6 (5 mg), vitamin D3 (5 u µg), folic acid (400 ugg µg), and selenium (400 ugg µg). The data of the patients were analyzed prospectively. There was no industry sponsorship and financial conflict of interest.

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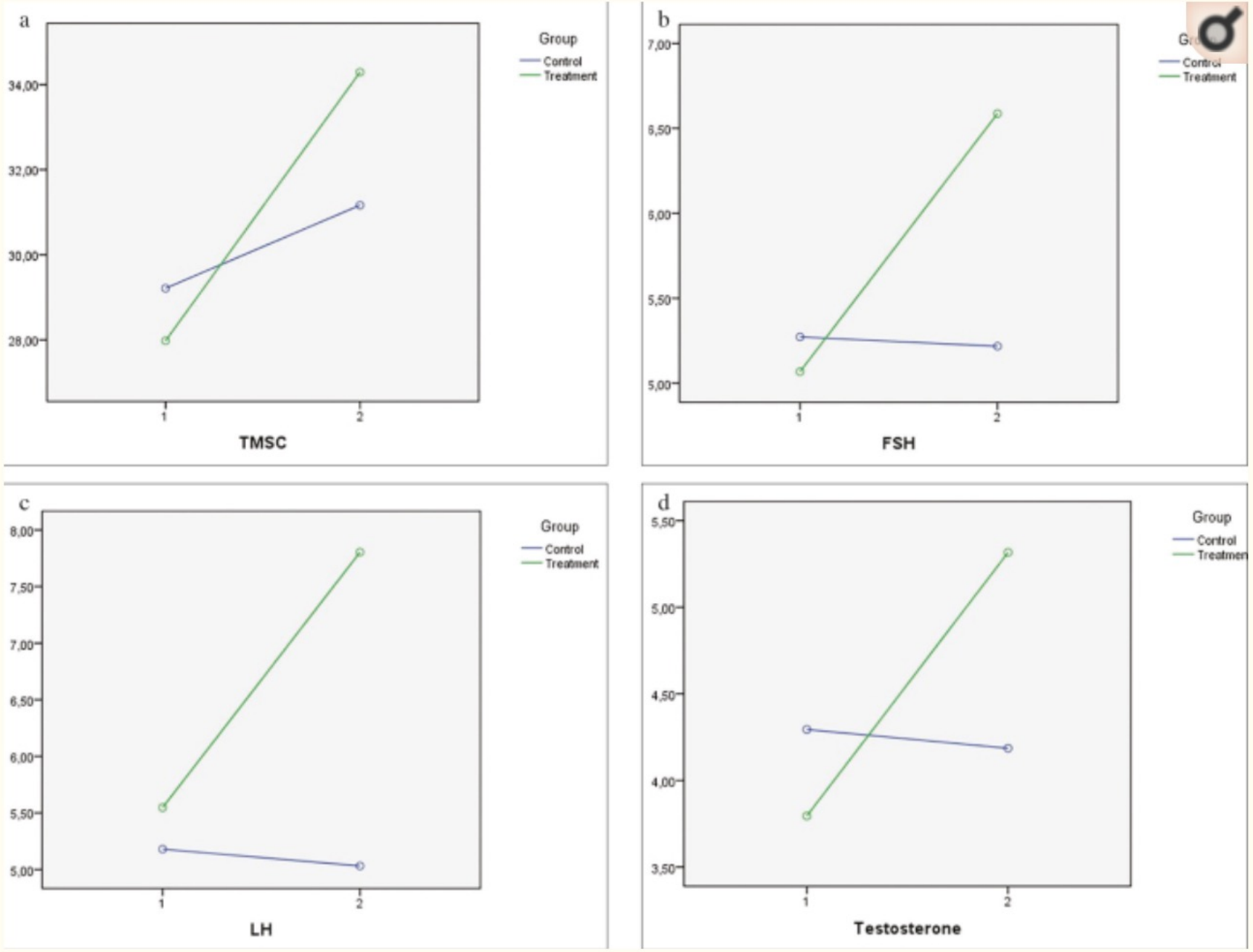
In our study, FSH, LH, and total testosterone levels significantly increased in the treatment group. It can be concluded that antioxidant use improves the serum sex hormone levels and increases an individual's fertility chances. Increase in the spontaneous pregnancy rates along with improvement in sperm concentration and motility was reported by the studies evaluating the effect of oral use of antioxidants on male infertility.[11] The limitations of this study are that there was no placebo group and sperm DNA damage could not be examined. Randomized placebo-controlled trials are needed to determine the improved effect of antioxidant treatment on male reproductive hormones and the effectiveness of antioxidant support in the treatment of idiopathic male infertility. Another limitation of the study is that the molecules in the antioxidant supplement can affect the hormones in another way or directly, apart from the antioxidant effects. For example, vitamin D acts as a steroid hormone with a progesterone effect.[31] Vitamin A metabolite affects thehypothalamic–pituitary–adrenal axis through the retinoid[32], zinc mediates the effect of androgens[33], and L-arginine affects hormones through NO.[34]


a
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LH
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d
5,50
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4,50
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1
2
Testosterone
Group
Control

73 yo male

Key (how to read the results):

Sex Hormones

Estradiol(E2)

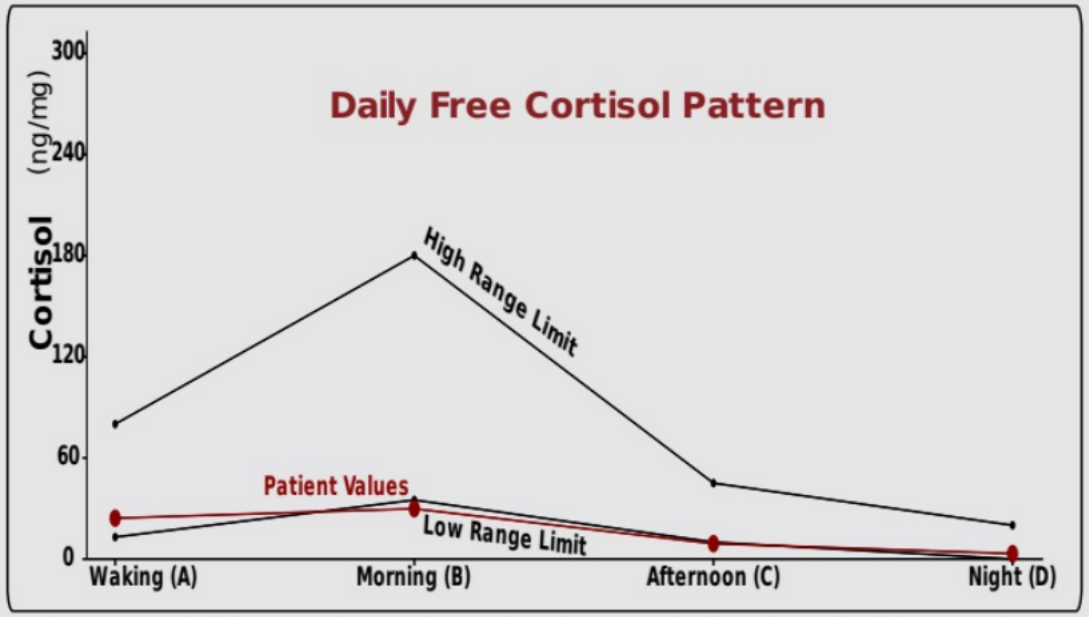
Testosterone

Testosterone

Age	Range
18-25	50-115
26-40	40-95
41-60	30-80
>60	25-60

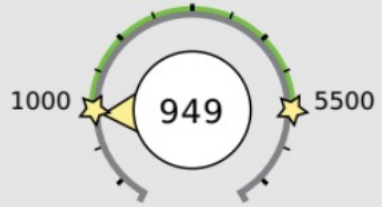
Adrenal Hormones

See pages 4 and 5 for a more complete breakdown of adrenal hormones



Total DHEA Production

Age	Range
20-39	3000-5500
40-60	2000-4000
>60	1000-2500



Total DHEA Production
(DHEAS + Etiocholanolone + Androsterone)

24hr Free Cortisol
(A+B+C+D)

cortisol metabolism →

Metabolized Cortisol (THF+THE)
(Total Cortisol Production)

Free cortisol best reflects tissue levels. Metabolized cortisol best reflects total cortisol production.

21 yo male

Key (how to read the results):

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Estradiol(E2)

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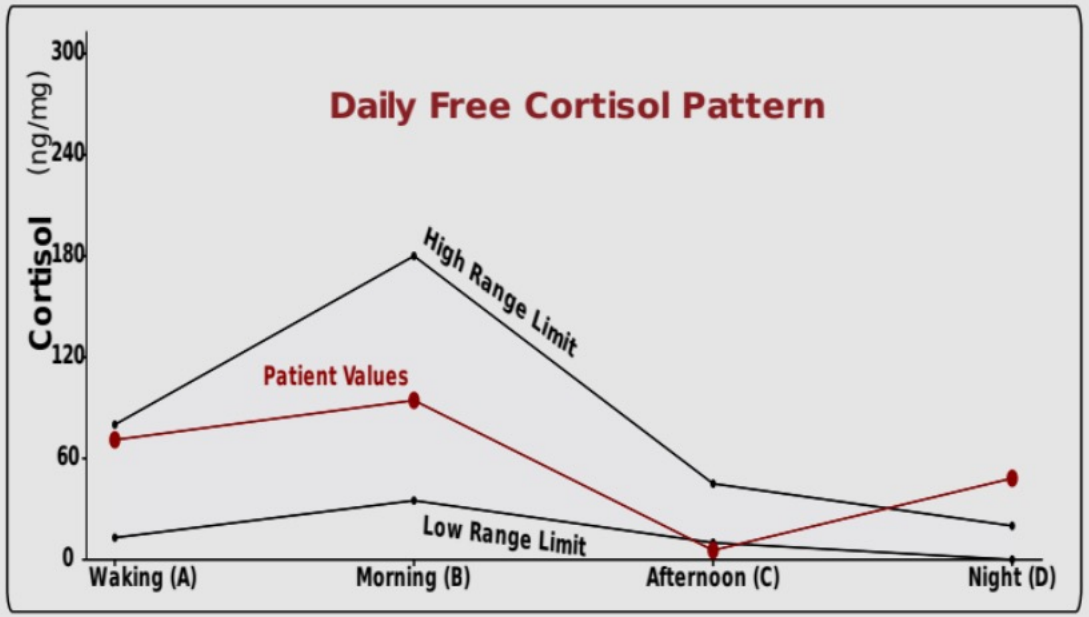

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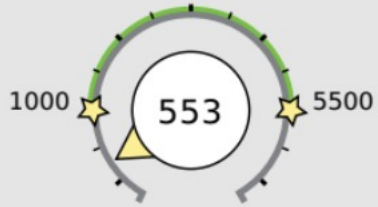
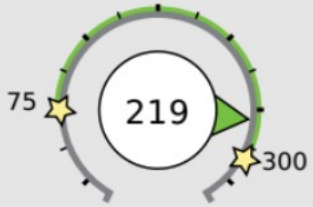
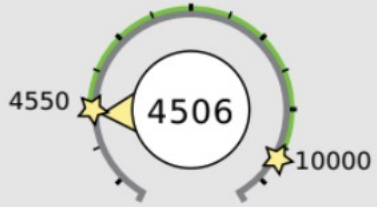


Total DHEA Production
(DHEAS + Etiocholanolone + Androsterone)



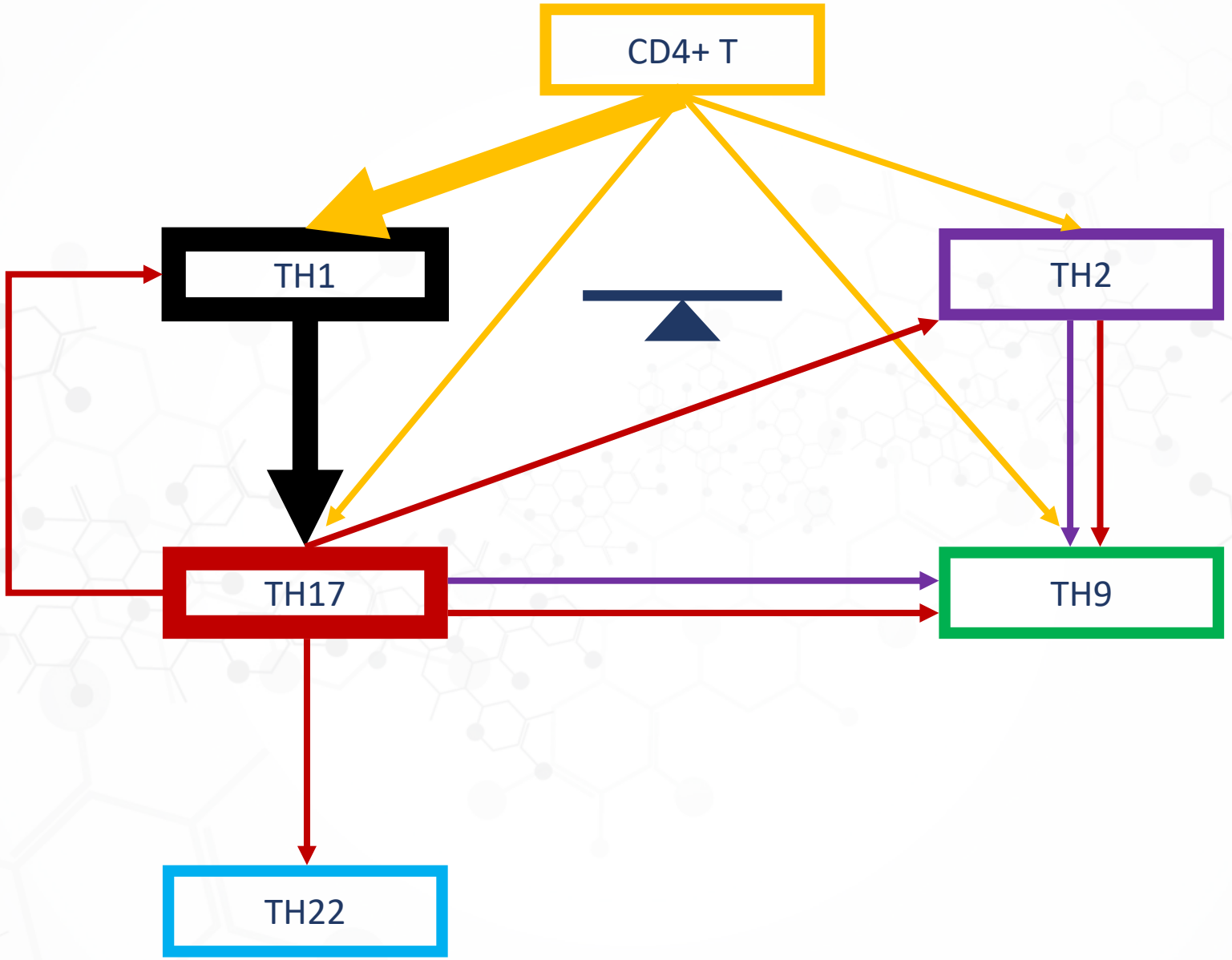
24hr Free Cortisol
(A+B+C+D)

cortisol metabolism



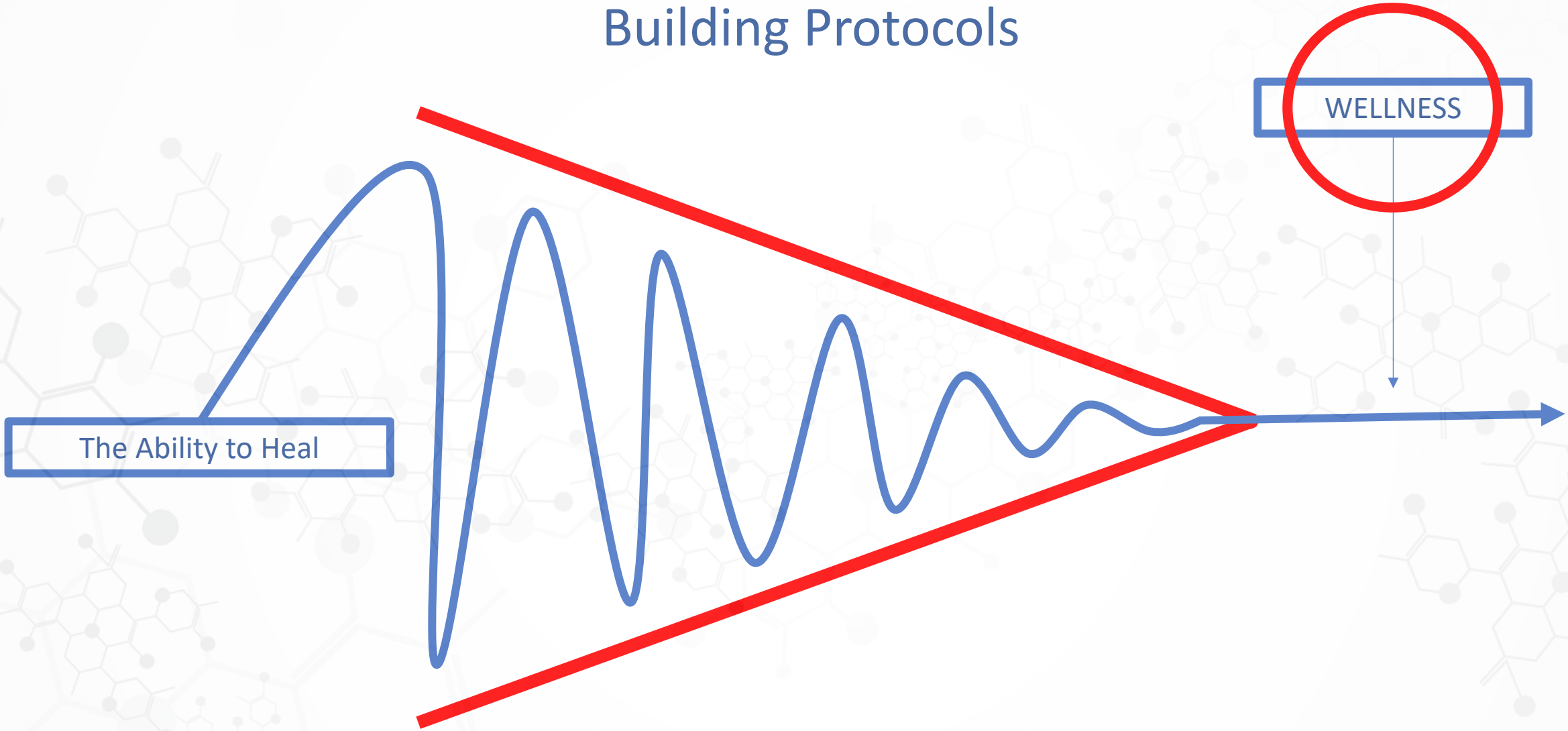
Metabolized Cortisol (THF+THE)
(Total Cortisol Production)

Free cortisol best reflects tissue levels. Metabolized cortisol best reflects total cortisol production.


CD4+ T
TH1
TH2
TH17
TH9
TH22
(Dermatologic)

Biogenetix Antioxidant Support

Building Protocols



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