



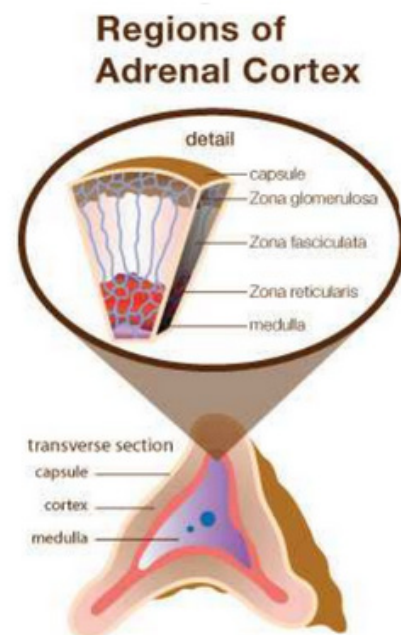
DHEA/CORTISOL RATIO: IS IT A USEFUL CLINICAL NUMBER?

An extensive literature search revealed that there are some foundational issues with the DHEA/ Cortisol ratio that may prevent its utility as a clinically relevant gauge. As a lab we have decided not to calculate this ratio, and what follows is our reasoning.

First, there is no standardization of how this ratio is reported. Clinical researchers and diagnostic laboratories calculate the ratio in multiple ways. Some use DHEA-s, the sulfated form, and others use DHEA, the unbound active form of the hormone. One lab might use single time-point samples and others will report the sum of 4 cortisol readings compared to the average of 2 or 4 samples of DHEA. Laboratories rarely stratify reference ranges by age even though production of these hormones changes depending on a person's age. Providers that use the DHEA/Cortisol ratio in their practice should ideally utilize a molar ratio of single point morning samples (when production of both hormones is the highest). However, note that DHEA is produced not only in the adrenal glands but also in the ovaries, testes and brain, so comparing DHEA and cortisol values does not necessarily give you a clear picture of the health of the adrenal glands.

Second, to explore the question from a physiologic view point we need to look at the structure of the adrenal gland. The two main adrenal hormones, cortisol and DHEA, are secreted from separate compartments in the adrenal cortex. This becomes especially relevant when analyzing adrenal function profile results (four-timed cortisols and a pooled sample of DHEA). Cortisol is produced in the zona fasciculata whereas DHEA is produced in the zona reticularis. Here's the important point: these two compartments do not have a feedback loop between them. All communication to these zones is through the brain (HPA axis) via ACTH. This means that the hypothalamic pituitary axis does all the regulation of these hormone levels. In evolving the zones as separate, "non-communicating" compartments, the body has evolved a natural "safety net" for production of the two hormones. This is important to remember especially when you discover that both the cortisol and the DHEA are low or suboptimal. It is imperative to support both zones or supplement with both hormones. Contrary to popular belief, boosting one of these hormones will not support nor boost the other.

The issue of this ratio's relevance admittedly is debatable. Guilliams writes that DHEA supplementation can cause the cortisol level to drop. However, DHEA is not a standard treatment recommendation to address cortisol spikes. DHEA does buffer the effects of cortisol on the cells, and the DHEA/Cortisol ratio, simply put, can represent the balance between anabolic and catabolic



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activity. The burden of cortisol on the tissues is a function of the availability of free cortisol and free DHEA in opposition.

Conclusion: Although these two hormones influence one another's effects on cells, they are not directly interdependent. Ratios are meaningful only when the two variables influence, alter, or depend upon one another. Since the compartments that manufacture these hormones are separate and regulated as such, a ratio of the two has no therapeutic bearing. In other words, the DHEA/Cortisol ratio does not provide additional information beyond the individual levels of these separate hormones.

References

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