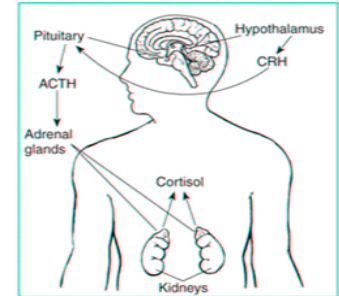


# Adrenal Fatigue

## Patient Information

### Adrenal Glands and Hormones

The adrenal glands are located on top of each kidney. The inner part of the gland, called the medulla, secretes hormones such as epinephrine. The outer part of the adrenal gland, called the cortex, secretes glucocorticoids (cortisol), mineralocorticoids (aldosterone), and androgens (such as testosterone). Signaling from the hypothalamus to the pituitary in the brain triggers the pituitary to secrete adrenocorticotropic hormone (ACTH), which stimulates the adrenal glands to produce corticosteroids. This is how the body controls the levels of corticosteroids in the circulation.



### What do adrenal hormones do?

**Cortisol** belongs to the class of hormones called glucocorticoids. Cortisol's most important job is to help the body respond to stress. Among its many vital tasks, cortisol helps to:

- maintain blood pressure and cardiovascular function
- slow the immune system's inflammatory response – counter-acting inflammation
- maintain levels of glucose (sugar) in the blood – breaking down glycogen to glucose
- regulate the metabolism of proteins, carbohydrates, and fats for energy use

The amount of cortisol produced by the adrenals is precisely balanced. Its levels are regulated by the brain's hypothalamus and the pituitary gland. First, the hypothalamus releases a hormone called corticotropin-releasing hormone (CRH) that signals the pituitary gland. The pituitary responds by sending out ACTH, which in turn stimulates the adrenal glands. The adrenal glands respond by producing cortisol. Completing the cycle, cortisol then signals back to both the pituitary and hypothalamus to decrease these trigger hormones.

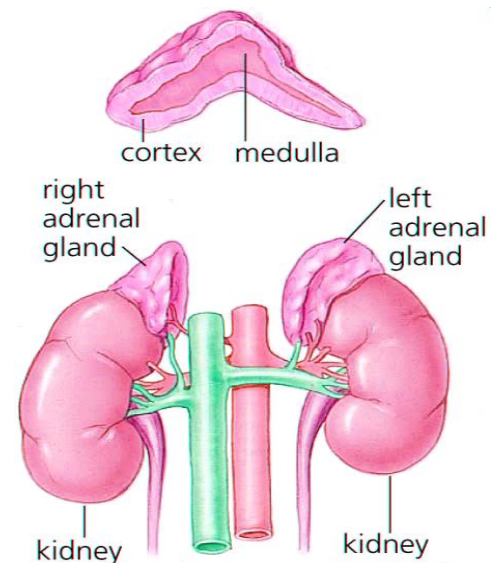
**Aldosterone** is a mineralocorticoid. It helps to maintain blood pressure and salt and water balance through actions on the kidney.

### Adrenal Fatigue

In today's society, people are constantly under a considerable amount of stress. This chronic stress continuously signals the adrenal glands to produce and secrete high levels of cortisol and adrenaline. This affects adrenaline production of DHEA, Pregnenalone, Progesterone, and Testosterone.

High cortisol levels over a long period of time can destroy healthy muscle and bone, slow down normal cell healing and regeneration, impair digestion and metabolism, interfere with normal endocrine function, and weaken your immune system. Cortisol, if not in the right range, can impair thyroid function. Patients taking thyroid supplements for thyroid abnormalities should have their cortisol levels checked.

When the adrenals are overworked, making high levels of cortisol, they have less capacity to produce dehydroepiandrosterone (DHEA). DHEA is a precursor to other important hormones: estrogen, progesterone, and testosterone. Low levels of DHEA can contribute to fatigue, loss of bone and muscle mass, depression, aching joints, decreased libido, and impaired immune function.



Carlynn Iverson

## **Testing for adrenal fatigue**

Patient's should test for adrenal fatigue if they are experiencing symptoms of fatigue, insomnia, weight gain, or depression. These symptoms may be a result of adrenal fatigue. The test shows the patient's cortisol levels throughout the day by measuring levels several times in one day. Normally, cortisol should peak in the morning, maintain a lower and steady level throughout the day, and fall in the evening to allow you to rest. There are several stages to adrenal function. In the early stages of dysfunction, cortisol levels are too high during the day and continue to rise in the evening. Further dysfunction results in variable levels throughout the day and still too high at night. In advanced stages of adrenal fatigue, the glands are so overworked over time that they fail to achieve normal cortisol levels necessary to adapt to stress.

## **Restoring healthy adrenal function**

To help improve your stress level and ability to adapt to stress you should eat a nutritional diet. Practice techniques to lower your stress and take time for yourself to de-stress. Try to get adequate amount of sleep necessary for your body to be fully rested.

Your pharmacist or physician may recommend a nutritional supplement or hormone supplement to improve your adrenal function and stress adaptation.

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