

## Cortisol

Cortisol is a steroid hormone produced and secreted by the adrenal cortex. Cortisol has many functions. It plays a role in the metabolism of proteins, lipids, and carbohydrates. It affects blood glucose levels, helps maintain normal blood pressure and regulates the immune system. Cortisol also helps the body manage stress.

Production of the hormone is regulated by the hypothalamus and by the pituitary gland. When the blood cortisol level falls, the hypothalamus sends CRH (corticotropin-releasing hormone) to the pituitary, which responds by secreting ACTH (adrenocorticotropic hormone). ACTH stimulates the adrenal glands to produce and release cortisol into the bloodstream.

### Why the Cortisol Test is Performed?

A cortisol test may be ordered when excess or deficient cortisol production is suspected. Symptoms that suggest a high level of cortisol and Cushing syndrome are:

- High blood pressure
- High blood sugar
- Obesity, especially in the trunk
- Fragile skin
- Purple streaks on the abdomen
- Muscle wasting and weakness
- Osteoporosis
- In women, irregular menstrual periods and increased facial hair
- In children, delayed development and a short stature.

Symptoms suggesting a low level of cortisol, primary or secondary adrenal insufficiency are:

- Weight loss
- Muscle weakness
- Fatigue
- Low blood pressure
- Abdominal pain
- Dark patches of skin (occurs in Addison's disease, but not secondary adrenal insufficiency)

### **How the Test is Performed and How to Prepare for the Test?**

Typically, 2 blood samples are drawn from a vein: one in the morning (at about 8 a.m.) and another in the evening (at about 4 p.m.). Sometimes urine is tested for cortisol. In this case, usually a 24-hour urine specimen is acquired. Sometimes a saliva sample is also used. The saliva sample for cortisol testing is gathered between 11p.m. and midnight.

The patient is asked to avoid strenuous physical activity the day before a cortisol test and is also asked to stop taking drugs which may change the results of the test (e.g. Estrogens, Androgens, Prednisolone, Phenytoin, oral contraceptives, Hydrocortisone etc.). The patient should take a rest for about 30 minutes before the test and avoid physical activity. For a salivary cortisol test, the patient is instructed to refrain from eating, drinking, or brushing teeth for about 15-30 minutes prior to the test.

### **What Abnormal Results Mean**

Higher-than-normal cortisol levels may be due to:

- Adrenal tumor
- Cushing's disease
- Ectopic ACTH-producing tumors
- Tumors with ectopic cortisol production
- Depression
- Kidney or liver disease
- Hyperthyroidism
- Obesity

Pregnancy, recent surgery, injury, illness or sepsis can also cause high cortisol levels.

Lower-than-normal cortisol levels may be due to:

- Hypopituitarism
- Addison's disease
- Congenital adrenal hyperplasia
- Hypothyroidism

### **Alternative Names**

No alternative names

**Useful Information**

Normally, cortisol levels rise during the morning hours and reduce towards the evening. This pattern may change when a person works the night shifts and sleeps at different times of the day. Cortisol levels can be affected by many factors, such as physical or emotional stress, infection, injury, obesity and chronic disorders. There are also many drugs that can influence cortisol concentration.