

Salivary Cortisol

FOR THE DIAGNOSIS OF HUMAN CORTISOL AND THEIR ABNORMALITIES

Test Highlights

For determination of cortisol status

Clinical Background

Production of cortisol has a circadian rhythm. Levels maximize in the early morning and drop to the lowest concentration at night. Levels rise independently in response to stress. Increased cortisol production is associated with Cushing disease and adrenal tumors, while decreased cortisol production is associated with adrenal insufficiency (Addison disease) and adrenocorticotropic hormone (ACTH) deficiency.

Indications for Ordering

Cortisol measurement is a powerful tool for the evaluation of suspected abnormalities in glucocorticoid production. Patients with Cushing syndrome (hypercortisolism) lack the diurnal variation and show elevated values, particularly late in the evening. Addison disease, or secondary adrenal insufficiency (hypocortisolism), produces the opposite effect and reduces the values in the morning hours. In many cases, it is necessary to perform dynamic tests (suppression or stimulation) in order to localize the defect at one of the three main levels of regulation (i.e. adrenal, pituitary, and hypothalamus).

Interpretation

- Reference Interval:**

Age	a.m.	p.m.
Male		
30 months-7 years	0.060-0.700 µg/dL	0.080-0.660 µg/dL
8-11 years	0.112-0.904 µg/dL	Less than 0.249 µg/dL
12-18 years	0.046-0.950 µg/dL	Less than 0.296 µg/dL
19-20 years	0.094-1.551 µg/dL	Less than 0.359 µg/dL
21-30 years	0.112-0.743 µg/dL	Less than 0.308 µg/dL
31-50 years	0.122-1.551 µg/dL	Less than 0.359 µg/dL
51 years and older	0.112-0.812 µg/dL	Less than 0.228 µg/dL
Female		
30 months-7 years	0.060-0.700 µg/dL	0.080-0.660 µg/dL
8-11 years	0.112-0.904 µg/dL	Less than 0.249 µg/dL
12-18 years	0.046-0.950 µg/dL	Less than 0.296 µg/dL
19-20 years	0.094-1.551 µg/dL	Less than 0.359 µg/dL
21-30 years	0.272-1.348 µg/dL	Less than 0.359 µg/dL
31-50 years	0.094-1.515 µg/dL	Less than 0.181 µg/dL
51 years and older	0.149-0.739 µg/dL	0.022-0.254 µg/dL

- 11:00 p.m. Cortisol: <0.112 µg/dL
- 11:00 p.m. Cortisol, Cushing syndrome: >0.112 µg/dL

Limitations

Saliva only. Collect between 11:00 p.m. and 1:00 a.m., using the supplied kit for Cushing syndrome, and then collect again between 6:00 a.m. and 8:00 a.m.

Methodology

Cortisol is bound by rabbit antibodies coated on a microtiter plate. Unknowns and cortisol standards compete with cortisol linked to horseradish peroxidase for the antibody binding sites. After incubation, unbound components are washed away. Bound cortisol peroxidase is measured by the reaction of the peroxidase enzyme on the substrate tetramethylbenzidine (TMB), which produces a blue color. A yellow color is formed after stopping the reaction with sulfuric acid. Optical density at 450 nm is read on a standard plate reader. The amount of cortisol peroxidase detected, as measured by the intensity of color, is inversely proportional to the amount of cortisol present.

Related Tests

Serum or Urinary Cortisol

References

1. Raff H, Raff JL, and Findling JW. Late-night salivary cortisol as a screening test for Cushing syndrome. *J Clin Endocrinol Metab* 2001;83, 2681-2686.
2. Papanicolaou DA, Mullen N, Kyrou I, and Nieman LK. Nighttime salivary cortisol: a useful test for the diagnosis of Cushing syndrome. *J Clin Endocrinol Metab*, 2002;87, 4515-21.
3. Migeon CJ, and Lanes RL. Adrenal cortex: hypo- and hyperfunction. *Pediatric Endocrinology, A Clinical Guide*, 1990;333-352).
4. Chernow B, et al. Hormonal responses to graded surgical stress. *Arch Intern Med*, 1987;147, 1273-1278.

Test Information

0081117 **Cortisol, Saliva**

For specific collection, transport, and testing information, refer to the ARUP Web site at www.aruplab.com.