Adrenocorticotropic Hormone

Test Overview

Adrenocorticotropic hormone (ACTH) is produced in the pituitary gland in response to the release of another hormone, called corticotropin-releasing hormone (CRH), by the hypothalamus. In turn, ACTH causes the adrenal glands to produce a hormone called cortisol, which helps your body manage stress and fight infection. Cortisol is essential for life, so its levels in the blood are closely controlled. When cortisol levels rise, ACTH levels normally fall. When cortisol levels fall, ACTH levels normally rise.

Both ACTH and cortisol levels vary throughout the day. ACTH is normally highest in the early morning and lowest in the evening. Therefore, a doctor who suspects abnormal levels looks for low ACTH in the morning and high ACTH in the evening.

Because ACTH is released in bursts, its levels in the blood can vary from minute to minute. Interpretation of the test results is difficult and often requires the skill of an endocrinologist.

This test is done on a blood sample taken from a vein.

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Why It Is Done

A test to measure ACTH is done to determine whether:

- The adrenal glands are making normal amounts of cortisol. A high level of ACTH and a low level of cortisol (or low ACTH and high cortisol levels) could mean a problem with the adrenal glands. Low levels of ACTH and cortisol could mean a problem with the pituitary gland.
- Overproduction of ACTH is causing overactive adrenal glands and the release of too much cortisol (one form of Cushing's syndrome).
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Results

The interpretation of the adrenocorticotropic hormone (ACTH) test is difficult because many factors can affect the results (such as the time of day when the blood was drawn). The test is most useful when a doctor who is experienced with the test interprets its results. ACTH test results should be evaluated along with medical information gathered from other tests, especially the blood cortisol level.

Normal

Normal values vary widely from lab to lab.

<table>
<thead>
<tr>
<th>ACTH</th>
<th>6 a.m.–8 a.m.</th>
<th>6 p.m.–11 p.m.</th>
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<tr>
<td></td>
<td>25–50 picograms per milliliter (pg/mL)</td>
<td>0–50 pg/mL</td>
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Greater than normal values may mean

- High levels of ACTH can be caused by emotional or physical stress (such as recent surgery or severe pain).
- High levels of ACTH may indicate Addison's disease, Cushing's disease, or a tumor that is producing ACTH.

Lower than normal values may mean

- Abnormally low levels of ACTH can indicate damage to the pituitary gland caused by factors such as surgery, radiation, stroke, head injury, or a tumor.
- Abnormally low levels of ACTH can also indicate overactive adrenal glands due to a tumor that is producing cortisol.