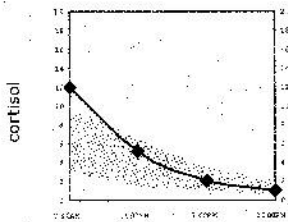


ADRENAL FUNCTION INFORMATION FOR PATIENTS

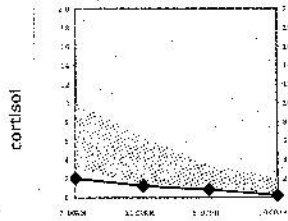


Adrenal Function Graphs



Graph 1

Single Elevated Cortisol



Graph 2

Low Cortisol Throughout Day

- The green shaded area in the above graphs indicates the normal range for cortisol levels throughout the day. Saliva samples are indicated by the dark blue diamonds and are taken first thing in the morning, before lunch, before supper and before bed.
- Graph 1 shows an elevated morning cortisol. A single elevated cortisol point may indicate the Alarm Stage, and be a response to a specific single stressor, or it could be a marker of the beginning of the Resistance Stage.
- Graph 2 shows markedly low cortisol levels throughout the day. This is a classic profile for Adrenal Exhaustion. These people typically have trouble getting up in the morning, feel exhausted, depressed and 'burned out'.

About Stress

Stress is unavoidable, which is why we have physiologic systems in place to help us cope. Under stress, the adrenal glands produce the hormone cortisol plus the catecholamine hormones adrenaline and noradrenaline. Exposure to stress can result in what is known as the General Adaptation Syndrome, which has three major stages:

Alarm Stage

In the Alarm Stage, bursts of the hormones cortisol, adrenaline and noradrenaline are released in response to a stressor, resulting in the traditional "fight, flight or freeze" responses.

Resistance Stage

In the Resistance Stage, the body uses high cortisol levels to free up stored energy that helps the body physically resist the stressor. However, a prolonged Resistance Stage may increase the risk of developing stress related diseases. If cortisol levels remain elevated, symptoms may include: feeling tired but wired, difficulty sleeping, and anxiety. Excess cortisol also interferes with the action of other hormones (progesterone, testosterone and thyroid), creating more hormone imbalance and more symptoms.

Exhaustion Stage

At this stage, the adrenal glands are either depleted from producing too much cortisol or are reacting to the detrimental effects of high cortisol, and thus reduce cortisol production significantly. Symptoms of low cortisol may include fatigue (particularly morning fatigue), increased susceptibility to infection, decreased recovery from exercise, allergies, low blood sugar, burned out feeling, depression and low sex drive. Other hormones can be affected, particularly aldosterone and DHEA. Low aldosterone may result in reduced sodium and potassium levels. Symptoms of low DHEA are not well defined, although low DHEA often occurs with chronic illness.



Since cortisol is the major stress hormone produced by the adrenal glands, measurement of cortisol levels is an excellent means of assessing adrenal gland function.

Why Test Saliva Cortisol

- To accurately assess adrenal function, it is necessary to measure four cortisol levels throughout the day: within half an hour of waking, before lunch, before supper, and before bed.
- Saliva collection is painless and easy to do at home. Blood collection requires a trip to the laboratory, which makes measuring multiple cortisol levels throughout the day very impractical.
- Saliva measures hormone that *actually* gets into tissue, because hormones pass through the tissue of the saliva gland before getting into saliva. Blood measures hormones that *might eventually* get to tissue.
- The stress of a needle puncture for blood collection tends to raise cortisol levels. Saliva collection is generally not considered stressful and therefore does not raise cortisol levels.
- Saliva testing of cortisol is widely accepted in the research community and is rapidly becoming the preferred method for measuring cortisol.

