

# Adrenal Fatigue (HPA-Axis Dysfunction)

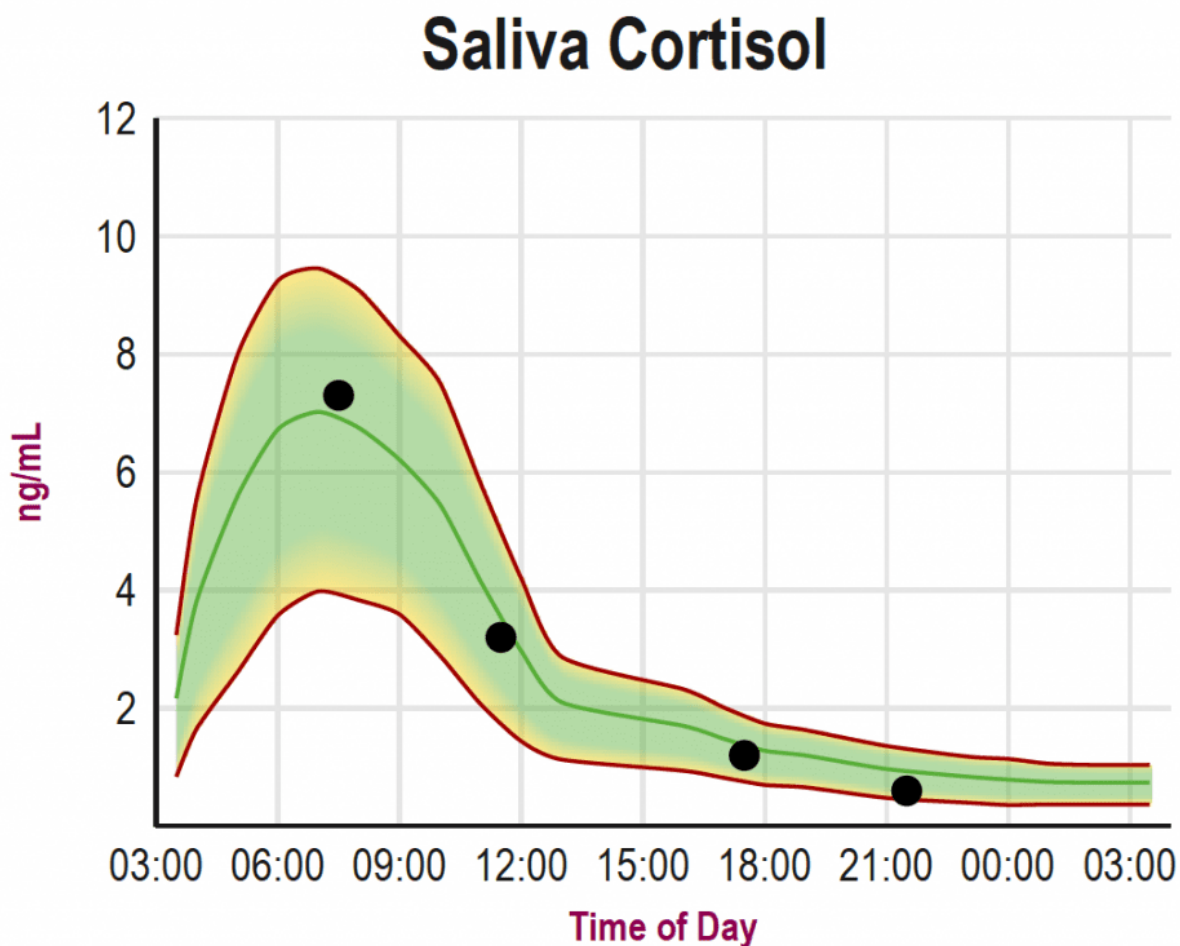
Or HPA-Axis Dysfunction? The fancy abbreviation of HPA means Hypothalamus-Pituitary-Adrenal Axis Dysfunction.

Cortisol is a stress hormone that is needed for the optimal functioning of your body. It is important to maintain a level of cortisol in a balanced state, which will improve your mental AND physical health, as well as reduce inflammation and have optimal body weight.

## What is Cortisol and How Do We Make it?

Cortisol is produced by the cortex (outer layer) of adrenal glands in a diurnal (fluctuating) pattern all day long. The highest level of cortisol made by our adrenals is in the morning when we wake up. Cortisol is the hormone that makes us feel awake and ready to conquer the world ... and the to-do list we compiled the night before. Cortisol also rises when we feel threatened or stressed. The pituitary gland in our brain "decides" how much of the adrenal hormone to be set free to give a "fight or flight" body reaction. Unfortunately, living in the 21st century makes us be under constant stress due to work demands, pressure of being there for our children and families, and other commitments we have. Our bodies and our brains stop understanding what is a real threat to our well-being and acknowledge everything as a stressful situation. The zebras chased by lions forget about the stress of being chased the minute they get to the safety and food. We never forget and even minute stress can be perceived by our brains as a real threat that never goes away! In this state of constant perceived danger, our adrenals make more cortisol than we need at the wrong times of day. Too much cortisol causes insomnia, weight gain, constant anxiety, chronic fatigue in the morning. The hormone is not produced exclusively under the influence of

stress, it has other functions, but chronic stress activates cortisol, increasing its level in the blood, which once depleted lead to a total fatigue, low immune system, etc. Cortisol is also a regulating hormone that organizes hormones such as thyroid, progesterone, estrogen, and testosterone hormones.



This graph shows the diurnal curve of cortisol levels throughout the day. Cortisol is the highest in the morning and decreases slowly in the evening. Curves of different colors reflect the natural levels of variation of this hormone in different people. But when we are in a state of chronic stress, the higher level of cortisol is produced all day long until we deplete our adrenals and feel worse from the too low levels of cortisol.

# Ideal Cortisol

In a healthy person, cortisol is the highest in the morning. This level of cortisol helps us to be fully awake and focused. It slowly decreases during the day and is the lowest in the evening when we get ready to go to bed and fall peacefully asleep. The warning signs of cortisol imbalance would be frequent colds and flus, as well as getting tired very quickly after doing a regular activity. Blood serum level of cortisol is not highly accurate as it does not differentiate between total and free cortisol, but if your morning level of cortisol is lab low it means that you may be experiencing functional secondary adrenal insufficiency. To determine your free cortisol level highs and lows I would recommend 4-point salivary cortisol with the help of laboratory methods, but it still can be difficult to identify a real imbalance, this requires a comprehensive examination.

## High levels of morning cortisol

The level of cortisol is the lowest at around 2-3 am, then begins to grow rapidly, reaching a maximum at 7-8 am. If you wake up regularly before dawn in a state of anxiety, most likely it is your cortisol is high way too early before 8 am. One of the common causes could be hypoglycemia (low blood sugar) in the middle of the night. Adding 1 tablespoon of raw honey at 9 pm may solve this issue, as well as eating protein and fat with each meal.

## High morning cortisol levels

1. Your mind experiences racing thoughts as soon as you wake up;
2. You get anxious when you wake up;
3. You are angry or have a "short fuse" when you wake up;
4. Frequent awakenings during the night;
5. You feel drained after noon and cannot focus/think.

Signs of high cortisol levels in the evening:

1. Difficult to fall asleep;
2. Anxiety and excitement in the evening as well as trying to get a lot of things done;
3. TV increases your cortisol as well as blue light from TV watching and LED light bulbs.

Low cortisol throughout the day

After cortisol has been elevated for a long time, your adrenals cannot keep up with high levels of cortisol production anymore and the level of cortisol drops significantly. You always feel tired and brain fogged, it does not matter how much thyroid hormone you get, you do not feel much more energy. "Adrenal fatigue syndrome" was used to describe the issue of low cortisol, but now this concept is being revised – low cortisol levels are increasingly associated with pituitary (the gland in the brain) dysfunction. ACTH (Adrenocorticotrophic hormone) made by the pituitary gland decreases with time and does not stimulate the adrenals to make more cortisol. The causes are intense stress, irregular sleep, night shift work, undiagnosed and untreated hypothyroidism, or hypothyroidism that was UNDERtreated with insufficient doses of thyroid hormone.

Signs of low cortisol:

1. You feel empty even after a full sleep.
2. You need several cups of strong coffee throughout a day to have a spike in energy.
3. You feel better after high-intensity workouts, but the next day you may crash and feel wiped out if you pushed yourself too hard during HIIT.
4. You fall asleep any chance you get, even when you should not (the most severe cortisol depletion).

# How to Restore and Balance to Cortisol

## Diet

A low-carb diet may be detrimental if you have problems with cortisol. Studies show that people with a cortisol imbalance and healthy low-glycemic carbs consumption predominantly in the evening felt better faster and were able to regulate their cortisol levels. As a result of this diet, they restored the correct function of the adrenal glands. Cortisol is decreased due to the increased intake of carbohydrates – craving sweets during stressful times, anyone? Carbs raise blood sugar and the pancreas increases insulin production to regulate blood sugar levels in the blood. Insulin reduces cortisol. When the blood sugar level rises, cortisol decreases. Reducing carbohydrate intake can lead to cortisol being above its normal physiological values.

## Supplements for elevated cortisol

1. Vitamin C and B5 (pantothenic acid) are the most important vitamins for the adrenals and healthy cortisol production. Since vitamin B5 appears to reduce cortisol hypersecretion, it is recommended for patients with chronic stress. The complex B vitamins with active methyl or hydroxyl/adenoxyl forms will be useful, it is also useful to use vitamin C, but not more than 1000 mg per day if you have a history of kidney stones in particular or high oxalates detected in your body.
2. Relaxation. The task of the adrenal glands is to protect us from a possible threat. Evolutionarily, we are not meant for a lot of emotional stress. Basically, the threats were associated with physical damage, and therefore the “fight or flight” reaction was fixed in our genes. Relaxation allows to restore the normal functioning of the adrenal glands. As such relaxation,

walking, meditation, the opportunity to be in silence without rushing can be useful.

3. Exercise. The best time for sports load is the morning hours. The fact is that intense exercise in the evening can provoke a non-physiological rise in cortisol and thus cause insomnia or anxiety. Plan your evening exercises in a relaxing way, let it be yoga or stretching, it will reduce your cortisol.
4. Sleep. Eight-hour sleep is simply necessary with an increased level of stress. Meditation and yoga in the evening will reduce cortisol levels. Adding the correct low-glycemic carbohydrates to dinner and adaptogens (for high evening cortisol) will improve the quality of sleep.
5. Herbal Adaptogens. Herbal supplements with withania somnifera (Ashwagandha), Rhodiola rosea, Ginseng, and others help to gently restore the adrenal function. In some cases the Adrenal Cortex glandular or cortisol prescription may be necessary too. Adaptogens that make up these drugs reduce stress levels and help reestablish cortisol to its optimal level. These herbs support the adrenal and pituitary systems, helping them work more efficiently. But only taking herbal adaptogens will not help you feel better faster if the lifestyle measures are not addressed!
6. Melatonin. Melatonin is a hormone regulating the cycle of sleep and wakefulness. It works in together with cortisol. When cortisol falls, melatonin helps you fall asleep. When you sleep, relatively low levels of cortisol allow your cells to recover. If cortisol levels remain elevated, your body cannot repair, and you wake up feeling tired. Taking melatonin at a dose of not more than 3 mg would do no harm while trying to balance cortisol. After restoring proper cortisol levels, you will feel more energy, be more active, cope with stress easier; sleep better; get sick not as often if at all; experience a steady level of energy throughout the day

without crashing.