

# READE'S REVIEW

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## UNDERSTANDING STRESS

### Special points of interest:

- Introduction
- Stress Hormones
- HPA Axis
- Solutions to Stress
- Nutrients and More for Stress

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Exactly what is stress? Most of us will immediately think of something that would cause us mental/emotional stress like our job, spouse, family or other relationships. Well, that is true but, stress can come in several different forms that we might not think about or are not consciously aware. Stress can be medically defined as a physical, chemical or emotional factor that causes bodily or mental tension and may be a factor in disease causation.

Things that promote stress reactions in the human body are called **stressors**. Some examples of **environmental** stressors are, excessive noise, crowding, colors, weather conditions especially hot and cold temperature extremes, natural disasters, war, seasonal changes, exposure to light especially while sleeping, length of light exposure during the day, excessive ultraviolet exposure from the sun, ionizing radiation such as x-rays, CT scan, or cosmic rays, or low level electromagnetic fields from computers, cell phones and other electrical devices.

Some examples of **physical**

stressors: accidents or injuries, surgeries, travel (jet-lag), disrupted sleep, excessive or lack of physical exercise, prolonged periods of work without breaks, menopause, menstruation, and infections.

Some examples of **chemical** stressors: medications, toxins found in air, water and food, heavy metals, mold and mycotoxins, processed/junk food, blood sugar imbalance, imbalanced fats in our diet, food sensitivities, cigarette smoke, excessive alcohol, excessive caffeine and lack of proper nutrients. All of these can overload our bodies ability to detoxify and create stress.

Lastly, **mental, emotional and spiritual** stressors: fear, anger, unforgiveness, helplessness, hopelessness, divorce, apathy, death of a loved one, depression, guilt, shame, loneliness, jealousy, hatred, worry, bitterness, watching the news, financial burdens and many others. The key is the ability to cope with events in life and the perception of situation that we are dealing with.

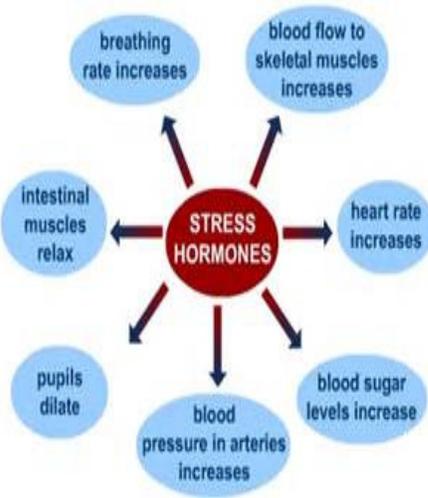
All of these various stressors can lead to a concept of the "total load". So the number of



stressors and the perceived intensity contributes to a total stress load. Stressors also have a tendency to be accumulative over time if not dealt with properly. This can eventually lead to physiological dysfunction or a "cracking" of ones health.

However, not all stress is bad as it can cause us to respond to situations appropriately or cause us to move forward towards a better place. Chronic unresolved stress is what leads to many of our health problems. The Foundation for Integrated Research in Mental Health found that globally, more than 3 out of 5 doctor visits are for stress related problems!

## STRESS HORMONES



**Certain emotions, thoughts or other stressors will stimulate the hypothalamus to release a hormone...**

The main response to stressors has to do with the production of stress hormones. There are three main stress hormones produced. The first two are **epinephrine** and **norepinephrine** and are called catecholamines. The next is called **cortisol**. The catecholamines are produced by sympathetic nerve endings and by the inside portion of the adrenal glands called the medulla. Cortisol is produced and released by the outer portion of the adrenal glands called the cortex.

Catecholamine effects:

1. Increases blood pressure and heart rate.
2. Dilates blood vessels to skeletal muscles.
3. Increase in blood sugar.

4. Increases cholesterol and fatty acids in blood .
5. Decreases insulin release and blood sugar uptake by tissues
6. Shrinks lymphoid tissue.

Cortisol effects:

1. General increase in glucose (blood sugar ) formation and protein breakdown
2. Increased use of glucose by brain and nervous system
3. Increase in insulin resistance, prediabetes
4. Slowing of digestion
5. Inhibits sex hormone production and alters reproduction

6. Increased blood pressure by sodium retention
7. Suppression of immune system
8. Alters thyroid hormone production and sensitivity
9. Depletes body of magnesium, zinc, glutamine, carnitine and many others.
10. Speed up process of osteoporosis.
11. Slows connective tissue healing such as: ligaments, discs, tendons
12. Decrease in T lymphocytes and other white blood cells.
13. Decreases protein synthesis in muscle, bone, skin and lymphoid tissue.

## HPA AXIS AND STRESS

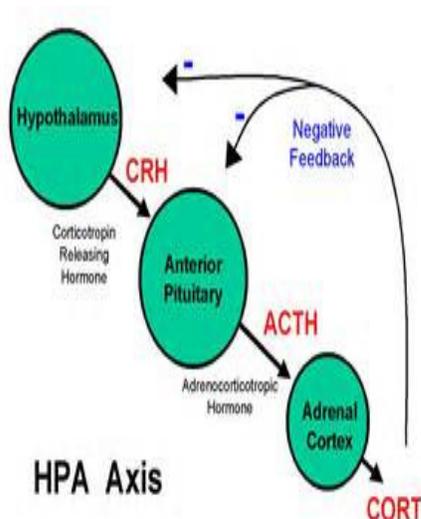
There is an area of the brain that is referred to as the **limbic system**. This area of the brain consists of many parts such as the amygdala, hippocampus, limbic cortex and others. The important thing to note about this area of the brain is that it is deeply involved in regulating the autonomic nervous system and endocrine/hormonal system. It has important input directly from the thinking part of the brain (cerebral cortex) and has direct connections to the hypothalamus. It can be considered the “emotional” part of the brain.

The HPA axis is used when explaining the many sections of the brain and organs involved in adrenal gland hormonal regulation. H is for hypothalamus, P is for pituitary, A is for adrenal.

Certain emotions, thoughts or other stressors will stimulate the hypothalamus to release a hormone called corticotrophin releasing hormone (CRH) which stimulates the anterior portion of the pituitary gland, considered the master gland. The pituitary then releases another hormone called adrenocorticotrophic hormone (ACTH) which has direct

stimulation to the adrenal cortex which will cause the release of the “stress” hormone cortisol.

The limbic system along with hypothalamus have direct input into the sympathetic nervous system. Generally speaking the sympathetic nervous system is stimulatory and will increase blood flow to the skeletal muscle, increase heart rate and contractibility, dilate air passages, elevate blood pressure and others. The sympathetic nerves directly stimulate the adrenal medulla to release epinephrine and norepinephrine.



## SOLUTIONS TO STRESS

We now understand that stress affects more directly the brain (cerebrum, limbic system, hypothalamus), nervous system (sympathetic), endocrine system consisting of the pituitary, thyroid, ovaries, testes, adipose, (fat) tissue and especially the adrenal glands. Therefore, the key to addressing stress is to evaluate the brain, nervous system and the adrenal glands in particular.

We will look at some solutions that have direct impact on all the areas of the body that respond to stress especially the HPA axis. Helping the body to recover from stress is like trying to repair a plumbing problem. The problem could be at the water main going to your house (our brain), it could be in some of the other pipes in the house (our nervous system) or could be a problem at the faucet (the adrenals).

The first thing to address to seek recovery is to find the source of the main stressors. It could be “toxic emotions” coming from marital, family, relationships, financial issues. It could be from chronic viral, oral/tooth infections, gastrointestinal infections or improper bacterial /yeast overgrowth in the digestive tract or malabsorption of nutrients due to impaired stomach or intestinal function. It could be due to inflammation secondary to gluten sensitivity or other food sensitivities. Environmental toxins, medications, and other things leading to inflammatory changes.

Another major factor is balancing blood sugar. Without

changing your diet and improving blood sugar you will **never** balance out your stress hormones, cortisol, epinephrine and norepinephrine or adrenal gland function.. Generally you should eat foods that have a low glycemic index. Generally, they should be 2 parts carbohydrates to one part protein. As an example, 20 grams of protein with 40 grams of carbohydrates.

Sleep is another major factor. It is best to go to sleep by 10pm. Physical repair of the body is best performed between 10pm to 2am. A significant stress reaction (cortisol shift) occurs when there are shifts in sleep duration and with frequent disruptions in sleep during the night. A sign of excessive stress is having a tendency to wake up between 2-3am. Proper sleep assists in reducing cortisol levels.

Also very low amounts of light even from a cell phone or other electronic device can disrupt your sleep and production of melatonin. Even going to the bathroom and flipping on the lights can interfere with melatonin, cortisol and sleep. So, sleep in a darkened room and avoid any extra light. Some people are very photosensitive and should turn off their computers and TV by around 8pm. This can interfere with melatonin levels from rising and providing sounder sleep.

Exercise is another major stress reducer. Proper levels of exercise can normalize the levels of the stress hormones, reduce insulin and blood sugar

levels, increase oxygen levels, improve metabolic, cardiovascular and other hormonal function. The best type of exercise is interval aerobics along with progressive resistance strength training.

Many people with poor adrenal function should avoid caffeinated beverages and foods high in refined sweeteners. Fruit juices should also be avoided. These all create blood sugar, hormonal and sleep disruption.

In some patients, especially those in the later stages of the stress response, may need extra sodium. Yes, extra sodium! Others in the earlier or mid stages may or may not be affected by extra sodium. Those patients in late stage stress/adrenal response should avoid foods high in potassium and having a high glycemic index such as bananas, melons, dried apricots, dried figs and potatoes.

The next major stressors are mental and emotional factors. Toxic emotions such as bitterness, resentment, fear, worry, anger, hopelessness, helplessness and many more can lead to rapid and sometimes sustained stress hormone response and adrenal dysfunction. Rumination, which is focusing on negative things in the past and not letting go can have tremendous effects on the HPA axis. Another thing that can cause tremendous stress is concept shifting or commonly known as multi-tasking. The constant shift from one subject to another strains the brain and adrenals.



**Without changing your diet and improving blood sugar you will never balance out your stress hormones ...**





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Dedicated to Quality Natural Health Care

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Our mission is to help inform and educate the public about alternative treatments that are less invasive and employ more natural therapeutics. We in no way are suggesting that regular medical treatments should not be sought and with some conditions we will suggest a referral to the appropriate specialist.

We wish to provide hope to those people suffering and especially to those with chronic conditions. It is our purpose to provide you with knowledge that is helpful and can provide better health.

## **Bringing you Natural Healthcare Information**

### **COMBAT STRESS WITH NUTRIENTS AND MORE...**

Just a few more comments on diet. Always have a nutritious breakfast that is high in protein and fats such as eggs, raw nuts, meats, fish, poultry, high quality protein powders such as denatured whey, pea or rice protein, vegetables, avocados, coconut, coconut oil low glycemic fruits such as berries and very small amounts of whole grains (avoid gluten).

The type of nutrients that would do best for a patient depends upon the stage of dysfunction of the adrenals and the HPA axis. To help determine the type of nutrients that would be helpful to reestablish balance it is important to run a **salivary cortisol and hormonal analysis**. This test is available in our office.

Early Stages of HPA Dysfunction : Ashwagandha, theanine

(from green tea), magnolia, phosphatidyl serine. Generally, these are good at reducing elevated cortisol. Theanine can help to reduce blood pressure and anxiety. Magnolia calms the mind by stimulating what is called GABA receptors.

Mid Stage Dysfunction: Rhodiola, holy basil, eleuthero (siberian ginseng), maca and ashwagandha. Many of these are adaptogenic herbs meaning they help balance organ function rather than stimulating or inhibiting activity. They have wide spread effects and influence on the brain, nervous system, energy production, endocrine and immune system. Maca has the ability to effect mood and improves libido.

Late Stage Dysfunction: Vita-

mins B1, B2, B5, B6, forskolin, DHEA, pregnenolone and licorice. These all help in restoring failing adrenal function, hormonal production such as estrogens, progesterone, testosterone and improve energy production.

For Sleep Melatonin, curcumin, theanine, glycine, 5 HTP

Some Other Nutrients : oral lavender, vitamin C, vitamin D, calcium, magnesium, fish oils, antioxidants, probiotics and more.

De- Stress Activities: yoga, prayer, meditation, being exposed to sunlight, enjoying nature, living in the moment, being connected to others, a sense of community, artistic/creative activities and simply being still are all great for stress reduction. So, now get your eggs lined up in a row!

