Supporting the Stress Response

Simple Practices to Relieve Stress and Build Resilience

What is the Stress Response?

Stress is commonly defined as a state of real or perceived threat to homeostasis – the state of balance in the body. To maintain this homeostasis in the presence of daily stressors, the body initiates a complex range of responses involving the endocrine, nervous, and immune systems, and is largely called the stress response.[1] The key components involved in the body's response to stress are the hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic nervous system (SNS).[2] Activation of the stress response initiates behavioral and physiological changes that are intended to improve an individual's chance of survival such as increased alertness, improved cognition, higher respiratory rate, and increased blood pressure.

How Does the Stress Response Work?

During a stressful encounter, the hypothalamus releases corticotropin-releasing hormone (CRH) and arginine vasopressin (AVP), leading to the production of adrenocorticotropin hormone (ACTH) from the pituitary.[2] The main target for circulating ACTH is the adrenal cortex, where it stimulates the synthesis of glucocorticoids – such as cortisol – to regulate physiological changes in the body. Neurons in the brain activate the immediate "fight or flight" response targeting the adrenal medulla to secrete the hormones epinephrine and norepinephrine, which provides the body with the energy boost needed in times of stress by increasing heart rate and blood pressure and blood flow to the muscles and brain.

Why is Cortisol the "Stress" Hormone?

Cortisol is a steroid hormone that regulates metabolic, cardiovascular, immune, and behavioral processes.[1] Cortisol releases glucose and increases blood pressure to supply energy and blood to muscles in a stressful situation requiring physical exertion, such as running away or fighting. Cortisol also mediates inflammation by reducing proinflammatory secretion of cytokines and stabilizing lysosomes. Cortisol may be released for several hours after encountering the stressor. Once a certain level of cortisol is in the bloodstream, receptors in the hypothalamus stop the release of CRH. Cortisol also acts on the pituitary gland to stop releasing ACTH. Both actions provide negative feedback to the HPA axis thereby stopping the stress response. The negative feedback loop helps to protect the body against prolonged HPA axis activity.[1]

Ways to Support the Stress Response

Supporting a healthy stress response helps maintain normal function of the HPA axis and can be achieved through activities that are relatively easy to adopt in one's daily lifestyle:

Managing Daily Stressors

For those whose lifestyle includes avoidable stress, identifying stress triggers and learning ways to cope with these is beneficial. Job stress should be evaluated and considered avoidable if significant enough.[3] A consistent work, sleep, and eating schedule helps to moderate stressors at work. Daily, weekly, and yearly periods of relaxation (such as a vacation) are necessary for optimal health. Daily physical activity is also important. Moderate, non-competitive exercise provides numerous health benefits, including stress reduction. Yoga and meditation are other techniques shown to be effective stress reducers.[4]

In the case of unavoidable stressors, an individual's response can make a big difference. Adrenal stress can result from anger, fear, anxiety, or depression in unavoidable stressful situations. Learning to perceive and respond to stressful situations in ways that do not stimulate the HPA axis will help support a healthy stress response.[2] Some practices to support this healthy stress response include deep breathing, meditation, mindfulness thinking, and regular sessions with a counselor if needed.

Consuming A Healthful Diet

The glycemic impact of one's daily diet is important to maintain appropriate insulin and cortisol levels. Both hyperglycemia and hypoglycemia are stressors that signal HPA axis production of cortisol.[2] Chronic glycemic dysregulation results in chronic high cortisol levels, which is exacerbated by obesity and insulin resistance. Research suggests that following a Mediterranean-style diet (with a focus on fruits and vegetables, polyunsaturated fats, whole grains, and lean proteins) and consuming soluble and fermentable fibers that produce short chain fatty acids (SCFA) to feed the gut microbiota improve glycemic control and play an important role in improving long-term health outcomes.[5-6]

Dietary patterns that are recommended:

1. Model the daily diet on the Mediterranean eating pattern
2. Reduce glycemic impact by avoiding refined carbohydrates and sweetened beverages, and increasing whole grains and soluble and fermentable fibers
3. Always eat breakfast. This meal sets the foundation for glycemic control for the entire day and supports the transition from high morning cortisol production

Maintaining a Consistent Sleep Schedule

Poor sleep quality and duration has been linked to HPA axis dysfunction.[7] Maintaining a consistent sleep schedule with adequate sleep every night (at least 7 hours) is recommended.

Adaptogenic Herbs & Other Ingredients

An adaptogenic herb is defined as a substance that increases the body's ability to adapt to stressors and exerts a balancing effect on various systems of the body.[8] Several botanicals have been identified as "adaptogens" under this definition; two of the most common are Ashwagandha (Withania somnifera) and Panax Ginseng. Long revered in Ayurvedic medicine as an herb supporting stress resilience, Ashwagandha is recognized today through clinical studies for its ability to help reduce stress. More specifically, two standardized Ashwagandha preparations (Sensoril® and KSM-66®) have been used in clinical studies and shown to lower cortisol levels and reduce occasional anxiousness.[9-11]

Ginseng is an adaptogen traditionally used in herbal medicine to revitalize and replenish energy during times of fatigue related to stress. Ginseng is thought to contain antioxidant activity, and the active component, ginsenosides, give ginseng its adaptogenic properties and ability to balance the body.[12]

Other ingredients found in supplements, such as L-theanine and gamma-aminobutyric acid (GABA), help to calm the mind within a short amount of time. L-theanine helps relax the mind by acting on alpha 1 and 2 EEG brain wave activity, which are the calm and focused brain waves.[13] GABA, as the main inhibitory neurotransmitter in the brain and nervous system, reduces the firing of neurons to support relaxation and lower stress.[14-15]

Ingredient	Adaptogen	How it Supports the Stress Response
Ashwagandha (Withania somnifera)	Yes	Acts over a period of time to lower cortisol levels in the blood and reduce occasional anxiousness
Panax Ginseng	Yes	Acts over a period of time to replenish energy during times of fatigue related to stress
L-Theanine	No	Acts right away (within 30 minutes) to stimulate the calm and focused brain waves
GABA	No	Main inhibitory transmitter reduces firing of neurons to support relaxation and lower stress

Should I Add a Stress Support Supplement to My Daily Routine?

It's important for patients to communicate with their healthcare professionals about any changes to their daily regimen including dietary supplements.

About Nature Made

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