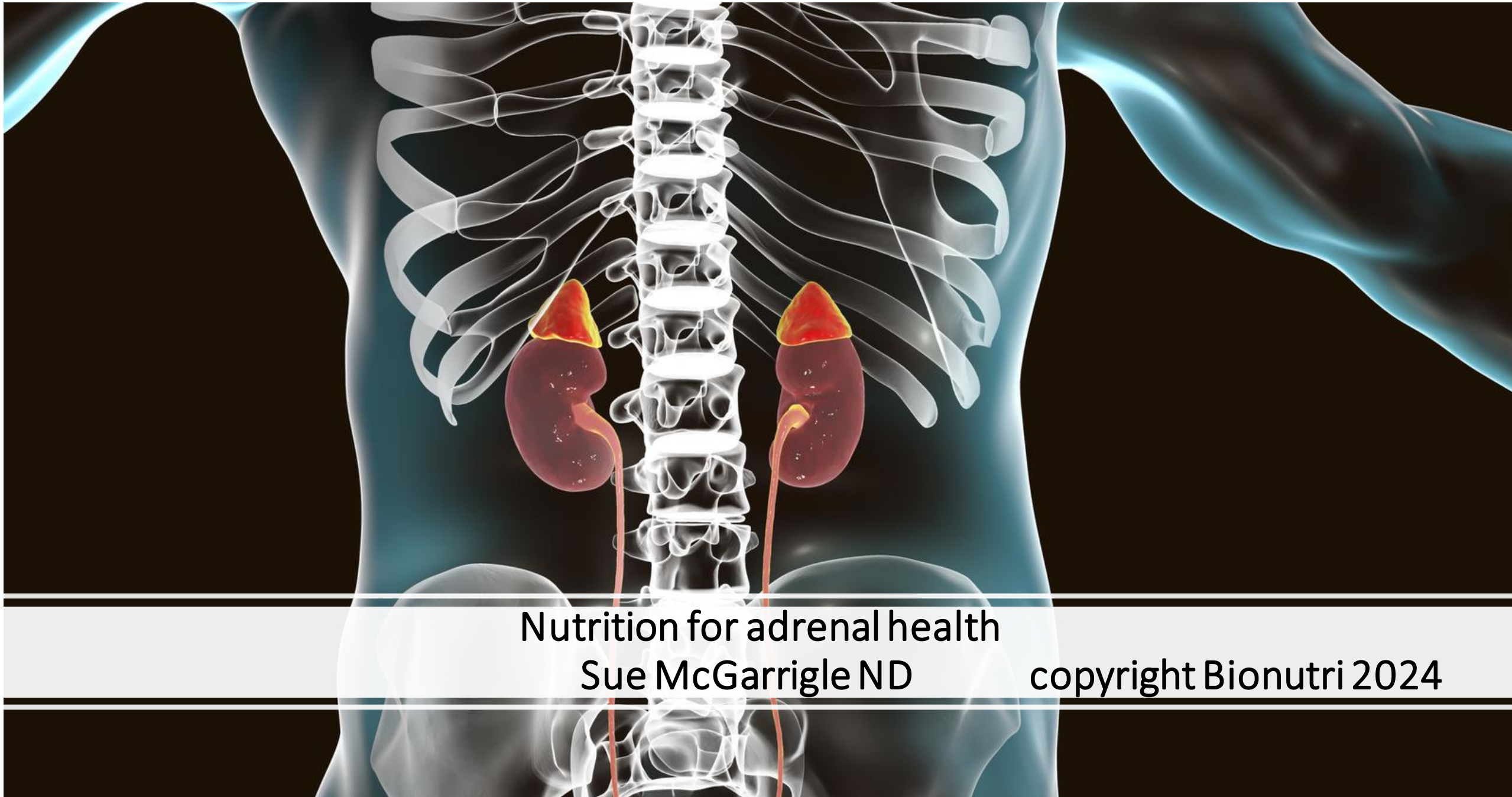


Nutrition for adrenal health

Sue McGarrigle ND

Good health -based on natural foods, light, warmth, massage, fresh air and regular exercise. The body will always reach towards a state of health, using its own natural processes to heal itself and the quality and type of food is vital

People live on the edge-our modern lifestyle exposes us to less rest, more noise, more information, a greater influx of toxins and many ‘new’ threats to survival than before.

Ill health only exists when the body is not given the opportunity to self-heal and most people ignore what their body signals tell them

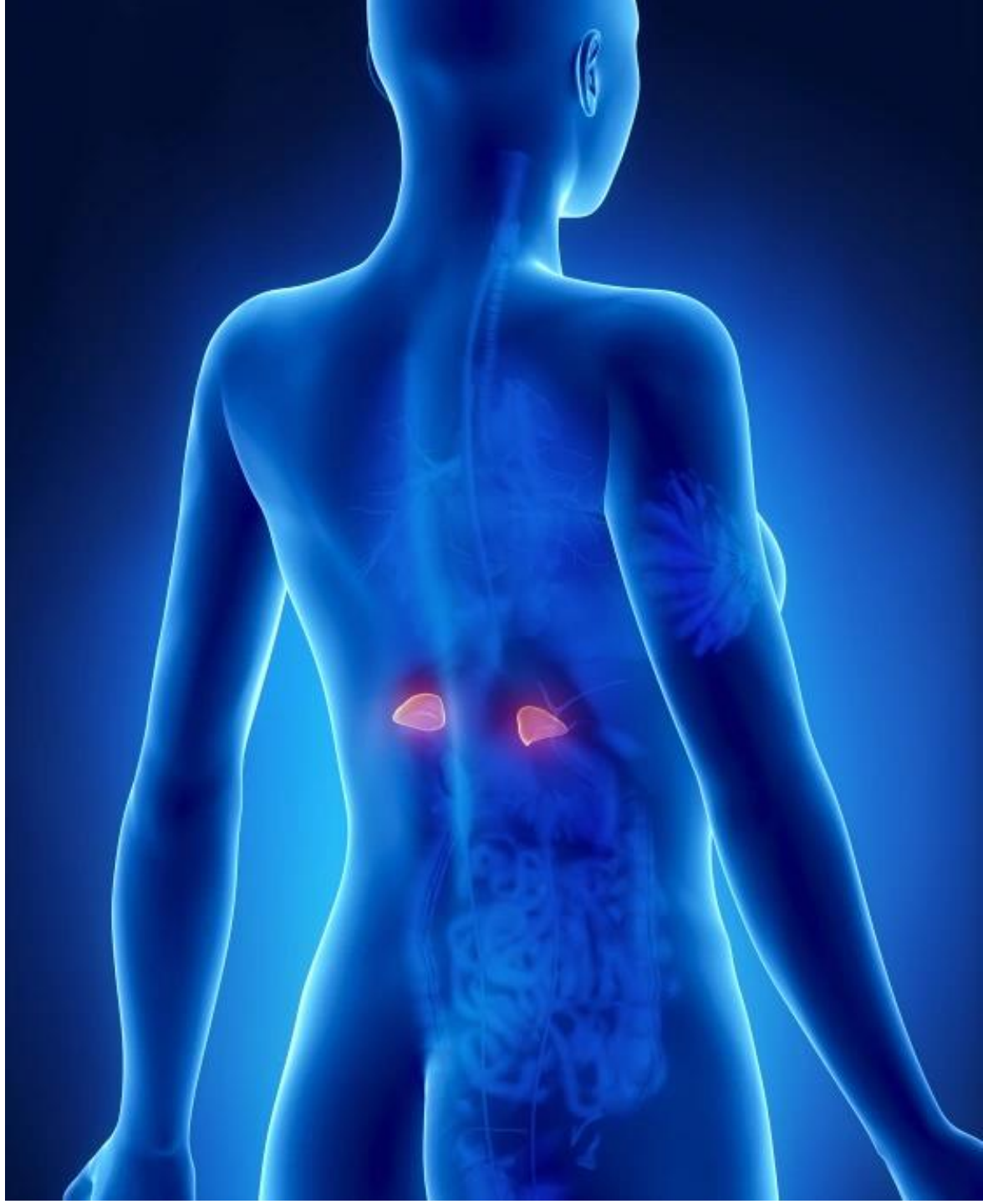
Bionutri looks at the pathways and the utilisation of nutrients to biological advantage without overstimulation

Bioavailability and biological activity of nutrient combinations is dependent upon several factors; simply bombarding a stressed or weakened system can be either over-stimulating or just ineffective.

We use food nutrients that provide a nutritional role within our products as part of a complex and that underpin global biological effects back to health other than isolated or aggressive approaches.

The adrenal glands

- The Endocrine system influences nearly all organs, cells and function in the body.
- The adrenal glands are part of the body's endocrine system, which is composed of a system of glands that release chemical messengers-hormones. These hormones are carried through the bloodstream to specific tissues and organs.
- The adrenal glands consist of two main parts:
- Medulla: The medulla is the inner part of the adrenal gland, and it releases the hormones adrenaline (epinephrine) and noradrenaline (norepinephrine) (catecholamines).
- Cortex: The adrenal cortex is the outer part of the adrenal gland, and it releases corticosteroid and mineralocorticoid hormones. The most important are aldosterone (the primary mineralocorticoid), which helps the kidneys control the amount of salt in the blood and tissues of the body, cortisol (a glucocorticoid), and androgens and oestrogen (sex hormones). Mineralocorticoids are a class of steroid hormones that regulate salt and water balances, they promote sodium and potassium transport, usually followed by changes in water balance.



Catecholamines

- Noradrenaline and adrenaline are catecholamines that play major roles in regulation of the ‘inner world’ of the body.
- Adrenaline is the main hormone secreted by the adrenal medulla and is a key determinant of responses to metabolic or global challenges to homeostasis, such as glucoprivation, and of manifestations of emotional distress.
- Adrenaline responses to stressors are more closely linked to responses of the hypothalamic-pituitary-adrenocortical system than of the sympathetic nervous system.
- Catecholamines affect cardiovascular functions by actions at adrenoceptors on cardiovascular cells, in the nervous system, and in the kidneys.

Cortisol

Is the main glucocorticoid released from the zona fasciculata layer of the adrenal cortex. The hypothalamus-pituitary-adrenal axis regulates both production and secretion of cortisol.

Cortisol the most important steroid hormone with a significant effect on body metabolism has many functions in the human body, such as mediating the stress response, regulating metabolism, the inflammatory response, and immune function

Cortisol strongly affects peripheral tissues and the central nervous system. Fluctuations in cortisol secretion often accompany psychiatric disorders.

Loss of regulation can lead to cortisol excess disorders, such as Cushing syndrome, or cortical insufficiency, such as Addison disease.

Cortisol

It also helps:

Fight infection.

Maintain blood pressure.

Regulates blood sugar

As an anti-inflammatory hormone, during chronic stress cortisol production increases, suppressing the immune system. This suppression can make the body more sensitive to allergens, potentially worsening the allergic response and overall allergy symptoms.

Cortisol is involved in tissue health.

Cortisol

In a healthy person, cortisol rises and falls at different times of the day. It's usually higher in the morning and lower at night unless a person works late or has changing shifts.

Other events or factors can affect cortisol levels, including:

- Exercise.
- Hypothyroidism
- Infection, injury or disease.
- Medications such as hydrocortisone, prednisone or birth control pills.
- Obesity.
- Pregnancy.
- Physical or emotional stress.

High Cortisol

Everyone has high cortisol from time to time, and levels vary throughout the day. It's part of the body's natural response to threats of harm or danger.

But, if the body consistently makes too much cortisol, it usually indicates an underlying health problem. Doctors may refer to high cortisol as Cushing syndrome or hypercortisolism.

High levels of cortisol might indicate:

- Effects of large amounts of certain medications (see previous slide).
- Poor and processed diet
- Tumour in the pituitary gland that's producing adrenocorticotropic hormone (ACTH), which stimulates the production of cortisol.
- Tumour in the adrenal gland that's producing too much cortisol.
- Tumour elsewhere in your body, such as small cell lung cancer.

High Cortisol

- Stimulates release of stored energy
- Breaks down bone and inhibits the synthesis of body tissue and enzymes.
- Raises peripheral oestrogens, inhibits clearance of oestrogen from the liver
- Induces insomnia and depression
- Affects bone growth
- Compromises immunity
- Affects digestion
- Increases inflammation
- Stress increases cortisol which can inhibit secretion of TSH (thyroid stimulating hormone) from the pituitary gland, leading to partial suppression of thyroxine, the main hormone produced by the thyroid gland.
- Conversely hypothyroidism causes elevated cortisol levels due to both decreased clearance and negative feedback of cortisol on the hypothalamic pituitary-adrenal axis.

Symptoms of high cortisol

- Changes in sex drive.
- Diabetes.
- Excessive hair growth or balding.
- High blood pressure (hypertension).
- Purple stretch marks over the abdomen.
- Red, round face.
- Wounds that heal poorly.
- Easy bruising on the arms and legs.
- Weak muscles and thinner arms and legs.
- Stunted growth in children.
- Weight gain.
- Mood swings.
- Increased fracture risk and weaker bones.
- Increased risk of blood clots.

DHEA

- Reverses immune suppression caused by excess cortisol levels. thereby improving resistance against pathogens, allergies and cancer
- Stimulates bone deposition and remodelling to prevent osteoporosis.
- Improves cardiovascular status by lowering total cholesterol and LDL levels
- Increases muscle mass, decreases percentage of body fat.
- Involved in the thyroid gland's conversion of T4 to the more active T3.
- Reverses many effects of excess cortisol, creating subsequent improvement in energy/ vitality, sleep, premenstrual symptoms, and mental clarity.
- Accelerates recovery from acute stress (e.g., insufficient sleep, excessive exercise, mental strain, etc.)
- Libido and sex drive in women
- High DHEA a red flag
- Low DHEA-drugs, high cortisol, adrenal insufficiency

Glucocorticoids

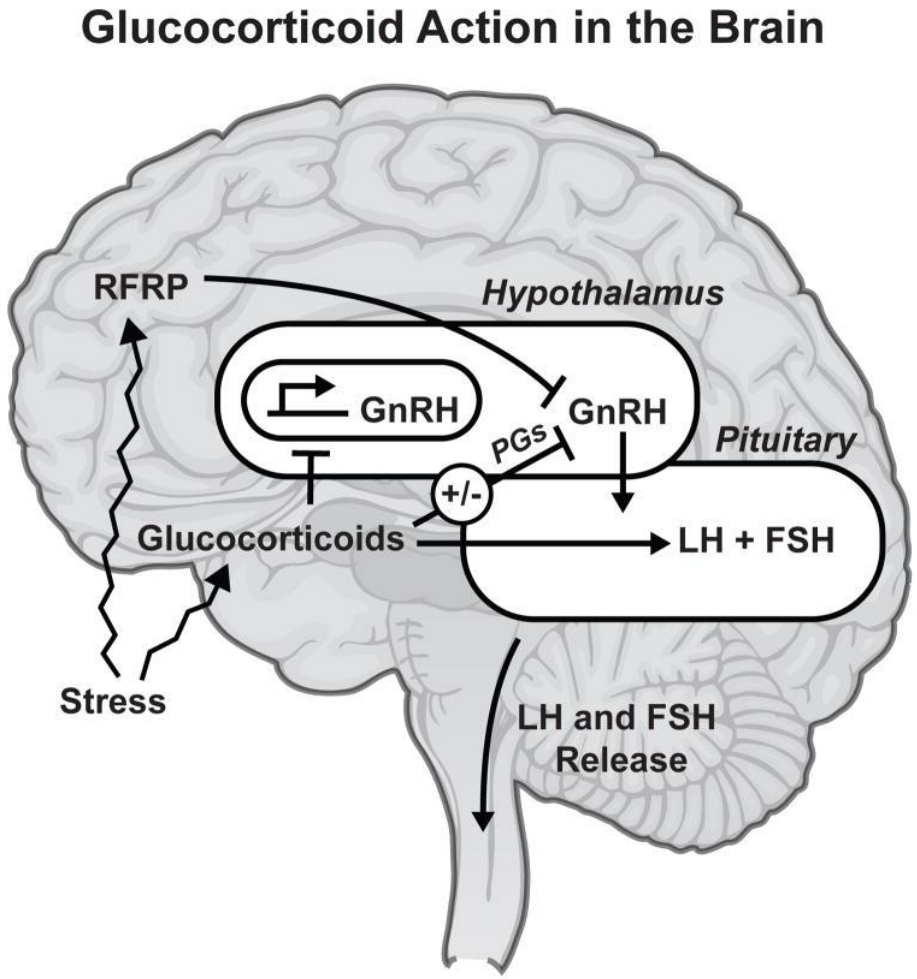
- Glucocorticoids affect gonadal function at multiple levels in the hypothalamo-pituitary-gonadal axis:

1) the hypothalamus (to decrease the synthesis and release of GnRH)

2) the pituitary gland (to inhibit the synthesis and release of LH and FSH)

3) the testis/ovary (to modulate steroidogenesis and/or gametogenesis directly).

- Chronic adrenal stress depresses hypothalamic and pituitary function. And since these two organs direct hormone production, anything that disrupts the HPA axis will also suppress hormone function
- Prolactin(from pituitary) increases and can prevent ovulation, periods can stop



Minerva Endocrinol. 2010 Jun; 35(2): 109–125.
PMCID: PMC3547681
NIHMSID: NIHMS403039
PMID: 20595939 Glucocorticoids, Stress, and Fertility Shannon Whirledge and John A. Cidlowski*

HPA support


QBionutri
Tyro Plus
QBionutri
Tyro Plus
Tyrosine, Glutamine & Glycine with Sarsaparilla,
B Vitamins and Vitamin D Zinc, Manganese,
Selenium, Iodine and Copper
Food Supplement
90 Capsules

Sarsaparilla root *(smilax officinalis)- traditional use*

- Contains plant steroids/saponins
- Pituitary stimulant/hormone balance
- Antimicrobial
- Anti-inflammatory
- Blood purifier
- Skin disorders
- General tonic
- Liver protective

Stress-anything which challenges our survival

Many factors can start the stress response, but physical stressors are most important.

- Physical – , trauma, injury, surgery, inflammation, excess exercise
- Chemical – pollution, allergies, BS imbalance, hormonal imbalance, poor diet, stimulants, drugs, heavy metals, change of supplements
- Emotional, lack of love
- Thermal or intense cold
- Infection or illness, serious disease

Stress responses

Important factors causing a **high** stress response are as follows:

- trauma (severe injury) of any type
- severe illness or infection
- intense heat or cold
- surgical procedures
- serious diseases
- allergic reactions

For the body to respond to, and cope with physical stress, the adrenal glands make more cortisol.

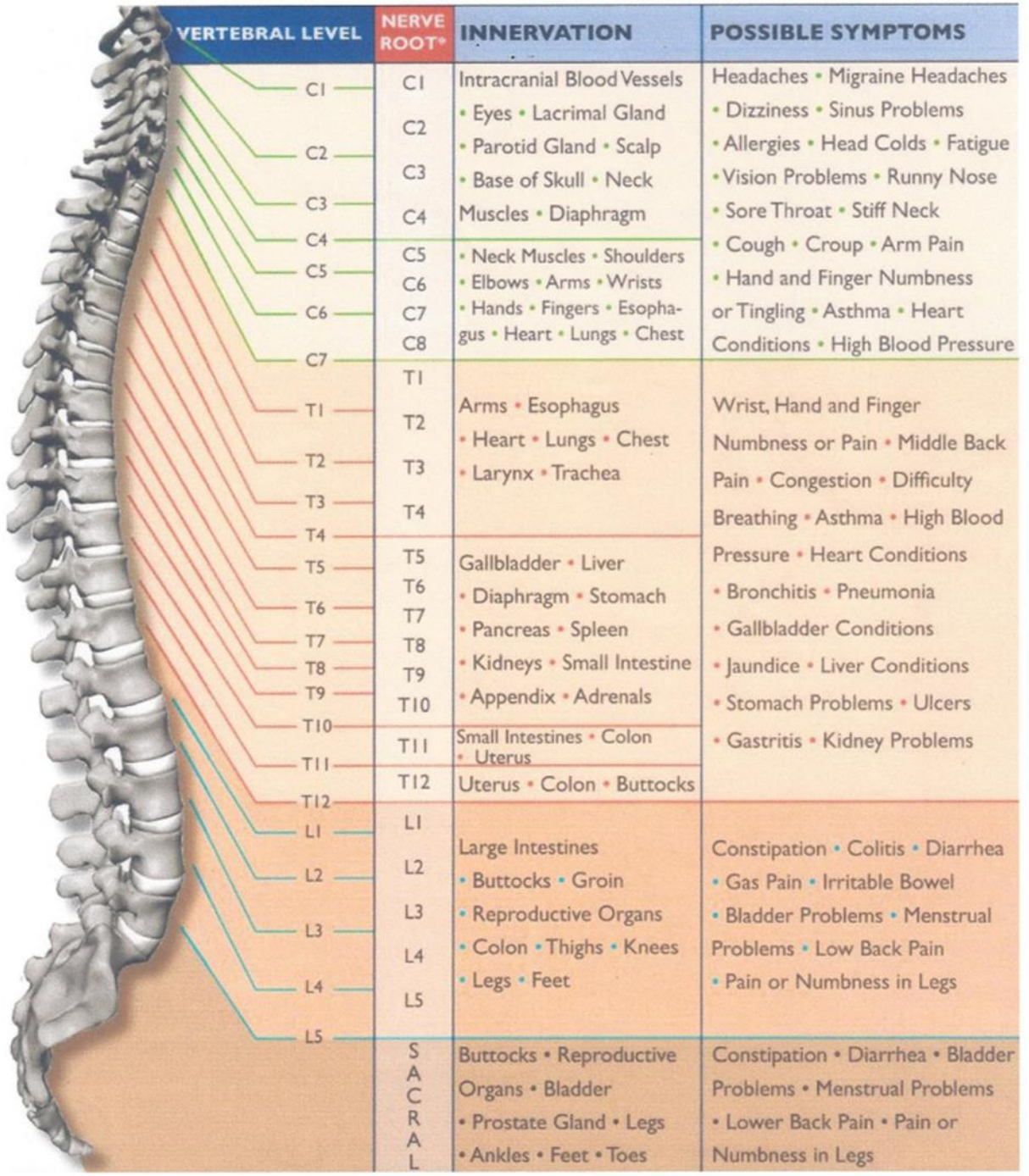
Stress factors

Multiple stress factors	Hormone balance is deeply connected to the food we eat, the exercise we get, the toxins we absorb, the weight we carry, and the amount of stress we endure	Multiple stress factors
Poor stress Coping capability		Lifestyle factors/stress Stimulants, social/family pressures
Postural and structural stress Trigger points, overuse, injuries		Sleep and rest patterns
Chronic infectious stress Fungal, viral, bacterial, parasitic	**Homeostasis**	Hormonal stress Clearance and production
Nutritional deficiencies Fatty acid status		Eating patterns Food quality
Functional stress Hyperventilation, lack of exercise		Thermal or cold stress
Emotional stress Self-esteem, anxiety, depression, anticipation Early childhood stress leading to overreaction to stressors in later life		Chemical stress Toxicity- drugs, pollution, environment Genetic predisposition, inborn tendencies and problems
		Chaitow Fibromyalgia and Muscle Pain 2001

Stress weakness points

The stress response is complex and can influence endocrine system as well as immune and nervous system function:

- Heart
- Kidney
- Adrenals/Secretion of thyroid hormones
- Thyroid
- Liver
- Blood sugar balance
- Stress puts intolerable strain on the glandular system and hinders the processing and utilisation of food
- The spine-an unhealthy spine can have a negative impact in the overall health of a person/neck tension/poor posture/poor circulation



VERTEBRAL LEVEL	NERVE ROOT*	INNERVATION	POSSIBLE SYMPTOMS
C1	C1	Intracranial Blood Vessels • Eyes • Lacrimal Gland • Parotid Gland • Scalp • Base of Skull • Neck Muscles • Diaphragm	Headaches • Migraine Headaches • Dizziness • Sinus Problems • Allergies • Head Colds • Fatigue • Vision Problems • Runny Nose • Sore Throat • Stiff Neck • Cough • Croup • Arm Pain • Hand and Finger Numbness or Tingling • Asthma • Heart Conditions • High Blood Pressure
C2	C2		
C3	C3		
C4	C4		
C5	C5	• Neck Muscles • Shoulders • Elbows • Arms • Wrists • Hands • Fingers • Esophagus • Heart • Lungs • Chest	
C6	C6		
C7	C7		
	C8		
T1	T1	Arms • Esophagus • Heart • Lungs • Chest • Larynx • Trachea	Wrist, Hand and Finger Numbness or Pain • Middle Back Pain • Congestion • Difficulty Breathing • Asthma • High Blood Pressure • Heart Conditions • Bronchitis • Pneumonia • Gallbladder Conditions • Jaundice • Liver Conditions • Stomach Problems • Ulcers • Gastritis • Kidney Problems
T2	T2		
T3	T3		
T4	T4		
T5	T5	Gallbladder • Liver • Diaphragm • Stomach • Pancreas • Spleen • Kidneys • Small Intestine • Appendix • Adrenals	
T6	T6		
T7	T7		
T8	T8		
T9	T9		
T10	T10		
T11	T11	Small Intestines • Colon • Uterus	
T12	T12	Uterus • Colon • Buttocks	
L1	L1	Large Intestines • Buttocks • Groin • Reproductive Organs • Colon • Thighs • Knees • Legs • Feet	Constipation • Colitis • Diarrhea • Gas Pain • Irritable Bowel • Bladder Problems • Menstrual Problems • Low Back Pain • Pain or Numbness in Legs
L2	L2		
L3	L3		
L4	L4		
L5	L5		
	SACRAL	Buttocks • Reproductive Organs • Bladder • Prostate Gland • Legs • Ankles • Feet • Toes	Constipation • Diarrhea • Bladder Problems • Menstrual Problems • Lower Back Pain • Pain or Numbness in Legs

The Liver and Stress

- Decreased detoxification and metabolic function – immune suppression
- Hypoxia (can lead to poor iron conjugation and anaemia) and metabolic toxicosis
- Dysregulation of enzymes increasing intracellular degradation
- Loss of quality blood to connective tissue(aches and pains)
- Liver energy down – affects overall energy
- Depression, anger, judgment, mood

more circulating hormones

Stress and digestion

- Small intestine- mucus secretions decreased by epithelial cells and a reduction in acidic mucopolysaccaride component of mucus
- Changes occur in adhesive properties of the bacteria and epithelium
- Secretions of hydrochloric acid reduce in the stomach
- Klebsiella, Enterobacteria and H.Pylori can increase
- Peristalsis decreases
- Food bolus is colonised by pathogenic bacteria due to lack of beneficial bacteria
- E.coli, Bacteroides and Candida Albicans may increase
- Glucocorticoids suppress production of TNF, IL-6 and IL-1, so low levels of cortisol are associated with elevated pro-inflammatory cytokines and elevated symptomology of cytokine sickness syndrome. Thus, individuals with adrenal fatigue and hypocortisol production are in a state of chronic inflammation caused by stress
- sIgA is influenced
- Vasoconstriction
- Poor sleep-due to overstimulation in the day

Stress-influences in coping

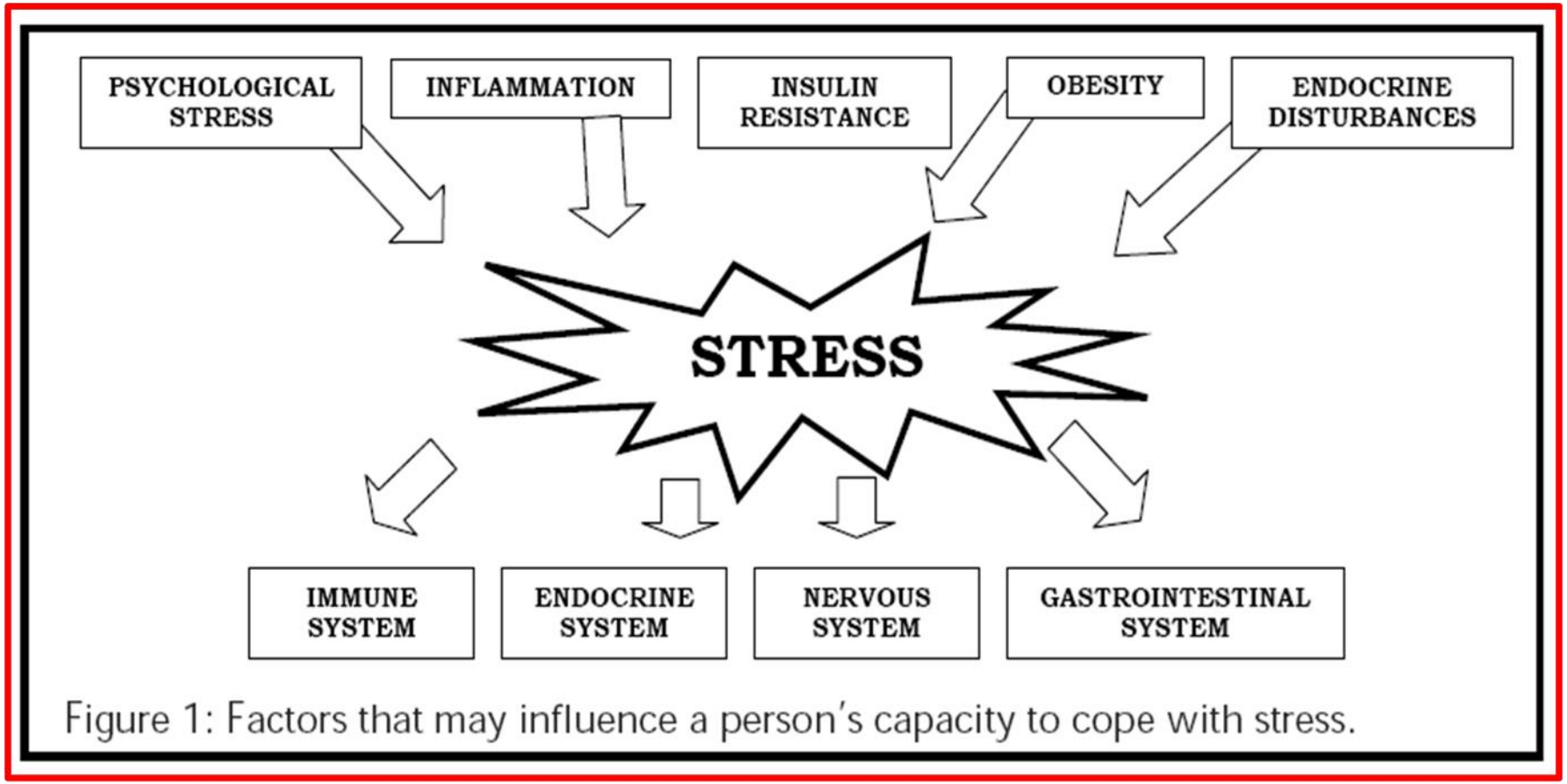


Figure 1: Factors that may influence a person's capacity to cope with stress.

Stress management

- Healthy sleep pattern
- Minimise screen exposure
- Walking
- Tapping
- Deep Breathing-improves energy, internal rhythm and calming of sympathetic nervous system
- Diet of course including sufficient potassium and sodium, good protein and healthy fats. Breakfast within an hour of rising with good amount of protein.
- Exercise is an effective way to reduce stress and improve adrenal function. Aim for at least thirty minutes of moderate exercise most days of the week.
- Even a minimal exposure to stimulants can cause sensitivity
- Vital – vitamin C
- Vital – pantothenic acid
- EFA's
- B6
- Magnesium and other minerals
- Glandulars?????
- Over stimulating the adrenals can cause over processing of Thyroxine, easy check is pulse rate and temperature am and pm to monitor adrenal status
- You do not want to suppress natural production for future challenges!

Adrenal fatigue-a mild form of adrenal insufficiency-not medically recognised

- Adrenal fatigue should not be confused with adrenal insufficiency, which is a verified medical condition that occurs when your adrenal glands are unable to produce enough hormones. Symptoms below may be due to a different underlying problem.
- Persistent stress has been shown to cause imbalances in the hypothalamus pituitary adrenal axis, resulting in less sensitivity to stress hormones. Adrenal fatigue can be an imbalance in the cortisol rhythm. Cortisol is either low when it should be high, high when it should be low, or always low or always high.
- But the problem isn't isolated in your adrenals. In fact, your brain tells your adrenal glands what to do through a complex web of communications called the hypothalamic-pituitary-adrenal axis (HPA axis), or simply the brain-adrenal axis. Your hypothalamus releases corticotropin-releasing hormone (CRH), which tells the pituitary gland to release the adrenocorticotropic hormone (ACTH). ACTH then tells your adrenal cortex to release cortisol.
- Adrenal fatigue is really a dysfunction of your brain's communication with your adrenals – not the adrenal glands themselves.

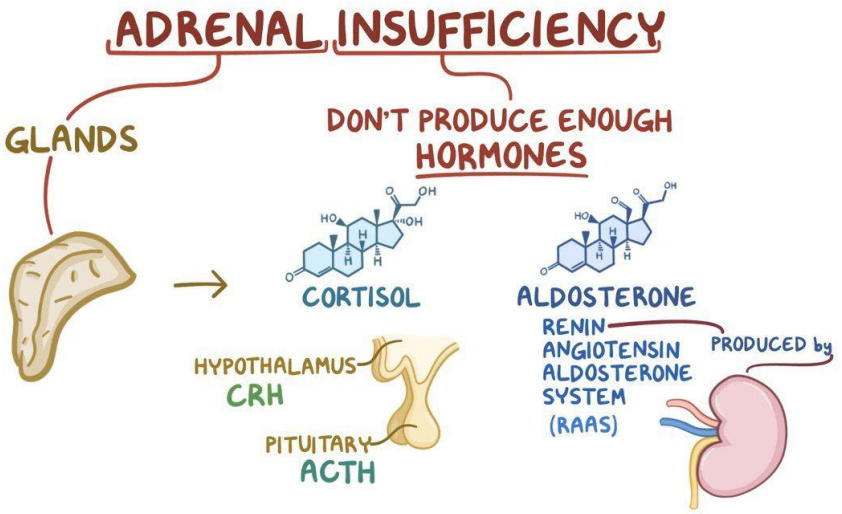
Adrenal fatigue

Symptoms may include:

- Difficulty waking up or falling asleep
- Increased cravings for salt or sugar
- Low energy levels
- Inability to relax
- Immune issues
- Dependence on stimulants, like caffeine

Adrenal Insufficiency

Adrenal insufficiency can be primary or secondary:



Primary adrenal insufficiency. This is known as Addison's disease. It occurs when the adrenal glands are damaged. They don’t make enough of the hormone's cortisol and aldosterone. This condition is rare. It may occur at any age.

Primary adrenal insufficiency is most often caused when the immune system attacks healthy adrenal glands by mistake.

Other causes may include:

- Cancer
- Tuberculosis infection of the adrenal glands
- Inherited disorders of the endocrine glands

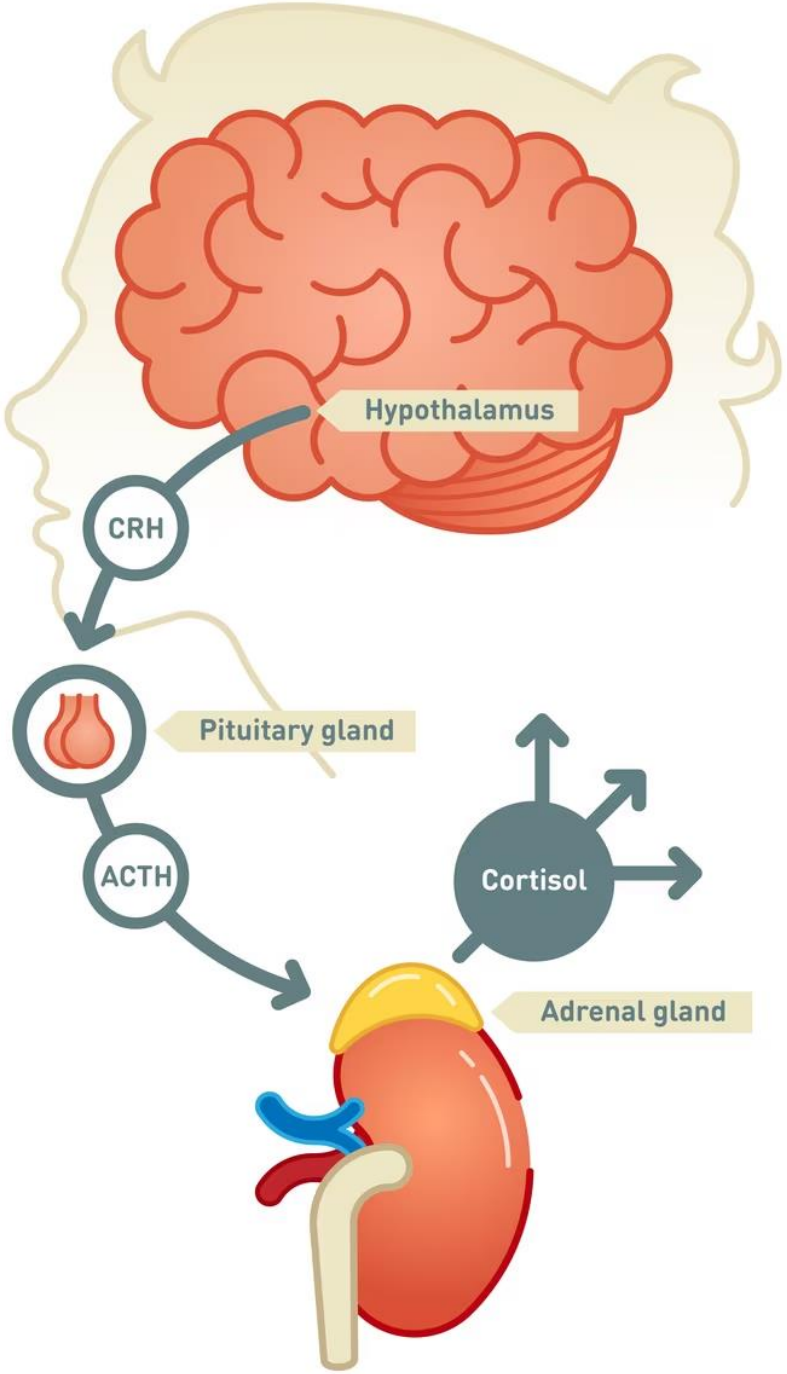
Adrenal insufficiency

Secondary adrenal insufficiency. This starts when the pituitary gland doesn't make enough of the hormone ACTH (adrenocorticotropin). As a result, the adrenal glands don't make enough cortisol.

This can happen if certain steroids must be taken for a long time due to a health problem. For example, people with asthma or rheumatoid arthritis may need to take prednisone.

Other causes include:

- Pituitary gland tumours
- Loss of blood flow to the pituitary
- Pituitary gland is removed, or radiation treatment of the pituitary gland
- Parts of the hypothalamus are removed



Symptoms of adrenal insufficiency

Symptoms may include:

- Weakness
- Fatigue
- Dizziness
- Dark skin (Addison's disease only)
- Bluish-black colour around the nipples, mouth, rectum, scrotum, or vagina (Addison's disease only)
- Weight loss
- Fluid loss (dehydration)
- Lack of appetite
- Muscle aches

Symptoms of adrenal insufficiency

- Upset stomach (nausea)
- Vomiting
- Diarrhoea
- Low blood pressure
- Low sugar levels
- In women, irregular or no menstrual periods

If not treated, adrenal insufficiency may lead to:

- Severe abdominal pain
- Extreme weakness
- Low blood pressure
- Kidney failure
- Shock

When is adrenal support needed?

- Low DHEA and high cortisol (High DHEA is a red flag)
- Low cortisol with DHEA showing weak adrenal function
- Postural hypotension
- A worsening thyroid situation
- Thyroid surgery or radioactive treatment
- Clinical hypothyroidism with normal blood test results
- Major surgery or shock or accident

Tests

Tests that can diagnose adrenal insufficiency include:

- Blood and urine tests. These can check levels of the adrenal hormones and ACTH.
- Imaging tests. These include X-rays, ultrasound, and MRI.

Tests for adrenal insufficiency

- Saliva tests-A study done in the Clinical Endocrinology (Oxf)1 stated, “salivary cortisol determined by enzyme immunoassay is preferable to serum total cortisol for assessment of dynamic hypo-pituitary-adrenal axis activity.”
- Blood tests are the most accurate way to assess most hormone levels and that this type of testing continues to be regarded as the "gold standard" against which results of other testing methods must be measured.
- Saliva tests for cortisol are now considered highly reliable and that a growing body of evidence suggests that saliva tests can also accurately determine levels of testosterone and DHEA.
- Whatever substance is being tested, labs are only a part of our clinical puzzle, sometimes just a tiny piece, especially when dealing with the incredibly intricate endocrine system.

Thyroid

- If adrenals become weak the thyroid will be downregulated-T4 and T3 will be reduced which in turn will increase TBG and rT3.
- The body's cry for help-an applying of the brakes. (Secondary hypothyroidism)
- TSH will be normal or elevated.
- Resolve the root problem of adrenal fatigue=resolve thyroid issue.
- Total T4 and T3 may show as normal
- You can always check thyroid for hypothyroid with the Barnes temperature test which is a good indicator.

Worsening adrenal function

- Putting in thyroid medication to address low markers while in adrenal fatigue worsens the adrenal picture.
- Thyroid replacement with T4 and T3 without first considering adrenal fortification is a common mistake and often leads to a worsening state of adrenal fatigue over time. The reason is simple. Thyroid replacements tend to increase metabolic function and energy output. Raising the basal metabolic rate is akin to putting all systems of the body into overdrive at a time when the body is trying to rest by down-regulation.
- An already weak adrenal system in a low energy state may not be able to carry the burden of extra energy output. What the adrenals need is rest, not extra work. Thyroid medication administered under such circumstances may lead to a temporary relief of symptoms and a slight boost in energy at first. However, this is often short lived.

Adrenal and Thyroid

Radioactive iodine/surgery/incorrect Thyroxine dosage also causes stress to the adrenals

Test for adrenal **AND** thyroid function

Which came first?

Signs and symptoms of both- a useful chart on link

https://www.drrind.com/metabolic-scorecard

Signs and Symptoms: Adrenal Fatigue vs. Low Thyroid Function

Key: - generally absent; +possibly present; ++ often present; +++ always or almost always present

Signs and Symptoms	Adrenal	Mixed (1)	Thyroid
Body Type	Mild: Gains weight easily; Moderate: Can't lose weight; Severe: Thin, can't gain weight	Gains easily,goes to tummy/hips first, very hard to lose	Weight gain, generalized or global, extremely hard to lose
Face Shape	Eyes, cheeks sunken when severe	Normal	Full, puffy around eyes
Eyebrows	Tend to be full	Normal to sparse	Very sparse outer 1/3 to 1/2
Tissue Around eyes	Sunken appearance, may have dark circles	Normal or some "bags" under the eyes	Puffy around the eyes, often bags under the eyes
Facial Coloring (2)	Tendency to pallor, especially around mouth. In dark skin, it darkens around mouth, forehead, sides of face	Pallor around mouth (more visible with light skin)	Ruddy or rosy complexion, including around the mouth
Hair quality	Thin and wispy. May become straw-like or straighter. Dry. Falls out easily. Sparse on forearms or lower legs.	Tendency to become sparse	Tends to be coarse, sparse, may become wavy or curly (rare) or change color. If severe enough, hair loss is common.
Nails	Thin, brittle	Break easily	May be thick
Skin Quality	Dry, Thin, Finger-prints often "smoothed out" or flat/shiny and may have longitudinal wrinkles over finger pads (probable cause is low collagen level)	May be thin, dry, bruise easily, poor healing.	May be oily or moist. Poor healing, May bruise easily. Skin thickness is normal (not thin). Typically good quality finger prints.
Fluids/Secretions	Dry skin, little secretions. Can't hold onto water.	Mixed, e.g. dry body and oily face	Good secretions. Skin may be oily. Tendency to fluid retention.
Connective Tissue Quality (ligaments, tendons, skin, hair, and nails)	Lax ligaments or flexible (e.g. flat feet, double jointed). Joint strains/sprains are common.	Mixed	Poor flexibility.

Pigment Distribution	Vitiligo (white spots or patches) in late stage. May tan too easily. In dark skin, darker on forehead, sides of face, around mouth and chin/jaw.	Milder version of vitiligo (small patches or tiny white spots on arms and/or legs) and dark patches if dark skin.	In pure hypothyroidism, vitiligo and hyperpigmentation are very rare.
Fluids/Secretions	Dry skin, little secretions. Can't hold on to water.	Mixed, e.g. and dry body and oily face	Good secretions. Skin may be oily. Tendency to fluid retention.
Light Sensitivity or Night Blindness	++	+	-
After Image (e.g. seeing the image of a flash bulb or bright light moving by longer than others)	++	+	+/-
Typical Pains	Headaches, migraines, muscles, carpal tunnel	Muscles, carpal tunnel	Occasionally joints, muscles, feet/lower legs
Temperature Pattern (see Metabolic Temperature Graph)	Thermal chameleon (hot when it's warm and cold when it's cool). Poor thermoregulation. Tends to low body temperature around 97.8 or lower. Fluctuating pattern.	Fluctuating pattern, usually averaging 97.8 but can be lower	Stable, non-fluctuating pattern, average can be from low 90's to a little below 98.6
Cold Intolerance	+++	++	+/-
Heat Intolerance	+	++	+++
Cold Hands / Feet	+++	Happens often	-
Warm Hands / Feet (in spite of low body temperature)	-	Happens occasionally	++
Sweating	May be excessive in early phase. Poor sweating in late phase.	May appear normal	Normal to increased, more oily than 'wet'
General Reactivity: Emotional, physiological, immune, etc.	Hyper-reactive (over)	Moderate	Hypo-reactive (under)
Immune Function	Tendency to over-react results in allergies, sensitivities, autoimmune problems	Mixed	Tendency to under-respond results in infections (sinus, bladder, bowel, skin, etc.)
History of EBV or Mononucleosis	+++	++	+/-

Sensitivity to medications, supplements etc. Needs small doses	++	+	-
Intuitive (3). Picks up other peoples feelings (e.g. at malls, parties).	++	+	+/-
Personality Tendency: Humor	+/-	+	++
Personality Tendency: Serious	++/+++	++	+/-
Depression (10)	+	++	+++
Anxiety(11), panic attacks, worry, fear, insecurity, feelings of impending doom (any combination). "I thought I was dying..."	+++	++	+
Obsessive Compulsive Tendency (11) (12)	++	+	+/-
Startle Easily	++	+	-
Tolerance to Change/Stress	Poor	Poor/Moderate to good	Moderate
Sleep Patterns	Tendency to one or more: Insomnia, light sleeper, waking up at 2-4 AM, unrefreshing sleep	May or may not have sleep disturbance	Tendency to one or more: Sleepiness, narcolepsy, sleep apnea, unrefreshing sleep
Mental Abilities	Poor focus, clarity, concentration, short-term memory. 'Brain fog'	Poor focus, clarity, concentration, short-term memory.	Poor focus, clarity, concentration, short-term memory. 'Slow thinking'
Energy Pattern	Complains of fatigue or exhaustion, "wired and tired", can't persevere, low motivation	Variable energy that can be good or poor.	Complains of being tired, sluggish, low motivation
Exercise Tolerance	Causes fatigue. Can't persevere. If severe, body temperature drops after exercise.	Mixed	Can't exercise much. Tires easily.
Edema (swelling), non-pitting in lower legs	-	+/-	+
Standing still is difficult or causes discomfort. Walking is easier.	+	+/-	-

Fibromyalgia / chronic fatigue	++	++	++
Orthostatic Hypotension (light-headed when getting up to stand from laying or sometimes, even sitting)	++	+/-	-
Blood Pressure	Tends to run low, e.g., from 80/50 at the low end to 110/70 at the high end	Can be low, normal or high	Ranges from normal to very high and poorly controlled by medications
Heart Palpitations ("feels like my heart was about to jump out of my chest").	++	+/-	-
Mitral Valve Murmur or Prolapse (4)	++	+	+/-
Dietary Habits	Often lean toward being vegetarian or avoids certain foods	Tends to have fewer dietary restrictions than the pure adrenal type	Tends to eat everything
Digestion	Often has difficulty digesting meat, or other proteins. Some foods troublesome (5)	May be normal or difficulty with some foods.	Poor but they often think it's good.
Bowel Function	Tendency to be irritable, or hyperactive, transit time may be too fast (food exits stomach too fast causing poor [enzymatic] digestion)	Poor/mixed	Tendency to constipation, hypoactive, slow transit time (food leaves stomach too slowly) and poor mechanical digestion.
Malabsorption	+++	++	+
Cravings	Sweets, carbohydrates, salt (any combination), black licorice	Mixed	Fats
Blood sugar. (Hypoglycemia = low blood sugar. Hyperglycemia = elevated blood sugar)	Tendency to hypoglycemia. May need many small meals or "crash"	Can range from mild hypoglycemia to hyperglycemia	Normal to hyperglycemia
Problems with menses and /or fertility (females)	++	+	+/-
Typical Findings on Blood Tests			
Blood Tests	Adrenal	Mixed (1)	Thyroid
Chem: Total cholesterol (6)	Usually low to low normal (e.g., under 160)	Mixed: Can be low, mid-range, or high	Usually over 200. Very hard to reduce.

Chem: HDL (6) (the good cholesterol)	Tends to be relatively high	Mixed: can be high, low, or midrange	Tends to be relatively low
Chem: Cholesterol/HDL ratio	Usually 3.0 or less	Can be high, low or mid-range	Usually 3.5 or more
Chem: Serum Potassium	Tends toward high normal (typically 4.0 or higher)		Tends to be under 4.0
Chem: Serum Sodium	Tends toward low normal (typically 140 or lower)		Tends to be over 140
Chem: DHEAS	Low to low normal		
Sugar levels	Tend to be low, e.g. 60's to 80's	Tend to be normal or elevated	
CO2	Tends to be at the low end (23 or less) (13)		
Chem: Testosterone	Tends to be low-normal to low		
CBC: WBC (7)	Tends to be low normal (e.g. 3.5 to 5)	Normal to low normal	Often in the mid-normal range or high end (e.g. above 7)
CBC: Platelets (7)	Tend to low normal	Normal to low normal	Normal to high normal
CBC: MCV (8) (mean corpuscular volume)	Often 93 or higher. Taking vitamin B12 regularly may normalize it.	Tends to be high or high normal. Taking B12 regularly may normalize it.	Tends to be 90 or less
CBC: RDW (9) (reticulocyte distribution of width)	Normal to high normal	Normal to high normal	Normal to high normal
Blood type	Most are type A		Often type O
Platelets	Typically under 200	Typically under 300	Typically over 300

Footnotes:

1. In working with thyroid and adrenal dysfunction, I have come to realize that most patients with low body temperatures have a mixture of low thyroid and low adrenal symptoms (also called Wilson's Syndrome).
2. Facial Pallor: A pale color, especially around the mouth. Easiest to see in light skinned individuals. In olive skinned individuals it is much harder to see. In individuals of African decent, there is a tendency to have dark pigmentation around the mouth, symmetrically on areas of the face or sides of the neck and usually over the forehead. Since wrinkles stay in the pale area, puckering the lips artificially creates wrinkles for a moment and their location identifies the

pale zone. This technique is particularly helpful in dark skinned individuals. It is also easier to see in women than men (because of the beard hair which interfere with color identification and thicken the skin to make it more resistant to wrinkles).

3. Intuition is an interesting quality of early life adrenal fatigue. The later in life the development of adrenal fatigue, the less likely one is to spontaneously develop intuitive ability. People that develop adrenal fatigue early in life are often described as empaths and will tell their friends (but not their doctor) about their ability to pick up feelings. They often suffer because of their high sensitivity and are always looking for new ways to 'ground' themselves. This problem often clears by simply supporting the adrenals and getting them to function well again. Poor adrenal function is not essential for intuitive development. Strengthening the adrenals does not weaken the intuition once it is there. Individuals that develop adrenal fatigue later in life (because of high stress, virus etc.) tend not to claim this intuitive ability. Spiritual orientation is more common in those with early adrenal fatigue. It is less common in those with later onset of adrenal fatigue and those with strong, healthy adrenals. There seems to be a personality difference (archetype) between those with strong adrenals and those with weak adrenals.
4. Mitral valve problems seem to affect women with adrenal fatigue more often than others. Body proportions tend to be smaller at the top, heavier at the bottom where the weight gain, if any, tends to take place. The tendency to valve problems may be related to connective tissue quality since it sometimes improves with connective tissue support. Hawthorn Berry seems to help. Individuals with plain hypothyroidism don't appear to have a higher incidence of valvular problems compared to the rest of the population.
5. These individuals tend to digest meat poorly because of low gastric acidity. They often think they have high acidity because of occasional heartburn or heartburn when taking digestive enzymes containing digestive acid. The problem is usually not a problem of gastritis or gastric reflux caused not by excess acid but rather, it is a problem of inadequate acid production, but *less adequate* gastric protection not making enough gastric protective secretions. This could be helped by chewing or sucking on a specific type of licorice candy called DGL or by taking some Slippery Elm or trying both. Suck or chew on it about ½ hr before the meal. It produces increased secretion of gastric (stomach) mucous protective layer. This helps to prevent irritation by the acids in the stomach.
6. In adrenal fatigue, the total cholesterol tends to run low to low-normal while the HDL tends to run high-normal to high. In hypothyroidism, the opposite tends to occur with a high-normal to high cholesterol and normal-low HDL.
7. In low metabolic energy states of adrenal origin, it is common to see WBC (White Blood Cells are the front line soldiers against infection) and Platelets (they work to initiate a clotting response in areas of vascular injury) low relative to optimal. Typically, the WBC is under 5 and the platelets are under 200. It is also important to look at relative values. For example, if one has adrenal fatigue (we expect WBC to be <5) but if the wbc is>6, we can say that in a relative sense, the WBC is elevated (it is higher than we expect). We therefore suspect that something is elevating the WBC (white blood cell count) and that this is either a low thyroid function or an infection (sinus, a cold, bowel, bladder etc.) or both. A point of interest: I think it is interesting that with adrenal fatigue, we tend to see high end fibrinogen (increases clotting) and low end platelets (these also help clotting). Thus the higher fibrinogen (chemical) and lower platelet (cellular)

balance each other out. Similarly, with immunity the antibodies tend to be high (overactive component) while the white blood cells tend to be low. Again, the (high) chemical component and (low) cellular component tend to balance each other out.

8. The MCV (mean corpuscular volume) is a measure of the size of the red blood cells. Their size tends to increase as vitamin B12 deficiency increases. Individuals with poor digestion / absorption tend to run low on vit. B12, so they tend to have larger blood cells, i.e., MCV tends to be at the high end of normal or high. This is more common in adrenal fatigue since these individuals tend to eat less meat, tend to digest it poorly if they do eat it and generally absorb poorly.
9. RDW measures the distribution or variability of the size of young red blood cells. Individuals with stable health tend to have little variability in cell size. An unstable or poor state of health generally shows up as higher variability in cell size.
10. Whenever a patient comes in with depression, I look for a suboptimal thyroid function. This is not the same as saying 'outside of the normal range'. Optimal is a zone within the 'normal' range which I've identified as the range at which I find my healthiest patients. If the thyroid function is near or at optimal and depression persists, I then look for other supports such as supporting neurotransmitter levels with the following:
    - For Serotonin (the 'calmer') support: Tryptophan or 5-Hydroxytryptophan (i.e., 5-HTP) if the patient is not on SSRI antidepressants (SSRI's can adversely interact with Tryptophan or 5HTP by promoting excessively high serotonin levels). The way I dose it is usually by starting low doses AM, mid day if needed, and evening for sleep support. I find this especially useful for obsessive compulsive disorder (OCD) if the patient is not taking prescription medications of the SSRI type. A typical dosage regimen (after gradual increase to check for any adverse responses) might look like this: AM 50mg-100mg 5-HTP; Noon 50mg-100mg 5-HTP; Bedtime or a little before, 200-300mg
    - For Dopamine and Norepinephrine (the 'stimulants') support: Tyrosine is usually the one item most needed. A typical dose might be 1-2 capsules (500mg size) in AM and 1 capsule at mid-day.
11. I find that most cases of anxiety are due to adrenal causes. The typical condition is not severe enough to be picked up with standard test which are designed only to pick up the most severe adrenal fatigue. As the individual is heading in that direction, the standard blood tests will not pick up this transition but the symptoms become quite noticeable with anxiety, cold hands or cold intolerance, poor and/or un-refreshing sleep heading the list of probable symptoms.
12. Obsessive compulsive tendency may look like a repetitive act such as washing hands too many times or going back several times to double or triple check to see the door is locked or oven turned off. As the adrenals improve and insecurity diminishes, this tendency also diminishes or clears.
13. Low CO2 is often associated with poor pancreatic production of bicarbonate. This as typically part of the poor digestion seen with adrenal fatigue. What probably happens is: adrenal fatigue -> low gastric production of hydrochloric acid (HCl) -> gastric contents when expelled from the stomach into the duodenum are not acidic enough to trigger an alkaline (bicarbonate) release from the pancreas used to neutralize the acid.

Author of adrenal/thyroid slides Rebekah Kelley

Adrenal fatigue

- Adaptogenic herbs help the body adapt to stress.
- Adaptogens improve the stress response and help the body adapt by normalising physiological processes during stressful times.
- Adaptogenic herbs are a healthy way to support energy and HPA axis function while nourishing the adrenals.
- Adaptogens achieve this by regulating homeostasis via their actions on the hypothalamic pituitary adrenal (HPA) axis. They also control vital mediators of the stress response, such as heat shock proteins and stress hormones like cortisol.
- Some adaptogens stimulate the body and enhance mental performance, while others help calm the body and soothe the adrenals. Timing is important.
- Adaptogens can also support the body's natural circadian rhythm and help promote more restful sleep.

Adaptogens

The best way to support the adrenal glands is to incorporate herbs and lifestyle changes that support a normal cortisol rhythm, healthy HPA-axis function, and healthy inflammation levels.

Adaptogens increase the body's ability to cope with both physical and mental stresses and their use, particularly in the long term, leads to increased endurance.

They act by tipping the balance in the right direction.

The same adaptogen can help sleep in the evening and, if taken in the morning, can give energy.

They support proper hormone balance and are generally safe for most people as they have little to no side effects.

Ashwagandha

Ashwagandha, aka Indian Ginseng or Withania somnifera, is an ancient plant used extensively in Ayurveda (the traditional medicine of India) for over 3,000 years.

Its traditional uses include stress; menstrual difficulties such as PMS or irregular periods; adrenal health; sleep; immunity; thyroid support; sex drive; energy; and cognitive function.

In herbalism, Ashwagandha is considered a nervine, which supports the nervous system, and an adaptogen, which helps the body adapt to physical, mental, and emotional stress. It has a calming effect reducing anxiety.

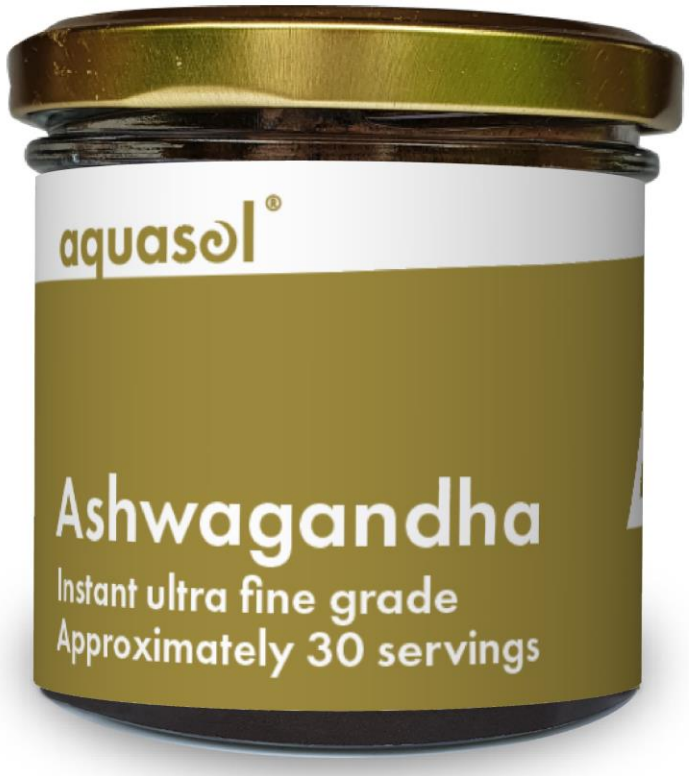
Modern science has conducted several studies on ashwagandha and identified over 50 chemical constituents, including steroidal alkaloids and lactones, collectively known as withanolides these constituents are active components that may impart specific health benefits.

Ashwagandha has been proven to support normal cortisol levels, which affects the entire endocrine/hormonal system via the HPA (hypothalamus-pituitary-adrenal)axis.

It's also been shown to support sleep via its effects on the HPA axis, which governs the cortisol awakening response.

The cortisol awakening response refers to the naturally higher levels of cortisol a healthy body should produce after a sustained period of rest.

This is again related to the HPA axis, which controls cortisol secretion with the sleep cycle/circadian rhythm and the stress response.



Siberian Ginseng

- Siberian Ginseng can help increase resistance to stress and support healthy cortisol rhythm.
- By reducing anxiety and helping with the mechanisms of stress, Siberian Ginseng fights fatigue and boosts energy.
- A study has shown that it can increase cardiovascular function, improve concentration, stabilise blood sugar levels and enhance immune function.

Other adaptogens include Schisandra, Holy Basil, Licorice (extends the life of cortisol and increases DHEA)and Rhodiola Rosea

- Not all adaptogens suit everyone

Rhodiola Rosea

- Rhodiola rosea is a herb in the rhodiola genera (Crassulaceae family)which has traditional usage as an anti-fatigue agent and adaptogen.
- Regarding fatigue, rhodiola appears to be able to significantly reduce the effects of prolonged and minor physical exhaustion that results in fatigue. This is more related to stress and the 'burnout' effect, or prolonged but low intensity physical exercise.
- Inhibits binge eating in response to stress
- Mild depression/anxiety
- Attention span
- Memory

Acute usage of rhodiola for fatigue and anti-stress has been noted to be taken in the 288-680mg range.

2-3% rosavin and 0.8-1% salidroside. Start with 100 mg once a day for a week and then increase the dosage by 100 mg every week, up to 400 mg a day

Review Article

Stress management and the role of Rhodiola rosea: a review

Ion-George Anghelescu, David Edwards, Erich Seifritz &Siegfried Kasper

Pages 242-252 | Received 27 Oct 2017, Accepted 12 Dec 2017, Published online: 11 Jan 2018

Gingko biloba

One lesser-known benefit of Gingko biloba is its ability to lower cortisol levels with studies showing it can help mitigate the rise of both blood pressure and cortisol during times of heightened stress.

Gotu Kola

Gotu kola is regarded as perhaps the most spiritual of all herbs in India. Growing in some areas of the Himalayas, Gotu kola is used by yogis to improve meditation. It is said to develop the crown chakra, the energy center at the top of the head and to balance the right and left hemispheres of the brain, which the leaf is said to resemble.

It is regarded as one of the most important rejuvenative herbs in Ayurvedic Medicine. Sri Lankans noticed that elephants, renowned for their longevity, munched on the leaves of the plant, the leaves became known as a promoter of long life.

Gotu Kola

Supports immunity

Blood tonic

Skin health

Promotes restful sleep

Combats high BP

Mild diuretic that can help shrink swollen membranes and aid in the elimination of excess fluids.

Improves healing of wounds and reduces scarring

Improves the flow of blood while strengthening the veins and capillaries.

Memory function

Neuralactin Plus

L-Theanine & Hydrolysed Casein with B Vitamins & Vitamin C

30 & 60 Capsules

Nutrition Information

2 capsule (daily intake) provide

Hydrolysed Casein	200mg
L-Theanine	100mg
Magnesium Ascorbate	100mg
Calcium Ascorbate	100mg
- providing Total Vitamin C	160mg
Vitamin B1	2.2mg
Vitamin B2	2.2mg
Vitamin B3	2.2mg
Vitamin B5	100mg
Vitamin B6	2.2mg
Vitamin B12	24µg

Children from age 5 may take 1 capsule at night

Suitable for vegetarians

Product Code:5625

30 & 60 capsules

Bioactive peptides

- Milk proteins are the only proteins synthesised by mammals to produce the primary food for newborns. Beyond their nutritional importance, these proteins and particularly caseins, are now largely recognised as a source of bioactive peptides that have been shown to play a physiological role in peripheral and central systems including the nervous system.
- These bioactive peptides can be released during digestion or manufactured in vitro by specific enzyme-mediated proteolysis (Pihlanto-Leppala, 2001; Silva and Malcata, 2005).
- Bioactive peptide found in the hydrolysate of milk protein is responsible for promoting sleep in newborns due to infant enzymes producing the peptide, but these enzymes are not present in adults

Bioactive peptides

The bioactive peptides were found to have

- Antimicrobial, anti-thrombotic, anti-hypertensive properties

(Clare et al., 2003; Rutherford and Gill, 2000; Sipola et al., 2002; Takano, 2002; Zucht et al., 1995).

- Immunoregulation

(Gill et al., 2000)

- Opioid effects

(Chiba and Yoshikawa, 1986; Meisel and FitzGerald, 2000; Teshemacher, 2003; Zioudrou et al., 1979)

Casein hydrolysate (CTH) (alpha-s1 casein hydrolysate)

- Casein hydrolysate is a unique and innovative food. By using the digestive enzyme trypsin with the milk protein casein to produce a hydrolysate (breaking it down into its constituent amino acids – pre-digested) this produces a bioactive peptide with anti-stress properties, and which lowers cortisol and aids sleep
- Useful on waking during adrenaline surge
- Casein hydrolysate does not cause a problem with lactose intolerant individuals

Reference

Effects of a Bovine Alpha S1-Casein Tryptic Hydrolysate (CTH) on Sleep Disorder in Japanese General Population

Zara de Saint-Hilaire*[,1], Michaël Messaoudi[2], Didier Desor[3] and Toshinori Kobayashi[4]

This study describes the effect of bovine alpha-S1 casein tryptic hydrolysate (CTH) in a representative sample of day-time workers from the general population of Japan with the occurrence of insomnia during the preceding six months. To investigate this issue, 32 subjects, aged between 25 and 40 years, were examined for the subjective sleep quality using the Japanese Pittsburg Sleep Quality Index (PSQI-J).

CTH

- CTH significantly improves the PSQI total score of the treated subjects. It particularly improves the sleep quality after two weeks of treatment, decreases the sleep latency and the daytime dysfunction after four weeks of treatment

- Given the anti-stress properties of CTH, it seems possible to relate the detected improvement of sleep aspects to a reduction of stress

Reference

Guesdon B, Messaoudi M, Lefranc-Millot C., Fromentin G, Tomé D, Even PC. A tryptic hydrolysate from bovine milk W_{s1}-casein improves sleep in rats subjected to chronic mild stress. Peptides 2006;27:1476-82.

CTH

Casein hydrolysates bioactive peptide has a high and selective affinity for some receptors in the brain called GABA-A receptors, stimulates the activity of Gamma-Amino Butyric Acid (GABA), a neurotransmitter known to inhibit anxiety and the stress response in the brain. (Miclo et al., 2001)

It allows regulation of the body's mechanisms of adaptation preventing stress

CTH

- The anti-stress efficacy of casein tryptic hydrolysate has been shown in reducing and regulating main side-effects of stress : mood swings, snacking, physical pains, tension, interpersonal problems, digestion, sleep, memory and concentration
- It is proven to be non-toxic and does not have undesirable side-effects

Reference

Several rigorous scientific studies on humans established proof of effectiveness in treating stress symptoms using casein hydrolysate

Messaoudi M, Lefranc-Millot C, Desor D, Demagny B, Bourdon L. Effects of a tryptic hydrolysate from bovine milk alpha(S1)-casein on hemodynamic responses in healthy human volunteers facing successive mental and physical stress situations. Eur J Nutr2005;44:128-32.

CTH

- A bovine αS1-casein tryptic hydrolysate (CTH) was demonstrated to have an anxiolytic-like activity in the conditioned defensive burying (CDB) test and the elevated plus-maze (EPM) when i.p. injected to rats (Miclo et al., 2001).
- Results obtained from both pre-clinical and clinical studies also suggest the ability of the CTH to protect individuals from the effects of different stressful situations (Guesdon et al.,Messaoudi et al., 2005).
- This peptide shows some conformational similarities with nitrazepam (Lecouvey et al., 1997).

Diazepam

Results were observed with Diazepam in accordance with numerous epidemiological and clinical studies in humans that demonstrated the implication of the benzodiazepine in the emergence of risk-taking behaviours as opposed to similar anxiolytic effects using CTH but without the non-adaptive (risk) behaviour

Benzodiazepines

The pharmacological profile of benzodiazepine-receptor agonists consists of anxiolytic, anticonvulsant, sedative and myorelaxant activities.

For long-term use of benzodiazepines tolerance to certain effects and physical dependence might develop. New agonists without these secondary effects should be of greatest pharmacological interest.

CTH

- What is considered as milk allergy is often lactose intolerance.
- Knowing that approximately 85-90% of children lose clinical reactivity to milk once they surpass 3 years of age, the adults are rarely concerned.
- CTH does not contain ß-lactoglobulin which is one of the most allergenic proteins.
- Hydrolysate can be considered as a hypoallergenic substance.

Host A. (2002) Frequency of cow's milk allergy in childhood. Ann Allergy Asthma Immunol;89(6 Suppl1):33-7.

L-theanine

- Found in tea, primarily green tea
- Able to cross blood-brain barrier -Yokogoshi et al. (1998a,b)
- Anti-stress effects
- Calming
- Counters alcohol induced loss of glutathione in the liver
- Neuroprotective
- Promotes relaxation through increase in alpha waves
- Reduces time to fall asleep
- Decreases night-time awakenings
- Focus and concentration, ability to learn and remember
- Enhances mood through production of dopamine, serotonin and GABA
- No negative side effects or drowsiness

L-theanine

- L-theanine could influence the secretion and function of neurotransmitters in the central nervous system even at 30 min after oral administration (Terashima et al., 1999)
- L-theanine binds to the glutamate receptor subtypes (AMPA, kainate, and NMDA receptors) and blocks the binding of L-glutamic acid to the glutamate receptors in cortical neurons (Kakuda et al., 2002; Nagasawa et al.,2004)
- Since there are so many neurons activated by glutamic acid in the limbic system of the brain, and because these neurons could modulate the activation of the autonomic nervous system, it is possible that results were induced by the antagonistic role of L-theanine to excitation of the glutamatergic phenotype.

L-theanine

- Several studies have reported that the oral administration of L-theanine modified the secretion of neurotransmitters, such as serotonin or dopamine (Kimura and Murata, 1986; Yokogoshi et al., 1998a,b)
- There is also a possibility that the observed reduction of acute stress responses is attributable not only to the antagonistic role to glutamatergic receptors but also to other neurotransmitter systems
- Yokogoshi H, Kobayashi M, Mochizuki M, Terashima T. Effect of theanine, r-glutamylethylamide, on brain monoamines and striatal dopamine release in conscious rats. Neurochem Res. 1998 May;23(5):667-73.
- L-theanine, a natural constituent in tea, and its effect on mental state. Nobre AC, Rao A, Owen GN. Unilever Food and Health Research Institute, Olivier van Noortlaan 120, Postbus 114, 3130 AC Vlaardingen, The Netherlands.

L-theanine

Emotional or physiological states in humans are modulated by the chemical behaviours of neurotransmitters, psychological and physiological states could also be influenced by L-theanine under stress.

Kobayashi, K., Nagato, Y., Aoi, N., Juneja, L.R., Kim, M., Yamamoto, T.Sugimoto, S., 1998. Effects of l-theanine on the release of a-brain waves in human volunteers. Nippon Nogeikagaku Kaishi 72, 153–157.

L-theanine

Reduction in the heart rate (HR) and salivary immunoglobulin A (s-IgA) responses to an acute stress task relative to the placebo control condition. Moreover, analyses of heart rate variability indicated that the reductions in HR and s-IgA were likely attributable to an attenuation of sympathetic nervous activation. Thus, it was suggested that the oral intake of L-theanine could cause anti-stress effects via the inhibition of cortical neuron excitation.

L-theanine reduces psychological and physiological stress responses Kenta Kimuraa, Makoto Ozekib, Lekh Raj Junejab and Hideki Ohiraaa Nagoya University Department of Psychology, Chikusa-ku, Nagoya, 464-8601, Japan 22 June 2006.

Green Tea

- There has been an awareness for several years that compounds in green tea increase caffeine's calorie-burning effects. L-theanine contributes to the prevention of weight gain and fat accumulation and promotes thermogenesis, it is very useful for restoring balance to systems neglected by people who are on the go.
- It helps counteract the stimulating effects of caffeine but complements caffeine's positive aspects such as fat burning.

References

Kakuda T, Nozawa A, Unno T, Okamura N, Okai O. Inhibiting effects of theanine on caffeine stimulation evaluated by EEG in the rat. Biosci Biotechnol Biochem. 2000 Feb;64(2):287-93.

Zheng G, Sayama K, Okubo T, Juneja LR, Oguni I. Anti-obesity effects of three major components of green tea, catechins and theanine, in mice. In Vivo. 2004 Jan-Feb;18(1):55-62. Psychopharmacology (Berl). 2008 Jan;195(4):569-77.

Time for tea: mood, blood pressure and cognitive performance effects of caffeine and theanine administered alone and together. Rogers PJ, Smith JE, Heatherley SV, Pleydell-Pearce CW. Department of Experimental Psychology, University of Bristol, 12a Woodland Road, Bristol, BS8 1TU, UK.

Reference

L- theanine has been shown to accelerate the digestion of acetaldehyde (a by-product of alcohol) and neutralise free radicals. It does this by increasing the level of glutathione that is normally depleted by the consumption of alcohol. Not surprisingly, a Japanese study concludes that Theanine could be effective against alcoholic liver injury

Sadzuka Y, Inoue C, Hirooka S, et al. Effects of theanine on alcohol metabolism and hepatic toxicity. Biol Pharm Bull. 2005 Sep;28(9):1702-6.

Reference

The same neurotransmitters that help us relax also regulate blood pressure in our bodies. Theanine's calming effect on our mental state is augmented by lowering blood pressure as well. (Yokogoshi et al., 1995)

Neurotoxicology. 2008 Jul;29(4):656-62.

Protective effect of the green tea component, L-theanine on environmental toxins-induced neuronal cell death.

Cho HS, Kim S, Lee SY, Park JA, Kim SJ, Chun HS.

Reference

Clin Neuropharmacol. 2007 Jan-Feb;30(1):25-38.

The deployment of intersensory selective attention: a high-density electrical mapping study of the effects of theanine.

Gomez-Ramirez M, Higgins BA, Rycroft JA, Owen GN, Mahoney J, Shpaner M, Foxe JJ.

Program in Cognitive Neuroscience, Department of Psychology, The City College of the City University of New York, New York, NY, USA.

Calcium and Magnesium

Calcium and Magnesium are important minerals which act together to regulate nerve and muscle activity.

Calcium along with magnesium helps to regulate the heartbeat, muscle tone, muscle contraction and nerve conduction

Calcium and/or magnesium imbalance will cause insomnia leading to chronic fatigue and anxiety, sleep disturbances, mental health / depressive disorders

Imbalance in stomach acid will affect both minerals

As will PPI's, tranquillisers and sedatives

Magnesium

Magnesium (muscle and nerve relaxant)

Muscle weakness, spasm

Heart arrhythmia, irregular contraction, or increased heart rate

Softening and weakening of bone

Imbalanced blood sugar levels

Headaches

Elevated blood pressure

Vitamin C

We have lost the ability to manufacture vitamin C so have a great deal in common with guinea pigs!

- Every cell and consequently all tissue, organs and sites need vitamin C.
- Vitamin C levels in the body can be a predictor of the state of our health
- Absorption of vitamin C is greater when several individual doses of vitamin C, in quantities less than one gram, are taken throughout the day rather than one mega dose

Jacob, R.A., Vitamin C. In: Modern Nutrition in Health and Disease. Ninth Edition. Edited by Maurice Shils, James Olson, Moshe Shike, and A. Catharine Ross. Baltimore: Williams & Wilkins, 1999, p. 467-482

Vitamin C

- Calcium and Magnesium Ascorbate provide a bioavailable source of Vitamin C which is important for maintaining the health of the adrenal glands.
- Ascorbate is best used buffered in combination with bioflavonoids
- Ascorbate is necessary for conversion of cholesterol into pregnenolone, one of the initial steps in cortisol, DHEA-S, and sex hormone production
- During chemical, emotional, psychological, or physiologic stress, the urinary excretion of vitamin C is increased
- A deficiency of ascorbate may create hypofunction of the adrenal cortex

Vitamin C

The nutritional and biochemical role of vitamin C is enhanced by the synergistic activity of associated food factors such as polyphenols, antioxidants, flavanols and tannins contained in Pomegranate, Plum and Blueberry

- Absorbed in upper part of SI
- Low acid for ease of absorption
- Small amounts
- With synergistic nutrients that normally accompany it in nature
- Vitamin C can only be found in nature in the presence of bioflavonoids
- Hydrolysable tannins found in Pomegranate as an example help the passage of vitamin C across the gut wall

Vitamin C

- Vitamin C is required for the production of the steroid hormones. Stress, infection and intense exercise all increase the cellular demand for vitamin C.
- Vitamin C plays an important role in the synthesis of the neurotransmitter, noradrenaline and aids the metabolism of tyrosine and thyroid hormone production. Tyrosine needs ascorbic acid to form the neurotransmitter substances dopamine and adrenaline.
- Vitamin C is required for the synthesis of carnitine, a small molecule that is essential for the transport of fat into mitochondria.
- The largest amounts of vitamin C are stored in the adrenals followed by the pituitary then the eyes. Chronic stress metabolises stored vitamin C
- Vitamin C is required with magnesium for optimal transport of iodine

Abraham GE, Brownstein D. Evidence that the administration of Vitamin C improves a defective cellular transport mechanism for iodine: A case report. The Original Internist. 2005;12(3):125-130.

Vitamin C

- Vitamin C promotes balanced lipid and sugar metabolism
- Vitamin C is a master electron donor and free radical scavenger-anti-viral, anti-oxidant.
- Vitamin C is also used to treat problems due to general inflammation from microorganisms, irritants, and/or decreased resistance
- Vitamin C aids detoxification pathways and reduces oxidative stress in the liver in Phase 1 preventing toxic damage-University Michigan Medical School
- Vitamin C is required for the synthesis of collagen, an important structural component of blood vessels, tendons, ligaments, and bone.

Vitamin C

- Vitamin C decreases stickiness of sperm, increases motility
- Low levels of vitamin C can cause DNA damage to sperm
- Vitamin C decreases platelet stickiness
- Vitamin C decreases menorrhagia
- Alcohol decreases plasma vitamin C
- Aspirin decreases vitamin C
- Smoking decreases vitamin C
- Oral contraceptives decrease vitamin C
- Nicotine and oestrogen increase copper which depletes vitamin C
- As vitamin C levels decrease histamine levels rise

Cheraskin Vitamin C Who needs it? 1993

Vitamin C

- Antioxidant
- Helps to stop or reduce hot flushes and night sweats
- Bioflavonoids relax smooth muscle and reduce inflammation
- Strengthens capillaries
- Absorption of iron
- Immune health
- Ensure adequate potassium levels within the body to support adrenal health

B Vitamins

B Vitamins support a wide range of metabolic functions in the nervous system and play a vital role in its structure as well as the formation of neurotransmitters

Essential for the healthy functioning of the nervous system, vitamin B5 is needed for the correct functioning of the adrenal glands and the production of some hormones and nerve regulating substances.

Vitamin B1, Vitamin B6 and Vitamin B12 are essential for the regulation and correct functioning of the entire nervous system including brain function.

A deficiency in any of the Vitamin B Complex vitamins can lead to feeling stressed, anxious and depressed.

Don’t forget digestive status for the liberation of nutrients-may need enzymes particularly in older people and those on acid suppressants as protein is much needed.

Nutrition Information

Recommended Daily Intake
1 capsule with each meal (3 daily)

3 capsules provide

Pineapple Concentrate (*Ananas comosus* fruit) providing 900 mUHb	325mg
Papaya Concentrate (*Carica papaya* fruit) providing 2400 mUHb	270mg
Gamma Oryzanol	300mg
Lactobacillus acidophilus CUL60 *Lactobacillus acidophilus* CUL21 *Bifidobacterium bifidum* CUL20 *Bifidobacterium lactis* CUL34	$3x10^9$ (3 billion) Viable cells

Suitable for vegetarians and vegans

Product Code:7044
30 & 90 capsules

Flower essences

Choose a flower remedy based on the emotional issue or issues at the heart of your situation. You can use a single cure or a combination of many.

We can help!

- Nutrition and Herbs for the Seven Chakras — Bionutri
- Flower Essences part 1 — Bionutri
- Flower Essences - Part 2 — Bionutri

Psychotherapy-mindfulness, CBT, breathing, talking, meditation, tai chi, yoga, massage etc.

- Mental and physical entwinement
- Effect emotions, effect physical state
- Change body's reaction and adaptation to stress
- Effect change on blood sugar reactions

Helpful for-

Addictions

Anxiety

Depression

Emotional difficulties

Family problems

Stress

Trauma

Work-related problems

Nature therapy

It consists of simply "taking in" the forest environment through all five senses and paying close attention to those.

Relaxing teas

Practitioner Support

- Website for your clients to browse www.bionutri.co.uk and a password protected practitioner page where you have access to catalogue pages and webinar listings for online registration (for webinars contact adel@bionutri.co.uk).
- CPD opportunities to join the hundreds of healthcare professionals that visit our free weekly 11-12 Wednesday webinar. A wide range of topics covered plus interactive Q and A. Extensive back catalogue of recorded CPD webinars available. Sign up at www.bionutri.co.uk/practitioner-signup-form
- We are also on Facebook/Bionutri for practitioners/Instagram and LinkedIn (Bionutri)
- Professional Product catalogue
- Technical Support by Zoom/phone or email-Sue McGarrigle ND (suem@bionutri.co.uk), Edward Joy Herbalist (ed@bionutri.co.uk), Rosie Rayner ND rosie@bionutri.co.uk
- Product training-one to one or small groups by telephone or Zoom/Teams.
- Kinesiology samples
- Samples for sensitive clients

Product sources

Practitioner/Patient

Bionutri Ltd
The Natural Dispensary

Ireland-Maria Cadogan at NT Supplies-
www.ntsuppliesireland.com

Thank you for listening

Sue McGarrigle ND DipION mBANT mGNC

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Gaia Herbs-herbal supplements for adrenal fatigue, March 30, 2023.

Dr. Will Cole, the ten best herbs to support your adrenals.

Pharma Botanica Gotu Kola.