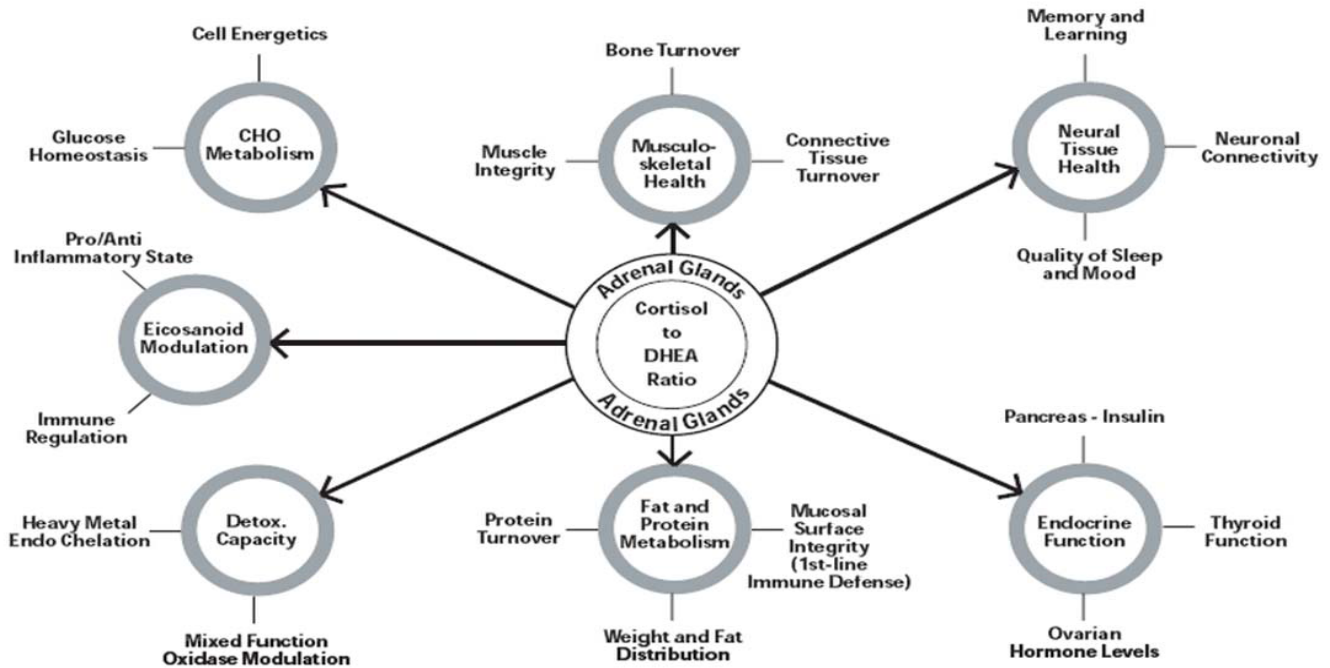


## "Adrenal Stress Screen, Hormone Testing and Adrenal Restoration

Referenced from DR. CARRIE MCMILLIN



### Screen for Signs & Symptoms of Cortisol Imbalance

#### Medical Adrenal Diseases

- Addison's disease
- Cushing's syndrome, Cushing's disease
- Sheehan's syndrome
- Nelson's syndrome

- Functional Adrenal Fatigue**
- Hypertension or hypotension
- Chronic fatigue and muscle weakness
- Nausea and vomiting
- Abnormal blood sugar
- Blotchy skin
- Weight gain
- Irritability, anxiety or depression.

### Screen for Symptoms of DHEA Imbalance

#### Low DHEA

- Depression
- Alzheimer's disease
- Colitis
- Parkinson's disease
- Lupus
- Osteoporosis
- Cardiovascular disease

#### High DHEA

- High blood pressure
- Weight gain
- Hair loss
- Fatigue
- Insomnia
- Abdominal pain
- Irregular heartbeats and heart palpitations
- Increased risk of certain kinds of Cancer

### Screen for Signs & Symptoms of IgA Imbalance

- Celiac disease
- IgA nephropathy
- GI & respiratory tract infection

## Screen for Signs of Gliadin sIgA Imbalance

Nausea

Fatigue

Joint pain

Depression

Diarrhea

### **Saliva vs. Serum vs. Urine Testing**

4 measurements of cortisol in one day between 8am and midnight [4 blood draws in one day it is certainly a bit problematic unless in the hospital for the day. So naturally saliva testing can be done at home. It is non-invasive, very simple and convenient

#### **Saliva**

- free fraction only of the hormone that is being measured whereas
- hormone that is actually in the tissues
- within 30 minutes we have them take a saliva sample, put it in a vial, they are still lying .. no anxiety- more indicative of the true state when they are waking up
- research is still a bit young on salivary testing whereas serum is very well established in the literature and current practice.
- salivary cortisol actually has been accepted by the Endocrine Society as an excellent screen test for Cushing's. salivary cortisol actually has been accepted by the Endocrine Society as an excellent screen test for Cushing's.

#### **Serum**

- total hormone levels, the free and the bound fractions.
- free fraction itself may not also represent what is in the tissue, free fraction in serum testing is usually a calculation
- **binding globulin** levels can be measured in serum only.
- anxiety about blood draws-> pumps up cortisol
- research is still a bit young on salivary testing whereas serum is very well established in the literature and current practice.

**Urine cortisol** is somewhat problematic at this time, not recommended.

### **ADRENAL STRESS INDEX PANEL by Diagnostechs [\$806/ \$848 through office, \$149 with insurance]**

**Collection Kit** = 4 vials and a cotton roll that is in each of these vials in which the saliva is collected, by saturating that cotton roll and that is placed into the vial. [vs. spits directly into the vial,

- **4 saliva cortisol** measurements → 6-8am, 11am-1pm, 4-5pm, 10pm-midnight.
- **insulin fasting and non-fasting**. Elevated cortisol is going to increase blood sugar levels → f/u with fasting blood glucose HbA1c. cortisol excess also may result in: impaired glucose tolerance, hyperglycemia, hyperinsulinemia. Preliminary screen for insulin resistance, not diagnostic.
- **DHEA + DHEA sulfate** pooled value of the two middle vials 11am-1pm and the 4-5pm.
- **17-hydroxyprogesterone**. Important precursor to cortisol
- **Total sIgA** . predominant antibody found on mucosal membranes, along the GI tract, consists of a **dimer between two IgA** + secretory components holding these molecules together. secretory component is protecting those molecules from being degraded by the enzymes in the GI tract. sIgA binds to antigens that present in the GI tract and other mucosal surfaces and work to prevent their adherence or just their admittance into the body. Often moderates the mucosal inflammatory response.

#### **Elevated sIgA**

- Auto immune disease
- Diabetes
- Gingivitis

- Apyhous ulcers
- Transiently with physicl or emotional stress
- In flammatory conditions- very elevated total SIgA it is almost certainly a patient with an inflammatory condition in the GI tract, whether it is known or not by the provider or by the patient → what could be the cause

**Depressed SIgA:**

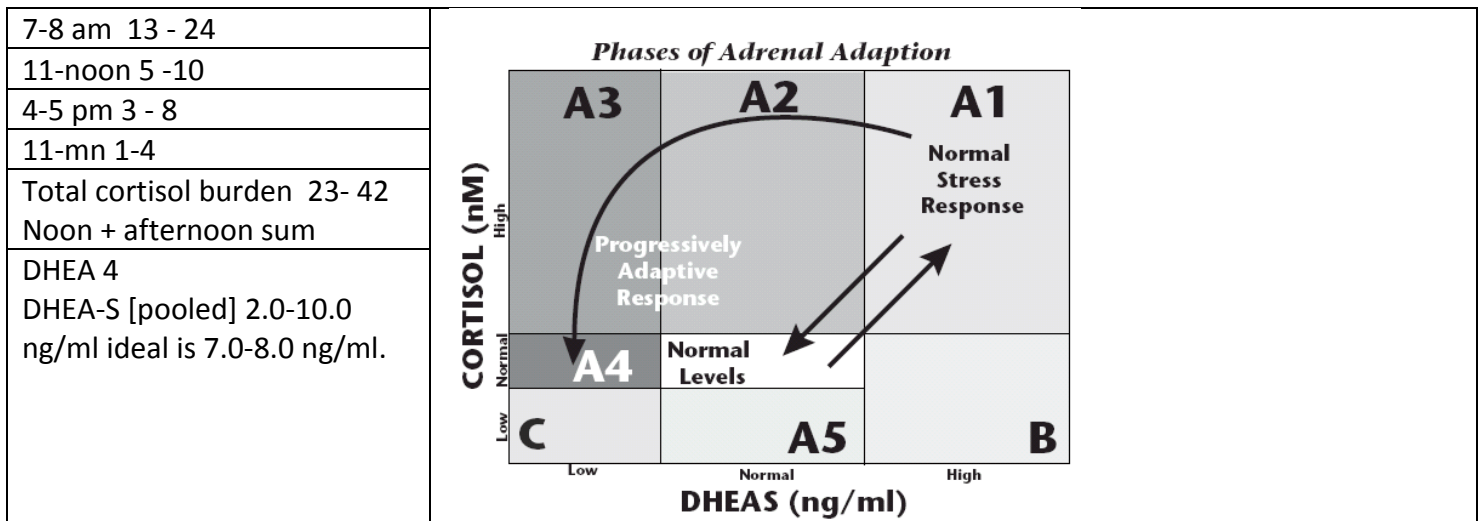
- Chronic stress
- Allergies/ food allergies
- Frequent upper respiratory tract infections
- Celiac disease has been associated with it.

**Gliadin SIgA**

SIgA like many of the immunoglobulins have a specific antigen. **Gliadin SIgA** is specific to gliadin allergy.

- Very high gliadin SIgA. Prioritize an elimination trial of gluten free for at least 2 months. Retest every 6 months to identify accidental exposure.

**Normal Cortisol curve**



**Calculating the Adrenal Adaption Phases of Adrenal Adaption and DHEA – Cortisol ZONE**

sum total of the noon + afternoon cortisol divide by 2 represents the vertical point on a graph.

The pooled DHEA-S represents the horizontal point on a graph.

- A1 ZONE / Stage 1** adapted to stress= HI CORTISOL & DHEA [OR LOW DHEA]
- A2 ZONE** adapted /stress fixation = HIGH CORTISOL + DEAH slump [failure of cortisol-hypothalamus feedback-> needs more costisol to shut down hypothalamus = STRESS FIXATION]
- A3 ZONE** maladapted phase 1 / stress fixation = HIGH CORTISOL + LOW DHEA
- A4 ZONE** = maladapted phase 2/ /stress fixation = NORMAL CORTISOL + LOW DHEA
- A5 ZONE** maladapted phase II/ stress fixation = LOW CORTISOL + NORMAL DHEA
- B ZONE** non adapted- low reserve/ stress fixation = LOW CORTISOL + HIGH DHEA
- C ZONE** adrenal fatigue and Addison’s Disease = LOW CORTISOL + LOW DHEA

## Adrenal Restoration Wellness Plan

- Identify stressors
- REST, Rest & more rest! Get to sleep by 10pm to 2am when the adrenals work the hardest to repair  
[Restorative sleep builds Kidney Essence & Qi]
- High protein diet-- 5-8 gms per serving
- Avoid caffeine
- Maintain good Glycemic control
- Minimize multi-tasking-> tremendous stress on adrenals
- Appropriate Supplements for the type of adrenal stress you have!
- Hardy breakfast
- Minimize sugar
- Increase a quality salt intake [HTN]
- Retest in 6 weeks after starting protocol**

### Low cortisol: DHEA Ratio [<5:1 to 6:1]

- Licorice
- Adrenal support
- Rx cortisol
- Lifestyle changes

### High Cortisol: DHEA Ratio [>5:1 to 6:1]

- Pregnenolone
- DHEA
- Adrenal support
- seiphos

### Total Cortisol Burden <23 or > 85 needs pregnenolone

WEEK	EXTRACT [METIGENICS]	PREGNENOLONE CAPSULE [METIGENICS]
1	3 drops 3x daily	1 [50mg] capsule daily
2	3 drops 3x daily	1 [30mg] capsule daily
3	3 drops 3x daily	1 [30mg] capsule daily
4-6	3 drops 3x daily	1 [30mg] capsule daily
7	2 drops 3x daily	1 [20mg] capsule daily
8-9	1 drop 3x daily	1 [10mg] capsule daily
10-13	none	none

- Total DHEA <7** [optimal is 7 to 8 NOT just ref range of 2-10 salivary]
  - o DHEA Max dose NTE 20mg
  - o typical 3-7 drops after breakfast and dinner
- Individual cortisols elevated**
  - o **phosphotyl serine/ serophos** 1 capsules 20- 30 min before morning 7-8am and then 11 to 12nm
- Elevated morning cortisol above 13 - 24**
  - o **phosphotyl serine/ serophos** [as above]
  - o r/o Eating high glycemic diet before bed time
  - o r/o parasites [eos >3 mono > 7]
  - o 3<sup>rd</sup> shift jobs -> reversal of circadian cycle
- Individual cortisols depressed**
  - Licorice extract or licorice Plus [Metigenics]. May not be effective when morning cortisol is < 5nM.
  - Morning cortisol is < 5nM may necessitate Hydrocortisone Dose protocol:
    - o 10 -15 mg in 6am to 7am with toast & fluids
    - o 7.5 to 10mg at 10 am to 11 am
    - o < 5mg at 3-4 pm
  - Licorice may be contraindicated with hypertension. Over dose can result in a Cushing's-like

- syndrome. Roman chamomile, black spruce essential oils have steroidal-like properties as well
- Neither licorice or hydrocortisone should be used for depressed evening cortisol- c/b insomnia

### **Other Adrenal Support**

- Support Adrenals [Biometrics] 2 in am & pm
- Support Minerals [Biometrics] 3 before bedtime
- pantotenic acid (pantheine) 100mg 3x D
- B-complex
- Vitamin C with bioflavanoids 1000mg 3x D
- Vitamin E 400 iu 1x D
- Magnesium (glycinate or aspartate) 400mg 1x D
- Zinc 25mg 1 x D with copper 1-2 mg 1x D,
- Selenium 200 mcg 1x D
- Licorice root (caution with HTN) 2xD
- Siberian ginseng & Panax ginseng 2x D (take care with the ginsengs)
- ashwaganda & astragalus root, each 2x daily

## Aromatherapy Adrenal Exhaustion Blend

- 6 drops **cedarwood Texas**
- 3 drops **grapefruit** = nourishes Kidney Essence
- 3 drops **lemon** = nourishes Kidney Essence
- 3 drops **vetiver** = nourishes Blood, Essence & Yin. Balancing sympathetic & parasympathetic
- 2 drops **cedarwood atlas** = nourishes yin, tones Kidney
- 2 drops **tuberose** = gloss the mind (or any exotic floral of choice)
- 1 drop **patchouli** = nourishes Heart & Kidney yin, Spleen & Stomach Qi
- 1 drop **black spruce** = tones Qi, Lungs & Kidney yang
- 1 drop **boswellia rivea** = activates Qi, descends Lung Qi (*rivea* ssp is less drying)
- 5 drop **Pine** = Pine benefits the lungs along with black spruce & boswellia. In TCM if one wants to tone an organ, it is beneficial to tone its mother organ. Kidney's mother is the Lung! Pine is a Wonderful addition to any 'pick me up' blend, refreshing & reviving both the physical & mental spirit. Pine can restore energy & balance. A specific for nervous exhaustion & debility... cleansing, healing & antidepressant." (Nature's Gift).

## General Adaptation Syndrome: 3 stages.

Hans Selye, an endocrinologist studied animal and human stress response, and developed a theory:

- to recognize environmental triggers so that they can be modified if possible
- to determine the extent to which adaptation to these stressors has occurred
- and then also to decide if intervention may be necessary and then to find a way to evaluate the effectiveness

### Stage 1 Alarm Reaction / A1 zone [Adaptive Responses]

Stage I generally have adequate reserves and they often feel well, But often heading to Stage II and eventually Stage III, and progressions to Zones A2 through A5 [stress fixation] when the output of DHEA falls from high to normal to low followed by the same progression for cortisol.

The level of cortisol is regulated through the HPA negative feedback. Continued demand for increased cortisol production necessitates ongoing ACTH release by the pituitary, but the adrenals can eventually experience difficulty in meeting the demand. The negative feedback of cortisol on the hypothalamus is lost as higher cortisol is required to shut down adrenal responses and bring ACTH into the normal range. DHEA continues to fall as cortisol remains elevated → see PREGNENOLONE STEAL away from DHEA and its metabolites [testosterone and the estrogens], Progesterone either remains normal or decreases, and yin qiao mai imbalance [in Chinese medicine]

- At least One Cortisol is High + Total Cortisol Sum is High + DHEA normal and increased probability of borderline, or low → depletion of adrenal stores [a kidney deficiency in Chinese medicine]
- Functional GI disturbances such as gastric ulceration / stress ulcer, malabsorption [spleen overacting on liver, stomach qi excess or deficiency; small intestines and/or yangming deficiency in Chinese medicine]
- Increased catabolism, → decreased body weight [shao yin constitution in Chinese medicine]
- Atrophy of the thymus gland and lymph nodes → increased susceptibility to colds and flu [wei qi deficiency and/or exterior deficiency in Chinese medicine]

### 2. Stage of Resistance/ transition / Stress Fixation

Continuing stress → accumulation of the secretory granules of these hormones in the adrenal gland.

The Transition from Increased to Decreased Cortisol Output, and general normalization of overall health status by the stressors as they come up. This is because Pregnenolone steal from the DHEA/sex hormone pathway to the progesterone/cortisol pathway is maintaining normalcy overall. BUT DO NOT INTERPRET AS NORMAL because the body is becoming less RESPONSIVE, and more imbalanced: continuing decline in cortisol output [from levels above normal] despite high or increased ACTH stimulation eventual low estrogen, testo.

- low or borderline-low morning, noon, or afternoon cortisol level + normal nighttime cortisol level + normal total cortisol
- DHEA is Borderline , with inc probability of Low
- inc anterior pituitary output of ACTH
- inc adrenocortical stimulation
- inc probability of pregnenolone steal
- increase in body weight [opposite of stage 1]
- decreased gastric ulceration but not necessarily functional I complaints

### 3. Stage of Exhaustion / Zone C

end stage In which we will see a depletion of the granules that contain the adrenal hormones → decreased resistance to stress. Endocrine and autonomic pathways, through endogenous and/or exogenous stress, have been conditioned by a complex of stimuli to respond beyond normal physiological ranges. The production of cortisol and DHEA falls into the zone labeled "C" hypothalamicpituitary-adrenal axis "crash," essential neuroendocrine feedback loops are endogenously unable to return the system to homeostasis.

- Most Cortisols are Low or Borderline Low with inc probability of that nighttime cortisol is low now
- + low Total is Cortisol Low
- DHEA is Borderline Low and inc probability of Low
- inc anterior pituitary output of ACTH
- inc adrenocortical stimulation
- pregnenolone steal
- Premature aging
- Severe imbalances in other hormone Systems
- cardiovascular failure is a high probability
- Symptoms of Adrenal fatigue [functional problem]
- ADDISONS [medical problem/ emergency in which the adrenals are unable to produce stress hormones]

**Maladaptative Stress Syndrome [MSS 0,1,2, and 3: MSS-0, MSS-1, MSS-2, MSS-3.]**

more modern THEORY – a modification of the General Adaptation theory.

**MSS-0**

- well-adapted stress response.
- vary between HYPO vigilance and HYPER vigilance.
- as long as RESPONSE is fairly appropriate we don't see any sort of pathology.
- level of vigilance, THAT IS properly regulated by epinephrine and cortisol, WHICH MAY BE high or low but it is generally appropriate.

**MSS-1**

- correlates with the alarm phase
- acute excess release of cortisol and epinephrine
- considered maladaptive if this response is not appropriate → excess release due to an extreme stressor, BUT not generally considered to be too pathologic.

**MSS-2 /** considered a suppression phase.

- Chronically elevated cortisol → increased epinephrine/ NE \_\_\_> somewhat suppressed immune & inflammatory response → susceptibility to infections: mycotic or fungal infections, depression, OCD, PANIC DISORDERS, GASTRITIS, ANOREXIA.
- Adrenal androgens are often BUT NOT ALWAYS elevated

**MSS-3 /** exhaustion phase,

- has been in MSS-2 for probably a period of time
- GLUCOCORTICOID DEFICIENCY [CORTISOL AND ADRENAL ANDROGENS]
- MINERAL CORTICOID DEFICIENCY [ALDOSTERONE,]
- Epinephrine episodically / sporadically increased with associated s/s: