healthpath

ADRENAL STRESS

PROCESS OVERVIEW

We evaluated **your symptoms**

+

We looked at **your cortisol and DHEA values**

+

We analysed **your cortisol:DHEA ratio**

WHAT YOU GET FROM US

Your bespoke supplement package

The Healthpath plate

The Healthpath fundamentals of health programme

Sleep

Activity

Stress

Diet

ADRENAL STRESS

TEST REPORT

Thank you for taking the Adrenal Stress Test. We're delighted to provide your personalised report.

The report is divided into three sections:

I. **Scientific overview**
The first section gives a brief overview of the stress response system, along with the two hormones we've tested: cortisol and DHEA. We know not everyone likes science as much as we do, but these simple explanations can help you to better understand your results.

II. **Your results**
This includes a measurement of your cortisol production and DHEA production, and the ratio between the two. All of these give us useful insight into your stress response.

III. **Recommendations**
The third and final section of your report delves deeper in to why you have these particular results, and gives some personalised recommendations. It's all very well knowing you have high or low cortisol, but an important part of this process is understanding why it's happening—and what you can do about it.

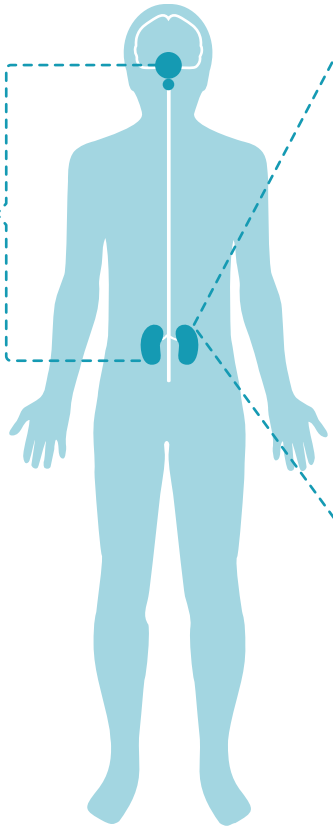
I. SCIENTIFIC OVERVIEW

Your body strives to be in a constant state of balance, otherwise known as 'homeostasis'. In simple terms, stress is anything (real or imagined) that threatens this homeostasis.

The HPA axis

The hypothalamic-pituitary-adrenal axis, or HPA axis, connects your brain with the rest of your body. Through a complex series of messages, it plays a key role in managing the stress response.

Whether you've been through trauma or are simply drinking too much coffee, your HPA axis is involved to make sure that levels of certain hormones and other bodily functions are appropriate for the situation.



Cortisol

This is one of the main hormones involved in the HPA axis. It's produced in the adrenal glands and is important for many bodily processes, including growth, immune function, cognition, behavior and reproduction.
The correct regulation of cortisol levels is therefore necessary for survival—too little or too much cortisol can result in poor health.

Not only does cortisol have its own daily pattern, but it should also rise and fall quickly in response to stressful events or circumstances. If a person is too stressed too often, this response can start to malfunction.

DHEA

This is another hormone produced in the adrenal glands, as well as a few other places. It follows a similar daily pattern to cortisol.

It can be converted into the hormones oestrogen and testosterone depending on the body's needs, and it also plays a role in heart health, muscle strength and immune function. It's believed to 'balance' cortisol.

II. YOUR RESULTS

Cortisol Production

When looking at cortisol levels in the saliva, we're considering two things:

1. Your circadian rhythm

Do you have a normal pattern to your cortisol production (i.e. is it highest in the morning and lowest in the evening)?

DYSREGULATED

2. Total production

Do you produce an appropriate amount of cortisol over the course of a day?

LOW

What do your results mean?

While low cortisol can indicate 'burnout', we really need to look deeper—what has caused this wear and tear on our physiology?

The latest research suggests two key theories:

Infection

Cortisol can reduce the activity of the immune system. If a person has an ongoing (possibly silent) infection, it's possible that the body has purposefully reduced cortisol production in order to let the immune system fight the infection.

In this way, low cortisol is an adaptive response—the body is doing exactly what it should be doing at that point in time. If this is the case in your situation, we need to consider your health history, particularly when it comes to infections. Have you ever suffered from glandular fever, for example?

Self-regulation

Cortisol is a potent hormone, and it can cause wear and tear on the body. If a person has been under too much stress for too long, the body may 'overadapt' to cortisol in order to protect itself. This can happen in several ways, from increasing cortisol output to reducing the sensitivity of cortisol receptors on cells (much like the insulin resistance that's seen in diabetes).

In this case, supporting the cell membrane (where some of these cortisol receptors are found) and focusing on deep restorative practices such as meditation, yoga and tai chi may be beneficial. Cultivating positive emotional states—joy, laughter and gratitude—can be extremely powerful. Adaptogens such as rhodiola and ashwagandha may be helpful too.

DHEA Production	LOW

What do your results mean?

Decreased DHEA levels are seen in thyroid disorders, cardiovascular disease, obesity, reduced immunity and rheumatologic diseases. It's also seen when a person produces too much cortisol, or if they're taking glucocorticosteroid medications.

Low DHEA levels may also indicate lowered capacity to endure physiological or psychological stress/trauma/injury. It can accompany an abnormal immune response, and is often associated with autoimmunity.

Cortisol:DHEA Ratio	LOW

What do your results mean?

The cortisol:DHEA ratio can be more useful than individual cortisol or DHEA figures.

This is because DHEA and cortisol are believed to balance each other. If a person has high DHEA, this could lead to a relative cortisol deficiency. If a person has low DHEA, this can result in a relative cortisol excess.

LOW cortisol:DHEA ratio

This can be seen in chronic fatigue syndrome, while a high cortisol:DHEA ratio is often seen in depression.

III. RECOMMENDATIONS

Based on your results, we recommend the following:

- Follow the Healthpath plate. This encourages a way of eating that's based on natural, whole and nourishing foods.
- Identify the sources of stress in your life. We can't transform our lives overnight, but we can make small, incremental changes for the better. Whether it's an overbearing boss, money worries or even a busy social calendar, work out what needs to give—and take action to address it.
- Find a stress-reducing practice you enjoy. This complements the above point. Try yoga, download the Headspace app or simply take a 15-minute walk in a natural setting.
- Prioritise sleep. Most people need 7–8 hours of undisturbed sleep each night. Start by going to bed just 15 minutes earlier, and work up from there.
- Make joy a feature of your day. What makes you happy? Is it chatting to friends, cooking new food, or simply reading a good book? Whatever it is, dedicate at least 20 minutes to a joyful activity each day.
- Consider investigating infections. This is particularly relevant if you've ever suffered from IBS or glandular fever. You may wish to speak to Healthpath practitioner to explore the best test for you.

  It's also important to appreciate that adrenal dysfunction doesn't spontaneously develop. The root cause needs investigation, which is why we recommend you consider your stressors, possible underlying infections and/or suboptimal gut health.

Take the following supplements:

PRODUCT NAME	DOSE	HOW TO TAKE	DURATION
Optimal Adrenal by Seeking Health	3 capsules	Take after breakfast. If needed, take an additional 1–3 capsules after lunch.	6–8 weeks

This supplement is available in the **Healthpath Energy Uplift supplement bundle.**

Disclaimer: if you're pregnant, breastfeeding, taking medications or suffering from a disease or medical condition, please consult your doctor before following these recommendations.

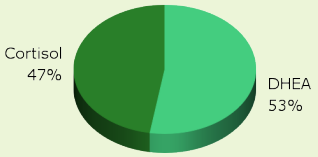
ANNEX
Original Test Report

ADRENAL FUNCTION PROFILE

Cortisol 1	Cortisol 2	Cortisol 3	Cortisol 4	Cortisol 5
6.5 nmol/L	22.0 nmol/L	12.2 nmol/L	4.3 nmol/L	1.0 nmol/L
NORMAL RANGE 3.0 — 16.0	NORMAL RANGE 9.0 — 26.0	NORMAL RANGE 5.0 — 19.0	NORMAL RANGE 3.0 — 9.0	NORMAL RANGE 0.5 — 4.0

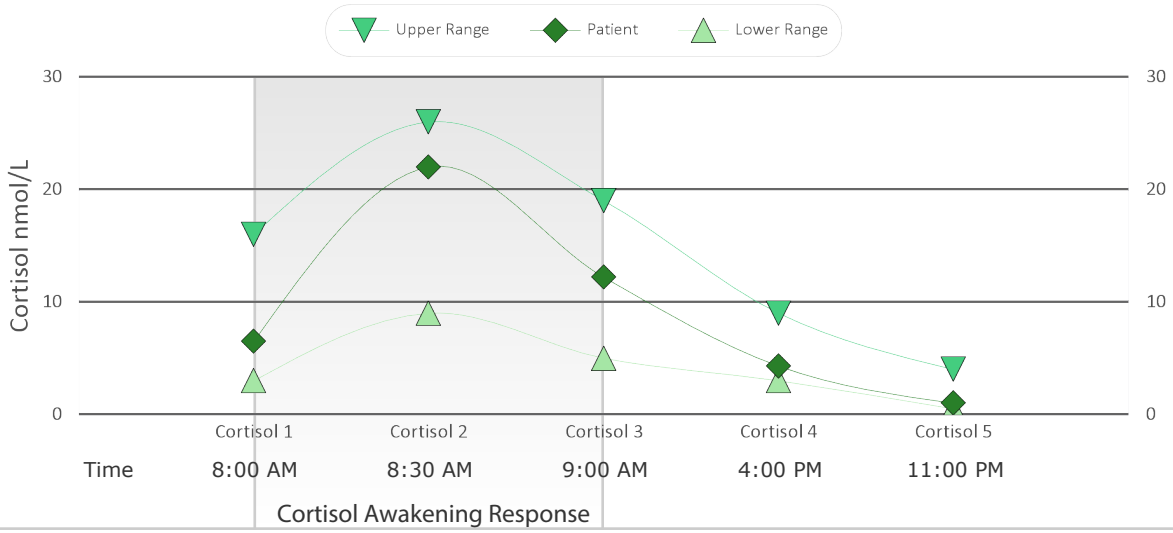
DHEA am	DHEA pm	Cortisol Daily Total	Cortisol DHEA Ratio
0.92 nmol/L	0.43 nmol/L	46.0	30.0
NORMAL RANGE 0.23 — 1.38	NORMAL RANGE 0.13 — 0.69	NORMAL RANGE 20.5 — 74.0	NORMAL RANGE 30.0 — 50.0

Cortisol : DHEA Balance



Optimal 50:50

Cortisol Diurnal Rhythm



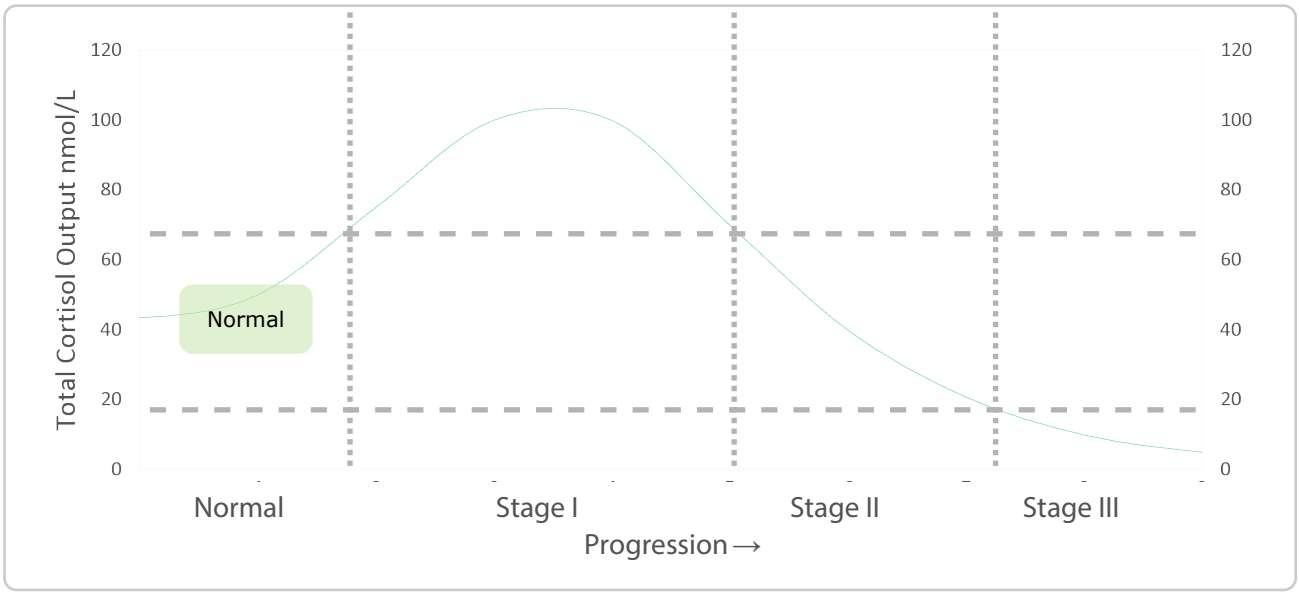
Method: ELISA Test Type: Saliva Report Printed: 14/01/2019 17:34

This test was performed using CE marked analysis kits approved for diagnostic use

STRESS EVALUATION

In the hypothalamic-pituitary-adrenal control loop (HPA axis), an increase in ACTH output from the pituitary gland stimulates the adrenal glands to release stress hormones including cortisol. The level of cortisol is regulated through the HPA negative feedback loop. Continued demand for increased cortisol production necessitates ongoing ACTH release by the pituitary, but the adrenals can eventually experience difficulty in meeting the demand.

This diagram illustrates the common pattern of cortisol through the stages of adrenal dysfunction. The total cortisol sum is shown to rise then fall as the stages of dysfunction progress left to right. NB. This should not be confused with Addison's disease



Adrenal Response: Normal

Normal or optimal adrenal function is achieved when both cortisol and DHEA levels are within the optimal range and the ratio of cortisol to DHEA is in proper balance. Measurement of this ratio is the best way to both evaluate adrenal function and determine the effects that stress is having on overall health. When cortisol and DHEA are in the correct ratio, the HPA axis is functioning optimally.

Cortisol

Cortisol is an important component of the stress response, where it protects the body through its role in enhancing vascular activity, suspending nonessential functions, inhibiting the inflammatory process, suppressingthe immune system, inhibitingthe actions of insulin, and increasing energy availability. Cortisol is the main glucocorticoidin humans and is produced in the zona fasciculata of the adrenal cortex. 90 % of the circulating cortisol are bound to carrier proteins and only 1–3 % are unbound. Only the latter part represents the active form of cortisol. In saliva only, this free cortisol fraction is present. The level of free cortisol regulates mainly its secretion in the adrenal cortex in a negative feedback mechanism via CRH (corticotrophin releasing hormone) in the hypothalamicregion and the ACTH in the pituitary gland, but it is also affected by different situations above all by stress. In humans there is a physiologicalfluctuation of cortisol achieving the highest level in the morning and the lowest during midnight. This fluctuation of cortisol plasma level is reflected in saliva normally with a peak within the first 60 minutes after wake up. Because of the diurnal fluctuation of cortisol levels, it is necessary to take several samples for an individual cortisol profile.

Cortisol Awakening Response

Cortisol 1 = 6.5 Cortisol 2 = 22.0 Cortisol 3 = 12.2 (nmol/L)

In this profile, Sample 2 (Post awakening) cortisol level is within the reference range.
Cortisol levels are generally high in the morning as we wake from a prolonged period of sleep, with an increase of up to 50% in the 20 to 30 minutes after waking. This is known as the 'cortisol awakening response'. This peak morning cortisol maybe a useful indicator of adrenal gland function.
Morning cortisol levels within reference range are suggestive of normal adrenal function with regard to peak circadian activity.

Afternoon Response

Cortisol 4 = 4.3 (nmol/L)

Sample 4 cortisol level is within the reference range. Afternoon cortisol levels may be a good indication of the adrenal glands' ability to help regulate blood sugar, since they represent a postprandial sample. Afternoon levels within the reference range suggest normal adrenal function, especially in the area of glycaemic control.

Prior to Sleep Levels

Cortisol 5 = 1.0 (nmol/L)

Sample 5 cortisol level is within the reference range. Late-night cortisol levels may be a good indication of baseline adrenal gland function since they typically represent the lowest level during the day. Normal late-night cortisol levels suggest normal adrenal function with regard to baseline circadian activity.

DHEA

DHEA (Dehydroepiandrosterone) and its sulphate ester DHEA-S, as C-19 steroid hormones they represent the most important adrenal androgens. They are almost exclusively (96 %) produced in the adrenal cortex, additionally, they are also produced in the gonads and in the brain. Due to quantity produced, they can be considered as the main products of human steroid biosynthesis. DHEA-S circulates in blood in 20-fold higher concentrations than any other hormone. The concentration of DHEA-S exceeds the DHEA levels by approximately 300 to 500 times. It serves as a kind of repository form of DHEA. The conversion of DHEA-S into DHEA takes place very quickly and in almost all body tissues as the corresponding enzymes are available ubiquitously. While the hydrophilic DHEA-S represents the inactive pre-hormone, the lipophilic DHEA can be reabsorbed by the cells of the peripheral tissues, converted into androgens and oestrogen's and then released into circulation. Only free, non-protein-bound, DHEA can enter the cells and be converted. This is also the case for saliva, where only the free active hormone is found. Therefore, the concentration of biologically active DHEA can be measured easily and directly in saliva. The concentration of DHEA in saliva is only around 3.5% of those in sera. The normal DHEA concentration changes significantly with age: In adults, peak concentrations of DHEA within an individual are expected to be achieved between the 25th and the 39th year, followed by a slow but continuous decline until a low value around the 50th year. This age-related decline of DHEA secretion is known as “Adrenopause” and is the result of a reduction of the production of DHEA in the adrenal cortex. Due to the ubiquitous occurrence of DHEA, its determination is useful in many fields of medicine and in research. DHEA is an important stress marker in the fields of psychology and sports medicine.

DHEA am = 0.920 DHEA pm = 0.431 (nmol/L)

DHEA is within the reference range. Proper levels contribute to the ideal metabolism of proteins, carbohydrates and fats, including efficient glycaemic control.

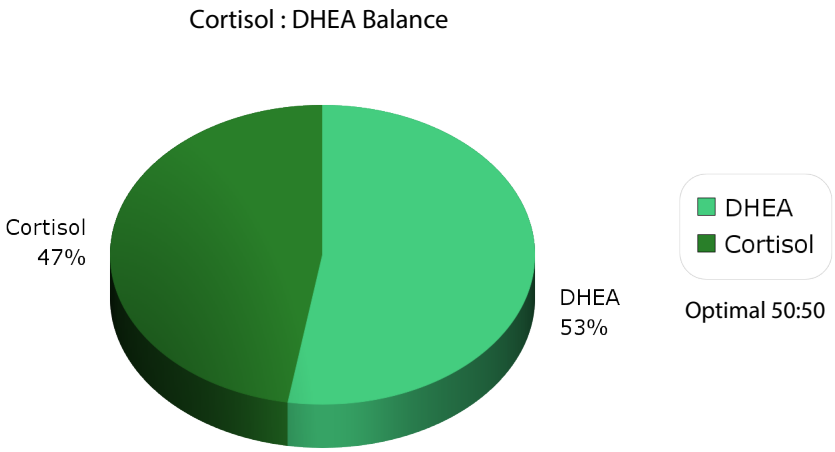
CORTISOL : DHEA RATIO

When cortisol and DHEA are in the correct ratio—determinable by lab testing—the negative effects of high cortisol/low DHEA are avoided.

Cortisol DHEA Ratio

30.0

NORMAL RANGE
30.0 — 50.0



The cortisol to DHEA ratio is believed to be very important to health, numerous functions in the body are deficient without the correct balance. Cortisol and DHEA are both powerful adrenal hormones that have a variety of physiological functions and are both synthesised from pregnenelone, the master steroidal hormone, which is derived from cholesterol. In many ways, the Cortisol to DHEA ratio modulates biological energy output, and their effects are felt at the cellular level all over the body.

The ratio of DHEA to cortisol is normal. This ratio indicates a relative balance of the adrenal output of androgens and cortisol. Both of the hormones are released in response to ACTH from the pituitary and a normal ratio indicates a balanced function of the hypothalamic-pituitary-adrenal axis.

SYMPTOMS OF HIGH CORTISOL LEVELS	SYMPTOMS OF ADRENAL INSUFFICIENCY (LOW CORTISOL LEVELS)
Wired or fatigued High blood pressure Hyperglycaemia Worsening memory and concentration Difficulty sleeping (insomnia) Decreased sex drive Erectile dysfunction Weight gain and obesity Weakened immune response Increased gut permeability (leaky gut) Food intolerance	Fatigue Worsening memory and concentration Difficulty sleeping (insomnia) Sugar and salt cravings Decreased sex drive Depressed mood Weight gain Bone and muscle loss Anxiety Irritability

Adrenal Glands and Their Essential Bodily Functions