Last Name, First Name:	Mrs.Test				
Gender:	female	**Date of birth:**	19.10.1996	**Received at lab.:**	31.01.2018
ID number:	125760	**Specimen collection:**	24.01.2018	**Date of result:**	05.02.2018

NEUROSPOT PLUS

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Hanko Medico **0003243**

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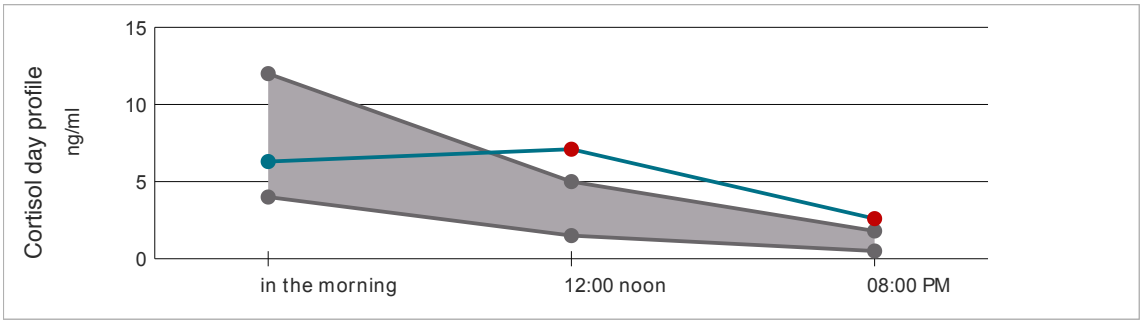
RESULTS

▼ Result ■ Reference range ■ Outside of reference range

Tested parameter	RESULT	Reference range	Unit	Assessment	Preliminary finding
Serotonin	220	100 - 225	µg/g creatinine	normal	not available
GABA	2.9	1,5 - 8,0	µmol/g creatinine	normal	not available
Glutamate	21.8	8 - 30	µmol/g creatinine	normal	not available
Creatinine	35.6	-	mg/dl	Reference value	not available
Catecholamines					
Dopamine	**321**	125 - 250	µg/g creatinine	elevated	not available
Noradrenaline	33	25 - 55	µg/g creatinine	normal	not available
Adrenaline	9.3	3 - 12	µg/g creatinine	normal	not available
NADR/ADR quot.	3.5	3 - 7	-	normal	not available
Cortisol diurnal profile					
Cortisol (morning)	6.3	4,0 - 12,0	ng/ml	normal	not available
Cortisol (12 noon)	**7.1**	1,5 - 5,0	ng/ml	elevated	not available
Cortisol (8 p.m.)	**2.6**	0,5 - 1,8	ng/ml	elevated	not available
DHEA diurnal profile					
DHEA (morning)	**522.9**	83 -496	pg/ml	elevated	not available
DHEA (8 p.m.)	81.1	36 - 216	pg/ml	normal	not available



OVERALL ASSESSMENT / OPINION ON MEDICAL HISTRORY

Clinical information:

Clinical conditions:

Not specified

Symptoms:

Tightness Across the Chest, Nausea, Flatulence, Belching, Gastrointestinal Problems, Fatigue, Anxiety States, Concentration Problems

Medication:

Not specified

With the present results, there is an increased dopamine concentration. During the first stage, dopamine has a stimulating effect, increases concentration, drive, motivation and cognitive capacities and is also responsible for the so-called flow experience. In the next stage, it leads to an inability to rest and regenerate, which in turn leads to daytime drowsiness and concentration issues and can cause digestive issues, sleep disorders, restlessness and psychological illness.

Furthermore, the diurnal cortisol curve shows a significant increase in cortisol as midday approaches, which indicates stress between morning and midday. In the evening, the cortisol level is still distinctly above the reference range. In the full presentation, elevated cortisol levels can lead to symptoms such as sleep disorders, jumpiness, metabolic disorders with excess weight, increased abdominal fat, elevated cholesterol levels, elevated blood pressure and susceptibility to infection.

DHEA is a direct cortisol antagonist and helps balance the stress reactions triggered by cortisol. Thus, DHEA can help increase stress resistance. A surplus of DHEA causes no negative symptoms and therefore does not require therapeutic consequences.

Further diagnostic approaches

Basically, the following differential diagnostic starting points arise in cases of a neurotransmitter imbalance:

Certain micronutrients and amino acids are indispensable cofactors for neurotransmitter synthesis. Likewise, stress often leads to gastrointestinal dysfunction. Thus, a neurotransmitter deficiency may be a result of nutrient absorption disorders. This is how intestinal health plays a central role in any stress and neurotransmitter imbalance therapy. Especially where intestinal issues are present in cases of reduced neurotransmitter levels, intestinal repair should be considered (see also: Therapeutic Orientation Aid, Intestinal Repair).

Indication	Diagnostics	Medium	Parameters	Procedure
IgG food allergy / chronic inflammation	ImuPro Complete	Serum	specific IgG antibodies against foods	ELISA
Histamine intolerance	HIT	Serum	Diamine oxidase concentration	ELISA

The correlations depicted above are not tailored to any present results and apply generally. According to individual results as well as the patient's symptoms, it is at the discretion of the treating therapist to decide which of the options mentioned above may be the next advisable step.

EXPLANATION OF PARAMETERS

Catecholamines (dopamine, noradrenaline, adrenaline)

In case of stress (any type of physical or psychological stress), catecholamines are released immediately as normal reaction of the body. For a short period of time, they enable the body to react to the increased demands posed by the stressors. The body is put into the so-called "fight-or-flight" mode. Thus attention is increased, blood pressure and pulse are elevated, the ability to react quickly and make snap decisions is increased. On the other hand, those bodily functions that are not absolutely necessary at the moment are being put on the back burner. Those include, among other things, the decision making, digestion, sexual activity, sleep and the like.

If the body can sufficiently recuperate thereafter, this is a perfectly healthy way to deal with normal stresses. However, if continuous stress occurs in which the body is not given sufficient recuperation, the stress becomes chronic which can lead to a variety of symptoms.

In order to produce all three catecholamines, the body requires the amino acid tyrosine as well as the essential amino acid phenylalanine (which can only be obtained from foods). These amino acids are used to synthesise dopamine, noradrenaline and adrenaline. Vitamin C, vitamin B6, vitamin B12, copper, magnesium and folic acid are required as co-factors in this process.

Food sources that provide sufficient amount of the necessary amino acids are poultry, eggs, meat, fish, legumes, nuts, and seeds. Only if you tolerate milk well, milk products are also a good source of protein.

Vitamin C is contained, in particular, in citrus fruit, strawberries, kiwis, guava, black currants, papaya, fennel, broccoli, bell peppers, and Brussels sprouts.

Particularly high amounts of vitamin B6 are contained in the following foodstuffs: Whole grain products, potatoes, bananas, legumes (e. g. soy beans, lentils), avocados, carrots, Brussels sprouts, sunflower seeds, walnuts, liver, meat and fish.

Particularly high amounts of vitamin B12 are contained in the following foodstuffs: liver, kidneys, saltwater fish (in particular tuna, herring, and mackerel), salmon, seafood, meat, and eggs. Only if you tolerate them well, milk products and cheese (in particular Gouda, Edam, Camembert) are a good source of vitamin B12.

A high copper content exists, in particular, in calf and beef liver, amaranth, quinoa, millet, prawns, oysters, legumes, nuts and seeds (in particular in pumpkin seeds and cashew nuts).

A considerable amount of magnesium is also contained in amaranth, quinoa, legumes, as well as nuts and seeds.

Liver, legumes, nuts and seeds also contain a lot of folic acid. Furthermore, endive, parsley, cauliflower, broccoli, Brussels sprouts, kale and leeks are good sources of folic acid.

Your dopamine level is elevated

Dopamine

Dopamine is one of the most important messenger substances in the brain. Dopamine acts mostly in a stimulating manner. It is particularly essential for coordination, motor functions, memory and learning as well as for concentration and mental performance. In addition, together with serotonin, it has a mood-lifting effect and regulates the so-called reward system and therefore drive and motivation. The well-functioning interaction between these two neurotransmitters is extremely important.

Excess dopamine

In acute stress, dopamine secretion is increased. Elevated dopamine can reduce the ability to recuperate and regenerate, resulting in daytime fatigue and difficulty concentrating. Additional potential symptoms are: Digestive problems, difficulty sleeping, restlessness, and mental disorders (schizophrenia).

Elevated dopamine can be caused by acute stress or the beginning of chronic stress. Taking drugs can also lead to an elevated dopamine level.

Creatinine

The creatinine measurement is a necessary reference value in the laboratory analysis of various parameters and is of no diagnostic significance in these findings. Inference of a potential dysfunction is not possible from this.

DHEA

The hormone DHEA is made from cholesterol, mainly in the adrenal gland.
The production of DHEA decreases continually as we age, from age 25 on. The lowered DHEA level is responsible for a number of degenerative processes in the body. That is why the DHEA level can be used so well to determine the biological age of a human. Not only that, DHEA is also the precursor for the sex hormones testosterone and oestrogen.
DHEA has a short half-life period of only about 10 to 15 minutes. For this reason it is mainly only detected in the storage form DHEA-S, which is turned into DHEA when needed.

DHEA is a direct counteragent to cortisol and balances the stress reaction caused by cortisol and thus helps in dealing with stress. It has a muscle formation enhancing effect and increases HDL cholesterol which reduces the fat deposits in the vessels. This way, it counteracts an atherosclerosis. DHEA has an anti-inflammatory effect and activates the immune system.

Your DHEA level is elevated

Excess DHEA:

An excess of DHEA does not have any negative symptoms and therefore does not require any therapeutic treatment.

Cortisol

Cortisol, also called the "stress hormone", generally effects the body's adaptation to stimuli. It is secreted in response to stress and plays an important role in the complex regulation of other messenger substances involved in coping with stress. Its varied effects include increased metabolism and blood glucose for energy production, controlling the distribution of fat in the body (accumulation of fat in the abdominal region), increased appetite, lowered sensitivity to pain, altered emotional sensitivity, inhibition of growth processes, decreased immunity and inhibition of inflammation. On the other hand, in case of a continuously high cortisol level, inflammatory activity in the body can be increased.

The production of cortisol from cholesterol takes place in the cortex of the suprarenal gland and is subject to a circadian rhythm. While sleeping, during the second half of the night, the body produces the most cortisol, so that in the morning, shortly after getting up, the cortisol level is at its highest. It quickly drops by the early afternoon and then slowly drops further until the late evening. During the course of the second half of the night it increases again greatly. Within this basic rhythm, the level of cortisol rises briefly and slightly in case of acute stresses during the day.
However, in case of chronic stress, this rhythm can go haywire. Therefore, the deviations of the level of cortisol from their normal course are a good indicator of the current stress load.
In acute stress situations, the morning-time outpouring of cortisol increases and normalises in the course of the day. In the case of continuous stress, the entire daily curve shifts upward, meaning that the cortisol level is elevated permanently. If the stress load remains and turns into chronic stress, the daily rhythm may become "chaotic", meaning that the level of cortisol moves outside of the normal values for the time of day. If the chronic stress persists even longer, then, at some point, the production of cortisol ceases and cortisol level drops below the normal level. Lowered cortisol values are being measured in, for example cases of burnout syndrome.

People who exercise regularly have a lower level of cortisol than those who do not exercise. This is also true during acute stress: short term spikes in cortisol are less pronounced in individuals who exercise regularly. In the elderly, the body’s stress reaction is also much more pronounced.

Your cortisol level is elevated from lunchtime on

Excess cortisol:
An elevated cortisol level leads to symptoms such as difficulty sleeping, tenseness, metabolic disorders with weight gain, increased abdominal fat, elevated cholesterol values, hypertension, and susceptibility to infection.

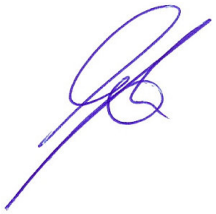
Acute stress and the beginnings of chronic stress can be the cause for elevated cortisol.

PARAMETERS OF NEUROSPOT
FUNCTIONS AND SYMPTOMS AT A GLANCE

Parameters	Responsible for	Symptoms at elevated level	Symptoms at diminished level
Serotonin	Mood Appetite Sleep	Rarely - except within the context of medication and serotonin syndrome	Depression Anxiety Sleeping difficulty Excessive appetite Headache Hot flashes Obsessive compulsive disorders
Dopamine	Good mood Joy and feeling well Satisfaction Voluntary muscle coordination Digestion Memory	Dyspepsia Developmental delay Attention disorders / concentration difficulty Mental disorders Autisms	Addiction problems Food craving attacks Motor disorders Restless legs syndrome Parkinson´s Disease
Noradrenaline	Attention / focus Alertness Emotional stability Emotional memory Endocrine function	Anxiety Hyperactivity Hypertension Post-traumatic stress disorder ADHD	Lack of energy Concentration difficulty Loss of motivation Abjection Impaired sensitivity to pain
Adrenaline	Energy Motivation Concentration States of agitation	Sleeping difficulty Anxiety Attention disorders	Fatigue / exhaustion Problems concentration Difficulties in losing weight
GABA	Rest and relaxation Learning Memory	Counter-regulation of increased excitatory neurotransmitters while under anaesthesia/tranquilizers	Uncontrolled fear Hyperactivity Sleeping difficulty
Glutamat	Learning Memory States of agitation	Disquiet Abjection Cramps Immune disorders Obsessive compulsive disorders Autisms	Fatigue / exhaustion Impaired perception Schizophrenia
DHEA	Decreases greatly with age Helps in dealing with stress Activation of the immune system Motivation	No symptoms	Increased susceptibility to stress Malaises Depression Lack of sex hormones PMS Menopausal problems
Cortisol	Adaption to increased requirements due to stress Elevation of blood glucose level Inhibition of immune response Increased appetite Lowering of pain threshold	Sleeping difficulty Metabolic disorders with overweight Increased abdominal fat Elevated cholesterol values Hypertension Susceptibility to infection	Difficulty getting up in the morning Fatigue Passivity Apathy Increased sensitivity to pain Forgetfulness

LABORATORY SUPERVISION

The examination of Ms Andrea Babos, born on 19.10.1996, was carried out under my direction.



Dr. med. Ludwig Grüter
Medical specialist for laboratory medicine

This finding was generated electronically and has been medically validated.

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Bad Zwischenahn

THERAPEUTIC ORIENTATION AID

Dopamine level regulation

Adaptogens are active ingredients which restore overall balance. They aid the individual in adapting to stress and have a balancing effect on the nervous system. Thus, they can have a regulating effect in cases of stress symptoms due to excess dopamine such as restlessness, high blood pressure, attention deficit disorders, sleep disorders and many others.

Examples of adaptogens for balancing dopamine are:

Active ingredient	Preparation	Dosage
Rhodiola rosea (phytotherapy)	Rhodiolan®Plus (Dr. Loges)	2-0-0- or 1-0-0
	Vitango (Schwabe Pharma)	1-1-0
Schisandra chinensis (phytotherapy)	Schisandra chinensis 300 mg cap. (Allcura)	3 x 1 capsule per day
	Schisandra 600 mg cap. (Nutritheke)	1 x 2 capsules per day
	Schisandra chinensis 500 mg cap. (Bioprophyl)	1 x 1-2 capsules per day
Whithania somnifera (phytotherapy)	Ashwaganda 4:1 extract 300 mg cap. (Hanoju)	1 x 1 capsule per day
	Ashwagandha drops (Biopure) contains 35% alcohol	3 x 2 drops per day or 10-15 drops in the evenings; always with water
Eleutherococcus (phytotherapy)	Eleu Curarina drops (Harras Pharma) contains 32% alcohol	2 x 30 drops per day
	Eleutherococcus Kapseln N (Bio-Diät-Berlin)	3 x 1 capsule per day
Ginseng (phytotherapy)	Roter Ginseng 300 mg tablets (Allcura or Aurica)	3 x 2 tablets per day
Ginkgo biloba (phytotherapy)	Rökan novo (Schwabe Pharma)	2-0-0 or 1-1-0
complex homeopathy	Manuia (DHU)	1 - 3 times per day 1 tablet. On acute symptoms every hour or every half hour 1 tablet (max. 6 per day)

Remarks on administration and dosage as well as recommendations on combinations with other products can be found in the manufacturer's information.
The exact dosage with regard to age, sex, body weight and overall patient disposition is at the discretion of the treating therapist.

The complex preparation NEUROadapt (MITOcare), for example, also contains well-dosed amounts of all these adaptogens and thus naturally promotes dopamine level balancing. Recommended dosage: 1-0-1 after 2 weeks 2-0-2

Regulation of elevated cortisol levels

Tambogia (sutherlandia frutescens), for example, can be administered as a regulating adaptogen for elevated cortisol levels.

Further suitable preparations, amongst others:

Preparation	Remarks
Pro Sirtusan (Tisso)	Contains antioxidant polyphenols
Pro Curmin Complete (Tisso)	
Neurapas balance (Pascoe)	In cases of nervous agitation, depressive moods
Neurexan (Heel)	In cases of nervous agitation and sleep disorders
Lasea (Schwabe Pharma)	In cases of nervous agitation, anxiety states, sleep disorders. Symptoms during the night: 0 - 0 - 1, during the day: 1 - 0 - 0, 1 - 2 - 1 is also possible

Remarks on administration and dosage as well as recommendations on combinations with other products can be found in the manufacturer's information.
The exact dosage with regard to age, sex, body weight and overall patient disposition is at the discretion of the treating therapist.

Regulation of cortisol levels with regard to symptoms

Essentially, cortisol therapy is oriented to symptoms.

In cases of fatigue symptoms or concentration/memory disorders, a therapy designed to support cortisol is advisable.

In cases of disordered diurnal rhythms, the objective should be to restore them. That means preparations should be taken at times when cortisol levels are not in line with the diurnal rhythm.

In cases of nervous agitation

Passiflora extract has a balancing effect on states of nervous agitation and can support cortisol level regulation. Suitable preparations, amongst others, are:

Active ingredient	Preparation
Passiflora extract	e. g. Pascoflair (Pascoe) or Passiflora (WALA)

Remarks on administration and dosage as well as recommendations on combinations with other products can be found in the manufacturer's information.
The exact dosage with regard to age, sex, body weight and overall patient disposition is at the discretion of the treating therapist.

In cases of fatigue

In cases of fatigue symptoms, excitatory messenger substance support may be done with irregular, even with elevated cortisol levels. Suitable preparations, amongst others, are:

Preparation	Dosage	Remarks
For NEUROaktiv (MITOcare) ingredients see www.mitoshop.de	Initially: 1 - 1 - 0 After two weeks: 2 - 2 - 0	Contains essential nutrients which support adrenal gland function, cortisol synthesis cofactors as well as adaptogens such as maca and rhodiola. Contains 5-HTP
Phyto Cortal (Steierl)		Adrenal gland support
Phyto C (Steierl)		Increase dosage gradually, as required

Remarks on administration and dosage as well as recommendations on combinations with other products can be found in the manufacturer's information.
The exact dosage with regard to age, sex, body weight and overall patient disposition is at the discretion of the treating therapist.

Adaptogens for cortisol level regulation

Adaptogens are active ingredients which restore overall balance. They aid the individual in adapting to stress and have a balancing effect on the nervous system and neurotransmitter as well as cortisol synthesis. Thus, they can be used for states of deficiency as well as excess. Some examples of adaptogens are: Rhodiola rosea, schisandra, withania somnifera, ginseng, ginkgo biloba, eleutherococcus.

The complex preparation NEUROadapt (MITOcare) also contains well-dosed amounts of all these adaptogens and thus naturally promotes cortisol level balancing.
Recommended dosage: 2-0-2
Detailed information on ingredients can be found at www.mitoshop.de

Stress management

Elevated values for stress messenger substances (dopamine, noradrenaline, adrenaline, glutamate, cortisol) indicate a high level of stress.

In the first instance, stress is a physiological reaction of the body in situations of increased pressure which helps the individual to cope with said situations. A promising treatment approach for stress-related symptoms is therefore the determination of causes for stress and the elimination of those causes, where possible. Drug therapy alone is often not sufficient for lasting improvements. We recommend sustainable stress management tailored to individual living circumstances with the help of an expert.

Professional stress management may focus on reducing perceived pressure in order to increase the patient's well-being as well as his/her capacities. The basis thereof is a detailed analysis of causes for stress created together with the patient. It yields techniques suitable for each patient which can be used to reduce perceived pressure. Those techniques may be time management, yoga, hypnosis, autogenic training, progressive muscle relaxation, mindfulness training, physical exercise, dietary changes, communication training, personal demand management or psychotherapy, amongst others.
The choice of techniques should always happen together with the patient and tailored to his/her individual needs. Temporary intensive supervision by the stress therapist and regular result testing for the chosen techniques are also part of a professional stress management.

Increased micronutrient requirements in situations of stress
Due to stress, requirements in terms of micronutrients contributing to maintaining normal immune functions and protection against oxidative stress may multiply. Through dietary supplements the supply of vitamins, micronutrients and polyphenols essential for the human body can be supported.

DHEA level regulation

Elevated DHEA levels do not lead to negative symptoms. Therapy is not necessary.

Intestinal Repair

It is not uncommon for chronic stress to cause inflammation in the intestinal mucous membrane. However, intestinal health is crucial for an individual's neurotransmitter balance. Only a healthy bowel can absorb the micronutrients required for neurotransmitter synthesis sufficiently . Due to the close connection between the ENS (enteric nervous system) and the CNS (central nervous System), also referred to as the gut-brain axis, gastro-intestinal dysbiosis also causes adverse psychological effects. Especially in cases of present intestinal complaints pointing to a likely disturbed bowel function, intestinal repair can effectively support and supplement neurotransmitter regulation therapies.

For example, the following preparations are suitable to this end:

Preparation	Dosage	Remarks
Flora Balance (MITOcare) AND Flora Immun PLUS (MITOcare)	20 ml in the mornings, ca. 6 - 18 months	Contains 24 probiotic bacterial strains (10^{11} germs per 100 ml), select digestive bitter compounds and plant extracts.
	3 measuring spoons in the evenings, ca. 6 - 18 months	Contains 8 bacterial strains (ca. 10^{10} germs per daily portion), colostrum, glutamine and psyllium seed husks.
Pro Emsan (Tisso)	15 - 30 ml, ca. 6 - 18 months	
Pro Basan Complete (Tisso)	1 - 2 g powder, ca. 6 - 18 months	
Pro Mucosa (Tisso)	6 - 12 capsules, ca. 6 - 18 months	In case of mucous membrane-cleansing therapy resistance and persistently low serotonin levels.
Omni Biotic Stress Repair (Allergosan)	1 sachet in the mornings and / or evenings	
Omni Biotic Power (Allergosan)		
Symbioflor (Symbiopharm) according to the following formula:		
Weeks 1 - 4 (month 1) Pro-Symbioflor Weeks 5 - 24 (months 2 - 6) Symbioflor 1 Weeks 17 - 24 (months 4 - 6) Symbioflor 1 and additionally Symbioflor 2	 2 x 5 drops/day. Increase daily, towards 2 x 20 drops/day 2 x 30 drops/day 2 x 30 drops permanently 2 x 5 drops/day Increase daily, towards 2 x 20 drops/day	

Remarks on administration and dosage as well as recommendations on combinations with other products can be found in the manufacturer's information.
The exact dosage with regard to age, sex, body weight and overall patient disposition is at the discretion of the treating therapist.

NOTE: Fundamentally, the treating therapist's orders should be observed for all preparations specified in this therapeutic orientation aid. Recommendations regarding administration and dosage can be found in the manufacturer's information.

Therapy control

We recommend a laboratory diagnostic therapy control using NeuroSpot ca. 6 weeks after the start of the therapy and, as the case may be, appropriate treatment adjustments. In cases of severe neurotransmitter deficiency, however, it may be reasonable to control levels only after 3 months, since the body takes a certain amount of time to balance the deficiency.

Sources of supply:

Mitocare products: www.mitoshop.de or in pharmacies
Tisso products: https://shop.tisso.de

All other products mentioned are available in pharmacies or online.