The Adrenal Glands – Woman's Health Issues- part 2 of a 5 part series

Today's article is about the Adrenal glands. I will discuss what they do, how they work, what goes wrong with them, and what you can do to improve their function and your health.

These hard working glands have many important functions and are often exhausted or over stimulated. The gland produces the following hormones: Cortisol, Corticosterone, DHEA , Aldosterone, Pregnenolone, Estrogen, Progesterone, Testosterone, Androstenedione, Epinephrine and Norepinephrine

The following conditions are very common and are often due to Adrenal Gland dysfunction.

1**Insomnia** You cannot fall asleep due to high Cortisol or you cannot stay asleep due to low Cortisol. High Cortisol at night is an indication of a dysregualted communication between the Hypathalmus and the Adrenals. Cortisol should be low at night, and it is very stimulating. This is part of why some people are "night owls". Low Cortisol causes us to wake up in the middle of the night. We use Cortisol while sleeping to convert stored sugar (glycogen) to usable sugar (glucose). Our brains need Cortisol while we sleep, because the brain never sleeps. If we run out of Cortisol, we can use alternative Adrenal hormones like Epinephrine/Adrenaline. The problem is the alternative hormones are very stimulating, and they wake us up, or cause light sleep that is not as restful as deep sleep states. This is why some people wake up and feel like they did not get a good nights sleep.

2 **Low Blood Sugar/Hypoglycemia**- Low cortisol can cause low blood sugar, because cortisol converts stored blood sugar to usable blood sugar. Between meals, if your Cortisol is low, the conversion does not take place, and low blood sugar symptoms occur: fatigue, feeling lightheaded or aggravated, craving sweets, afternoon fatigue, getting dizzy when you stand up. After sleeping, which is a fast, it is a mistake to miss breakfast and restore blood sugar. If you miss breakfast, and you have low Cortisol, you will experience hypoglycemic symptoms. If you eat a high carbohydrate snack with coffee, you will over-stimulate the Adrenals, and causes blood sugar to spike and then be quickly reduced, which leads to hypoglycemic symptoms:fatigue, craving sweets, feeling cranky, and functioning at a low level mentally. Some of our co-workers or teachers are hypoglycemic and their mood and effectiveness if determined by this phenomena.

3 **Inflamation** - Cortisol can reduce inflammation due to injury or infections, by reducing the body's production of inflammatory cytokines. We produce cortisol when we get injuries and infections, for short term relief. Chronic infections and injury can wear out the adrenals. Chronic Arthritis can exhaust the Adrenals due to the constant pain. Arthritis is a treatable condition, and is often the result of allergies and toxic deposits made into the joints. Sometime Arthritis is undiagnosed Lyme disease. Low Cortisol cannot deal with chronic inflammation, and chronic inflammation leads to low Cortisol.

4 **High /Low Blood Pressure** – Aldosterone is a mineralcorticoid hormone which helps regulate Sodium/Potasium levels. Aldosterone works with the Kidneys and lungs to regulate blood pressure. Aldosterone increases sodium retention, increases potsassium excretion, increases water rentention, increases extracellular volume, enhances the sodium/potassium pump activity in the cells, and helps "bring on line" the sodium and potassium channels in the luminal membrane in the kidneys. All these functions raises blood volume and therefore increases blood prsssure. Low blood pressure can be due to Aldosterone deficiency, and high blood pressure can be due to excess Aldosterone. Aldosterone alos has an effect on the constriction and dilation of small arteries, which also affects blood pressure. Constricted arteries raises

blood pressure, and dilated blood vessles lowers blood pressure. Today, it has been estimated that blood pressure disorders affect 30% of the polulation, and is rising.

Edema can result from excess fluid, and **Dehydration** can result from deficient fluid. Fluid levels are directly related to sodium/potassium levels and Aldosterone levels.

Low blood Pressure is a growing hidden problem. Aldosterone prevents the loss of sodium into the urine, and helps maintain blood volume and blood pressure. Low blood pressure is experienced like: fatigue, low motivation, low resistance to illness, poor stamina, slow to heal form injury. Low sodium can lead to low blood pressure. Aldosterone is directly and indirectly related to low blood pressure.

5 **Menopause Symptoms** (Hot flashes, night sweats, racing heart, dry skin, fatigue, low libido)- The adrenals can make hormones like Pregnenolone and DHEA that get converted to Estrogen, Progesterone and Testosterone if they are healthy. During Menopause, Ovarian Sex hormone(Estrogen/Progesgteorne) decline. The Adrenals can make sex hormones and you can avoid many symptoms of Menopause due to sharp declines in sex hormones. Many woman have depleted their Adrenals due to chronic stress and poor blood sugar management (high carb diet, inadequate protein, lack of sleep, over work). When Menopuase starts, you might have have poor adrenal function and declining Ovarian function. That combination is severe and can cause significant discomfort. Sharply lowered estrogen is also a factor is cardiac risk for woman. Menopause symptoms are preventable and treatable.

6 –**Dehydration** – Is affected by sodium/potassium levels. As I stated in # 4, Aldosterone increases sodium levels and increases potassium excretion via the kidneys. If there is excess sodium in the blood, fluids can be pulled from the cells, and that is cellular dehydration. It can show up in the skin turgor, and make you look older and less vibrant. Dehydration can weaken cell function, and interfere with the exchange of important substances through the cell walls like minerals, sugar, hormones, gases like Oxygen, toxins, and Immune substances.

7 **Insulin Resistance**- This is a condition that occurs when the cells are chronically subjected to high levels of blood sugar. The cell walls become resistant to Insulin entering the cells. Insulin escorts Glucose into the cell, and the cells cannot get Glucose without Insulin. Insulin is made by the beta cells of the pancreas, and is secreted in response to glucose entering the blood (after eating and digesting food). If you eat a high carb meal, a barrage of glucose will be produced and move into the blood from the small intestines. This leads to high levels of Insulin being secreted. If this occurs chronically it leads to Insulin resistance.

Glucose is needed for all cells to function. It is the source of all energy in the body. Glucose is converted to ATP in the cells, in a very complex metabolic process called the krebs cycle. If glucose does not get into the cells, they suffer from low sugar – not low blood sugar, but low cell sugar. The problem is often that the glucose/sugar is in the blood and is not getting into the cells. That is pre-Diabetes.

The high blood sugar causes the pancreas to keep secreting Insulin, while the cells are starving for glucose. This is a process that continues to get worse, once it starts. You labs will show high glucose readings and low insulin. The sugar in the blood gets converted to fat and triglycerides. That is how weight gain occurs. Insulin is also very inflammatory, and is often the cause of other health problems, like Haishimotos disease, and other thyroid problems.

The Adrenals also play a part in Insulin Resistance. Elevated Cortisol (often due to stress) generates high production of Insulin, because Cortisol converts stored sugar into blood sugar, which again causes more Insulin to be produced. If you already have Insulin resistance from inappropriate carbohydrate consumption, the additional insulin that is produced due to elevated cortisol/elevated glucose aggravates Insulin Resistance further.

Elevated Insulin also causes elevated Cortisol, because elevated Insulin is inflammatory, and Cortisol will be produced to reduce inflammation. This is a vicious cycle of elevated Cortislol causing elevated Insulin and elevated Insulin causing elevated Cortisol. This patterns depletes the Adrenals and the Pancreas. Usually the adrenals will get fatigued long before the Pancreas.

Insulin Resistance is "Pre-Diabetes- and has many symptoms: weight gain, fatigue, headaches, poor circulation, craving sweets, getting sleepy after meals, poor circulation, vision problems, cardiac problems, brain dysfunction.

8 **Weight Gain at the Abdomen**- This is one of the most embarrassing symptoms of excess Cortisol. Cortisol is a "stress hormone". It give us the ability to respond to an emergency. However, chronic stress in a common operating state, and this drives the Adrenals to keep producing Cortisol continuously. Our bodies start to add adipose (fat) tissue for emergency energy, in response to constantly using our reserves for stress responses. Fat in the abdomen is highly correlated to cardiac problems. The abdominal fat also stores toxins, hormones and metals which can leech back into the blood and cause many hidden problems.

9 Allergies – Cortisol helps to mitigate allergic reactions. If our Cortisol is low, our ability to deal with allergic reactions is compromised. Today, we are processing more allergic substances than ever before. We are processing unprecedented levels of drugs, chemicals, pesticides, food coloring, antibiotics, air borne allergins, and hormones. We are seeing more allergic patterns at every age, even newborns, as our Immune system and Adrenal glands get worn down.

10 Thyroid Regulation- Excess Cortisol suppresses TSH – thyroid stimulating hormone- a hormone produced by the Pituitary, which stimulates the thyroid to produce thyroxin. Even if the hypothalamus senses Thyroxin is low, and sends TRH to the Pituitary to secrete TSH, so that thyroxin is produced, high cortisol will surpress the whole system and cause hypothyroidism. This is a big subject, which I am going to devote a whole article. The symptoms of hypothyroidism are: cold hands/feet, weight gain, depression, constipation, infertility, unstable pregnancy, fatigue, low mental function, and low metabolism.

Low cortisol causes the Thyroid to work harder to compensate for low blood sugar and low energy. This leads to a hyper-functioning thyroid. Symptoms of hyper-thyroidism are: palpitations, headaches, feeling heat in the head, irritability, feeling aggravated, weight loss, increased metabolism, dehydration. Chronic over compensation by the thyroid to make up for low Cortisol and low adrenal function will wear out the thyroid and cause it to become under-functioning and this leads to hypothyroidism

11- Depression- Norepinephrine and Epinephrine are Adrenal hormones. Cortisol and norepinephrine are both correlated to the onset of depression. Neurotransmitter physiology is complex and not well understood. However, dysregulated blood sugar, and inappropriate levels of epinephrine and nor-epinehrine can be part of the cause of depression. Part of the treatment for depression can be the restoration of adrenal hormone levels and blood sugar balance.

12 Digestive and GI symptoms -Elevated Cortisol (often due to chronic stress) can induce gastric ulcers, and hypochlorhydria. Hypochlorhydria (low stomach acid) can be the beginning of a great many problems. HCL (hydrochloric acid) is needed to break down protein. If it is low, protein does not break down, and remains in the stomach, and becomes more acidic, produces gas, and get regurgitated (acid reflux). Epinephrine causes the production of HCL to stop as part of the stress response. Chronic stress leads to chronic low levels of HCL.

Another problem is the Chyme, the liquid that leaves the stomach and moves into the small intestines, is far too acidic, if HCL is low and protein is undigested. The small intestines are designed to be much more alkaline than the stomach, and if it is flooded with highly acidic Chyme, the delicate digestive enzymes produced in the pancreas are damaged or destroyed. Low levels of pancreatic enzymes do not allow the food to be further digested and absorbed. The result of poor digestion is poor absorption and poor nutrition. The contents of the small intestines now moves into the large intestine, largely undigested. This sets the stage for the growth of fungus, bacteria, and a general dysbiosis (imbalanced friendly bacteria and unfriendly bacteria)

H Pylori is a common bacteria that grows in the stomach, and is commonly found in patients that have chronic elevated cortisol. It is thought that HCL issues begin to wear out the lining of the stomach, allowing H Pylori to get a foothold. H Pylori produces all kinds of discomfort and distress.

13 -Bone Density (Osteopenia and Osteoporosis)

One of the functions of Cortisol that is not well known is the maintenance of bone density via calcium absorption. Osteoporosis and fractures can result if Cortisol is chronically low, due to low calcium absorption. Low Cortisol is often due to chronic stress and chronic blood sugar dysfunction.

14 -PCOS – Poly Cystic Ovarian Syndrome

Chronic elevated blood sugar not only can cause diabetes, it is a primary cause of the most common endocrine system disorder for woman – PCOS- a condition that is marked by elevated Testosterone, proliferation of cysts and other growths, and numerous other symptoms. Elevated testosterone and PCOS are major causes of infertility, fibroids, cysts, and menstrual irregularities.

What can we do to improve our Adrenal function? Well, quite a bit. Here are some simple actions anyone can take that support Adrenal function that involve lifestyle changes and diet changes:

1 Eat breakfast – low glycemic foods and some protein – try to minimize coffee either none or reduce amount

2 Eat protein with every meal- this keeps glucose spiking and sugar cravings to a minimum

3 Eat protein snacks between meals- this helps maintain blood sugar levels

4 Go to sleep before 11:00 pm and do not engage in stimulating activities before sleep.

5 Treat infections aggressively – especially dental infections, fungal, viral - that means see your dentist regularly, and find a way to treat chronic conditions.

6 Get allergies identified and avoid allergic foods- especially subtle allergies that cause digestive problems. If you have some of the following symptoms, you probably have allergies: gas, bloating, diarrhea, constipation, acid reflux, stuffed up sinuses, chronic headaches, unresolved skin problems, stomach pain, asthma. Autoimmune disease are exacerbated by allergies, especially to gluten and casein.

7 Learn what "low glycemic" foods are –and eat more of them and avoid high glycemic foods. This information is on the internet. Google "Glycemic Index" and you will get a lot of info. There are also many good books on the subject.

8 Start exercising – moderately – it reduces the effects of stress and helps reduce excess weight. Incorporate stress reducing activities like Yoga , Tai Chi , Pilates, weight lifting and aerobic movement so all forms of exercise are utilized.

9 Do not eat late at night – eat dinner by 7:00 pm as often as possible. Eating late interferes with good sleep and the stomach functions at a low level late at night. Lack of sleep in a form of stress and so is indigestion.

10 Take digestive enzymes- they help digest food and minimize allergies. Enzymes break down food into it's constituent parts (amino acids, fatty acids, glucose). Allergies are reduced because many allergic reactions are due to the larger more complex food, and not to it's components.

11 Take probiotics – they help restore friendly bacteria – which reduces internal stress. Do not underestimate the far reaching effects of dysbiosis, a name for depleted friendly bacteria. This is caused by antibiotic overuse. Antibiotics kill all bacteria, friendly and unfriendly. There are antibiotics in our food. This is another reason to buy food that is not tampered with

12 Take Essential fatty acids – they improve blood sugar metabolism. Our cell walls are made up of essential fatty acids, if they are available. We will use poor quality fatty acids if we lack essential fatty acids and this creates problems at the cell wall level. Avoid trans fatty acids – they cause inflammation and digestive stress

14 Avoid excess stimulants – (coffee, soda, red bull, alcohol)- they all over-stimulate the Adrenals, especially when the Adrenals are already depleted. Of course, you may want stimulants the most because your Adrenals are already depleted. Anyone who cannot get through the day without caffeine is suffering from Adrenal depletion. All forms or caffeine are depleting to the Adrenals

15 Drink at least 1 quart and hopefully 2 quarts of quality water a day. Do not drink tap water that is full of chlorine, fluorine and other chemicals.

Supplements are available to help the adrenals recover and stay healthy. A professional practitioner with good training can offer many quality products to restore proper circadian rhythm to your Cortisol production, as well as nourish the adrenal function. Taking hormones may be necessary until the Adrenals can make them (DHEA, pregnenolone, progesterone, estrogen, testerone).

I am going to list a few supplements that support the Adrenals that a professional should provide for optimal dosage and coordination with other medication and supplements:

I Adaptogenic Herbs for the adrenals: Panax Ginseng, Siberian Ginseng, Ashwaganda, Holybasil Leaf Extract, Rhodiola, Boerhaavie Diffusa, Licorice Root, Panthenine, Phosphatidylcholine

II Insulin Resistance botanicals and minerals –Chromium, Vanadium, Gymnema Sylvestre, Alpha Lipoic Acid, Mixed Tocopherols, Magnesium, Biotin, Zinc, Inositol

III – Essential Fatty Acids – Omega III fatty acids (DHA and EPA

IV- Probiotics – friendly bacteria like Bifidus, Acidopholus, Lactobacillus

V- Digestive Enzymes- Lipase, protease, amylase,

VI –Elevated Cortisol - Phosphatidyl Serine, B vitamins, Valerian, Lemon Balm, Milk Thistle, Juniper

VII-Deficinent Cortisol- L-tyrosine, licorice root, Pregnenolone, DHEA, Siberian Ginseng

Stress reduction is paramount. All forms of stress deplete the Adrenals.

Internal stress can be due to: 1 emotional causes: worries, fears, 2- biochemically: anemia, vitamin, mineral, neurotransmitter, blood sugar, protein deficiencies 3- infections: Viral, bacterial, fungal, parasitic 4- pain and inflammation 5- lack of sleep 6- toxicity (metals, chemicals, neurotoxins) 7 allergies

External stress can be due to: 1 excess work 2- lack of exercise 3- financial problems 4 relationship issues with a variety of people, 5 – time management issues 6 – lack of joy 7- exposure to environmental hazards like cold, heat, humidity, pollen, air pollution, 8 emergencies 9 loss of loved ones

If it is caused by internal conditions or external conditions, in the end, stress is stress. Some forms of stress are easier to manage than others. Over eating of high glycemic foods is relatively easy to change. Working less hours and spending time enjoying your life can be a big change. If you do not have a day "off" this is an issue that must be addressed. Deal with anything that interferes with good sleep. Go to therapy if you cannot deal with a relationship that is troubling and is draining your energy. Learn to manage your money so money is not a form of stress. Improve your job skills and work skills if that will change your life for the better.

Get acupuncture, massages, Reiki, Chiropractic adjustments, Rolfing, or hire a trainer. These are excellent ways to reduce the impact of Adrenal dysfunction.

Get lab tests (blood, saliva, stool) to get clear about your status . If you have a major issue, you cannot handle it yourself. Major issues are: autoimmune disease, pre diabetes, diabetes, high blood pressure, an Epstein Barr Virus, H Pylori bacteria, CMV virus, Celiac's disease, anemia, elevated C Reactive Protein, elevated Homocysteine, elevated liver enzymes, elevated Cholesterol, etc

Get professional guidance regarding food and supplements. Most people do not know what to do on their own. If the practitioner uses lab tests, even better.

As far as lab tests go – I like the Adrenal Stress Index Saliva test to determine Adrenal fatigue. It costs about $100 and measures Cortisol and DHEA and Insulin. For an extra $50 you can test: Ovarian hormone levels (estrogen, progesterone, testosterone) , and Pituitary hormones (FSH & LH)

I like a comprehensive blood test that measures: blood sugar, Kidney function, Liver enzymes, thyroid function, Cholesterol, Red blood Cells, White blood Cells, C - reactive protein triglycerides, basic minerals. This test cost approximately $115

If necessary, I get a GI panel to determine parasites, intestinal infections, fungus. This test costs approximately $150. This is only done of there are good reasons to suspect pathogens

Lastly, nuture your spirit. When the spirit is well, the body follows. Do not despair. If you are depressed, get supplements or medication that lifts your depression. If you are discouraged, get support and reach out to people that can be helpful. If you are stuck, find a way to get moving. If you are exhausted and confused, improve your adrenal function. I quote an old poem " with all its sham, drudgery and broken dreams, it is still a beautiful world"