

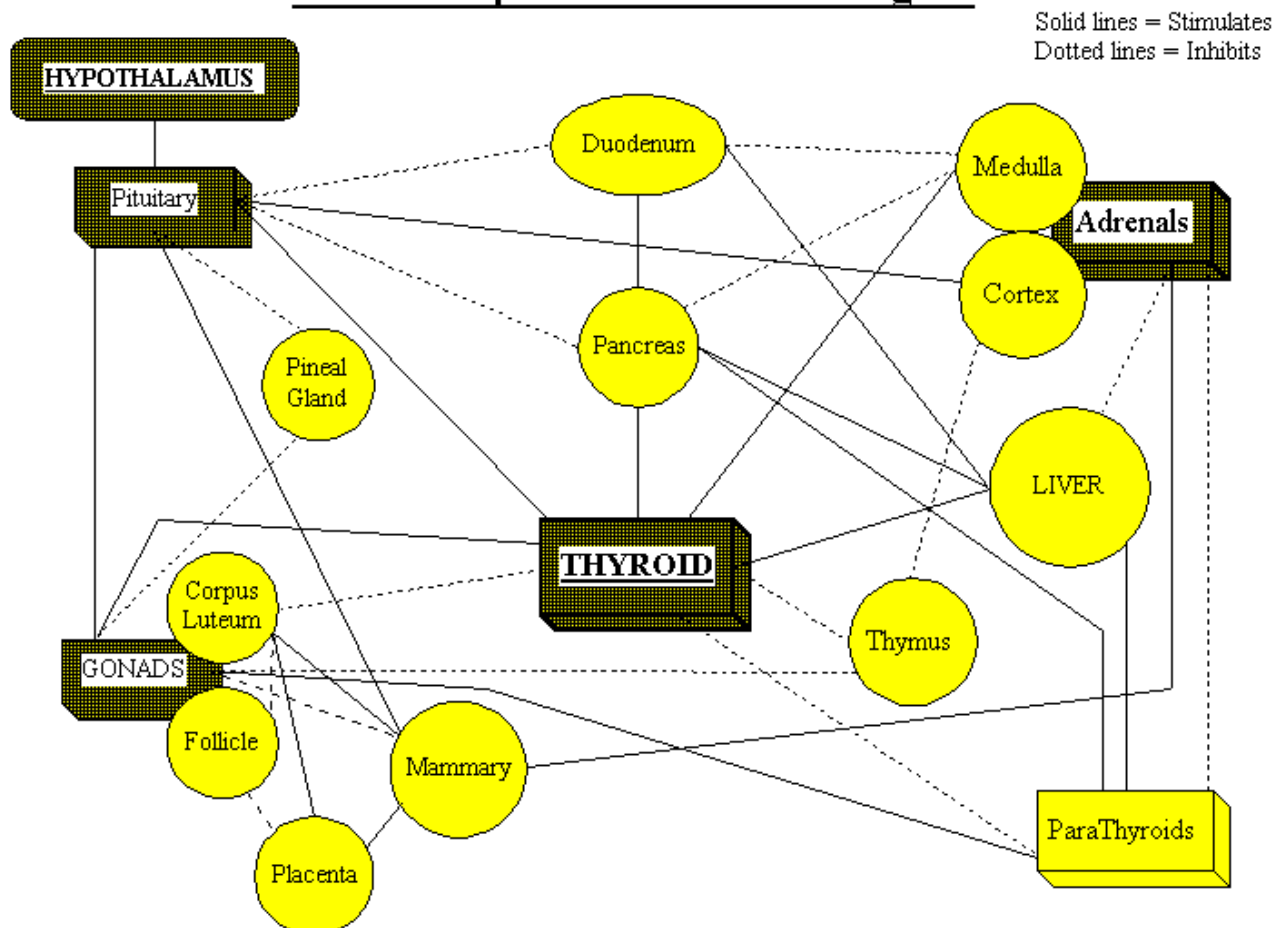
Understanding Adrenal Fatigue

When we talk about the adrenals, we are talking about glands. The system of glands that our body uses is called the **Endocrine System**. Just as the nervous system uses impulses that can produce an effect within a millisecond, the endocrine system uses chemicals known as hormones that can produce a rapid response as well, such as adrenaline. But unlike the nervous system, the glands can also be slow and persistent in their response. This second type of response is the more common since it provides day-to-day maintenance and growth such as the thyroid hormone thyroxine.

Glands secrete hormones that either stimulate or inhibit function. Hormones are different from enzymes, which act as a catalyst that speed up chemical reactions (think of your digestive enzymes). Hormones are inactive while carried to their destination. Once they reach their target tissues, they bring about a chemical reaction making the hormone metabolically active. Hormone secretion is controlled by signals from the nervous system, chemical changes in blood and other hormones. Most often, negative feedback systems regulate hormonal secretions.

The Endocrine system consists of various glands and glandular tissues that maintain a constant balance of physiological functions within the body despite fluctuations in the outside environment including metabolism, nutrient levels and energy balance. **Harrower's Chart** is one of the most comprehensive views of the interrelationships between glands in the Endocrine system.

Relationship of the Endocrine Organs



There are two types of glands, exocrine glands that secrete their products into ducts that carry the secretions into body cavities or onto the surface of the body [sweat glands, goblet cells in the digestive system, salivary glands]. The second type of gland is endocrine, glands which secrete their products into the extracellular fluid around the cell, which then passes into the blood stream through the capillaries, such as from the thyroid.

We not only have exclusive glands in our system, but we also have glandular tissue, found in the hypothalamus, kidneys, pancreas, liver, the skin and the heart. Each gland manufactures and secretes a specific set of hormones. When a particular hormone is present in abundance the number of receptors for it will decrease and when the hormone is present in less amounts, the number of receptors will increase. This is one way of the body regulating hormone activity for homeostasis. Sometimes an underactive gland, such as the thyroid, really isn't underactive, but simply has overproduced, causing receptors to lessen. This can happen especially during periods of stress. In fact, stress is the most crucial determinant of glandular function. Severe stress can even cause the adrenal glands to wear out their reserves of hormones, causing fatigue, body pain, emotional instability and fluid retention.

Many hormones must circulate through the blood for long distances to reach their target tissues include adrenal steroids such as cortisol, amines produced from amino acids such as histamine and proteins such as insulin. Many of these are lipids making them difficult to transport through the blood. These rely on transporter proteins synthesized by the liver to make them temporarily water-soluble. If blood flow is compromised because of stress, muscle tension or other imbalances, then many hormones will have no mode of transportation to target tissues. Other hormones are more localized reaching target cells close to their release site such as eicosanoids, which mediate inflammation. Some hormones even act on the same cell that secretes them.

But the glands that are essential for our day-to-day ability to handle stress are the adrenals. The adrenals adapt to our environment and our sensory awareness, handling constant bombardment of our senses such as with noise. They are a part of the kidney meridian and in fact, lie on top of each kidney. For this reason the herb *Rehmannia* works both on the adrenals and on the kidneys. There are two areas of the adrenal, the cortex on the outside and the medulla within. The adrenal cortex releases a group of hormones known as **Mineralocorticoids**, which include aldosterone. **Aldosterone** controls the balance between intra and extra-cellular fluid, increasing blood levels of sodium and water and decreasing blood levels of potassium. This action can help to prevent acidosis and low blood pressure.

The cortex also releases a second group of hormones known as the **Glucocorticoids**, the most important of which is **Cortisol**. These act to increase the rate of the breakdown of protein, stimulate synthesis of glucose and the breakdown of lipids. In this way, they provide tissues with a ready source of ATP to combat a range of stresses. Cortisol is catabolic and is anti-inflammatory, immuno-suppressive and helps to regulate glucose production. When cortisol levels drop, because of this immune effect, histamine levels can rise and so allergies may develop that are a direct result of adrenal fatigue.

It redirects blood to somatic muscles for the fight or flight response and also inhibits the thyroid by increasing thyroid-binding proteins made in the liver. It influences the activity of DHEA and testosterone. If the adrenals are healthy, then it enables the body to produce endogenous progesterone after menopause. Cortisol also cycles numerous times through the blood instead of being removed, leaving it to cause extensive shifts in body function for lengthy periods of time. Cortisol should be highest in the early morning at around 6-8 AM and lowest around midnight. In addition, it may be a bit higher after meals. Normal levels should be 6-23mcg/dl of blood. It also competes with progesterone, making progesterone deficiency common in Phase 2 Adrenal Fatigue. Progesterone also provides a

calming influence, which means that progesterone deficiency can cause anxiety. Cortisol also affects female hormonal balance by preventing ovulation when cortisol levels are elevated. This prevents the additional stress of pregnancy from overloading the body's stress-handling system.

The final group of hormones from the cortex are the **Androgens** such as **DHEA**. In females DHEA is thought to increase sex drive and libido. DHEA is anabolic and androgenic, an anti-atherogenic which increases bone deposition and remodeling to prevent osteoporosis. It improves cardiovascular status by lowering total cholesterol and LDL levels. It also has a tremendous effect on our sex hormones as a precursor to testosterone in men and to estrogen in women. Recently DHEA has become sought after for its ability to increase muscle mass and decrease the percentage of body fat. It also is involved in the conversion of T4 to T3 in the thyroid. When we first experience adrenal fatigue, as the cortisol elevates, the body will self-medicate by increasing DHEA levels as well to offset the negative effects of the high cortisol. This will create temporary improvements in energy, vitality, sleep, PMS and mental clarity.

All of these cortex hormones are cholesterol-based and are strongly linked to reactions to stress.

The Adrenal Medulla secretes only one group of hormones, the **Catecholamines** which include **Epinephrine** or **Adrenalin** and **Norepinephrine**. These produce effects that mimic those of the sympathetic division of the autonomic nervous system during times of stress.

So What is Adrenal Depletion?

Adrenal depletion is not viewed by the medical community as a condition that merits significant attention, yet virtually 75% of our clients at ISIS suffer from some level of adrenal fatigue. The adrenals gained more notoriety when Matt Damon experienced severe adrenal fatigue during grueling dieting and training while preparing for a recent film. Adrenal fatigue is usually the result of some type of stress or combination of stressors. These can be weather-related, noise, pollution, internal toxic load, lack of proper nutrition, chemical agents, trauma, emotional agents, biological pathogens and even radiation which can actually fragment the DNA of our cells.

General symptoms of adrenal depletion are:

Constant tiredness, need for extra sleep, inability to cope with stress, reduced sex drive, low back pain, sighing, yawning, recurrent infections, irritability, craving sweet food, irrational anxiety.

The adrenal glands are dependent on ACTH released by the anterior pituitary. Without it, the adrenal cortex atrophies and cortisol secretion ceases. Homeostasis is the balance between cortisol and DHEA. Increased cortisol levels can exhaust DHEA production. Many drugs can deplete the adrenals such as the statin drugs. The use of statin drugs cause low libido and muscle fatigue, problem that can be prevented with healthy levels of cholesterol.

Stress also has an effect on sugar balance and cortisol by causing an increase in adrenalin bringing about the release by the body of stored sugars. Cortisol does this by drawing glucose from muscle tissue. This in turn elevates insulin in order to restore normal blood glucose levels. The herb *Gymnema* can balance carbohydrate and sugar cravings that may arise from this pattern.

There are a number of things we can provide to help restore energy to the depleted adrenal glands...

Herbs: There are many herbs that can have an effect on the adrenals. The two types that are most used are **adaptogens** and **tonics**. Adaptogen is a term first defined in 1947 by Lazarev as ".a substance which elicits a state of raised resistance to stressors." It allows for adaptation to excessive strain or stress. Adaptogens help the adrenals to produce normal levels of hormones despite chronic stress being present. They promote regeneration, increase concentration and increase glucocorticoid action. Adaptogens increase anabolic biosynthesis of RNA and proteins, increase carbohydrate metabolism by also regulating blood glucose absorption. They also save serotonin which balances and maintains mood. In order to work effectively, adaptogens need to be taken consistently twice each day for 3-4 months. Some adaptogens include Rhodiola, Eleuthero, Ashwaganda, and Codonopsis.

Adrenal tonics increase available energy from our reserves. They nourish and restore the adrenal glands, reduce side effects of corticosteroid drugs and improve regulation of cortisol and DHEA output. They give the adrenal glands a rest by temporarily giving us energy. In this way they protect the adrenals against damage. Tonics include Licorice, Rehmannia and Korean Ginseng (in limited amounts). Tonics should be given first thing in the morning and for no longer than 4 weeks.

Foods and Nutritional Concentrates: Since the adrenals are natural body tissue they require nutrition for optimal function and a healthy life. There are many foods in our diet which contain all the right things for the adrenals to function. But it's not just about the food, it's about how you eat. With adrenal fatigue, eating behavior is a crucial factor in balancing nutritional reserves and adrenal function.

The main goal of adrenal nutrition is to break the cycle of cascading hormonal stress that provides the stimulus to our eating choices and patterns. First, you cannot reduce your calorie intake or skip meals for weight loss. That simply convinces the body that it is a "fasting" mode and it will promote storage of all nutrients and reduction of metabolism to make those reserves last. The second thing is that if you eat any high-sugar item, it will not only cause an insulin surge, but also an adrenalin surge as well increasing fat storage. In fact, this is the reason that we crave sugar when we are depressed, or mistake the drop in blood sugar for needing actual sugar to offset fatigue. When under stress, we will tend to eat more calories per meal, and increase our intake of refined sugars and carbohydrates. This simply continues the cycle of stress eating, sugar fluctuations and adrenalin and cortisol imbalances.

Sweating: Releasing stored toxic material and rebalancing water through sweating can help to reduce high cortisol levels and bring about a more relaxed state of the nervous system. Massage Therapy can speed this process by increasing circulation and reducing the muscle tension that can interfere with proper hormonal secretion and transport.

Exercise: We all know that exercise is important for health, but it is vital for adrenal fatigue. Depending on the amount of energy you have, you need to do both cardiovascular exercise and resistance-training with weights to build muscle. Only anaerobic activity such as weight training can increase your basal metabolic rate that is the essential determinant of body shape all through the day. Do as much cardiovascular as you are able, but don't forget to get resistance-training in as well.

Lifestyle: Adrenal fatigue is a sign that your body does not process stress well, and you need to arrange your life to accommodate that weakness. If you continue to expose yourself to chronic daily stress in your job, your relationship and your life, you will not have the support of your adrenals and all the functions they control will be reduced. Nothing has to be done overnight, but you need to find ways to reduce stress a little more each day. Therapies such as yoga, meditation, tai chi, massage, acupuncture and breathing can all help to release tension and daily accumulated stress hormones.

So here are the eating rules:

- Eat little amounts often throughout the day, 5-8 small meals.
- Don't skip breakfast and be sure to have your first meal within 1 hour of rising.
- Eliminate all sugar and refined carbohydrates.
- Add protein to each meal.
- Eat essential fats. This gives your body something else to use as energy instead of sugar.
- Don't eat quickly or on a time schedule.
- Chew your food very well. This improves digestion and limits bacteria content in food.
- Be sure to drink as much water as possible throughout the day – no carbonated water and do not count the water in juice, tea or coffee.
- Increase your natural fiber intake. Fiber controls blood sugar swings and slows digestion, so digestion is more complete and you feel full longer with less food.
- Eliminate caffeine in all forms, including tea, coffee, chocolate, colas and even some headache medications. Caffeine is a stimulant to the release of cortisol and insulin. Over time it can make your body insulin-resistant.
- Reduce alcohol consumption. Alcohol acts as a diuretic causing dehydration, it interferes with the metabolism of essential fatty acids, blocks nutrient absorption and raises insulin levels, not to mention how it affects liver detoxification ability.

The best foods to include or avoid for better adrenal energy and weight loss:

- Avoid wheat and refined grains.
- Avoid potatoes and sweet potatoes
- Avoid bananas, dried fruit, grapes and fruit juices.
- Do include all vegetables including carrots, mushrooms, oats, alfalfa and buckwheat which contain the highest concentration of nutrition for the adrenals.
- Do include all beans.
- Do include whole grains, rye, oats, brown rice, barley, quinoa and millet.
- Do include all proteins, but not in large quantities.
- Do include all healthy fats. Peanuts especially contain high levels of adrenal nutrition. But avoid snacking on high fat foods between meals which elevate cortisol levels.

Once we have experienced adrenal fatigue symptoms for a lengthy period of time, we may not be able to simply change our diet and achieve the results we need. So there are concentrated supplement forms of the foods that are best for the adrenals. The one we recommend most often is **Drenamin**. It also can support balanced blood pressure due to the high fiber concentration of the foods included. The vitamins it contains, C, B and E, blended with essential fatty acids is a great combination for promoting adrenal health. Minerals are also essential to support the adrenals, particularly Magnesium, Zinc and Manganese. This combination is found in Organically Bound Minerals which helps to reduce sympathetic dominance symptoms common with adrenal fatigue. For severe fatigue, we even recommend Min-Tran which is a natural mineral tranquilizer to the nervous system, containing high levels of alkaline ash minerals that are soothing and supportive to a restful state.

We also recommend our wonderful Adrenal Broth, which can feed and nourish tired adrenals: Simmer the following ingredients for one hour, remove all solid matter from the soup and drink the broth at least twice each day. Refrigerate any unused portion.

- 16 oz. green beans
- 1 cup chopped celery
- 1 zucchini, sliced
- 1 medium onion, chopped

1 cup tomato juice
1 cup spring water
2 tbsp. raw honey
1 tsp. paprika
1 cup organic chicken broth
pepper

So How Tired Are Our Adrenals?

There are three phases that have been documented and accepted in treating adrenal fatigue. Generally we associate each phase with a different type of stressed feeling. Phase I is stressed and wired, while Phase II is tired, then wired, while Phase III is stressed and tired. Each phase can take up to three months to regain health and balance, which means that if someone is in Phase III adrenal fatigue, they should plan that it will take 9 months to reach full recovery.

In **Phase 1**, we experience normal adaptation and resistance to stress. This is the **alarm phase** which means it is intended to be of short duration, such as 30-40 minutes and should be without symptoms, except perhaps a surge in energy and alertness from the release of insulin. Both cortisol and DHEA increase during this phase. High levels of cortisol will initially cause the insulin surge, which can also be exacerbated by foods such as caffeine, sugar, nicotine, high-glycemic carbohydrates and hydrogenated oils.

In this phase, we use adaptogenic herbs to fine-tune our stress response mechanism so that Phase 1 is more efficient. The response will be stronger and faster and the feedback control is more effective so the response is shut off faster.

Phase I Adrenal formulas:

Ashwaganda - this is an adrenal adaptogen for people living with daily uncontrollable stress. It helps to reduce onset insomnia and promotes a feeling of calmness. This is particularly helpful when the cortisol level is very high. It is excellent as an antiinflammatory and for people with anemia. It also promotes growth and appetite. 5-10 ml per day.

Drenamin - this formula is designed for the adrenal structure, as opposed to function, helping to restore and rebuild the adrenal glands. It is also a vasodilator to bring blood to the glands, essential for chronic fatigue, food or environmental sensitivity, hypoglycemia, low blood pressure and a general dragging feeling. 3-6 per day.

Organically Bound Minerals - this formula is for sympathetic dominance, when you feel anxious all the time. Some of the typical symptoms that we see in the clinic which would lead us to suggest this would be frequent sighing, breathlessness, dry mouth, gagging easily or tachycardia. It also helps to prevent polyglandular weakness.

Valerian Complex - this formula is a temporary aid for sleepless nights and nervousness. 4 per day, particularly before bed.

Hawthorn - this helps to balance blood pressure irregularities that typical with adrenal fatigue.

Ginger – this wonderful herb helps to modulate cortisol levels and increase the adrenals' ability to adapt.

Withania Complex - this is an excellent formula for people with the afternoon energy slump. A dose late in the day should only be used if you are sleeping soundly at night. 2-4 tablets per day.

Phase 2 is known as the **resistance phase**, in which cortisol remains high but DHEA decreases and we become sympathetic dominant. We are, during this phase, hyperadrenal. Symptoms during this phase may include anxiety attacks, mood swings, onset insomnia, restless leg syndrome and a generally "stressed" feeling. Due to the higher cortisol levels, many patients experience "epic" dreaming, which is very exhausting. Increased cortisol levels extend the length of REM cycle sleep, allowing less time for Delta Wave sleep, which is the period of healing, repair and growth. Because of this, healing capacity diminishes and immunity weakens. Increased levels of cortisol require additional calcium to sustain higher cortisol production. If there is insufficient calcium that is bioavailable, the body will cannibalize bones and other structures. Higher levels of cortisol will increase prolactin which can cause a lack of ovulation and increases the removal of calcium from bones into the blood, which supports sympathetic dominance. High cortisol increases obesity by increasing fat deposition and the loss of lean muscle mass. It also has an antagonistic effect upon insulin production. High cortisol also causes headaches from vasoconstriction and inhibits the conversion of T4 to T3 for thyroid function. It shrinks and kills off hippocampus cells depleting emotional memory.

During this phase, higher protein intake can cause an elevation in cortisol potentially making symptoms more severe. As the DHEA decreases, depression will begin. It is common for potassium levels to be low compared to sodium levels during this phase. Adaptogenic herbs in this phase will have a sparing effect in order to delay the onset of Phase 3. They also counter chronic immune depletion in stressed individuals.

Phase 2 Adrenal Formulas:

Rehmannia - this extract for the adrenals can provide energy in 30-45 minutes. It is recommended when there is a high systolic blood pressure level. 5 -8 ml per day as an adrenal tonic.

Ashwaganda - this is an adrenal adaptogen for people living with daily uncontrollable stress. It helps to reduce onset insomnia and promotes a feeling of calmness. This is particularly helpful when the cortisol level is very high. It is excellent as an antiinflammatory and for people with anemia. It also promotes growth and appetite. 5-10 ml per day.

California Poppy – this opioid-like analgesic helps to reduce REM sleep, so that more time is spent in Delta Wave sleep, the phase in which DHEA and adrenal hormones are replenished.

Ginger – this wonderful herb helps to modulate cortisol levels and increase the adrenals' ability to adapt.

Organically Bound Minerals - this formula is for sympathetic dominance, when you feel anxious all the time. Some of the typical symptoms that we see in the clinic which would lead us to suggest this would be frequent sighing, breathlessness, dry mouth, gagging easily or tachycardia. It also helps to prevent polyglandular weakness.

Cataplex G – these are the fat-soluble B vitamins that are essential to restore normalized neurological balance and to help with mental performance.

Drenamin - this formula is designed for the adrenal structure, as opposed to function, helping to restore and rebuild the adrenal glands. It is also a vasodilator to bring blood to the glands, essential for chronic fatigue, food or environmental sensitivity, hypoglycemia, low blood pressure and a general dragging feeling. 6 per day.

Min-Tran - this formula provides the minerals necessary to reduce sympathetic dominance and to act as a tranquilizer for sleep.

Rhodiola – this amazing herb has been shown in clinical studies to increase endurance, memory and productivity. It has been used to treat fatigue, depression and impotence. This is the perfect formula for someone who has a demanding job and a very stressful work environment, particularly if it is a physical occupation. It is essential for those experiencing erectile dysfunction as a result of stress. We have also used it to treat people traveling to high altitudes. It is the essential ingredient in recuperating from a stressful event.

Valerian Complex - this formula is a temporary aid for sleepless nights and nervousness. 4 per day, particularly before bed.

Fe-Max Iron Tonic - excellent as a general daily restorative tonic. 5 ml per day.

Nettle Leaf - this extract provides a multi-mineral support for the deficiencies common with phase 2 fatigue.

Livco - this liver detoxifier helps to reduce headaches that are due to elevated cortisol levels.

Tribulus - helps to regulate and increase DHEA levels, helping with atrophied muscles and low libido. 2-4 tablets per day.

Skullcap – this is perfect for relaxing the nervous system and reducing symptoms of anxiety, panic, fear and lack of control.

Phase 3 is known as the **exhaustion phase** in which cortisol and DHEA are both low. The person is now Parasympathetic Dominant and hypoadrenal, causing the body to enter a conservation mode. Symptoms of this phase are depression, maintenance insomnia and exhaustion, all of which can contribute to a chronic fatigue state. Low levels of cortisol can bring on fibromyalgia symptoms, impotence in men, panic disorders, infertility, anorexia nervosa, low white blood cell levels and low blood pressure. To prevent the blood pressure from dropping any further, use a combination of Drenatrophin PMG and Cataplex B to support the adrenals. Sleep will be disturbed by waking up and not returning to sleep, a result of cortisol surges from the adrenals having lost their proper timed response. These surges can be worsened by hypoglycemia issues. Low levels of DHEA can cause recurring infections, arthritis, obesity and early menopause. Adrenal tonics can conserve cortisol during this phase.

Phase 3 Adrenal Formulas:

Rehmannia - this extract for the adrenals can provide energy in 30-45 minutes. It is recommended when there is a high systolic blood pressure level. 5 -8 ml per day as an adrenal tonic.

Licorice - this extract has so many uses, but here, it helps with all the symptoms of phase 3 adrenal depletion, particularly excessive fatigue. It also is the perfect choice for low systolic blood pressure levels. 4 ml per day, preferably in the morning.

Nevaton - for emotional stress and a depleted nervous system. 3-4 tablets per day.

Eleuthero – This is the formula for low DHEA and low cortisol, making it perfect for Phase III. It helps with exhaustion, maintenance insomnia and depression. It provides great support for environmental and occupational stress and can protect during and after radiation exposure, such as in cancer treatment. It helps to improve mental and physical performance. 2-8 ml or 3-4 tablets per day.

Korean Ginseng - this tonic is excellent for the first 4 weeks of treatment as a rescue remedy. It can be continued in elderly individuals. 2 ml per day in the morning.

Astragalus Complex - for recurring infections common with phase 3 adrenal depletion. 3-4 tablets per day.

Rhodiola – this amazing herb has been shown in clinical studies to increase endurance, memory and productivity. It has been used to treat fatigue, depression and impotence. This is the perfect formula for someone who has a demanding job and a very stressful work environment, particularly if it is a physical occupation. It is essential for those experiencing erectile dysfunction as a result of stress. We have also used it to treat people traveling to high altitudes. It is the essential ingredient in recuperating from a stressful event.

Cataplex B – this complex of water-soluble B vitamins is essential to Phase III adrenal fatigue sufferers. There is increased excretion of water-soluble components during this phase which must be replenished. It helps to improve the transmission of nerve impulses, blood sugar metabolism and puts strength in the vessels.

Super EFF - this essential fatty acid complex is to increase hormone production of the cholesterol-based hormones of the adrenal glands. 3 tablets per day.

Trace Minerals B12 – this formula is perfect for providing the complex minerals necessary for Phase III adrenal fatigue.

Dessicated Adrenal - this is for severe exhaustion or sudden shock as well as prolonged severe stress and should only be used short-term. Note: Do not use with Korean Ginseng. 6 tablets per day.

Vasculin – this helps to keep blood pressure stable at a higher level.

This is a lifestyle approach and a therapy each and every day. Balance is the key, and although you may need to be conservative and regimented for a few weeks, you can certainly relax and find a natural balance that keeps your energy up and your weight down for the rest of your life.