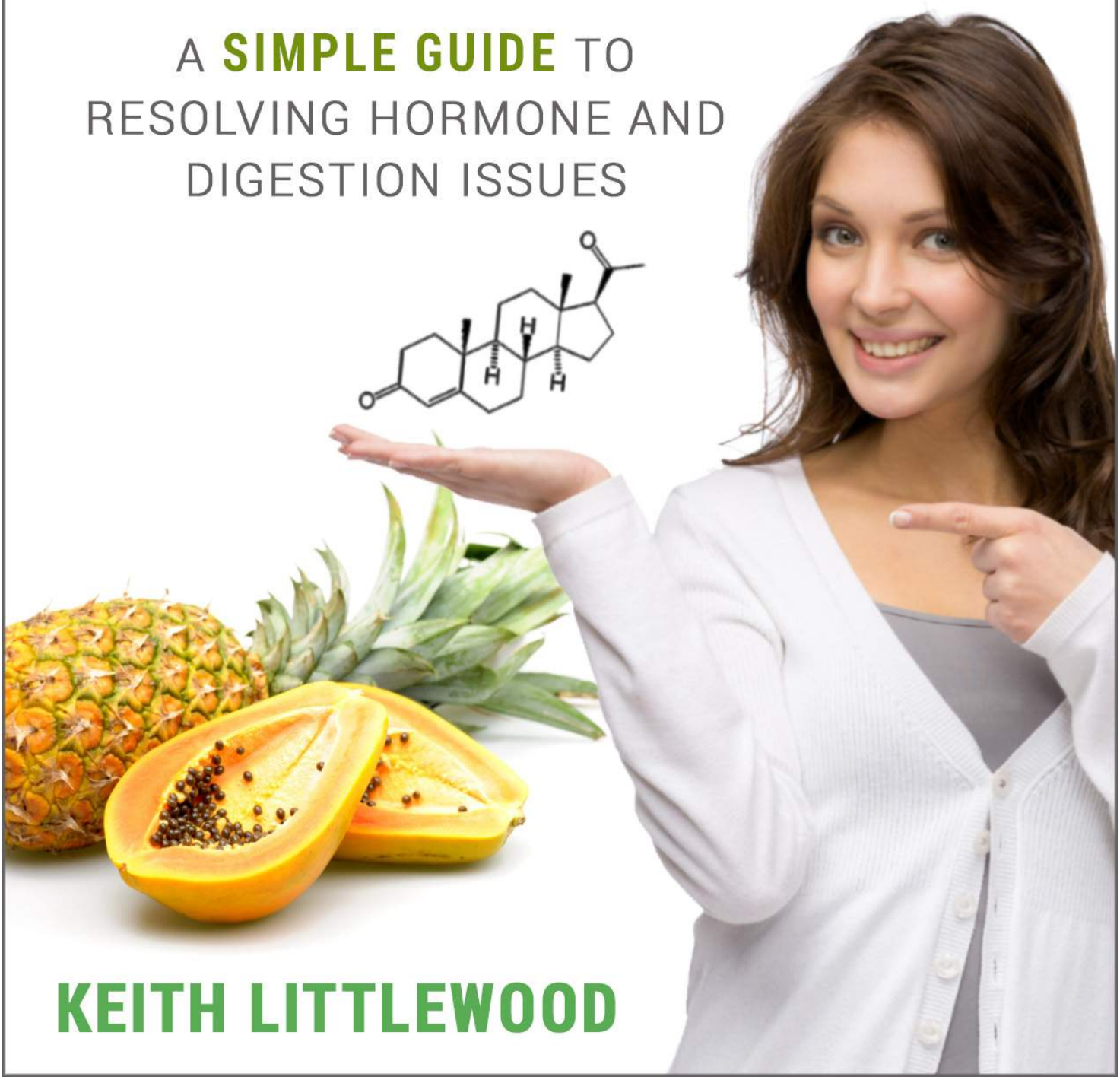
HAPPY HORMONES

A **SIMPLE GUIDE** TO RESOLVING HORMONE AND DIGESTION ISSUES



KEITH LITTLEWOOD

This book is not designed to replace the advice of a trained medical professional. If you do have specific hormonal problems, you should always consult a medical practitioner who is trained in such an area.

Although British, I prefer to use the Americanised version of the word estrogen, in place of the word with the redundant O.

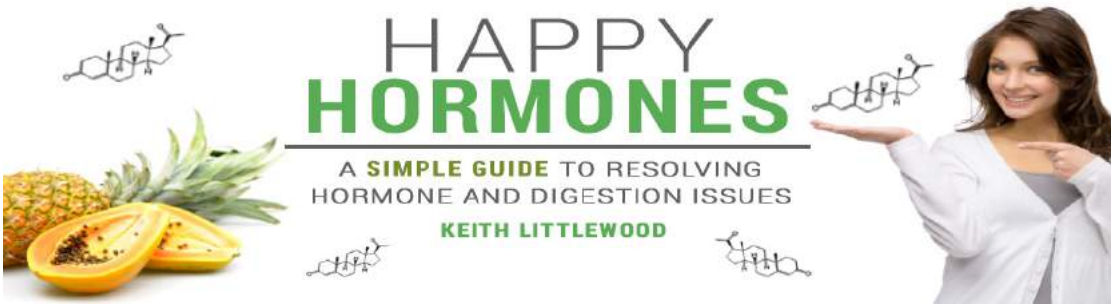
I have been coaching many clients to better health and function, for the best part of twenty years. Initially starting out as a fitness instructor (no, please keep reading, I have a rough idea of what I am talking about), then became a personal trainer, focusing on rehabilitation. For the last ten years I have been focused on pain, movement, energy and digestion-based issues (and am currently an MSc student of endocrinology). During that time I gained a Degree in Fitness and health and studied, nutrition and functional medicine. These felt useful, but with an overall reliance on lots of expensive testing, and focus towards reductionism of results, it often felt as if there were factors that were not being addressed.

Around 2009, an instructor, who was coaching me in an area of nutrition, suggested that I read the works of Raymond Peat, PhD. Ray holds a doctorate in biology with special interest in orthomolecular medicine, notably the roles of estrogen, progesterone and other compounds, that have a huge impact on human physiology. I didn't really start reading his works, with much depth, for another couple of years. But I can say that it has profoundly changed the way that I choose to assist clients in achieving better health in the realms of energy, digestion and other hormone-related factors. His writings have provided a much deeper study of an area, which, although seemingly complex to the onlooker, has many simplistic features that can go a long way towards improving health issues for males and females alike.

His references have included the works of great Dr's and scientists such as Hans Selye (stress scientist), Broda Barnes (Thyroid doctor), Katharina Dalton (Dr specialising in treatment of progesterone/estrogen issues) and many others. He also inspired many other Drs, like the late John Lee MD, who has written some great books relating to hormone dysfunction and how to reverse it. Much of this book is written with the knowledge of these experienced people and my own experience of coaching (and being coached) people and if you decide you want to explore these subjects with more depth, I would invite you to go and read the work referenced at the back of this book.

I have tried to provide an overview of the subject of lowering stress, improving hormonal interactions, digestion, sleep and overall wellbeing, all of which can be achieved by you, through following the suggestions in this book. I hope you find it useful.

Keith



“ *Everything in biology is artefactual* ”

Ray Peat-PhD

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If you are a woman, you might be asking yourself why reading a book, written by a man, on the subject of hormones, would be beneficial? Technically we tend to all have the same hormones, but in varying concentrations and relations to each other. More importantly, if you want someone to understand what it's like to experience fluctuations of hormones that contribute to anxiety, digestive, sleep, energy, weight gain, low libido, feelings of depression, and ill health, then you don't necessarily need to be female.

When I was feeling at my lowest, I had all of these symptoms. It's true that Pre-Menstrual Stress or PMS has specific female factors related to the menstrual cycle, but you will be able to apply much of the issues that are talked about in this short book, to both females and increasingly males. Hormone dysregulation in the forms of increased estrogen and estrogen-like compounds, cortisol and decreases in thyroid hormones, are factors that are becoming increasingly prevalent.

Despite the complexities, there are many factors that you can take charge of, such as improving your mood, energy, sleep and outlook on life. None of the recommendations in this book are radical or ascetic. They simply require a common sense approach to restoring energy and function.

So what defines human health? Is it the ability to get into that smaller dress? Is it how fast you can run? Or how much weight you can lift?

Much of what we see in most of the media these days, from fitness magazines to so-called 'inspirational' Instagram accounts, seems to dictate the so-called healthy norms. Assuming you buy into these vacuous (although not all the accounts and articles are tinged with the same dysfunction that I will talk about) ideas, such as low levels of body fat and other visual markers of "health" and inspiration. Often, but not always, when you scratch beneath

the surface of the visual delight of low body fat, you will encounter some of the following factors.

- Loss of menstrual cycle
- Fibroids
- Poly Cystic Ovary Syndrome
- Anxiety
- Constipation or diarrhoea
- Insomnia
- Depression
- Irritability
- Thinning hair
- Loss of libido
- Accelerated aging
- Endometriosis
- Increased PMS

There are others too. But at this point, shouldn't we be asking the question: How healthy is this? Is the low level of body fat creating health and improving biological function, or actually decreasing it? Of the hundreds, or thousands if you include structural and pain clients, that I have worked with, one of the most consistent themes that appears is the inability of females to accept even a small amount of weight gain, in the face of getting better sleep, better energy, feeling more balanced and going to the bathroom on a daily basis. I have even warned many clients that if they are coming to see me purely for weight loss, then they may feel more comfortable seeing another practitioner.

I could not always guarantee that weight gain would not occur, but I was confident that restoration of hormonal function and improvement of the above markers could be achieved.

Of course, excessive exercise and erratic eating habits are not always the mechanisms behind these issues. There can be many others that we will explore throughout this book.

Why is this happening? Is it my genes? But I eat clean. I hold onto water. I always eat healthily but I stay the same. I train really hard. I crave carbohydrates. I can't sleep. No energy. Paleo diet worked for a while

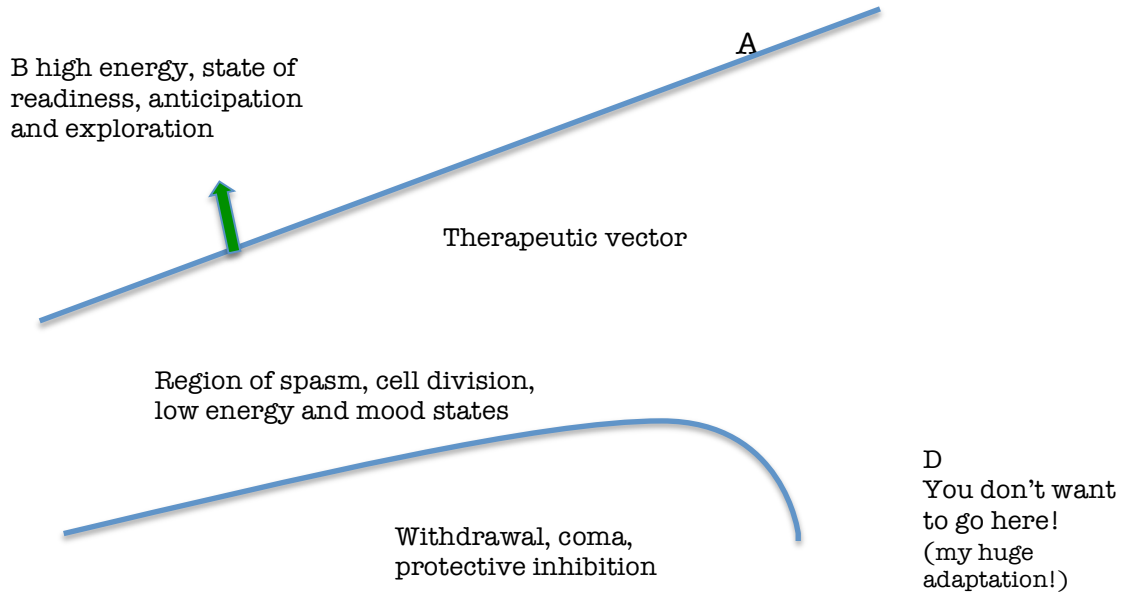
So what the hell is going on?

A common question is, “What caused this?” “I am really healthy, I eat really clean.” Therein lies the paradox many women face (but not all, thankfully). Some face a situation of not eating regularly, skipping breakfast or drinking alcohol on an empty stomach, after work perhaps.

Here are some of the precursors that are a key factor in creating dis-chord with the menstrual cycle.

- Unresolved childhood stress
- Environmental pollutants
- Dietary choices
- Contraception
- Relationship with food
- Excessive exercise

I am a big fan of Ray Peat’s work and in his book, *Generative Energy*, he summarises the benefits of optimal energy and a purposeful life with this perfect diagram that I have adapted.



Usually it’s an interaction between all of these factors creating stress that cascades, decreasing feedback and flow. This interruption to communication and function will ultimately affect your hormones, digestion, energy and other factors.

The concept of stress was defined by the pioneering stress physiologist, Hans Selye. Selye wrote numerous books and produced more than fifteen hundred research papers on the mechanisms of the stress response. The stress response is merely a reaction to both positive and negative situations. Stress is unavoidable and rather than shying away from it (unless totally necessary for survival), Seyle suggests:

"Although contrary to public opinion, we must not-and indeed cannot-avoid stress, we can meet it efficiently and enjoy it by learning more about its mechanism and adjusting our philosophy of life accordingly."

Much of Selye's work featured the concept of adrenal function and the concept of exhaustion. The adrenal glands are two pyramid-shaped structures that sit atop each kidney. Their role is the production of dozens of hormones that contribute to optimal body function. He summarised the reaction to adrenals and stress with the G.A.S. or general adaptation syndrome. If I were to try the impossible task of summing up the work from the Godfather of stress physiology, I might suggest the following:

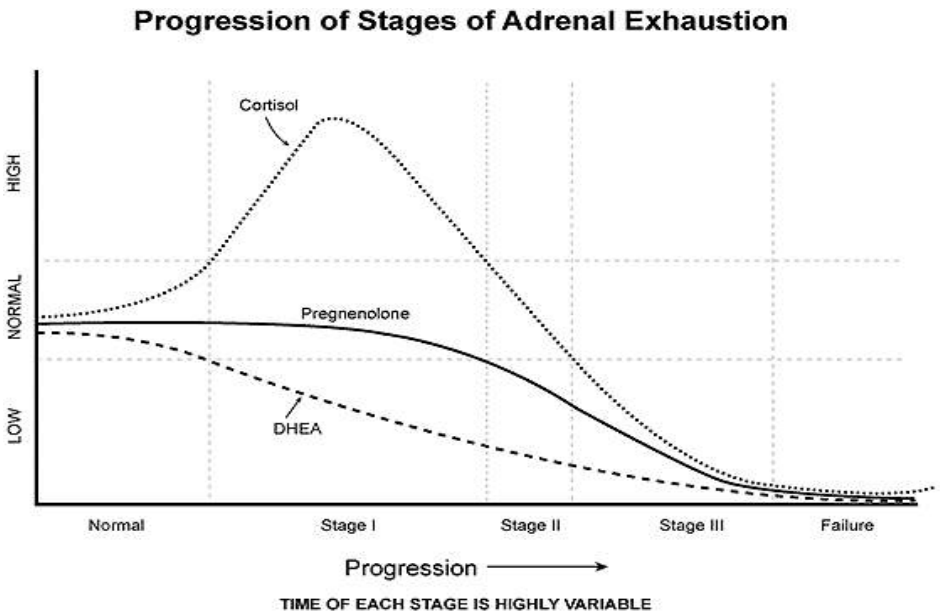
Hans Selye's work on the stress response details the mechanisms of stress, the ability to respond and adapt to that stress and, in cases where a failure to adapt to that stress occurs, total exhaustion and death of the organism ensues.

Sounds grim, doesn't it? But not necessarily so as some of his research showed what changes could happen, when a helping hand was lent. Learned helplessness can be the spiralling into feelings of desperation, low self-esteem and confidence. Probably not as harshly as the experiments completed on rodents, which detailed the complete fatigue, loss of will to survive and ultimate death experienced by the rats exposed to swimming in a tank, without help to get out. However, when rats were exposed to a more helpful situation, which enlightened them to the possibility of rescue and survival, the rats could swim for longer, motivated by the possibility of survival. The learned helplessness experienced by rats that were not offered a helping hand didn't seem to occur.

With increased urbanisation, lack of green spaces, closed and cramped quarters with others, exposure to electromagnetic frequencies or EMF, many people are often exposed to feelings of increased stress perception and learned helplessness. Perhaps if we were to offer more helping hands to others, or learn to understand the stressors around us, we might be able to

become more robust and meet the increased demands of the environment around us?

You may or may not have heard the term ‘Adrenal Fatigue’ from other people, from co-workers to nutritionists, who may offer some slant on the poor functioning of the adrenal glands. In this regard, aspects of Selye’s work have often been taken out of context. It’s true that Adrenal exhaustion can and does exist. However to get to that point, you will have used up considerable other resources before getting there. What I hope to achieve by the end of this book, is to have given you a set of tools for managing environmental factors, tweaking your diet and understanding key hormones, preventing you from ever reaching that dire state of adrenal exhaustion.



(Example of Cortisol *vs.* DHEA output graph)

One of the most important factors in adrenal function is the production of cortisol. This is often a poorly understood hormone. It is a hormone of stress, but it is also a potent anti-inflammatory hormone. You will often hear people suggesting that you need to lower cortisol based upon testing of cortisol levels, usually in relation to the amount of DHEA, a hormone that is often associated with repair and produced at night. The example of cortisol output above is similar to the many adrenal stress index tests, or what is commonly referred to as the ASI.

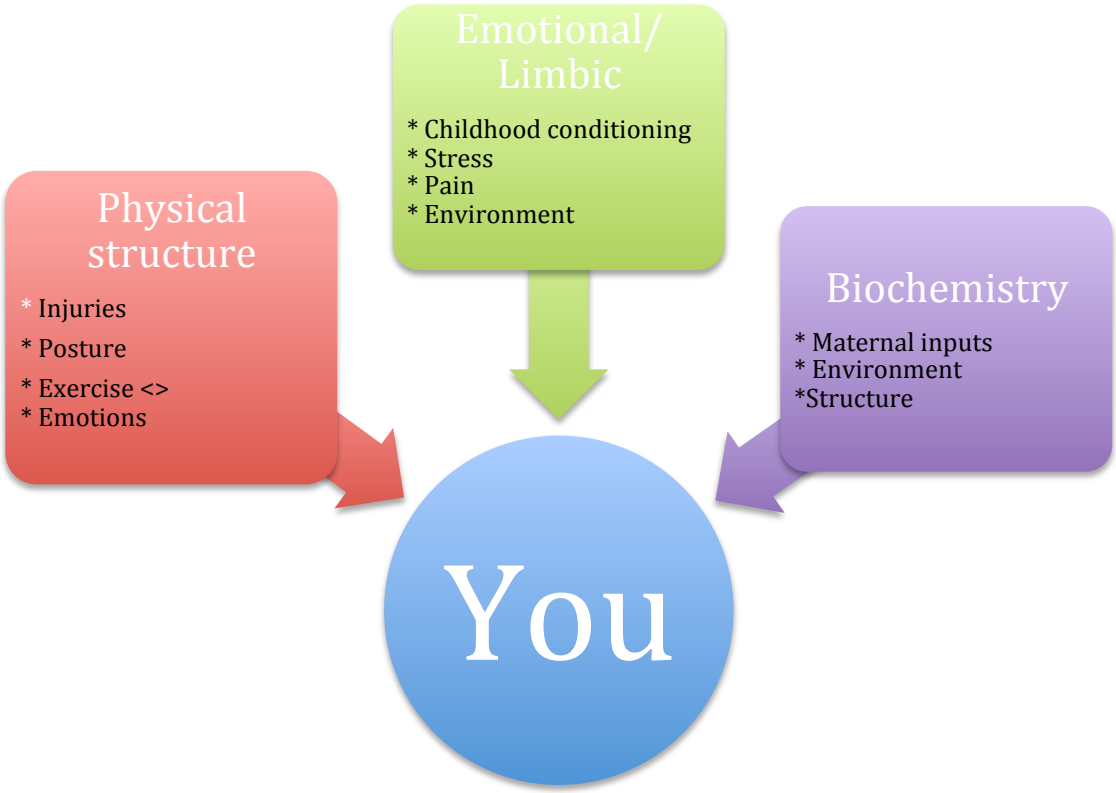
Very frequently, many naturopathic and functional medicine physicians will rely too heavily on the ASI to determine how much cortisol is being produced, without understanding the overall scheme. For instance, what if cortisol is elevated, in effect, in an attempt to protect you, dampening, so to speak, the fires of excessive inflammation? What if cortisol is high because you have missed a meal and simply need to balance your blood sugar levels? Wouldn't cortisol simply be doing its job then? Could we not decrease it by lowering the inflammatory mediators? Might it not also be lowered, by simply eating a meal that would balance your blood sugar levels?

Stress has both a positive and negative role to play with regards to increasing our robustness in dealing with certain situations on both a physical, chemical and emotional level. Stress, as Selye suggests, cannot and should not be avoided, but there is much that we can do to select optimal situations, and change inputs (like food, exercise, stimulating situations that allow for growth, etc.) that enhance our capacity to deal with stress and stride on through life.

Our body remains under varying forms of stress throughout the day. Even night-time is stressful for us, which is likely why we produce a lot of hormones that help with repair and counteracting the stress of darkness.

Unresolved stress.

Alas, this is the area that I will maintain is outside of my area of expertise. However I will give my thoughts on some helpful activities that can help to resolve repetition of negative thinking at the end of the book. Let's consider that much of the body's function and issues revolve around a mechanism called the triad of health.



These forces, some tangible and physical such as an ankle injury, a surgery or car crash, play a role in creating movement patterns in an attempt to avoid pain or perhaps create a pattern of adaptation that may be positive or negative. On going unresolved pain can have a significant impact on the biochemical aspects of your body, producing adrenaline or cortisol or using elevated levels of vitamin C. This may expend more energy, requiring more calories or nutrients, or inhibiting the thyroid gland over time.

Emotional conditioning, mediated by experience, can equally affect physical structure and hormonal aspects of oneself. Biochemistry, including hormonal and neurotransmitter factors, are well known to play key roles in depression, anxiety and other psychological states. Pain and structure can also be negatively affected by changes to your body's own chemistry states.

It has become clear that to maintain health throughout life, understanding or at least addressing these key components is essential.

These aspects of adaptation provide us with our own unique 'functional architecture'. This architecture is an interaction between nature, nurture and the dynamical systems that are at work maintaining life. The nature is a lineage derived, genetic version influenced by previous generations and the

forces at work in their environments. The nurture aspect impacts our function on a structural, biochemical and emotional level, constantly adapting based upon our own environmental stimulus. You may have noticed the quote that "everything in biology is artifactual" from Ray Peat. In essence, this means that everything that your body is experiencing now is a product of all of its previous inputs or hysteresis. Hysteresis is the function of a system based upon its history. Think yo-yo dieting, excessive exercise, on-going stress, exposure to pollutants. Everything that happens to our body leaves a trace that influences your body and how it functions.

Physical stress—Is there a difference between the female athlete and the average woman?

There's often a distinction made between the female athlete's loss or change to the menstrual cycle, and the same symptoms when observed in the average woman. But is there any real difference, apart from the activity level, when it comes defining these changes? Let's look at the two scenarios. The first is defined by a large volume of activity, an imbalance in energy intake versus output, and either a cessation in the cycle (amenorrhea) or Oligoamenorrhea, usually defined by four to nine periods per year. The suggestion is perhaps that excess androgens, notably testosterone, are elevated and contributing to the change in the cycle.

The second scenario isn't defined by the volume of exercise alone. But there are two main similarities. It may even comprise little exercise, although exercise and energy expenditure need not always be defined by how much exercise one does at the gym. A parent running a household, with children, certainly requires a consistent energy intake to meet that demand. What is consistent, though, is the low or inadequate energy/dietary intakes coupled with changes or loss to the cycle.

There's a suggestion that a mutation to a certain gene can predispose some females to experience cycle changes. Let us recognize that this can be a very small percentage and that perhaps environmental factors may also be at work, combined with the given individual's ability/function to deal with exposure to any forms of stress or eustress. These processes are certainly energy-dependant.

A small paragraph on a complex subject

Genetics has been held on a pedestal for all the wonderful changes to science and medicine it is often associated with. Since the identification of DNA by Francis Crick, much has been promised by those whose work,

livelihood and reputation depend on the gene/genomic paradigm. There are also many tests proposed that promise to offer the key to identification of genetic issues. Single Nucleotide Genetic Polymorphisms or SNP's (often called SniPS), allow for the identification of genetic and supposedly predetermined issues. You may have heard of laboratory testing companies like 23andme that provide such services.

This essentially falls under the umbrella of Neo-Darwinism, a gene-centred concept of evolution. In *The Journal of Experimental Biology*, D. Noble points out in several articles that this concept is actually a relatively untenable proposition. You may have heard of the book by Richard Dawkins (known more so for *The God Delusion*) titled *The Selfish Gene*. In is in the latter that Dawkins popularizes this concept of "genetic determinism" and other similar concepts based on analogies with codes, programs and blueprint, but Noble rightfully insists that these need to be re-examined if we are ever to provide a better framework to explain complex biological processes. DNA, as such, provides a template for our body and its functions, yet it is subject to the forces of the environment.

Phenotypes are suggested variations, such as blue eyes, blond hair, etc., and acquired inheritance of traits from the environment (as first detailed by the biologist Lamarck, he gets a mention shortly) from maternal and paternal influences, are quite valid. Genes can be affected by inputs from your mother and father, but also various other factors in an individual's given 'milieu, including food, pollutants, stress and a whole host of other factors.

Now whilst these factors may be present, I am more inclined to suggest the potential to change some of these factors, especially so if the individual/organism is given the adequate environment for growth and to restore optimal function. The ability to adapt to environmental features of stress can be achieved with a presence of purpose and usefulness within its society. The ability to achieve biological stability and adapt, I believe, is definitely of the realm of the possible. Shall we, then, keep focusing on the genes or the potential for change?

Environmental stress and pollutants

Invisible stressors such as found in air, pesticides in food, perfumes, cleaning products and a host of other factors can contribute to an increased load on the body that, for some, may just be the key factor in the symptoms that they are experiencing.

Air pollution is unavoidable around the world; these compounds found in the air, emitted by cars, aircraft and other engines, act in a manner similar to an excess of **estrogen**. As these are produced external to the body, they are termed xeno-**estrogens** and possess a potent capacity to mimic the effects of an excess of **estrogen**. Some medicines possess a similar capacity and are termed xenobiotics. [It's only coincidence that those three estrogens ended stacked up on top of each other, but I thought it was worth highlighting for extra effect.]

My point is that estrogen and estrogen-like compounds are ubiquitous. What I don't want you to do (unlike myself, when I first got into studying the detrimental effects of pollutants) is to worry about everything. Some things you just can't change. Some things you can. What happens in your house, where you rest and regenerate? What you choose to put on your body can help to increase or lower the load, which can contribute to improving your response to chemical and physical stress. We have been evolving over millions of years and have constantly been exposed to harmful compounds, which help to stimulate our immune system and stress response. These very mechanisms have helped us to get to this present day.

Various problems have become increasingly well-documented as far as the effects of pollution on human health, from fertility, to how our cells function to produce energy. An exposure to compounds that mimic estrogen may be responsible for an increasing body of symptoms such as fatigue, digestive dysfunction, sleep, mood and a host of other conditions that can prevent us from being at our best. Below is a list of common compounds that appear to be negatively influencing human health in some people.

Phytoestrogens: Phytoestrogens can be found in a bulk of foods. Due to the confusion surrounding estrogen and its optimal levels, many Dr's and nutritionists often recommend the consumption of compounds such as soy. In some, they can be harmlessly excreted while in others who already suffer from an excess of estrogen, this can compound existing health issues related to low progesterone and high or unopposed estrogen. Red clover, for instance, is a notorious agent for increasing endogenous levels of estrogen. Combined with pesticides, these factors can contribute to on-going estrogen dominance symptoms.

Xenoestrogens:

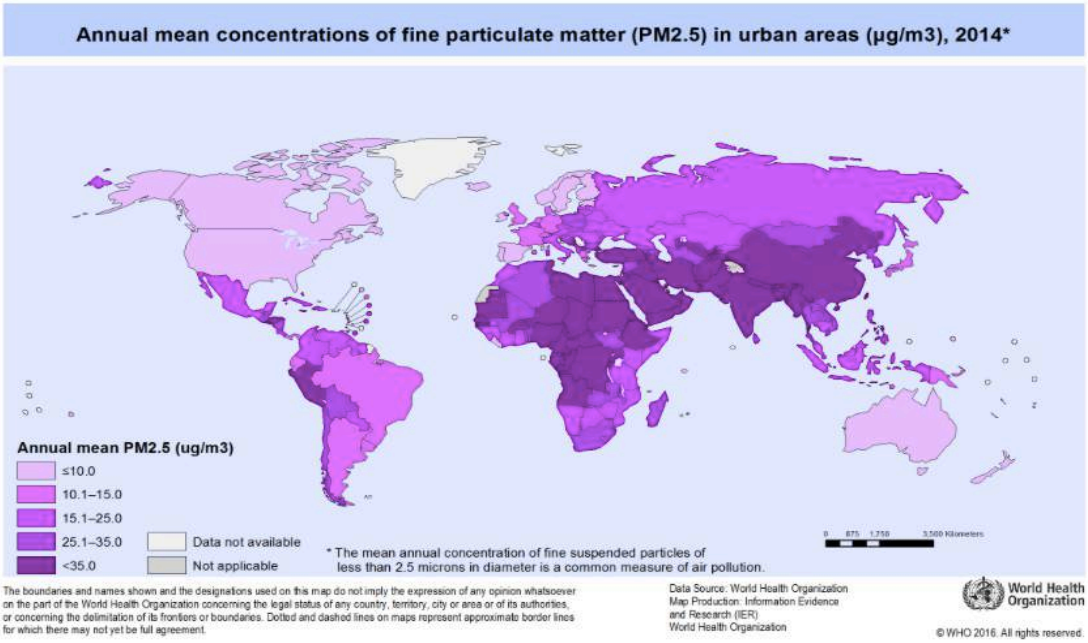
- These estrogen-mimicking compounds can be found in petrochemicals and the combustion of fuel

- Xenobiotics found in many medications, but most prevalent in contraception
- Pesticides and fertiliser that run off from farmland into water supply
- Plastics, especially in bottles
- Pthalates
- By products of industry PCB's, dioxins
- Solvents in glues, paints and other building products
- Perfume and makeup, and nail varnish, which is a particularly tricky compound to detoxify
- Use of silver iodide in cloud seeding
- Sewage containing all of the above has seeped into the water supply around the world at astonishing rates over the last hundred years or so.

I remember a mentor of mine once stating "If you can smell it, it's already hit your blood stream." The body then has to work to detoxify these compounds. Given that perfumes, household cleaning products and nail varnish are common features that you might smell on a regular basis, there's much to consider when it comes to decreasing the load that your body is exposed to on a regular basis.

Air pollution is a real problem to a living organism. The disruption to optimal health is becoming a problem and effects millions of people each year. From respiratory disease to increases in mortality air quality is a substantial factor in hormonal health. Air quality and pollution is measured by the accumulation of fine particulate matter (PM2.5). The WHO suggests that 1 in 8 people die globally as a result of air pollution. That's a pretty scary stat and the main offenders are carbon monoxide, nitrogen and sulfar dioxide, which come from cars, industrial factories, stoves and forest fires.

An excess of carbon monoxide is problematic as it binds to haemoglobin (the oxygen carrying factor found in blood), 200 times more effectively than oxygen itself. Like many compounds carbon monoxide plays a useful role in signalling but in excess, has severe consequences to human health. The WHO map below gives an insight to global recordings of pollution. You might want to consider this if wanting to address long-term health issues that may be affected by pollution.



Perhaps with the slow but suggestive switches to cleaner sources of energy production we might be able to create some change to pollution. Solar, wind and other technologies might be great long-term solutions but some cities have managed to address pollution by making some simple changes. The Guardian in 2016 ran an article about Rajshashi in Bangladesh detailing how they managed to halve the PM2.5 particles in the air from 70 to 37 since 2004 by making some simple changes. Planting more trees, switching to battery powered rickshaws, banning diesel lorries from the centre made significant strides to lowering pollution levels and improving health. Keeping the air clean in your own living space is one of the first things that you can do, improving metabolism, hormones and health.

Mycoestrogens:

Many stored foods such as grains, cereals, dried foods, coffee, beans, legumes and others contain mould-like substances which often contain mycoestrogens.

Zearalenone is an estrogen-like compound that was found to lower reproduction in farm animals. It is thought that mycoestrogens like this may not have as much biologically active estrogen as that produced internally, but may have carcinogen like qualities. If external estrogen is excessive and unchecked by progesterone, the perpetuating effects of high estrogen simply keep mounting up.

In the book, *Pollutants, Human health and the Environment*, Plant et al., summarises the effects of estrogen. "*Administration of estradiol by subcutaneous injection or implantation has been found to result in an increased incidence of mammary, pituitary, uterine, cervical, vaginal and lymphoid tumours and increased incidence of the testis in mice and an increased incidence of mammary and pituitary tumours in rats. Injections in neonatal mice resulted in precancerous and cancerous vaginal lesions in later life."*

Now whether or not you buy the extrapolation of data from rodents to humans as valid (some rodent modelling is suggested as inaccurate due to the difference in fluctuations between hormone cycles in rodents and, well, they are not humans), note that in both males and females, excess levels of estrogens appear to be cancer-inducing at any age.

Heavy metals: Taking the rock and roll from life.

The use of the word toxin is ubiquitous in health-conscious circles. By definition, any compound known to man has the capacity to be a toxin. The amount required to become a noxious substance is the defining feature. Most heavy metals and trace elements have some of the most harmful features of a compound in excess.

The description of harm induced by heavy metals such as lead, cadmium, arsenic, mercury and others have been documented in most great histories. From the great Chinese dynasties to the suggestions of toppling the mighty Roman Empire, the deleterious effects of lead poisoning are well known. The Mad Hatter character in Lewis Carrol's, Alice in Wonderland was suggested to be somewhat demented, due to his contact with mercury, used in the process making his most elegant of hats.

Heavy metals are notoriously difficult to excrete from the body. Their persistence and excess seems to accumulate in tissues like bone, nerves, the brain and other soft tissues, including body fat. In heavy metal toxicity, it's unlikely that any part of the body's processes remain unaffected. They often play havoc with key systems such as neurological and immune signalling,

depletion of enzymes, vitamins and minerals. Mercury is well known to deplete selenium stores, interfere with thyroid hormone binding sites and down regulate metabolic processes. This is something that I can relate to. I made the decision several years ago to have my mercury amalgam fillings removed. Despite using a holistic dentist, my health took a nose-dive for a couple of years.

When I work with clients, I try to rely on as little laboratory testing as possible. One reason is due to the unnecessary costs to clients. Whilst studying functional medicine, I found some of the base knowledge to testing and physiology useful but failed to understand other key physiological processes. Suggested treatments often relied on the use of many supplements. I still see many clients who come to with a list of ten to fifteen supplements that have been recommended to them in order to help improve their situation. Some of the simple assessments are detailed later but occasionally I still use some tests if clients fail to respond to the simple suggestions at the end of this book.

One way of determining the impact of metals is by conducting a urinary porphyria test. A similar test is known as a toxic elements test. An example of mine, below, was taken two years after having my mercury amalgams removed. Precoproporphyrin is one of the markers associated with mercury. You can see that the levels are still extremely high.

Methodology: UPLC/Fluorescence detection, Colorimetry

Ranges are for ages 13 and over

Compound Tested	Results (nmol/g creatinine)		Quintile Ranking (1st / 2nd / 3rd / 4th / 5th)	95% Reference Range
Porphyrin Pathway Intermediates				
1. Uroporphyrin I & III	8.7		16.6	<= 27.2
2. Heptacarboxyporphyrin	2.6		5.9	<= 11.2
3. Hexacarboxyporphyrin	<DL*			<= 3.3
4. Pentacarboxyporphyrin	<DL*		2.1	<= 5.4
5. Precoproporphyrin‡	8.3	H	7.5	<= 14.8
6. Coproporphyrin I	20		33	<= 56
7. Coproporphyrin III	76		89	<= 159
Calculated Values				
8. Total Porphyrins	107		143	<= 233
9. Precopro/Uro I & III	0.95	H	0.64	<= 1.11
10. Copro I/Copro III	0.26		0.53	<= 0.87

Creatinine = 166 mg/dL

* <DL = less than detection limit

Pesticides and fertilisers

Prior to the middle of the nineteenth century, pesticides were not available and therefore not used on crops. Human and animal waste were often seen as the best fertiliser for crop growth Time travel to the beginning of this century and approximately 2.4 million tonnes of pesticides are used each year. Artificial fertiliser represents a whopping 136 million tonnes. Not just on crops and food produce, but also on golf courses and gardens. By definition a pesticide is:

"Chemical pesticides (the suffix '-cide' means to kill) are designed to poison one or several forms of life."

Generally pesticides do their job with efficiency, killing heaps of pests (defined as other living things that also like to eat food) and unwanted critters. The problem with these compounds may be due to their use of elements such as arsenic, mercury, cadmium, barium, fluorine, phosphorus and other elements. These elements, as I suggested earlier, are persistent and notoriously hard to remove from the organism's tissues. An argument often proposed by the pro-chemical using industry and agricultural organisations, is that these poisons are used at such low levels that they pose no threat to humans.

The World Health Organisation estimates that approximately one million people are killed each year by pesticide poisoning and, each year, another two million hospitalised by trying to kill themselves with pesticides. This figure only represents a percentage of the real figures and many incidents may not be recorded unless reported at a hospital or to a doctor. These compounds act more aggressively than estrogen, but low-level exposure over many years presents many distinct similarities in terms of disruption of optimal cell function.

Unfortunately, the use of Organo Chloro pesticides or OCP's, such as DDT and PCB, was done decades ago and with very little research being conducted on the implications to human health. Studies conducted in the last century tended to show little or no implications to hormonal disruption. Studies have become more robust, and differentiation between animal and human systems, have been revised. The persistency not simply a characteristic that presents as accumulation in adipose or human fat tissue, since many studies have also shown that these compounds are readily passed from mother to baby via breast milk.

It's worth noting that although hazardous hormone disrupting chemicals such as DDT has decreased in the states due to stricter regulations, it is still used prolifically around the world. Countries like India have been using it in abundance on fruit and vegetable crops. I stumbled across this small documentary on the subject that I think is worth a view that shows the prevalence of poisoning by pesticides. http://topdocumentaryfilms.com/the-slow-poisoning-of-india/

Plastics and more

It might have become glaringly obvious that many man-made chemicals are indeed potent estrogen-like compounds and act as pervasive endocrine or hormone disrupting agents. Without abandoning the scientific process, it can be safely sated that plastics appear to offer a similar level of disruption to biological functions as observed in pesticides and other compounds used in farming. We can then apply the same thinking to personal health and cleaning products, fuel compounds such as polyaromatic hydrocarbons (PAHs), which are derived from fuel engines, and it goes on and on and on.

My intention is not to scare you half to death and turn you into neurotic "pollutants are everywhere, worry monsters", so I will refrain from listing all the chemicals that do pose a problem as far as human health is concerned, or likely increase the incidence of mortality from a slow miserable death (aren't there enough David Avocado Wolfe and Food Babe types already running around crying Taawxins, Taaawxins everywhere? In English one might say Toxins). What I am going to do, instead, is highlight some of the major factors that you can take control of, in the process making you more robust and more open to factors that can facilitate physical and emotional growth. In essence, maintaining a state of biological stability and adapting to environmental stressors rather than being constantly oppressed by them.

Dietary choices

Tis the season to be green, brown and jolly. There's no doubt that eating a diet high in fresh fruits and vegetables is beneficial for human health. What tends to get distorted along the way is that all foods should be as raw, green or wholesome as possible. In some cases people do well on a raw food diet. But increasingly, many people do not seem to thrive on such an approach. Nutrition has got very confusing for many people, including people who offer nutrition advice, who will frequently give conflicting information.

This obsession with trying to eat everything as nature intended, such as diet high in uncooked vegetables, nuts, seeds, and low in dairy, fruit and meat, can be disastrous for those who are experiencing high levels of stress, who exercise intensely or who have underlying hormonal dysfunction.

Many of these 'whole' foods contain an abundance of compounds that decrease the availability of nutrients and can actually lower the production of key hormones such as thyroid. Couple this with a low-carbohydrate intake and what you may start to see after a great honeymoon period are the inklings of low energy, sleep disruption, low libido, low blood sugar, digestion issues and many more factors.

I am not suggesting that you are all getting it wrong: context is key. What I am saying is that if you suffer from poor sleep, low energy, inefficient digestion and other such markers, chances are your diet is not supporting your needs, or there may be some other environmental factors that need to be addressed. In fact, to give but one simple example, regular eating through times of stress can be one of the most beneficial modifications to implement, rendering one more robust in the face of these stressors.

Vegetable oils

Polyunsaturated fatty acids or PUFAs have been playing havoc on the human body for decades. I say decades more than centuries, because in many cultures, saturated fats have been used in cooking consistently, until the scam of seed oil companies took its toll in the 1980s. I can actually remember my grandmother reading about the dangers of cholesterol in a newspaper. You know cholesterol, that essential compound that is used as a building block for cells. Like saturated fat, cholesterol was made out to be the bad guy, but cholesterol is an essential compound produced by the liver. If you go on a low cholesterol diet, your body will respond by producing more cholesterol.

Two points worth considering here regarding cholesterol levels are:

1). Cholesterol usually elevates when the body has to regenerate new tissue due to on-going inflammation and injury and
2. If the thyroid is not working adequately, then cholesterol levels are generally elevated. Once thyroid levels are adequate, cholesterol usually decreases. Can these factors be addressed by diet? Yes, they can.

These 1970s and 80s suggestions slowly convinced us that saturated fat and cholesterol were bad and that we would benefit from shifting to the liquid PUFAs. It's only in the last couple of years that we have begun to understand the real dangers associated with using PUFAs, particularly so, when they are heated.

As these oils are heated, they rapidly become unstable, are oxidised and contribute to excessive inflammation, damaging the cellular energy-producing processes of the body. These oils are ubiquitous in fast fried foods and added to increase the shelf life of some foods. Unfortunately, in another form, flaxseed and other similar oils, are often recommended by many health-promoting practitioners, such as nutritionists and Dr's who don't fully understand the role that these oils play in damaging the body. In many of the studies that show a positive role of PUFA's in the diet, there remain many factors that were not considered in the final health promoting assertions that were made.

Ray Peat's work highlighted the ability of PUFAs to disrupt optimal energy production. Their actions are not dissimilar to the impact of estrogens, which will be discussed throughout the book.

Here is a list, that was posted by Rob Turner of Functional Performance Systems (he also has some great info on the work of Ray Peat and others (check out the website I the references) of most common oils that are found, with their approximate fatty acid content.

Mean SFA, MUFA, & PUFA Content of Various Dietary Fats

Sorted by SFA%:PUFA% Ratio - Highest to Lowest
Most Safe to Least Safe

Dietary Fat or Food Product	Mean SFA%	Mean MUFA%	Mean PUFA%	S/P
Coconut Oil	86.5	5.8	1.8	**48.1**
Cocoa Butter	59.7	32.9	3.0	**19.9**
Butter	50.5	23.4	3.0	**16.8**
Beef Tallow	49.8	41.8	4.0	**12.5**
Mutton Tallow (Adult Sheep Fat)	47.3	40.6	7.8	**6.06**
Lard (Pork Fat)	39.2	45.1	11.2	**3.5**
Duck Fat	33.2	49.3	12.9	**2.57**
Goose Fat	27.7	56.7	11.0	**2.52**
Olive Oil	13.5	73.7	8.4	**1.61**
Chicken Fat	29.8	44.7	20.9	**1.43**
Turkey Fat	29.4	42.9	23.1	**1.27**
Shortening	18.4	43.7	33.5	**0.55**
Peanut Oil	16.9	46.2	32.0	**0.53**
Cottonseed Oil	25.9	17.8	51.9	**0.5**
Almond Oil	8.2	69.9	17.4	**0.47**
Soybean Oil Hydrogenated	14.9	43.0	37.6	**0.4**
Seasame Oil	14.2	39.7	41.7	**0.34**
Soy Lecithin	15.3	10.9	45.1	**0.34**
Wheat Germ Oil	18.8	15.1	61.7	**0.3**
Commercial Salad Dressing (Mayo, Soybean Oil)	11.8	22.7	41.3	**0.29**
Sunflower Oil	10.1	45.4	40.1	**0.25**
Soybean Oil	14.4	23.3	57.9	**0.25**
Corn Oil	12.7	24.2	58.7	**0.22**
Canola Oil (Rapeseed Oil)	6.8	55.5	33.3	**0.2**
Walnut Oil	9.1	22.8	63.3	**0.14**
Linseed Oil (Flaxseed Oil)	9.4	20.2	66.0	**0.14**
Grapeseed Oil	9.6	16.1	69.9	**0.14**
Safflower Oil	9.1	12.1	74.5	**0.12**

Source:
Agriculture Handbook No 8-4: Composition of Foods--Fats and Oils - JB Reeves III, JL Weihrauch, Consumer and Food Economics Institute - Science and Education Administration, USDA, Washington, DC 1979
http://naldc.nal.usda.gov/download/CAT87209368/PDF

It's actually quite hard to avoid PUFAs in the diet, so the increase in the diet over the last thirty years or so, has posed a number of issues. I remember when I worked as a fitness instructor and provided nutrition guidelines based upon the ACSM or American College of Sports Medicine's guidelines, which entailed lower saturated fat options such as margarine and low-sugar drinks like diet colas. Both saturated fat and sugar have been through their fair share of demonization but the facts are, avoidance of saturated fats and sugar will not only make you miserable as hell; their actual restriction can lead to some specific problems.

Another source of PUFA's comes from nuts and seeds. It seems to be highly fashionable with the concept of so called paleo type diets to recommend plenty of nuts and seed
Coming up at the end of the book, you will find specific guidelines to improving your symptoms using foods that support your biological function and will make eating a joy again.

To tipple or not to tipple?

Much has been said on the effects of alcohol and as Paracelsus wisely stated, "the dose makes the poison". As I already wrote, that is true of any compound, be it water, oxygen, broccoli or the much-maligned sugar. So, is drinking alcohol beneficial to the human body?

Whenever I see someone who has died in the newspaper, who lived well into their nineties or perhaps a centenarian, I am often curious about their diet or lifestyle. What did they do? What seemed to be a constant feature of their food intake? It would be fair to say that the odd tipple seems to feature in many cases. Let's take Nazar Singh, from the UK who died, at the ripe old age of 111, in 2015. The Guardian newspaper cited, "*He put his longevity down to a loving family, good food and a drop of whisky every night.* So beyond alcohol, there may be some other external factors, such as a loving and supportive family, sense of self-worth and purpose, all of which may contribute to a long and prosperous life.

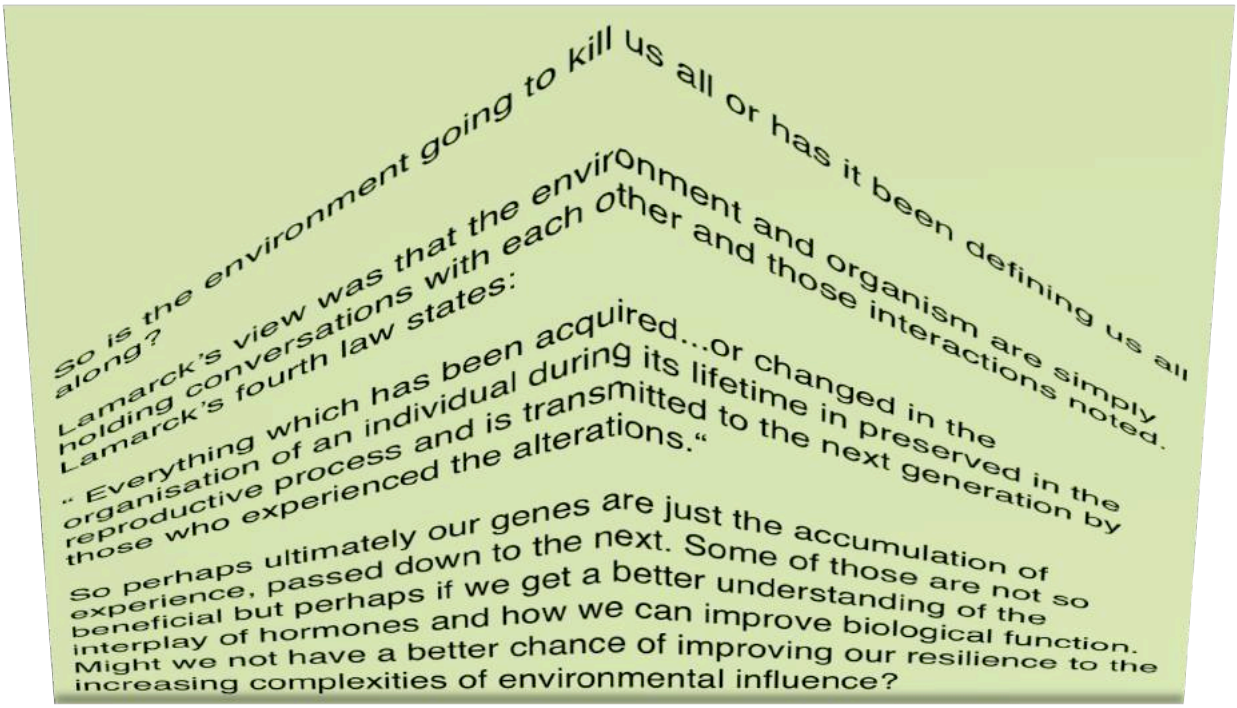
In London, where I worked for many years, I often saw many female clients who, straight after work, went to the pub to finish up their long, stressful work day. Let us look, here, at some of the reasons why alcohol consumption may be problematic. Drinking alcohol on an empty stomach can pose several problems. Some alcohols contain, yeast, sulfites and other preservatives, all of which can irritate the digestive tract by mechanisms discussed later. Another key issue is that when you are just consuming large amounts of carbohydrate on their own, without a balance from fats or proteins, this can contribute to insulin sensitivity, which in turn disrupts carbohydrate

assimilation (and production). Add to this the stress of a hard day, the late nights and resultant stress to circadian rhythm from lack of sleep, and it is not long before this lifestyle can help to create many of the symptoms that we will be discussing later in this book.

Can alcohol, at a given dose, be protective? We frequently encounter in the news wine or beer consumption, due to their antioxidant content, among them resveratrol, praised as being protective. Resveratrol has been touted as an antioxidant/anti-aging supplement that shows promise in increasing lifespan. Unfortunately, much of the research on resveratrol fails to show any significant effect on decreasing factors that are associated with limiting aging.

When I worked as a personal trainer, I had the pleasure of working with a cancer research scientist who suggested that, to get the benefits from resveratrol, you would have to drink at least 15 liters in one sitting. I only know a couple of people that would actually be able to pull that off over the course of a week, perhaps. Resveratrol is in fact a phytoestrogen and much like our other lists of estrogenic compounds, should, ideally be restricted, rather than recommended as daily supplement. Sorry folks but that daily glass of wine is, at best, a well-marketed ploy. It doesn't mean that you have to stop forever, but it may mean you will have to change your choice of drink or cutting back, at least initially.

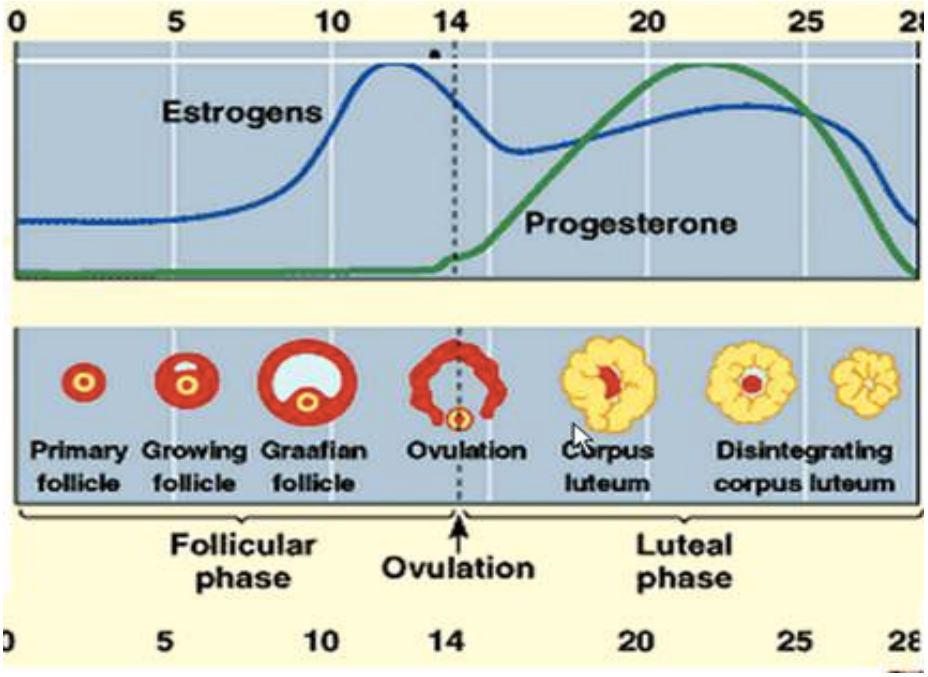
There's a great overview of the suggested positives and negatives of resveratrol at the Linus Pauling website. http://lpi.oregonstate.edu/mic/dietary-factors/phytochemicals/resveratrol



Estrogen, the female hormone?

Well, no, estrogen isn't a female hormone, and it's not a male hormone either. It's simply a class of hormones whose primary role is cell proliferation or growth. In contrast, progesterone is used for cell differentiation (more about progesterone shortly). Estrogen has many derivatives, but the three most commonly cited estrogens are: Estrone (E1), Estradiol (E2) and Estriol (E3).

Estrogen's primary role is that of growth. It is used to stimulate growth of tissue, especially so in the endometrium and breast. During the follicular phase, estradiol levels increase and, just before ovulation, they start to decrease. Progesterone's protective effects are enhanced via increased production in the corpus luteum during the luteal phase.

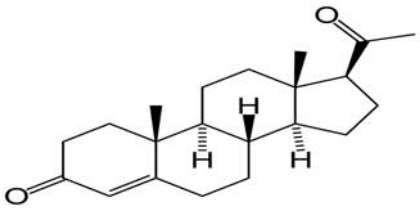


Whilst you may conclude from this graph that estrogen and progesterone levels have similar levels, the actual measurements differ substantially. Progesterone is measured in picograms, while estrogen is measured in nanograms. Therefore, in comparison, progesterone levels are actually recorded as being a thousand times higher.

Problems associated with excess estrogen have increased due to changes in diet, increased exposure to environmental pollutants and other factors that are not offset by increased production of progesterone.

You may remember from earlier on how two distinct forms of estrogen-like compounds can be found. These are endogenous—produced in the body *vs.* exogenous—from outside sources. The external sources can be present in food, chemicals such as pesticides, perfumes and benzene particles found in the air from used petrochemicals. These compounds are termed xeno-estrogens and have the effect of mimicking estrogen metabolites, increasing the likelihood of cell proliferation, potentially creating an increase in cell mutations that have the capacity to increase the incidence of cell dysfunction and result in cancers.

Progesterone



You might be starting to get an idea that estrogen, when elevated, is problematic, and you would be correct. This might be a worrying thought but fear not, as we have a champion at hand that can help to offset the deleterious effects of elevated estrogen.
Meet Progesterone, a potent adversary to elevated estrogen and protector to many optimal functions in the human body. Much of the literature that I have reviewed and that shows the potency of the beneficial effects of progesterone comes from the work of Ray Peat, PhD, an orthomolecular biologist who has studied the effects of estrogen. This led me to the seminal work of Katharina Dalton, MD, and John Lee, MD.

Dalton's work on the use of progesterone is well validated in scientific literature and there are hundreds of scientific articles confirming the effectiveness of progesterone to lower and in many cases, eradicate issues such as PMS and depression. John Lee's work provides some valuable insights into the effects of progesterone and dealing with all manners of estrogen excess such as fibroids, endometriosis, PCOS, osteoporosis and many other factors. Their books and publications can be found in the reference section.

Below are just some of the actions of both estrogen and progesterone.

Effects of Estrogen	Effects of Progesterone
• Breast stimulation • Endometrial proliferation • Increased body fat	• Anti tumour effects • Supportive to fertility • Sedative effects

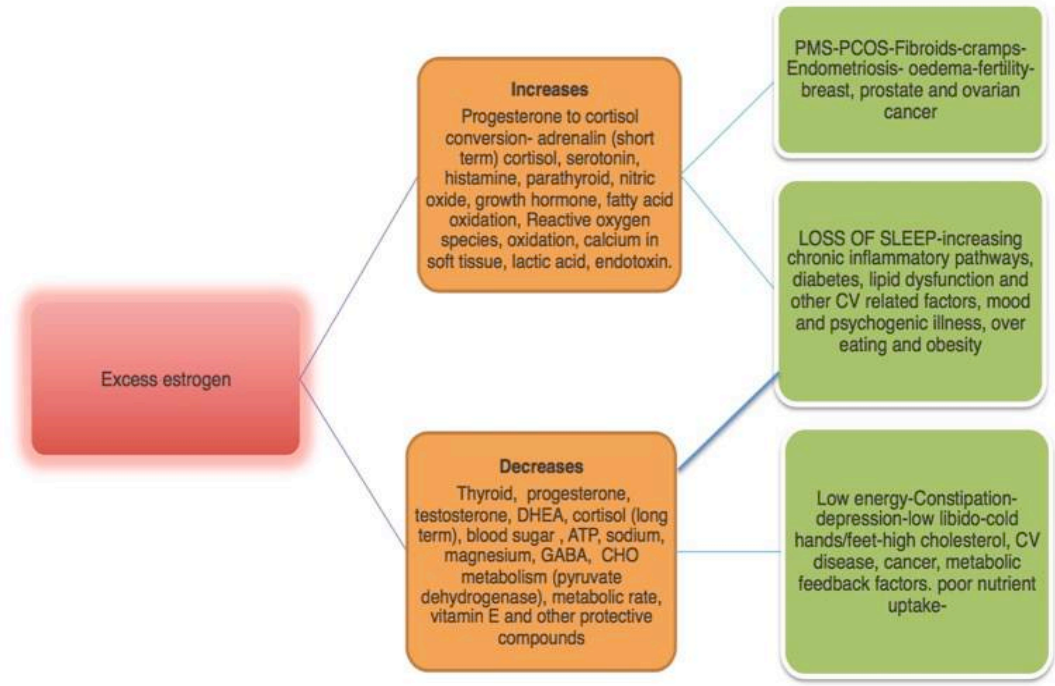
• Salt/fluid retention • Clotting • Depression • Headaches • Decreased libido • Impairment of blood sugar • Reduced oxygen (hypoxia) • Carbon dioxide • Risk of breast cancer • Osteoporosis • Decreased thyroid hormone • Increases CV issues • Insomnia • Memory loss • Foggy thinking • Fibroids • Uterine cancer • Hair loss • PMS	• Improves blood sugar levels • Ovarian cysts • Menopausal flushing • Removal of facial hair • Improves Acne • Menstrual cramping • Improved autoimmunity • Hormonal balance • Anti-Stress • Decreased Arthritis • Decreased prostate issue • Thickens hair on head • Restores libido • Relieves PMS • Improves neurological function

Progesterone has been well documented as the protective agent against cell proliferation and cancers.

‘

Progesterone antagonizes estrogen-driven growth in the endometrium, and insufficient progesterone action strikingly increases the risk of endometrial cancer.’

Sources of progesterone can be found in milk, butter, brains (if you are inclined to eat them) and exposure to sunlight.



Effects of estrogen dominance

Progesterone's hijacking

Like anything in nature, these compounds are ubiquitous. Progesterone is no different and producing progesterone is a fairly simple process. It doesn't have a patent and therefore pharmaceutical companies never stand to make that much profit from it. I hate to start sounding like the big pharma conspiracy theorist, but the fact remains that progesterone is one of the most potent compounds that can be used to lessen the incidence of common problems like PMS, depression, sleep, libido, blood sugar regulation and many other factors. However, it's not like the pharmaceutical companies haven't tried. Enter the progestins or progestogens.

Progestins are the synthetic, patented form of natural progesterone. Unfortunately, at one point things goytso confusing for Dr's and the public that progesterone was used interchangeably with progestins, with the assumption that progesterone and progestins were created equal.

So what are the differences between the two? Well the first point would be that they both have different chemical structures and therefore have different effects. Progesterone's only side effect from high doses appear to be a sense of euphoria, well-being and some anaesthetic-like effects. Consider the differences with progestins, which appear to cause….

- Acne
- Bloating
- Breakthrough bleeding
- Breast discomfort
- Depression
- Dizziness
- Fluid retention
- Headaches
- Irregular bleeding
- Lethargy
- Moodiness
- Nausea
- Prolonged bleeding
- Spotting
- Vomiting
- Weight gain

There have been many studies that have been used to assess the impact of progestins, often combined with estrogens. Many of these studies assess impacts of the use of progestins on factors such as preventing miscarriage, decreasing PMS and the impact of menopause. In a review of studies using a combination of estrogen and progestins, not only did the treatment do no better than a placebo (no treatment), it was stated that the use of such hormones appeared to increase the risk of maternal reproductive cancers.

An interesting study that compared differences between Mongolian versus UK females showed that despite high levels of meat and dairy consumption. Cancer levels were lower in the Mongolian study group, despite elevated estrogen levels. Progesterone, which in rural areas appeared some 50% higher, was most likely the protective agent in disease prevention and is an integral part of bone re-absorption of calcium. These levels decreased in urban areas of Mongolia and a suggestion, I would offer, is that increased progesterone levels protect against the deleterious effects of an excess of estrogen. Calcium intake and osteoporosis can only really be effectively assessed when you observe the interactions of progesterone, vitamin D and other co-factors. The suggestion, as such, is that the more developed the environment, the higher the likelihood of a corresponding increase in estrogen-like compounds accompanied by a decrease in progesterone, which I suspect may be a better indicator of diseases such as osteoporosis.

Progesterone also seems to be a potent agent in the recovery process from brain injury from strokes and traumatic brain injury. Its use in rats has shown powerful reductions in brain swelling, oxidative stress, inflammation and scar

formation, as well as neurological enhancements that lead to improvement in conductivity and function, quite rapidly in some cases. Given that it lacks any significant side effects, it's certainly worth using in post trauma stroke cases.

Testosterone

Much like estrogen's often misinterpreted female hormone designation, testosterone, which is more abundant in males, is equally needed by women and is essential for many aspects of female health. Symptoms of inadequate testosterone include low libido, reduced bone strength, depression, memory loss, skin health and vaginal dryness. Testosterone belongs to a class of hormones called androgens.

These also include androstenedione, and dihydrotestosterone or DHT. Their anabolic or tissue building traits have helped to give them their incorrectly attributed status of male hormone. An excess of testosterone (usually a conversion of testosterone to DHT) can lead to hair loss on the scalp, increased hair growth above the lip and other body parts, muscle-mass increase (but not always), a deepening of the voice, with supplementation with supra-physiological levels also shown to have an effect on memory.

Many people, including men, often view low levels of testosterone as a simple need for some form of supplementation. Getting testosterone just right can be a tricky procedure, but we need to understand the mechanics of why testosterone, much like progesterone, can be subject to the effect of high levels of estrogen in the body.

Estrogen, when in excess, can create a vicious circle of production. We know about environmental factors that perpetuate estrogen levels but, in addition to this, fat tissue in the body can be a source of estrogen and a common feature of an excess, in fact, is the production of aromatase enzymes, which convert hormones like testosterone and androstenedione into estrogen. DHEA, which act as our hormone of rest and repair, can also suffer the same fate.

PCOS, which will be discussed again shortly, is often associated with high androgen/testosterone levels, erratic cycles and hairy upper lip; there is very often no distinction made in terms of the continuous conversion of hormones like progesterone, DHEA and testosterone, into estrogen. It’s a bubbling soup of hormone conversion and, yes, there likely is an excess of androgens that ultimately perpetuates and facilitates conversion to estrogens, which continues to exert its deleterious effects on the reproductive tissues and the

female cycle.

Once again, progesterone's effectiveness in combatting an excess of estrogen extends to its ability to inhibit the conversion of testosterone to the more potent form of DHT. Decreased hair loss, acne and excess hair on the face can be prevented by the adequate production of progesterone, which is located at the site of testosterone's binding site.

The role of contraception.

The pill was hailed as a revolution, in much the same way that HRT or hormone replacement therapy was. But in fact, both have the capacity to cause very appreciable problems when it comes to normal hormonal function. Estrogen has been used widely for contraception and the synthetic progestins are also used to prevent pregnancy using different mechanisms. Natural progesterone has two key features in the role of contraception and gestation. The use of natural progesterone as a contraceptive has no side effects and, when used as a suppository, seems to be highly effective for preventing implantation of the egg in the uterus.

In contrast, estrogen's mechanism may actually not prevent the implantation from occurring but, due to its actions (including increased hypoxia, a lack of oxygen), may prevent the pregnancy progressing beyond the early stages. Most contraceptive pills and devices tend to use progestogens, or a combination with estrogen. Often, those at risk of developing PMS are more likely to suffer some of the negative symptoms such as weight gain, bloating, depression or mood changes, breast tenderness and headaches.

Synthetic estrogens, much like the synthetic forms of progesterone, pose equal problems. Just like progestins lower the amount of available progesterone, synthetic estrogens lower hormones, like estriol, which is essential for female reproductive tissue. In many cases where women have been on synthetic contraception for many years, we see a shift towards general estrogen dominance and lower levels of progesterone. In some cases, natural estrogen levels can be low, but this is rare.

Over the last few years, I have seen a number of young clients in their twenties who have been diagnosed with PCOS, endometriosis or fibroids, and who have often been prescribed the contraceptive pill, in an attempt to lessen their symptoms. In some cases, their erratic cycle may have improved, but in nearly all cases I have seen, their issues have not been resolved. Observing their histories, such as when they started their cycle, issues that they were

experiencing often reveal a suggestion that they were dominant in estrogen. The standard treatment is the use of a progestogen or combination to deal with the problem.

It's clear that the use of these compounds in preventing pregnancies does have the intended effect, but there are safer ways. The use of natural progesterone as a suppository seems to offer the same amount of protection against pregnancy as both the pill and intrauterine devices. With this method, there are none of the unwanted side effects of progestogens or estrogens. Perhaps the only negative factor is there may be some earlier than usual bleeding. In fact some, of the only negative effects of an excess of progesterone appear to be a sense of euphoria and an anesthetic-like feeling.

During pregnancy, Dr. Dalton again noted the effects of both progesterone and estrogen. Toxemia during pregnancy, intense morning sickness and other unwanted symptoms, appear to be a product of elevated, unchecked by progesterone, levels of estrogen. When natural progesterone was used, these symptoms seemed to disappear. Anecdotally, I can certainly attest to these changes. During my wife's first pregnancy, she literally threw up for 7 months of her pregnancy. The second pregnancy was a very different story; after supplementing with natural progesterone after week twelve, all of the symptoms of morning sickness had virtually disappeared.

It's quite interesting to note the effects of progesterone supplementation on a child's development. It seems that babies, whose mothers used supplemental progesterone, scored higher on IQ tests.

The role of anti-progesterone compounds in abortion.

RU486 or Mifepristone is a medication commonly used to induce labor and an abortion up until the 9-week mark. Its role as a progesterone-blocking factor highlights the role of progesterone in maintaining a healthy pregnancy. Its effects mimic the similar nature of high estrogen, tissue hypoxia/lack of oxygen and uterine contraction. It is usually used with another medication. Unfortunately, its side effects are quite severe.

In U.S. trials of RU-486/misoprostol, 99% of patients experienced at least one of the following:

- abdominal pain (cramping) (97%)
- nausea (67%)

- headache (32%)
- vomiting (34%)
- diarrhea (23%)
- dizziness (12%)
- fatigue (9%)
- back pain (9%)
- uterine hemorrhage (7%)
- Fever (4%)
- Viral infections (4%)
- Vaginitis (4%)
- Rigors (chills/shaking) (3%)[37]

More on the effects of this anti-progesterone can be found here
http://www.ru486facts.org/index.cfm?page=sideeffects
Unfortunately some of the negative effects may be irreversible or seriously harm those who might consider taking them.

Osteoporosis

The role of calcium is well defined in the mechanisms of bone formation, but it represents a modest component of improving bone density. There's no doubt that we need an adequate intake of dietary calcium, which needs to come from dairy primarily, and perhaps some other foods. There are many memes and myths (much like any subject that you see on social media these days) that say things like:

DON'T DRINK MILK, IT'S BABY CALF MILK.

Well thanks for that advice. Maybe I shouldn't drink my coconut water as it is for BABY COCONUT?

Parathyroid hormone or PTH increases when calcium is low, and this can be problematic, as calcium will be removed from bone and teeth in order to maintain equilibrium. Calcium is instrumental in muscle contraction and in low calcium states, twitching of muscles can be observed. It's worth noting that stressed animals produce stressed metabolic byproducts in both meat and dairy, in much the same way that stressed plants produce compounds from intensive agricultural methods. Organic may or may not always be the best solution in these scenarios, but an animal that has been raised in the best manner, free to roam, and pasture fed, perhaps offers the best solution.

Some suggest that the hormonal impact of dairy products may have a

detrimental effect on human health, but studies suggest that the feed has a huge impact on the amount of estrogen produced; for example, red clover is abundant in phytoestrogens. The process of lactation often requires increased levels of estrogen and prolactin, but the processing into forms such as yoghurt and dairy appears to lower the levels of estrogen and its metabolites. It would appear that many factors affect hormone levels in milk, including farming practices that may also be prevalent in non-dairy farming.

Some studies suggest that these hormones are often detoxified in the liver and readily excreted in the urine, rather than posing a problem. It's worth noting that having a well-functioning liver, with ample energy, is key. In conditions like hypothyroidism, the liver can often become sluggish.

The action of maintaining adequate bone density is regulated by these key factors:

- Adequate progesterone — progesterone is responsible for osteoblasts which contribute to bone density
- Vitamin D — essential for regulating calcium uptake
- Vitamin K2 — essential for bone absorption of calcium

Here are some factors that are responsible for production of osteoclasts and the removal of calcium from bone.

- Excess estrogen (it strikes again, are you seeing the pattern yet?)
- Serotonin
- Parathyroid hormone or PTH, a marker for insufficient levels of calcium or Vitamin D
- Prolactin during breast feeding and stress

So in summary, excessive estrogen contributes to a decrease in bone density, while progesterone contributes to the maintenance and building of bone tissue. So what role does Calcium and vitamin D have to play in this context? Vitamin D is the compound that is metabolised, initially in the skin, from exposure to ultraviolet or UV light. 25OHD is the form of vitamin D that is metabolised in the liver.

Endometriosis

The endometrium is the lining of the uterus and one of the most hormonally responsive/sensitive areas, which makes it readily susceptible to unwanted areas of tissue growth. There's a suggestion that between 5–10% of females (in the US) may be affected by Endometriosis, an inflammatory disease of the reproductive tissue.

One thing appears certain with Endometriosis and that is estrogen, both via internal and external exposure, is responsible for this condition. Endometrial cancer is caused by an excess of estrogen and a lack of antagonizing progesterone. Remember that estrogen, specifically estradiol, is essential for the cyclical responses of tissue growth in the uterus and essential for the implantation of the egg into the uterus. Progesterone's role is to prevent unwanted growth in this sensitive tissue.

One of the most common endometrial cancers (adenocarcinoma), termed type 1, is due to chronic exposure of all types of estrogen and low available progesterone. As PCOS, obesity and anovulation (the lack of a monthly cycle) rise, so does the internal production of estrogen. As estrogen increases cortisol, the net effect is the reduction of progesterone entering the cell. This can also happen during times of stress and when you skip meals. The use of HRT (hormone replacement therapy) and Tamoxifen have been shown to be key factors in the incidence of Endometrial cancers. Another key factor in maintenance of healthy endometrium is adequate thyroid production, which we will discuss later.

PCOS

Polycystic ovaries, like many hormonal balance issues, seem to be common place. Whilst insulin sensitivity seems to be considered the main culprit with PCOS, a subsequent restriction of carbohydrates (and, of course, processed foods) often has favorable effects. This simple focus on insulin, however, leaves a gaping hole in the jigsaw puzzle and the actual driving mechanisms behind the condition, thus, remain neglected. Chris Masterjohn, PhD, has a great lecture on YouTube, where he makes the point that we have evolved to consume dietary carbohydrates efficiently and perhaps it is the product of oxidative stress that interferes with effective carbohydrate metabolism.

An observation of a stressed metabolic state can be seen in the mechanism called The Randall cycle or glucose-fatty acid cycle. During oxidative stress, insulin sensitivity and processing of carbohydrates is decreased and a shift to using fatty acids is observed. You might then see high insulin levels due to the ineffectiveness of the cells to use carbohydrates. With a shift toward using fatty acids as a fuel, you may see increased levels of glucagon and triglycerides in the blood. In a healthy individual, these observations could be seen following the consumption of a higher fat meal, with fewer carbohydrate, and represents a normal shift of fuel. Pre-diabetes is often a term used when the resultant loss of carbohydrate utilization is decreased and a shift towards reliance on fatty acids is observed, via the aforementioned Randall cycle.

But what are the mechanisms that create this inefficient system? Well, estrogen dominance and a progesterone deficiency is a good place to start. We know that estrogen has the capacity to lower blood sugar levels. Stress, long hours, poor food choices, use of contraception, eating irregularly and a lack of sunlight, can be some of the precursors to suboptimal output of energy and reproductive issues.

The work of John Lee and others makes a distinction, suggesting that processed foods and sugar tend to be the etiology or precursor to PCOS. When a person is inclined to do little exercise and eat junk food for most of their life, I would wholeheartedly agree. However, a distinction needs to be made. The people mentioned above start doing very well when they add back foods such as fresh fruits and vegetables, good quality protein and fats, accompanied by a sensible exercise program.

Often, PCOS can reverse itself in these situations. There are an increasing number of females who I have worked with who tend to under eat, skip meals and present with PCOS. They often have tendencies toward increased anxiety, worry about their weight (despite having great figures) or another worry, or stress.

This problem can be a product of poor carbohydrate utilization, as suggested above, and a constant overreliance on fats, due to poor blood sugar regulation. The production of cortisol to liberate energy from stored fats, once again, increases the restriction of progesterone to specific sites and estrogen continues to be unopposed. In this case, simply getting the person to eat on a regular basis can be a step in the right direction. Eating carbohydrates can be key in seeing improvement to blood sugar regulation and production of progesterone. Sugars can be obtained very easily from fruits, but even sugar found in foods like ice cream or adding sugar in your coffee can be useful for getting adequate calories in and improving blood sugar responses.

Many people who report issues of anxiety or shakiness with coffee consumption are usually showing a stress response related to low blood sugar levels. Caffeine is a metabolic stimulant and helps to promote the use of oxidation of carbohydrates and fats. Drinking caffeine without other calories or on an empty stomach, however, stimulates the production of energy from stored fats. The shakes are a result of increased adrenaline and cortisol.

I think caffeine has shown much promise in the prevention and reversal of many conditions. Current research suggests that consuming 3 to 4 cups of coffee per day has the capacity to improve insulin sensitivity, enabling a better use of carbohydrates. It also seems to be a neurologically-protective agent against Alzheimer's and its protective capabilities towards optimal cell function

means that it is a likely also a great anticancer compound.

Fibroids

Fibroids or Uterine Leiomyomas affect women of reproductive age and are the most common growth conditions that women encounter. The tissue is often benign (non-cancerous) and often comprised of smooth muscle and connective tissue. Again, the primary suggestion of fibroid growth is related to estrogen dominance. The size can be as small as a squash ball or as big as a grapefruit. The main symptoms associated with these myomas are excessive bleeding, pelvic pressure, constipation and in some cases, infertility. This may be increased if a surgical intervention has taken place, leading to adhesions from scar tissue. Hysterectomies from advanced fibroid growth have been increasing in premenopausal women. In some cases, the use of the medication RU-486 has been used to decrease fibroid growth, but not without risks.

There have been several studies that have assessed the impact of endogenous estrogens and their role in fibroid proliferation. Soy formula, which has been used extensively in parts of Africa, is a phytoestrogen, and has been associated with an increase in fibroid proliferation.

One study conducted by Upson et al. and released in May 2016, whilst writing this book, reported the incidence of increased bleeding among young women who had been fed soy formula during formative years. Although a drawback of this study can be found in its methods of data collection. Self-reported data was collected from these ladies (*vs.* the collection of clinical data). In another study conducted in 2015, again by Upson and colleagues, they found that, whilst soy formula consumption did not appear to affect the prevalence of fibroids, those who had been exposed to soy formula, had on average a thirty-two percent increase in fibroid size.

Non-surgical procedures can offer a ray of hope for women suffering from fibroids. Aromatase inhibitors have been studied and found to be ineffective at decreasing fibroid size. Aromatase is a compound that converts hormones such as testosterone into estrogens. In many cases, use of progesterone has been successful in decreasing fibroid size. This factor may be most successful depending on the size of the fibroid. In John Lee's book, *What Your Doctors May Not Tell You About Menopause*, he suggests that fibroids that are no bigger than a tangerine, respond favorably to progesterone supplementation. If you are working with a Doctor, with regards to addressing fibroids, it would be worth discussing the role of progesterone in treating this condition.

As you might have gleaned from this and many other female-related conditions, estrogen and estrogen-like foods are certainly something that should be avoided.

A word on surgical procedures

It is often deemed necessary to remove cysts and other tissue growth associated with endometriosis by surgical means. I think that it would be an important process to follow the information, suggested later in this book, before considering this option. This can, in many cases, allow for the normalization of hormone function and your menstrual cycle without the need for surgery. Progesterone can indeed restrict the action of estrogen on uterine fibroids, however, once they get beyond a certain size, progesterone may also become a factor in their growth and hormonal restriction is warranted.

On a weekly basis, I see many men and women who have undergone surgery for one reason or another. From a structural perspective, a surgical incision can play havoc with your body's perception of stability. Many female clients whom I also see for back pain have undergone surgeries such as C-sections for birth or laparoscopies to address Endometriosis or advanced polycystic ovaries. Here's some details from an old blog on C sections and back pain http://balancedbodymind.com/cesarean-section-or-chaos-section-why-you-may-have-back-pain-after-your-baby/.

On reflection, I think too few people perceive the act of the surgery as stressful, especially once it has taken place. There can be a large amount of stress placed on the nervous and endocrine system during and for months following the surgery. The body needs to heal the scar, requiring more nutrients, and the pain may create more stress, more adrenaline and cortisol, blocking progesterone production further.

Another feature is the lack of adequate rehabilitation (if any) that is suggested to anyone who has had key surgeries. For example, the laparoscopy requires three small holes, through the abdominal wall. In a C-section, a more obvious horizontal incision from near hip to hip is created. What does this do to the body? Whenever a separation of the abdominal tissue occurs, there is usually a feedback issue between the signals that travels from the CNS (Central nervous system or brain) to the abdominal muscles.

Another feature and this is purely speculative, may be that chronic compensation patterns and an inability to move efficiently may place demands on the nervous and energetic system, which may play a role in fatigue. I worked with a lady recently and found that her diagnosis of Fibromyalgia cleared when resolving the issues associated with scar tissue and pain receptors. This highlights the points made earlier that working on levels of structural, chemical and often emotional aspects can provide the outcome that many people seek to improve.

PMS

Most of the symptoms evaluated below form the broad title of premenstrual stress/tension and are usually a product of low progesterone, coupled with an excess of estrogen.

Headaches

The menstrual cycle is often implicated with the onset of headaches. Simply keeping a record of your cycle and the onset of headaches or migraines can help to determine if your hormones are part of the problem. For instance, as estrogen elevates at the beginning of your cycle, during the follicular phase, this will stimulate a decrease in blood sugar. Often the lowered blood sugar can be the cause of the migraine. This can often be resolved with adequately maintained blood sugar levels by eating regularly and using progesterone. Remember that progesterone plays a significant role in blood sugar regulation, but the need to eat often allows for the optimal assimilation of progesterone. It's no wonder that so many women crave carbohydrates and snacks during this time. When blood sugar levels drop, we crave readily available sources of carbohydrates. You might notice a pattern to these, such as a long busy day at the office, rushing around with the kids and not focusing on your own needs, or if engaged in intense exercise, not providing enough fuel for your body.

It's worth noting that headaches can also be attributed to other factors that include, neck, head and jaw tension, as well as pollutants. If after following the recommendations in this book your headaches have not improved, you may need to address these issues too.

Irritability and Mood

"No there's nothing wrong, just stop bloody asking me." OK, just kidding, it's

not always like that, but it does happen. Much like if you try to resolve issues with the male of the species before dinner, when it's been some time since his last meal, you might get the male version of this on a regular basis. Irritability can't be solely attributed to low blood sugar levels. I certainly think that there are other complexities, such as excess estrogen, serotonin, cortisol, low thyroid and other factors. However, regular eating during these times can serve to diminish the likelihood of getting crabby and irritable.

I am going to quote Dr Dalton here on the concept of blood sugar regulation during the cycle before I clarify again later.

"*There is altered glucose tolerance during the premenstruum, so that the individual becomes sensitive to a reduced blood sugar level (me: this is due to elevation in estrogen which, if you will remember, decreases blood sugar). When a low blood sugar level occurs, it is automatically restored by the outpouring of adrenaline (cortisol) into the blood, which can account for sudden panics, aggressive outbursts and irritability, faintness and migraine. This helps to understand the increased appetite and longing for sweet things, the binges and the food cravings."*

Another recent study highlighted the role between estrogen and leptin associated with the menstrual cycle and carbohydrate cravings. Its findings were the following. During the cycle when estrogen/leptin ratio is high, study participants had more frequent cravings for carbohydrates. However when the estrogen/leptin ratio was low there were fewer carbohydrate cravings. Why does this seem so backward? Those that designed the study were focused on the role that leptin had to play in carbohydrate craving. What seemed totally lost in the study is the impact of estrogen's blood sugar lowering capabilities. If we were exposed to higher levels of a hormone that decreased blood sugar levels, would we not release a hormone like leptin to ensure that we craved something that might balance our blood sugar levels? Sometimes the focus on mechanisms that detract from the biological process at hand can lead us from what it is that we need to do. Balancing blood sugar levels in the face of an excess of estrogen is far simpler than worrying about the mechanism of leptin to suppress carbohydrate craving.

No doubt, pre-menstrual cycle aside, it also helps to explain the male of the species predisposition to 'hangriness', that well-known syndrome when a lack of food is contributing to irritability.

Progesterone levels are maintained by the availability of adequate carbohydrates. We will touch on this again later and understand why regular food intake is key for progesterone uptake and blood sugar regulation.

Fluid retention

Estrogen has a key role in the swelling and puffiness seen before and during the cycle. Many people, often mistakenly, attribute this to high levels of salt, but there is a sound mechanical reason for suggesting that salt is an issue due to estrogen. In a healthy cell, a preferred level of magnesium and potassium is present, opposing the entry of sodium. Estrogen's stimulation of the kidneys and resultant production of angiotensin, further stimulates the adrenal glands to produce aldosterone. This creates the retention of salt and not only creates fluid retention, but will often affect blood pressure by increasing it, creating hypertension. Gestational hypertension may often be avoided by the provision of adequate levels of progesterone. Progesterone's effects allow for the appropriate balance of salt to be maintained.

Declining fertility

Do you have any friends that have or have you yourself had trouble or been unable to conceive children? I have known at least four couples over the last few years and I am talking about friends, not clients, who have either had IVF treatments or been unable to have children. Endocrine disruption in the face of persistent chemical exposure seems to be becoming more prevalent.

Spare a thought for the male of the species too

Hormonal insults are not restricted to the female populace. Men (and boys) are increasingly at risk of fertility issues due to estrogen-mimicking factors.

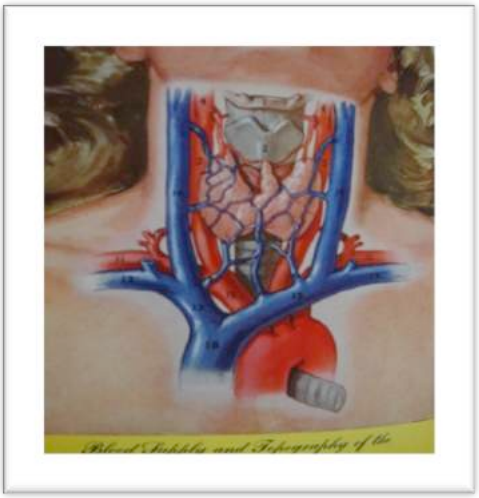
The moody blues

There remain two well-documented biochemical issues related to low mood states, depression and post-natal mood, often termed the baby blues. One of the most common issues related to mood and energy are related to thyroid function. Imagine the implications of failing to generate enough energy to get you through the day. Low thyroid and low energy intake can have similar implications. Although low thyroid can often be a long-term product of failure to meet energy demands. The constant toing and froing, in and out of low blood sugar states, combined to under eating, can have a long-term effect of metabolic suppression.

Due to the large output of progesterone production during gestation and its role in protecting the foetus, the sudden drop in progesterone production when the baby is born, can expose some women to rapid changes in mood. Throw in sleep restriction, lack of sunlight and a few other factors, and a predisposition to emotional and depressive like states can occur. Do note that

progesterone supplementation post pregnancy, whilst breastfeeding, would not be recommended due to its inhibitory nature and opposition to prolactin, the hormone necessary for breast milk production.

Thyroid



"Besides fasting, or chronic protein deficiency, the common causes of hypothyroidism are excessive stress or "aerobic" (i.e. anaerobic) exercise and diets containing beans, lentils, nuts, unsaturated fats (including carotene), and undercooked broccoli, cauliflower, cabbage, or mustard greens. Many health conscious people become hypothyroid with a synergistic program of undercooked vegetables, legumes instead of animal proteins, oils instead of butter, carotene, instead of vitamin A, and breathless exercise instead of a stimulating life." Ray Peat

Think of the thyroid gland as the head honcho of energy, weight and metabolic rate. Increasingly I think there are more maternal/paternal cases of low thyroid function being passed onto our offspring. Hypothyroidism is a potent reason why we start to get poor energy production, weight gain and a host of other issues. Hyperthyroidism is a slightly different issue and can be associated with weight loss and increased body temperature. Hypothyroidism is becoming more prevalent and these are the most-commonly observed issues:

- Poor sleep
- Digestive problems
- Constipation
- Infertility
- Heart disease
- Loss of hair
- Low libido
- Puffy skin
- PMS
- Arthritis
- Depression
- Cystic breasts/ovaries
- Osteoporosis
- Cancers
- Low energy
- Weight gain
- Anxiety
- Poor muscle tone
- Muscle pain
- Infections
- Headaches
- Diabetes
- Intolerance to cold
- High cholesterol

Increasingly health is defined by a bunch of arbitrary numbers. High cholesterol? That's not normal, take a pill. Low iron? Here, take this iron supplement.

In Ivan Illich's book, *Limits to Medicine—Medical Nemesis*, he makes clear his disdain for check ups.

"The medicalisation of prevention thus becomes another major symptom of social iatrogenesis. It tends to transform personal responsibility for my future into my management by some agency."

Instead of systems heavily reliant on numbers and markers, should we not look to improve qualitative and quantitative pairings to get a better picture of health and improve outcomes? The last ten weeks of my life have been wrapped up in a post-graduate diploma in endocrinology. Getting a better picture of how clinicians tackle complex areas has been a rewarding but at the same time frustrating area of study.

Sometimes the questioning has been down the lines of "This patient has this endocrine feature, what are the medication used, which medications interfere, what surgical options can be pursued and what is the follow up?" What is frustrating for me is there is little effort to understand the "why" Why? Why Donald why? Diet, stress and environmental aspects of hormonal health are often forgotten about, because the goal of getting that client back into the window of numerical health takes priority. But what if we took a better look at the why? Might it not yield better long-term outcomes for the patient?

Some of the most prominent thyroid researchers of the last century suggest large parts of westernised society suffer from hypothyroidism. One of the most prevalent problems that exist with diagnosing hypothyroidism is its increasing reliance on blood tests to confirm this condition. A vast majority of doctors still use the thyroid-stimulating hormone or TSH blood test to confirm whether or not patients suffer from hypothyroidism. This is madness for the simple reason that TSH assessment can be a complete waste of time.

Broda Barnes, one of the most respected doctors involved in treating hypothyroidism, as well as others, have shown time and time again that the basal temperature test is the most effective method for evaluating thyroid function. This can be achieved by simply placing a thermometer in the armpit upon waking. A suggestion is that temperature should be around 36.6 degrees on waking and after a good intake of food, rise to 37 degrees.

Another accepted thyroid test is the Achilles return reflex, which uses a rubber hammer to assess the myotactic reflex of the muscles associated with the ankle. Moreover, the simple clarification of some of the symptoms stated above, with low body temperature, remain an affective assessment for confirming hypothyroidism.

Another pitfall of this overreliance on numbers is in reference to thyroid stimulating hormone (TSH). TSH is considered the gold standard for hypothyroid diagnosis, but its limitations have become increasingly prevalent due to its production via the stimulating centers from TRH (thyroid releasing hormone) from the hypothalamus and then TSH from the pituitary. Thus, if a problem exists at the periphery, the likelihood of getting an accurate assessment is diminished. A normal TSH reading is defined as 0.4-4.5 mU/L, but generally many doctors do not consider someone hypothyroid unless they present with a TSH over 4 mU/L.

Increasingly some doctors are becoming aware of the reduction of hypothyroid symptoms when TSH is kept below 1mU/L and some evidence suggests that even at 0.5 mU/L (lowered but suppressed) is ideal to ensure that hypothyroid symptoms are decreased (Pantalone & Nasr, 2010).

Treatment of hypothyroidism by most endocrinologists depends on the use of synthetic T4, instead of the more effective treatment of dual T4 and T3 therapy. T4 is the relatively inactive form of thyroid hormone. T3 is the biologically active form of thyroid hormone that is converted at the periphery, mostly by the liver or kidneys.

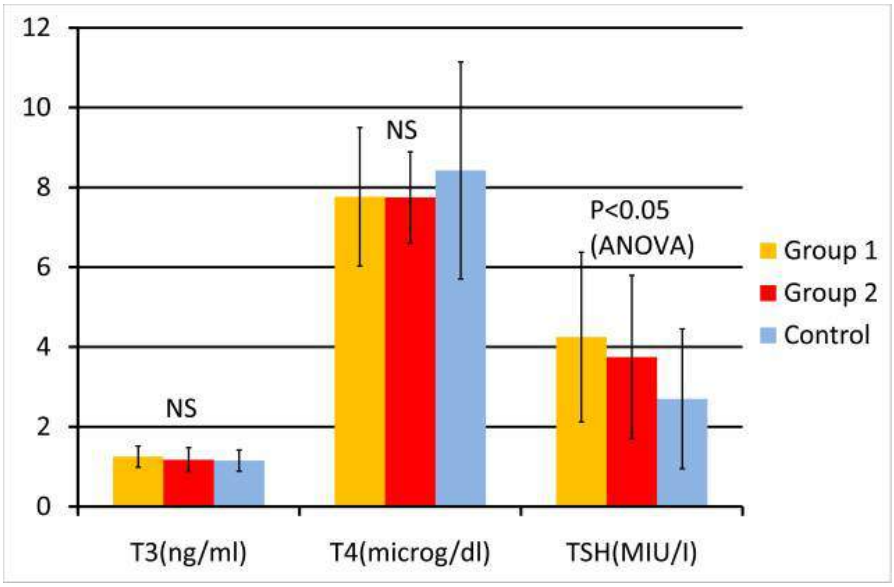
There's a significant amount of work discrediting the role of combined T4/T3 therapy and in particular natural desiccated thyroid (NDT). In many endocrine textbooks the levels of the active form of thyroid hormone, T3, was elevated significantly post NDT treatment. A confounding factor in this assumption was based upon a previously incorrect conversion which can still be found in endocrine textbooks stating that 1mg of NDT was equivalent to 1ug of LT-4. There is recent evidence available showing a patient preference for NDT, which showed improved outcomes to weight loss, energy, happiness, sleep and memory (Hoang, Olsen, Mai, Clyde, & Shakir, 2013).

Reliance on TSH, T3 and T4 levels alone may be ineffective at analyzing the effectiveness of combination therapy in comparison to synthetic monotherapy treatment of hypothyroidism. Additionally, this study highlights the inaccuracy of the assumed conversion of 1mg: 1ug. Using more accurate 3rd generation TSH assays yields a suggested ratio of 1.47 mg's to 1ug. This may explain the lack of effectiveness in previously conducted trials and the conclusion that

increased transient T3 levels were determined as unacceptable. NDT, in many cases, may offer a better solution than synthetic thyroid hormone after all.

Potential mechanisms of improvement may also lie in the actions of T1 and T2 and assumptions based solely on TSH, T3 and T4 may not explain the benefits recorded in this and other studies.

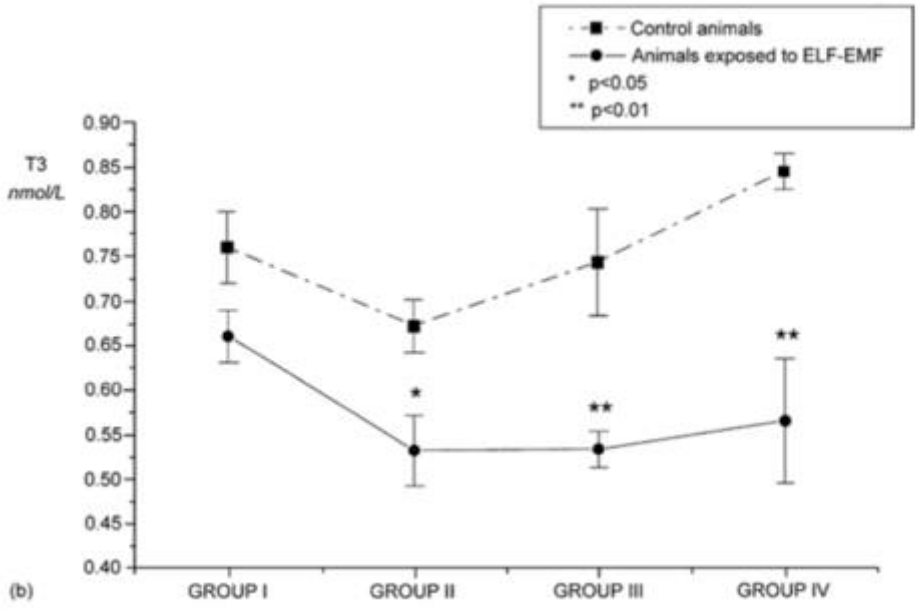
Much like the rise of estrogen, ever decreasing thyroid function is becoming more prevalent. The external sources of estrogen can wreck havoc with cellular and thyroid function and in a similar manner another factor of modern living may be interfering with thyroid function and increasing the likelihood of hypothyroid states. A small and short study by Sayed et al. in 2009, reported a significant increase in TSH levels following exposure to mobile phone use. Below you can observe the elevation of TSH, which may cause an interference with optimal thyroid hormone production when chronically exposed.



Another study conducted earlier in 2003 by Rajkovic et al. (again using rodents) reported effects of electro-magnetic frequency on thyroid function. The study detailed the short and long-term effects on both TSH, T4 and T3. By the two-month point of the study, thyroid output had increased, but analysis by the end of the study, at six months, showed thyroid output had significantly increased. In some cases the thyroid recovered once the EMF was stopped, but not in all cases.

This is particularly important, particularly if the goal is to restore optimal thyroid function, in order that adequate energy and detoxification pathways

are to be optimized. Here you can view the impact of EMF stress on T3, the active form of thyroid hormone.



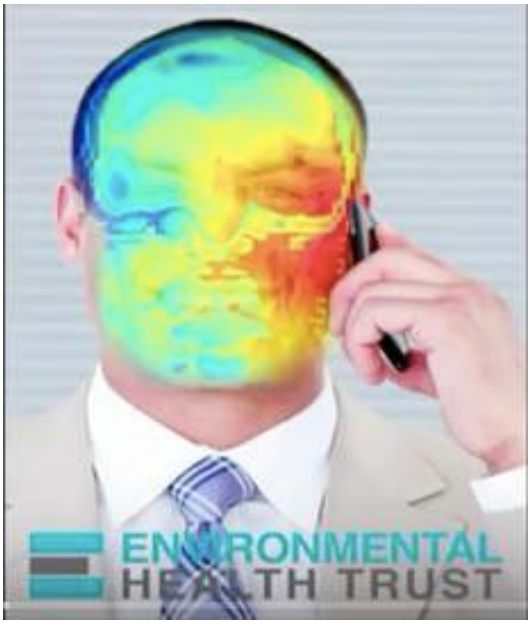
Some similarities were also observed in lower T4 values. What remains clear is that mobile phones, Wi-Fi and other forms of EMF pose a potent challenge to maintaining homeostasis or optimal balance within living tissue. You can spend plenty of time effectively lowering estrogen exposure, but failure to address other factors that influence thyroid function could prevent you from achieving your health goals. Many phones operate on a 450Hz frequency and Wi-Fi technology operates mostly on 2.4Hz.

There's a growing stance to restrict the amount of Wi-Fi on the developing brain and nervous system. France, Germany and areas in Australia (I am sure there are other countries) have taken steps for banning Wi-Fi in nurseries and some schools. There's a wealth of information that can be found here at Australian Wi-Fi in schools. http://www.wifi-in-schools-australia.org/p/scientific-evidence.html

I recently presented the information to my son's nursery, which had routers close to where the children were sleeping. Upon reviewing the information, they decided to switch the wireless system to the older cable system, to reduce the Wi-Fi signals found throughout the nursery.

Now, I know what you are thinking? It's pretty much impossible to eliminate all Wi-Fi unless you manage to get into the wilderness, and you would be correct. That might also be the reason why many clients feel much better when they leave the hustle of the cities to low Wi-Fi zones. Of course, there may be many reasons why that might be beneficial. Fewer Pollutants? Less stress?

More exposure to nature? All of those are valid, but given the increasingly overwhelming data that suggest that EMF is increasingly affecting our health, taking some of the steps recommended in this book can only assist in making positive changes to impact your overall well-being. It shouldn't be confined to you. Below are some other points related to exposure of EMF, especially poignant for youngsters, exposed to daily doses of technology.



Modelling of EMF signals into the adult brain

Modelling of EMF into developing skull and brain, penetrating deeper into the head and affecting the orbit and structures included in the eye.

The above pictures are modelling of EMF taken from a lecture from Dr Devra Davis about the potential of electromagnetic stress. Although the head is not being heated up. What actually occurs, are distortions to the central nervous system and an increase in oxidative stress, creating on going damage to cellular function. The consideration for Wi-Fi technology including tablets should also be observed in children. Another factor to consider, should you have your phone in your pocket, is the impact of EMF to reproductive tissue and that includes men too.

Another challenging factor for interpreting thyroid hormone is an emerging theory by Mark Starr termed Type II hypothyroidism.

In **Type 1** Hypothyroidism, Dr Mark Starr has tried to differentiate between types of hypothyroidism and Type 1 was distinguished as the inability to produce thyroid hormone, a common feature of most hypothyroid cases. A figure was suggested as 5% of the USA having Type 1 (perhaps more).

In **Type 2** Hypothyroidism—Starr defined a resistance of thyroid hormone at the periphery and the cells or mitochondria being unable to utilise available hormones. There is adequate thyroid hormone available and TSH appears normal, but the body is unable use them. This is often inherited or made worse by environmental issues such as Wi-Fi, pollutants such as heavy metals, pesticides and fuels, and other stressors.

Nutritional and environmental status

Before exploring key management of thyroid disorders during pregnancy, it would be inappropriate to explore hormone and medical drug recommendations without understanding maternal nutritional and environmental status. Adequate iodine is essential for the increases in maternal/foetal requirements of thyroid hormone. A deficiency of iodine is further compounded by deficiencies of vitamin A, selenium and iron (although from it seems that iron deficiency is often rare) Adequate intakes of macronutrients that support optimal thyroid function are also essential.

Conversely, diets high in goitrogens like broccoli, sprouts, cabbage and soy may have a considerable impact on decreasing TH production. Dietary iodine is essential for optimal TH production and failure to address this deficiency will not resolve with TH medication alone

Hypothyroidism in pregnancy

Hypothyroidism is the most common form of thyroid related disease and approximately 3-5% of females are affected and these guidelines discussed are the general recommendations suggested by most endocrinology organisations.

Chronic autoimmune thyroiditis is the most common form of hypothyroidism during pregnancy As the foetal thyroid gland does not form until the second trimester, foetal needs are often met by the thyrotrophic similarities of beta human chorionic gondatrophin (βhCG), which is produced by the placenta. Trans-placental supply of thyroid hormones to foetus and the increased need of the mother, require adequate TH production and available catalysts, which is often compounded by nutritional factors

According to the American endocrine society a normal TSH secretion is suggested as between 0.3- 4.5 mU/L in euthyroid individuals. During pregnancy the level is lowered to between 0.5 -2.5 mU/L (just increased again to 3 mU/L). I think what's worth paying attention to here, is a lowered level is suggested, so that mother and baby get adequate TH. There's a distinction, that perhaps at a higher TSH the incidence of hypothyroidism may occur. Perhaps the blurring between subclinical hypothyroidism and overt hypothyroidism should be maintained in non-pregnancy to both men and women alike?

When considering hypothyroidism, an assessment of a mothers stress and nutrition play a vital role in adequate TH production and should be considered in the diagnosis of subclinical hypothyroidism. A diagnosis of overt hypothyroidism during pregnancy requires a starting dose of 0.10-15mg (1-2ug/kg per day) levothyroxine (LT4) and TSH levels should be checked every 4 weeks for the first 16 weeks and at least once during second half, with previous dosage restarting 6 weeks postpartum

During pregnancy, women already diagnosed with hypothyroidism have been recommended to increase the dose of LT4, which is the preferred synthetic hormone of choice, by 30-50% of normal dose.

Post partum thyroiditis (PPT) is an autoimmune disorder that can be associated with either a hypothyroid or hyperthyroid. Women who produce thyroid antibodies in the first trimester appear to have a 33-50% chance of developing PPT. On-going evaluation of thyroid function during breast-feeding should be considered in these cases.

The easiest and most reliable test is simple to conduct. To perform a temperature test: Simply, upon waking, place a thermometer into your armpit for 5 minutes or so. Take the reading and then take again, 45 minutes or so after breakfast. Log these readings over a period of one week. Correlating this with pulse rate can give an indication of adrenaline.
More to follow on the thyroid.

Cortisol

"You have high cortisol, so we need to lower that", seems to the cry of the functional medicine practitioner or naturopath, and to be honest, I was once guilty of purposefully trying to lower cortisol with an array of supplements. This approach is simply a waste of time.

Cortisol is a glucocorticoid, a powerful anti-inflammatory hormone. A compound involved in regulating part of the stress response but most importantly, it elevates when blood sugar levels are not being regulated well. One of the tests that you can do to assess the impact of cortisol is the Adrenal Stress Index or ASI. This will usually give the practitioner an idea of cortisol readings throughout the day on waking, midday, afternoon and at night. There's a suggested norm for these cortisol readings and this should be dependant on several readings (if you are recommending interventions based on one test, you are doing the client/patient a real disservice, yes I have done that before).

Let's say the person isn't eating well, they didn't eat the night before and skipped breakfast. Will cortisol readings confirm that they have high cortisol perhaps? Do you want to lower that? Of course not, what is the point of taking supplements, to lower a perfectly normal biological mechanism, in response to a low blood sugar state? We do want to decrease the repeat of constant fluctuations in blood sugar that lead us to that stress response. But in many cases, high cortisol levels can be lowered by eating…..enough sugar/carbohydrates.

Absolutely not! Sugar is a toxin! It causes cancer and the host of other issues that we have been informed of by alarmist, scaremongering health freaks!

Let's put a few myths to bed regarding sugar consumption. A toxin, sugar most certainly is not. Sugar in the form of glucose is the most efficient fuel for the brain. A basic understanding of the biology of the body reveals that the use of carbohydrate a a fuel remains optimal. So why all the fear around sugar?

There's no doubt that an excess of calories in the form of sugar can cause problems. But then so can excess broccoli, water and oxygen. Many people blame sugar for the rise in complications of metabolic issues such as diabetes. In many cases it is a problem of the individual to utilise sugar and carbohydrates. Insulin sensitivity caused by oxidative stress, cellular function, low thyroid and many other factors can shift the body's preferential use of carbohydrates to the use of fatty acids. This can be observed by the elevation of triglycerides in the blood stream, the ability to use carbohydrates having slowly been lost. The shift to fatty acid oxidation prevails.
When this is allowed to continue, the body shifts its capacity to oxidise, firstly, carbohydrates to, instead, fats.

If this continues, the ability to use the oxidative system (this is often called the aerobic system due to the more efficient use of oxygen using carbs and fats to generate more energy) switches to anaerobic (or without oxygen), often termed glycolysis. This can be problematic, as the levels of various by-products of glycolysis, including lactic acid, rise. This can increase the acidity of the cell, which is a normal component of exercise and function. Sustained use of this system can further decrease the function of the body's energy production.

Which leads us to our next myth.

Sugar causes cancer. Because sugar is acidic!

Many alternative practitioners use the concept of acidity within the human body to create the concept of an acidic environment that causes cancer. To a degree, that part is correct. However, they often cite the godfather of cancer cell physiology Otto Warburg's research, mistakenly suggesting that cancer only occurs in acidic environments. This takes us back to our biology lesson I was suggesting moments before. Warburg's research clearly showed that cancer incidence increased when damage occurs to the respiratory apparatus of the cell, or what we call the oxidative system. As the cell becomes increasingly acidic, the cell's oxygen using capacity diminishes, again a normal function that signals the use of the anaerobic (or without oxygen) system. When this becomes a longer-term issue, we see damage to this capacity and cells no longer function correctly, leading them to mutate.

The other part to this argument is that when you alkalanise the body, these issues fade away. But the same problems that exist in the alkaline state cell can also be seen in the acidic cell. They too become damaged and the most efficient form of energy production is lost. One point that these theorists do have correct is that sugar does indeed feed cancer. A point I stress, however, is why is this not an important as you think it is. Cancer cells, much like normal cells in the body, function extremely well with sugar as an energy source. There's some interesting research that now shows that when you restrict sugar from cancer cells, they can bounce back with the inefficient use of converting energy from protein.

Sugar and carbohydrates, in the right amount, consist of efficient fuel for energy production. Is it any wonder that when people enter hospital in a bad state, they are given intravenous glucose and salt to help stabilise the body to optimal function or to facilitate the healing process.

Chris Masterjohn's work gets another mention here. In a recent article, he suggested the idea of sugar (or primarily glucose) as an essential antioxidant, due to its role in increasing glutathione (another key antioxidant in the body). So sugar, that toxic, addictive substance. It has to go right?

Serotonin

Serotonin is a neurotransmitter or mono amine that is used in a vast array of signalling and brain function. It's a modulator of sleep and combined with noradrenaline, histamine and cortisol, is instrumental in waking you from deep slumber or REM (component of sleep). There's a common misconception (as

with many compounds) that the more serotonin, the better. However, this is the type of thinking that can get us into a bit of a pickle. Some of the other functions that serotonin assist with are smooth muscle tissue contraction in the bowel and, in fact, 95% of the human body's serotonin is produced in the intestines by the enterochromaffin cells. As a result of the irritation, we produce much more serotonin, in part, as an attempt to expel unwanted food, bacteria and parasites from our body.

One of the naturalistic fallacies that many clients believe is that the consumption of plenty of nuts and seeds is healthy.

Chia and flax seeds seem to be de rigueur at the moment. But these foods can often play a substantial part in increasing constipation or loose stools. Consuming nuts, seeds and other undigestible foods like steamed vegetables and grains can elevate serotonin levels. Not only due to the levels of serotonin found in these foods, but due to a compound called endotoxin. The latter often accumulates when food is not easily digested.

Endotoxin produces lipopolysaccharides. These compounds irritate the bowel further, increasing serotonin, and have been implicated in the instigation of intestinal hyper permeability or leaky gut. It's no wonder I see many clients who either complain of constipation or rushing to the toilet on a regular basis. Another side effect of increased serotonin blood levels appears to be irritation and aggression.

Seeds are ideal for little furry animals that hibernate and look cute. But not that great for human beings that want to run an optimal metabolic rate.

Hmmmm, what happened to serotonin being touted as the compound of happiness? Serotonin also appears to disrupt optimal calcium uptake in bones and teeth. Therefore, reducing serotonin should actually be considered an appropriate mechanism for improving bone and tooth health.

Digestion

You can perhaps see from the factors discussed previously that digestion often takes a battering from factors such as low thyroid, increased estrogen and serotonin. There are many people who are often referred to gastrointestinal Drs and specialists to pursue and understand why they have a general diagnosis of IBS or irritable bowel syndrome. They may be put through a plethora of tests such as a colonoscopy, endoscopy and other procedures that fail to look at key mechanisms related to the digestive system. You may get some concrete symptoms confirmed. Yes, you have an irritable bowel. Or, yes, you have some gastrointestinal bleeding.

There's no doubt that these procedures can be useful in the right context, perhaps when there is something more sinister at work. But knowing now what you do, about the mechanisms of why the digestive system may not respond as well as it should, perhaps implementing some very simple changes may be the way to create the lasting change that you need? If digestive issues still persist after trying the recommendations in this book, a comprehensive digestive stool analysis (CDSA) can be useful to determine if you have any unwanted critters in your bowel. The standard test used by medicine is the microscopy test.

This is simply done by having a lab technician look at a stool sample under a microscope, hoping to catch a glimpse of eggs, worms, ameoboids and other parasites. It's hardly a fool proof practice and many times, these bugs have cycles, which can only be seen at certain stages in a period of time. A CDSA usually involves microscopy, DNA evaluation of bacteria and parasites, as well as other key functions, such as bowel acids, blood and inflammatory markers.

As a practitioner who used to conduct hundreds of these tests per year on clients with digestive issues (and get paid a healthy referral fee for each one), I often found that in most cases, some short-term gains could be made when there was an undesirable found in the gut. But addressing underlying issues such as energetics, food and hormone function helped to create change without the need for a heavily restricted diet and supplement schedule.

Some people blame gut function on parasites, bacteria, sugar intake, pesticides and many more (and I am not saying that some of these factors are out-and-out wrong). But what I am suggesting, like others before me, is if you put steps in place, to restore energetics, change diet, improve sleep and give the body what it needs, much of the digestive function appears to move back to its optimal state. So much so, that I only conduct two to three stool tests per

year, compared with hundreds, with clients that do not respond to my program advice.

Time to take charge

What can you do?

We have spent a considerable time attempting to clarify why specific problems occur. If you have spent many years feeling the energy-sapping symptoms of PMS, PCOS and the like, it may feel like there are many obstacles on your road to changing your health. Believe it or not, there are many simple factors that you can take care of that can reverse many of the symptoms you are experiencing.

One of the easiest factors to implement is to change what goes into your mouth. I want you to try to change the way you view foods. Forget about good or bad foods, #guiltfreeeating and all the other crap memes that you see on social media. For improving hormone and blood sugar regulation there's plenty of food that you can eat, although there are some that just don't stoke that fire, that you need to get you firing on all cylinders.

I am going to reverse the initial section of the book and the primary intervention will be how to change your eating habits to start making a dent on your hormonal situation. There are four key things that I want you to start doing, so that you can start to notice some real change to your situation.

1. Ditch all your notions and ideas about what you think you regard as healthy.
2. Remove all the problem foods.
3. Eat regularly to help balance blood sugar levels, aiming to eat every 3 hours.
4. Use the Ray Peat Carrot salad (suggested shortly).
5. Use the suggested shopping list provided for ideal foods
6. Look at those markers, which I think define health. These include good energy, digestion, sleep, libido, emotional balance and absence of pain

Why should I ditch my ideas about eating healthy?

Well, simply put, for many, you will have already been eating this “holier than thou” food regime espoused as cleaner than the next woman’s. By the way, the word clean in diet is one of the most nonsensical terms ever created. Were you really eating any dirtier before?

Sure cutting back on processed foods that contain a lot of preservatives, additives and vegetable oils is always useful. But if you are here because you suffer from the issues outlined in this book, a portion of it may partly be due to your diet.

Some women may purely have underlying hormonal issues that will need correcting with supplemental hormones, but there is a vast amount of change that can be created with your diet.

A note on body weight:

I often use a filter question with my clients so that their goals are congruent with their needs.

How do you feel about gaining some weight during this program?
The tension and disdain is often palpable. Some clients respond with a look of horror and say that would not be acceptable. I quiz them further. You have stated on your form that you would like better energy, for your cycle to return, to have better sleep, digestion, to feel happier, to have better skin, but you still place weight as a barrier to achieving these goals?

Unfortunately. poorly perceived societal norms tend to drive incongruent health goals.

My point is, that if you have spent the better part of a decade living in a stress response, under eating, eating a diet low in calories, full of so-called ‘healthy’ foods, feeling anxious, not sleeping and suffering debilitating PMS symptoms, weight is not a priority for the body. As you start to eat properly, one of the first things that your body may want to do, is to feel less threat and the initial strategy may be to gain a few kilos (but not always). Achieving hormonal balance, and in particular, improving progesterone uptake, requires several factors. Perhaps one of the most important is the regulation of blood sugar levels and eating regularly.

Whenever I would hear a client say that they eat ‘clean’ I used to shudder, now I hear and realise that this may be the very factor that got them into this mess in the first place. Eating clean is often synonymous with eating foods that are poorly digested, lack adequate energy to deal with a stressful day and generally serve to make you less robust to the stressors of life.

To fast or not to fast; that is the question?

If you haven’t been told about how amazing fasting is by your gym buddy, friend, random person in the pub, you are truly blessed. As soon as the New Year kicks in, you will often see the clean eating/intermittent fasting brigade, shouting from the rooftops about the wonders of these methodologies.

It makes sense that from an evolutionary perspective that we had evolved to deal with the harshness of winter, the lack of food and the uncertainty of the

next meal. Even scarcity of different macronutrients between seasons in some places makes a lot of sense, so we would indeed have had a lack of carbohydrate, protein or fat in different situations. We most likely would not have been exposed to the large amount of environmental pollutants and other factors that have been linked to the incidence of hormone/metabolic dysfunction and variety of cancers.

So let's assume you have a good functioning body able to deal with a certain amount of restriction and can tolerate missing a meal or two. Then fasting for weight loss might indeed be an appropriate temporary solution for weight loss. But the problem is, that most people do not have that capacity for utilizing fasting on a regular basis. An inability to regulate sleep, metabolism, blood sugar levels, fertility and a plethora of other key reasons, suggests that we need to focus on getting that balance back and restoring function before we push ourselves to cutting out the very foods that create optimal function.

I might make the suggestion that most women, who do very little, require a ball-park figure of around 1500 calories per day. If you throw stress and intense exercise into the mix on a regular basis then the figure is probably closer to 2500-3000 kcals per day. Not that I specifically want you monitoring calories at this point but merely taking some time to experiment with different amounts and types of food that make you feel balanced and ensures that your needs are met. At this point I won't deny that some people overeat and some people eat through boredom. These are separate issues. For many females under eating is a common theme.

Recently I had a consultation with a lady, who was frustrated, anxious and worried about her blood tests (thyroid and other tests, impacted by a low energy state) who was suffering from a variety of issues related to food intake. I actually suggested that I wouldn't take her on as a client. Her goal over the next week was to come off her paleo/low carb diet, which meant that she was only eating around 1000 kcals per day and to go away and have a bowl of ice cream and notice how she felt. Each day I wanted to challenge her to get more food into her system and notice the changes. The following week, the fatigue, sleep and anxiety was a distant memory and she was smiling from ear to ear, thanking me for the advice. Unfortunately, when you get yourself in a rut, you cant see the wood for the trees and sometimes eating enough food can be a real issue.

Defining Health Food.

"The line that divides nutrients from toxins is often thin and equivocal."

Chris Masterjohn, PhD

The concept of wholesome foods to be eaten 'as nature intended' often fails to understand why people who often eat a raw-natural diet seem to suffer the most from energetic and digestive disturbances. Eating as nature intended should consider the following points.

- Plants have evolved specific defense mechanisms to ensure that they thrive in tandem with insects, animals and bacteria.
- Plants produce fruit that, when ripe (as often unripe fruit is rich in anti-metabolic products), provide a nutritious, easily digested source of energy and help to disperse undigested seeds to ensure that the species survives.
- The seeds that plants produce contain toxins that inhibit enzymes and the digestive process.
- Whole grains contain many defensive compounds that render them undigestible.
- Compounds that seem to work well under lab conditions, in isolation, rarely play out as intended with other compounds associated with certain plants in the human body.

Plants, like humans and all living things, have been evolving over millions of years. If we were able to eat everything that those plants had to offer, their actual survival would have been doomed a long time ago. To cope with the threat of being eaten on a daily basis, plants produce their own natural pesticides and toxic chemicals.

- Cyanogenic glycosides—produced by over 2,500 plants including cassava, lima beans, sorghum, sprouts, flax, soy, almonds, seeds of plums, cherries, etc. These substances decrease the uptake of iodine for thyroid function and can cause goiter.
- Flavonoids and polyphenols can offer some antioxidant capacity, but some are able to chelate essential minerals and be inhibitory to cells by suppressing of thyroid function
- Nitroles and indoles — these compounds break down into cyanide. Cyanide restricts the use of oxygen and inhibits the production of ATP,

the energy currency of the body. The detoxification of these substances is problematic to thyroid function.
- Isoflavones — found in soy, peas and legumes contain genistein, which exerts an estrogenic effect.

The cruciferous vegetables broccoli, cabbage, etc., are well known for their effects on thyroid function and in poor energy states should be excluded or otherwise consumed very well cooked.

In fact, the very nature of the so-called flavonoids and other substances may come from the concept of hormesis—or potentially harmful compounds in small doses stimulate improved detoxification function.
"Various leaves contain anti-metabolic substances that prevent the assimilation of the nutrients, and only very specifically adapted digestive systems (or technologies) can overcome those toxic effects." Ray Peat.

Small amounts of these foods consumed by well-functioning people should not pose a problem and the consumption of fresh fruit over raw uncooked vegetables should be a preference. Broccoli does contain sulforaphane, DIM and other compounds that appear to be beneficial (DIM has been found to be useful in the detoxification and excretion of estrogen, however, many supplement brands also contain soy lecithin in small amounts which is also estrogenic) and therefore, like other vegetables, should be prepared with these points in mind.

- If you suffer from energetic and digestive issues, undigestible raw vegetables should be well-cooked.
- Opt for vegetables such as cucumbers, peppers, courgettes, scallions and potatoes that are low in unsaturated fatty acids
- Lettuce leaves are OK if you fancy salads.
- Whole grains should be viewed with caution.
- Energy, energy, energy! Consume foods that provide energy and nourish processes such as digestion. Poor energy states reduce blood flow to the digestive tract. If you lack energy, the digestive system suffers.

Gluten and other factors

Toast (with butter) may just be one of the most glorious foods on the planet but in some people the consumption of grains appear to be problematic. Gluten, that little protein that is found in grains such as wheat, oats and a variety of other grains, has got a lot of press of late. At one end there's your neurotic, I have a sensitivity to every morsel in the food chain and at the other

an evidence based practitioner who believes that unless you are celiac or test positive to the tissue transglutaminase test, you are just faking it.

The ground seemed to be clear-cut previously. You are either a celiac or there's nothing wrong with you. An emerging view on grains is that there are more factors than meet the eye. Gluten is certainly a problem for celiac disease sufferers', it is also implicated in thyroid disease like hashimoto's. But there are other factors that may increase the sensitivity to grains such as wheat. Pesticide exposure, fortification with iron, fermentation of grain related carbohydrates, genetics, hormones, environmental pollutants and even the plants own pesticides can contribute to wheat sensitivity.

Amylase tripsin inhibiters or ATI's are the plants own form of pesticides and appear to trigger the immune system in some, which can increase symptoms like arthritis and asthma.

Another factor of problems related to gluten consumption are detailed in papers that discuss the CDR or cell danger response. The CDR is a protective feature of the body's ability to adapt to on-going stress in the body, that requires a cascade of protective features to prevent further damage. In a stressed state the lining of the digestive system has to deal with the proline and glutamine proteins in a different manner often leading to increased gluten sensitivity. It's likely that in this state, an increase in endotoxin is present, which further contributes to intestinal permeability.

I have often seen the issues that can be associated with grain consumption increased when dealing with stressed bodies. The simple removal or limiting of these foods seems to be the most appropriate action until the symptoms are gone. This approach should be used with any foods that you think are a problem. Instead of spending silly amounts of money on food sensitivity tests, just remove for a minimum of 3 weeks (yes that means 3 weeks and not taking the weekends off) then reintroduce. If they return, you haven't dealt with the root cause yet or you actually have a food that subjectively induces a negative response that might not be the right choice for you.

What are the problem foods in this situation?

This is context specific. What I am not saying is that you can never eat these foods ever again. What I am saying is that, in the short term, to get the best gains, consider removing these.

Out

Known Goitregens

Soybeans including flour
Cassava
Pine nuts, peanuts
Flax seed
Millet
Strawberries
Spinach
Bamboo shoots (boiled make a great digestion improver like carrot salad)
Sweet Potato's
Brassica vegetables - Broccoli, cabbage, sprouts, bok choy, horseradish Canola, cauliflower, mustard greens, swedes, rapeseed, kale, kohlrabi, collard greens. It's worth noting that cooking for long periods can reduce the thyroid suppressing nature of these foods but I do suggest that simply leaving out for a few months can be the most beneficial action.

Grains such as flour-based products, like bread, pasta and cereals, should be limited.

Undercooked vegetables, especially brassica vegetables like cauliflower, broccoli sprouts, cabbage.

Beans and pulses.

Soy products, most nuts (or sparingly) all seeds.

If decreasing the incidence of loose stools is key, then be strict with the reduction of high serotonin foods such as Kiwis, Bananas, Pineapples, Walnuts, Tomatoes and the like.

Key Point: I am not saying that you need to stop eating these, period. If you want to get the most efficient response to improving energy and digestion, just try following the recommended foods for now.

Over drinking copious amounts of water can contribute to the swelling and edema like symptoms associated with an excess of estrogen. Taking in too much water will increase urination, which increases sodium loss. If the body perceives that salt is decreasing in the body, its natural reaction is to increase aldosterone, which will promote both fluid and salt retention. Unless you live in

very hot environments, there's simply no need to drink litres and litres of water for health reasons.

The exact amounts remain subjective, but for myself, and many of my clients, sometimes a litre of water a day is enough. Drinking juices, tea, coffee and eating fruits can often provide adequate levels of hydration. If you are involved in exercise and hot environments, then adding salt to your water is essential. Be mindful of the supplements that you are taking. Do you still feel rubbish in spite of taking them? Many of the supplements that people take are taken on the advice of others, without understanding what they actually do from a health perspective.

I have found that in many instances clients' temperature was negatively affected when taking multivitamins, a good sign that they probably aren't improving your situation and can be disposed of.

Resolving digestion issues

A big influence on my early thinking regarding digestive dysfunction was Paul Chek. I spent a couple of years toing and froing to Vista in San Diego and my home in London to study the CHEK (corrective holistic exercise kinesiology) Practitioners and Holistic Lifestyle coaches courses. The emphasis at the time was on a more paleo-type diet, tied in with metabolic typing (a form of individualistic thinking about different sub types of metabolism), you know "sugars bad and the parasites feed off sugar" type info.

Part of the lifestyle coaching was finding somewhere to use laboratory tests to diagnose enzymes, bacterial and parasitic issues, in order to assess whether a client had these issues. Invariably, clients did. I know this because I used to use lab tests and test hundreds of poo samples to deal with clients' digestive and energy issues. It wasn't bad financially either, as I would get almost a one hundred pounds kick back for each test that I recommended. It gave a nice battery of information and the general approach of getting rid of critters and enhancing the potential good stuff. Functional Medicine has a similar approach with the 4R method of:

Remove
Restore
Re-inoculate
Repair

There's often a host of supplements recommended with this approach, battering the client's wallet, after also spending a good three-four hundred pounds on the actual test. In a lot of cases you can actually see some positive results when there are deep-seated parasitic infections. This type of parasite killing program was often conducted with a low carb/sugar approach, lots of raw vegetables, meats, nuts, etc. Clients often felt better in the short term but very often, energy deficits would rear their head when long-term adherence to this diet accumulated. Initially, we were warned of the so-called Herxheimers reaction, a die off from bacteria, producing metabolites that created flu and fatigue like symptoms.

I don't doubt that an abundance of bacteria in the throes of death produces metabolites, but I also don't doubt that when you restrict carbohydrates and switch to using fat and the ensuing stress reaction, you may just get a similar reaction too.

It may prove to provide some great temporary relief to digestion, but what good does it do to also suffer from energy, sleep, libido, mental clarity and other such issues. Would it not be possible, if we were to raise our level of biological energy, to ensure that our body and immune system could effectively deal with factors like bacterial and parasitic factors? Is the SIBO (small intestine bacterial overgrowth) theory, not just another marker of a global down regulation of optimal function?

Many high level practitioners started to switch over to Ray's thinking, especially so when you start to think about the biological implications of digestive function and low energy states. To date, there are still some tit for tat exchanges on the practitioner forums. The more holistic crowd stating that sugar is a toxin, etc. and how this approach cannot be considered holistic. I have, on occasions, tried in vain to suggest that Ray's thoughts are truly holistic and if some were to delve into his great depth of work then they may have a different opinion. Sometimes the broccoli green tinted glasses are hard to gaze through.

If you are familiar with Ray's work, then you may be aware of a new independently backed film titled *On the Back of A Tiger*, interviewing prominent biological scientists such as Ray, Gilbert Ling (idea behind the MRI and alternative view to cellular physiology) Mae-Wan Ho (biology and quantum scientist) Harold Hillman (founder of Amnesty international and biologist) and others.

In a raw interview on the Kick Starter Campaigns site (which can be found here: http://perceivethinkact.com), I found a great quote from Ray, which

sums up the importance of energetics and why parasites can take a foothold in a low energy state.

On talking about Resonance and hysterisis reducing randomness. (or how previous inputs to a system will have a specific output and the future of your system is based upon those inputs)

“Your intended behaviour is affecting the environment that tends to support intention. If you get counter-intentions then that has a randomizing effect, breaks down the order that you are creating.

Occasionally you have very vigorous parasites that have intentions. If they encounter you in a state when your blood sugar is low, for example, the parasites might find an opportunity and start disorganising your system. So the competing systems’ lower system getting a foothold in a higher system, counts as randomness.

The assumption of randomness is usually that everything is always random. What has been ordered is achieved at a high cost, the arrow of time for these people is that you have to expend energy to create order, and get things piled up in a certain way can only do that by expending energy somewhere else. "

There are plenty of aspects of digestion that can be improved from bloating to low stomach acid (a feature of the low energy states), from excess gas to poor digestion, eating foods that increase bacteria and endotoxin and a host more. I would like to focus on two well-known features of digestive dysfunction. Constipation and loose watery stools (or urgency to evacuate) are probably the most common features of digestive dysfunction.

Constipation

Sluggish digestion, poor motility, low energy state of body and use of smooth muscle tissue

How to resolve: In most cases, simply increasing easily digested fruits can provide adequate energy, stimulate bowel function and remove nuts, seeds and uncooked and steamed vegetables.

On-going constipation can be viewed as a feature of low thyroid function and a need for use of thyroid hormones. However, to temporarily improve constipation symptoms, you can either use a magnesium sulphate (Epsom

Loose stools

Increases in endotoxin serotonin and histamine can often drive this reaction. Both situations can be mediated by eating the carrot salad suggested below.

Raw carrots pose a great solution to resolving loose stools. Combined again with removing foods like nuts and seeds and poorly digested foods.

Serotonin's role in smooth muscle spasticity can create both issues relating to constipation and loose stools in different areas of the bowel.

Ray Peat's carrot salad. 1–2x per day

"*One vegetable has a special place in the diet to balance the hormones, and that is the raw carrot. It is so nearly undigestible that, when it is well chewed or grated, it helps to stimulate the intestine and reduce the reabsorption of estrogen and the absorption of bacterial toxins. In these effects on the bowel, which improve hormonal balance, a carrot salad resembles antibiotic therapy, except that the carrot salad can be used every day for years without the harmful side effects. Many people find that daily use of carrot eliminates their PMS, headaches, or allergies. The use of oil and vinegar as dressing intensifies the bowel-cleansing effect of the salad. Coconut oil is more germicidal and thyroid promoting than olive oil, but a mixture of coconut and olive oil improves the flavour. Lime juice, salt, cheese and meats can be used to vary the flavour.*"

This simple addition to most clients diet has done some remarkable things. Tess who had suffered from IBS for twenty years or so, had this to say after adding the carrot salad into her diet.

"When we met, Keith went through the questionnaire results and advised me to make a few, small unexpected tweaks to my diet. I'm thrilled to say I have a 'new' healthy stomach! In a matter of weeks, my stomach was better than I can ever remember it being and it has stayed that way. I can't recommend Keith's program enough … for anyone who has stomach/digestive issues and is looking for a natural solution."

Oh the foul play I hear you cry, a bowel of carrots can't do that. But I can say with my hand on my carrot bowel that this can be a key feature of addressing digestive irritation and dysfunction, which can also have a significant effect on regulating endotoxin, serotonin, histamine, and estrogen. For both constipation and loose stools, the effects can be very positive. In some cases where clients restrict grains in the short term, this can be particularly important for adding some bulk to the stool that is usually met by water absorbing fiber that would normally lead to irritation.

Get ready for some intense food preparation. Ready? Here goes.

Get a carrot
Peel it
Shred it
Add a little coconut oil, a splash of vinegar and a dash of salt
Eat it.

I told you it was complicated. The only other things that I might suggest is that, although eating in between meals can be useful, avoid eating this as a snack if it has been some time between meals, as this snack will not be as effective at balancing blood sugar levels as, say, a snack of fruit and cheese, and may actually contribute to tanking your energy, instead, if you are tired or in need of a boost.

If bloating and digestive discomfort persist, there could be a tricky parasite infection that might need an extra kick. I have often found that adding some raw grated garlic to the carrot salad useful in getting rid of worms/helminth infections. Anicillin, an active anti-parasite compound found in garlic, has been well documented in dealing with a range of digestive system critters.

Of course there can be other factors like acid reflux, which could come from a structural implication related to breathing that may need some therapeutic, or structural work, or perhaps a bacterial infection (helicobacter pylori) which, once again, may be resolved by having the best working system. Addressing the issues above, with the suggested points, can be of great help.

If you find the constant grating of carrots a chore, you may find the use of a supplement called cascara segrada another useful way of improving bowel function. Cascara also has beneficial effects, such as lowering bowel endotoxin and provides an effective clear out, so beware.

Ultimately for those that have suffered from issues like constipation, a simple approach of keeping easily digested foods in your diet improve bowel function. Also, using caffeine as a bowel stimulant, maintenance of thyroid and key nutrients like magnesium, assist in keeping your system in its best working order.

Key nutrients:

Carbohydrates and sugar

What you may have started to realise from what you have read so far is that -

1. Carbohydrates are essential for an efficient system
2. Carbohydrate and primarily glucose is the preferred fuel for the brain.
3. Sugar is not toxic, nor addictive and represents a valuable addition to the diet, especially for those under stress or who exercise. Problems with sugar arise just like any other compound when we eat too much of it without other types of food.

You should be aiming for adequate carbohydrate with each meal, combined with fat and protein.

Proteins, meat and gelatin.

Regular protein intake is essential for many bodily functions. Assimilation of protein units called amino acids is essential for many factors such as thyroid function and tissue replacement. Adequate protein in the diet is an essential component of optimal health, but many people confuse the problem of excess protein with adequate protein intake. How much protein we need to eat remains subjective. I don't even think that people need to eat meat daily, but protein from a wide variety of sources such as animal meats, dairy products and plant-based products, will provide what we need.

Here are some common myths dispelled about meat eating.

Eating meat is acid-forming and causes health problems.

Many activities are acid forming. Exercise is acid forming. Should we stop doing that also? It is true that meat does produce ammonia, which should be readily excreted by the kidneys in the urine. If you are eating a very high meat diet, this can pose an issue if you eat little else. There's even research to suggest that when you eat meat, it can increase the bioavailability of minerals like calcium, when compared to non-meat sources of protein.

Eating muscle meat and high protein diets on a regular basis does pose an issue on certain levels. This is due to the consumption of excess levels of tryptophan. Tryptophan is problematic as it is the precursor for serotonin and as we discussed earlier that can be problematic for both mood and digestion. In fact one of the primary reasons that we tend to get an excess of the amino acid tryptophan, is due to the excess consumption of muscle meats in isolation. We have been convinced to view prime cuts of muscle meats that are low in fat as a luxury, and more beneficial for health.

When we consume more muscle meats that are high in tryptophan and lower in the amino acids like proline and glycine found in the skin and connective tissues, certain challenges arise in our production of antioxidants like glutathione. Other factors that may be an issue in the consumption of red meats may be the foods that they have been fed (unsaturated fatty acids, commercial seeds and grains, soy etc all have the capacity to influence our system), an excess of iron and other environmental factors associated with meat farming.

Fats

Unsaturated fatty acids should be kept to a minimum and the emphasis should be kept on the fats suggested on the shopping list. Saturated fats should be the fat of choice when frying or cooking at higher temperatures to decrease the amount of oxidation that occurs. Olive oil useful but remember, that it retains its protective nutrients when not heated, so it is ideal to use on salads, dressings and other dishes.

Vitamin A

Vitamin A is an important compound that is not consumed as regularly as it should. It plays a vital role in thyroid function and one of the most prominent sources of vitamin A is found in liver. Organ meats seem to have fallen out of favor these days, but ensuring replete vitamin A levels is essential. In addition to thyroid function, it is intimately involved with immunity, cell differentiation,

bone development, detoxification growth and reproduction. Mucous areas of the body such as eyes, nose and genitals, which turnover on a regular basis, rely heavily on vitamin A. In the presence of environmental pollutants such as PCB's and dioxins, found in plastics and industrial compounds (I would imagine that would be the case for a large majority of people across the globe), there is an increased need for vitamin A intake.

The standard daily amounts of vitamin A recommended (or RDA) are generally around 2,300 IU for females and for men 3,000 IU. In some clinical nutrition texts, higher doses of 4,000 and 5,000 IU respectively have also been recommended. Personally, I have seen my need for more Vitamin A jump considerably. I have used around 70, 000 IU, applied topically (skin application), to clear up a chronic case of cracked feet. Being a fair-skinned, ginger-bearded lad in the Middle East predisposes me to use more vitamin A than those with darker skin, or indeed, darker hair.

I remember being coached on these matters at the time by a friend called Éric Lépine, who I have to thank for inspiring me to write this book. If he ever writes a book, you will need to buy it, because it will be an essential read. He pointed this mechanism out to me. You can see the startling difference from just 2 weeks of a high dose of vitamin A, applied topically. I know it's not pretty, but the results speak for themselves.

Another factor with Vitamin A, or to make a distinction precursors of vitamin A, Carotonemia is a condition where the skin, particularly in the hands and feet, turn an orange colour. This is usually due to the liver's inability to use Vitamin A, a situation often encountered in hypothyroidism or in some cases from consuming too much vitamin A. Many of the concerns with vitamin A are based on complications during pregnancy. Both a deficiency of Vitamin A and an excess can cause problems related to developmental signaling of the

fetus. During developmental stages of the fetus such as gastrulation and neuralation (terms relating to development of the brain and central nervous system), the development of the spinal cord and central nervous system are vitamin A (and other nutritional factors) dependent.

Other symptoms may include poor night vision, skin flakiness, dandruff, energy issues, poor steroidal conversion of key hormones and ongoing infection

As a rule of thumb, I generally recommend the consumption of liver or pate one to two times per week. Liver is the highest source of vitamin A, fish liver also contains vitamin d , but vitamin A can also be found in butter, whole milk and egg yolks. Some people recommend the carotenes, found in dark green vegetables and in orange and yellow vegetables like squash, sweet potatoes, mangoes, apricots and carrots. Whilst it is true that carotenes can convert to vitamin A but the conversion remains problematic.

Chris Masterjohn (again) makes the point that carotene conversion is extremely subjective, based upon genetic variance, parasitic infections, health status and your own ability to convert carotenes. The ability to convert vitamin A at the liver appears to be harder for women and this could be related to the prevalence of hypothyroidism in females and the reduced peripheral conversion of thyroid hormone at the liver and its function. Studies have indeed shown that high intakes of carotenes can deplete vitamin A stores, so the consumption of vitamin A from vegetable sources, should not be considered reliable and I would actively recommend, eating a piece of liver, weekly.

Fair-skinned people tend to utilise more vitamin A when exposed to sunlight on a daily basis and therefore may require up to ten to twenty times above what is recommended.

Dairy

Bashing dairy products seems as popular as calling sugar a toxin at this moment. People often say that dairy is not essential in the diet and cite vegetables and other foods that have

good levels of calcium. As mentioned previously, calcium is a substantial part of the system that maintains healthy teeth and bones.

Adequate progesterone, vitamin D, K2 (found in dairy products) and other factors are just as important in preventing diseases such as Osteoporosis. Whilst vegetables do contain calcium, it is often harder to liberate calcium from vegetables and beans. You might also consider that if you do have digestive dysfunction, then this may be even harder to achieve.

If you truly do believe that you have a dairy issue. There are a couple of suggestions that I would add, to help with this issue. If you want to see if dairy is the culprit, simply cut it out for several weeks and then reintroduce it. Simple, and no need for inefficient food sensitivity tests. Just look for any negative features. During this time, you may need to add calcium into the diet, especially if you lead an active lifestyle. Simply save the egg shells that you use during the week, cover in boiling water to sterilise them and grind them up. You can achieve this by using a coffee grinder or a mortar and pestle. A recommendation of half a teaspoon per day, mixed in with food, should give you an adequate level of dietary calcium.

B vitamins

To run a furnace you need fuel. But you also need a spark, a catalyst to bring forth energy and heat. These are the crucial roles of B vitamins in energy production. The B vitamins, which are water-soluble which means that we tend not to retain them unlike the fat soluble vitamins, are:

B vitamin	Role	
B1 Thiamin	EM/NC	Oatmeal, Pork, brazil nuts, ,liver, brown rice
B2 Riboflavin	EM/C/N/S	Organ meats, eggs, rice, almonds, peppers, fish, some green veg
B3 Niacin	EM/C/S	Rice, organs, meats and skin, fish, conversion of tryptophan from dairy and meat products, peppers
B5 Pantothenic acid	EM/H/	Organs, mushrooms, fish, dairy, oatmeal, rice peppers, some brassica vegetables
B6 Pyridoxine	EM/H/C	Fish, animal livers, beans, bananas, avocados,

		peppers potatoes, egg yolks, spinach, dairy
B12 Cobalamin	NF/C/HN	Organ meats, fish, eggs, dairy
Biotin	EM/S/C	Liver, rice, eggs, oatmeal, mushrooms, fish
Folic acid	H/C/NF	Liver, Kale, spinach, mushrooms, dates, avocado, coconut, oatmeal, berries, corn

Below are just a few of the main classifications recorded for B vitamin function. Others include gastrointestinal function, immune system and conversion of other nutrients.

Energy and metabolism = EC
Neurological function = NF
Cognition/mood = C
Hematopoiesis or blood cell production = H
Skin health = S

Note: There are other sources of these nutrients in yeasts (In which most B vitamins can be found in brewers yeast), beans, nuts and seeds but they have been left out purposefully.

Like most nutrients, many organisations set out to define an RDA or recommended daily allowance. Whilst it might be nice to pigeon-hole specific nutrients into a small window of numbers, realistically we all have varied requirements for most nutrients. As we discussed our own functional architecture, earlier on, this might highlight these subjective needs, dictated by all of our previous inputs and current required function. Eating a variety of the foods discussed ahead, should help to avoid most general deficiencies but its worth keeping an eye out for changes to skin, mood, sleep, energy and the host of other functions that might be affected by specific nutrient deficiencies. It's worth noting that excesses of B vitamins and toxicity are actually quite rare.

Vitamin C

The Nobel award-winning scientist Albert Szent-Györgi, isolated the compound ascorbic acid or Vitamin C. He has written some insightful and interesting work on his discoveries that I highly recommend reading. His book *The Living State-Observations on Cancer* is a great read.

Vitamin C is an essential nutrient as humans are unable to synthesize it in the body. It plays crucial anti-stress roles and is a key factor in immunity, production of cortisol and gut mucosa (lining and production of antibodies), antioxidant and reduction of bruising. If you constantly bruise or bruise really easily, suspect a vitamin C deficiency. Bleeding gums, poor healing and ongoing infections can also be linked to a vitamin C deficiency. It also plays a role in recycling vitamin E, another powerful antioxidant.

RDA's vary for this nutrient some suggest between 200-1000mgs per day. Some studies have involved intakes of up to 20,000mgs per day, with no negative side effects. An easy way to determine an excess of vitamin C can be watery or loose stools and, much like magnesium, has been used regularly to improve bowel function in those suffering with constipation.

Foods such as citrus fruits, potatoes, cherries (extremely high amounts in comparison to other foods and fruit), peppers (Szent-Györgi managed to isolate vitamin C from his native Hungarian peppers) kale, guavas, watercress, parsley papayas and many other fruits contain great levels of vitamin C. Many hunters often consumed the adrenal glands of animals they had caught. Unbeknown to them the adrenal glands contain large amounts of vitamin C to produce cortisol. Your classic glass of orange juice has also been found effective at lowering the production of endotoxin in high fat and carbohydrate meals.

Vitamin D

Many people have suggested that vitamin D acts more like a hormone than a vitamin. Although as its actions seem to fit more in line with a nutrient that is prone to deficiency much like other nutrients. It's well known for eradicating rickets in children and much research continues to be done on vitamin D. The active form of vitamin D is called calcitriol or 1.25 Cholecalciferol. During sunlight exposure to the skin, vitamin D is absorbed at the skin, converted at the liver and then at the kidneys and measured as 25OHD. Much like when calcium is low, if Vitamin D gets too low parathyroid hormone is produced to increase conversion from food.

Here are some interesting thoughts on Vitamin D, from a lecture by Chris Masterjohn. When you go to the Dr's and have your vitamin D status checked by a blood test, are you effectively measuring Vitamin D status, which is measured by 25OHD levels? Given that vitamin D status is a product of sunlight, calcium and vitamin A (and most likely a host of other factors) levels, is the measurement simply a product of one specific marker? Does it not

make sense to measure the other synergistic markers that are responsible for that level? I have clients come to me who have been administered 100,000 IU of vitamin D, which is a scary thought.

Consider that looking at vitamin D alone, in the isolated form of a blood test, without considering other aspects such as calcium intake, vitamin A and K, will just give an incomplete picture. This will not be improved just by giving a vitamin D supplement.

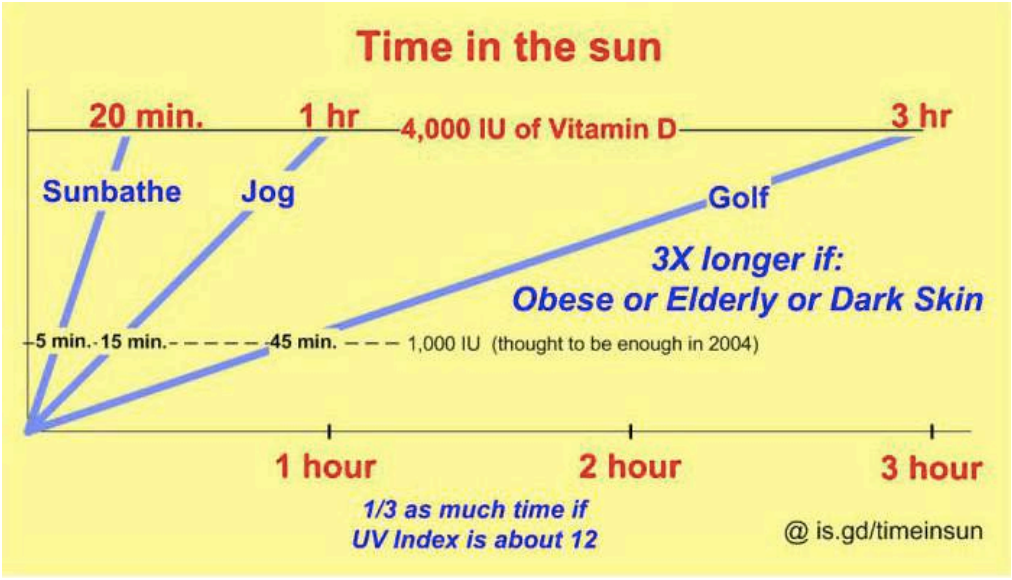
A primary role of Vitamin D is to regulate calcium. Therefore if you have a low calcium status, your body will consistently be utilising vitamin D to improve calcium regulation. This allows calcium to be leached from the bone and teeth and can often end up with calcification of soft tissues, most notably in the cardiovascular tissues. Adequate levels of vitamin K2 can help to prevent this. It certainly does appear that when you take elevated levels of vitamin D, your 25OHD levels do increase. However, if you do not have adequate balance between vitamin A-D-K and opt for mega doses, you may be asking for trouble.

This may an important factor that is overlooked, when endocrinologists look at problems related to the parathyroid gland. The parathyroids are small glands located very close to the thyroid gland. When calcium in the blood is low, the parathyroid glands release parathyroid to stimulate osteoclasts to enhance the resorption or dissolving of bone. This means that on-going low calcium status which may be from vitamin D, A or K deficiencies could increase the chronic production of parathyroid hormone, which increases not only bone breakdown to increase calcium, but also adds additional work to the kidneys to prevent calcium loss. Keeping parathyroid hormone low appears to beneficial and this can be achieved by adequate calcium, vitamins A, D and K (most notably K^2).

Ten minutes exposure to face and hands yields around 400 IU of vitamin D. A minimum exposure of twenty to thirty minutes each day should be achieved for maintaining vitamin D levels. If adequate sunlight is not available, particularly in the winter months, then oily fish like sardines, salmon, shrimp and tuna are a good source. Liver, butter, milk and some cheeses also contain amounts of vitamin D.

Food containing vitamin D rather than supplements remain a much better choice, but remember sunlight is the best source, and there's more to the sun than just the UV rays. That's not to say that getting enough UV rays isn't important and for those who simply aren't able to get adequate sunlight due to geographical constraints, the use of UVb lamps may be a necessity.

The following is a great guide for getting enough vitamin D.



Source http://www.vitamindwiki.com/No+–+10+minutes+per+day+of+sun-UVB+is+NOT+enough

Vitamin E

The tocopherol classes, Alpha, Beta Alpha (tocotrienol) Gamma and delta form Vitamin E. Its primary role is the prevention of oxidation of the unsaturated fatty acids, most notably the Polyunsaturated class or PUFA. Diets high in PUFA can create an increase in oxidation and knock on effect to a down regulation of metabolic and immune system function. These effects have a similar action to an excess of estrogen and a decrease in thyroid output.

Many people often recommend the consumption of seeds and nuts due to their high levels of Vitamin E. Nuts and seeds have a high PUFA content. Therefore might the vitamin E content be there to protect the PUFAs found in the nuts and seeds? As many nuts and seeds have often sat around in warehouses and shops for long periods of time, might those oils have already oxidised and turned rancid, making the vitamin E somewhat redundant? Inside the body, PUFAs tend to oxidise easily due to an increase in temperature. Oils like flax seed oil tend to oxidise spontaneously, even at room temperature.

Wheat germ oil contains an even larger amount of vitamin E than seed oils. You can also get a reasonable amount of Vitamin E from cold-pressed olive oil (which would be my preference for obtaining in the diet, without the need for supplementation). Virgin palm oil is another great source of vitamin E, but as it is also high in non-animal sources of vitamin A precursors or carotenoids their use should be taken in the context of increasing vitamin E and avoiding

toxicity from their other compounds, discussed earlier. Palm oil can degrade over time even in a cold environment, certainly not as drastically as the true unsaturated fatty acids but worth noting non the less. However, supplementation can be necessary and isolated tocopherols have their merit. Used therapeutically, vitamin E has shown very positive results in studies assessing its impact on metabolic, immunity, neurological and degenerative diseases.

A suggestion for those who consume large amounts of PUFA in the diet is to consider a higher vitamin E intake. As it appears relatively difficult to suffer from an unsaturated fatty acid deficiency, it might be more prudent to suggest that simply decreasing the amount of PUFAs might be the simplest advice to follow?

Vitamin K1 and K2

Vitamin K has a sub division of K1, which can be found in plants, most notably leafy green vegetables like kale and broccoli. Remember that due to their thyroid supressing anti-nutrients, it is often best for these to be well cooked to help resolve symptoms of low thyroid. K1 has functions in anti-clotting.

Vitamin K2 can be found primarily in animal fats, dairy and fermented foods like yoghurts, cheeses and derived from bacteria. Remember that K2 plays an essential part in the regulation of bone, in concert with calcium, vitamin D, vitamin A and progesterone. Osteocalcin is formed from K2, which is a calcium-binding protein essential for the mineralisation of bone. Vitamin K can also be metabolised from intestinal bacteria, but it is still essential to secure an external source, especially so for those with compromised nutrient absorption.

Selenium

This trace element plays an important role in endocrine and immune system function. It's interesting to note that in Graves disease, and in particular Graves eye disease. Selenium supplementation had great results in resolving ophthalmology the inflammatory eye disease associated with thyroid dysfunction. In general the hyperthyroid nature of Graves ensures that increased amounts of selenium are utilised, producing an excess of TH. Selenium can be found in liver, seafood, rice, corn, garlic, oats brazil nuts (yes I know I said no nuts.. but once the digestion is improved a few brazil nuts here and there, shouldn't be a problem).

Iodine

Iodine is an essential component of thyroid hormones. Iodine deficiency is possible but unlikely (but not impossible) in the westernised environment. As iodine is found in salt, seafood, seaweed, bread, vegetables and dairy produce it is unlikely that an iodine deficiency exists but should be considered in thyroid evaluations. It's quite possible that in cases of malabsorption, many

nutrients like iodine may be poorly digested. An excess of iodine also poses problems to thyroid function and reviewing supplement schedules may be key to determining an excess of iodine.

Sodium/salt

Salt — Both salt and sugar, in the form of glucose, are two compounds that are knowingly used in decreasing the stress response. Just ask any nurse or doctor in emergency wards across the world. It should appear clearer now that sugar can be protective, but what about the use of salt? Sodium is used in regulation of blood pressure. Well, partly, as factors of the mechanics lies in cortisol's ability to maintain contraction of smooth muscle tissue also. But during stress we utilise more salt than we usually would. It's pretty clear that during activity and sweating, we certainly use more salt. So get used to liberally salting your foods.

Caffeine/Coffee

Whooaa, you said coffee. But coffee contributes to adrenal fatigue doesn't it? Well, not really. Coffee's actions can be problematic, when people don't understand the action of caffeine on a stressed system. For example, you wake up in the morning, feeling sluggish. First thing that you reach for is a cup of liquid black gold, to stimulate some life into that run down body of yours. Thing is, you haven't eaten since last night, a broken nights sleep, affected by not having enough of the foods that help you enter deep sleep, mean that your blood sugar level is at its lowest.

Your body is crying out for a decent feed and instead you put high octane, overdrive juice into your body. As your body has little stored CHO available, it stimulates more cortisol, which has steadily increased overnight, in an attempt to liberate energy from stored fatty acids. You now spark to life; your appetite supressed and you begin another day of the stressed state, that you finished in much the same way yesterday.

Caffeine's effectiveness as an anti cancer/alzheimers compound, are well documented. It's also a very effective antioxidant and has a useful role in inhibiting the excessive uptake of metals. As caffeine is a useful tool for

increasing metabolic efficiency, we need to employ a rule to those who may be at particular risk of dipping into a low blood sugar state. The rule is this:

Never drink caffeine on its own or on an empty stomach!

If you want to drink coffee first thing, then simply drink along with your breakfast. The available carbohydrate, fat and protein should allow the caffeine to enter the blood stream at a steady state, as your blood sugar levels have started to improve. If you fancy a coffee on its own between meals, then you need to add cream/milk and sugar.

Stress

Managing stress is going to be key, but what constitutes an excessive form of stress for you remains subjective. For some, you might be engaged in an exercise program that is taking its toll, not getting enough calories or regeneration time. Therefore eating more and training a little less may be just the stress reduction that you need. For others, it might be a stressful relationship at work that drives your stress, maybe getting out at lunchtime to go for a walk might help you with that. Here are a few suggestions that you can implement to help lower stress.

If stress in the form of worry or anxiety (that is not a product of permanently low blood sugar levels) has been a consistent feature of your life, then addressing it with some form of counselling can be very effective. CBT or cognitive behavioural therapy is useful for addressing anxiety. Often talking to someone who is outside of the regular people that you converse, live and work with, allows you to open up and assist in working through aspects of emotional stress, which may indeed be something that is perpetuated by your own thoughts.

Self-assessment

So you now have a rough idea of what factors create problems and what foods are going to give you a nudge in the right direction. It's always a good idea to see how your low-carb, raw green, Chia seed and nut eating diet is affecting you.

I often recommend most new clients simply record their current diet and follow the recommendations suggested earlier.

This comprises of…

Upon waking: Take axillary temperature (armpit) on waking (for 4–5 minutes) and take pulse rate. Usually carotid (neck) or radial (wrist) arteries are most accessible. For ease of use, a simple pulse oximeter can be slipped on the finger, to obtain heart rate. A basic electric thermometer can be used.

An axillary or armpit reading may be the best location to assess temperature. Mouth can be OK, although if there is underlying sinus or gum inflammation, these can significantly increase the temperature. Comparing axillary with oral temperature can help to rule this out. Oral temperature can also remain elevated after eating or drinking for some time, so giving preference to axillary can be a useful approach to consider sticking with. Another factor is that if you have a significant amount of body fat, axillary temperatures can also be lower, so experimenting between various sites can be useful. I also recommend using behind the knee.

Temperature and pulse timings

1. On waking
2. 45–60minutes after breakfast
3. Mid afternoon.

Log the details down on a simple spread sheet

		Waking		After breakfast		Afternoon		Daily feeling
	Date	Temp	Pulse	Temp	Pulse	Temp	Pulse	
1								
2								
3								
4								
5								
6								
7								

I have found it useful for clients to rate a general feeling on the side to give an idea of feelings of energy, mood and other factors. Many clients have often seen the changes correlate with dietary choices, hormonal interactions, stress and other factors. I have seen many clients who shift from a rating of a 3/10 to a 6/10 simply by tweaking their diet alone.

Many clients often send back spread sheets showing improvements, with journals detailing a myriad number of information that can then be used to fine-tune how they function.

Suggested Shopping list
Experiment and play around

Carbohydrates:

Fruits:
Papaya, guava, pineapple, nectarines, peaches, plums, dates, melon/watermelon, cherries, lychees, grapes, blueberries, Ripe bananas, stewed apples, Pears, fresh orange juice.
Honey, maple syrup, sugar

Vegetables:
Potato, onions, leeks, carrots, cucumber, squash, Peppers, sweet potato, courgette, tomato, cooked spinach or kale. Beetroot. Artichokes. Lettuce

GRAINS: Soaked oats, Well-cooked rice, sprouted breads (with caution)
Occasional Hummus-chick peas

Fats:

Coconut oil, Butter, Ghee, Olive oil use cold, Avocado/oil, Cheese, cream, yoghurt, Milk. Tallow from cooking, goose fat.

Macadamia nuts

Dairy organic-grass fed where possible.
Avoid eating too many dairy products with added probiotics.

Protein: organic and grass fed where possible

Beef, lamb, pork, Elk, Deer, Duck, BISON, Buffalo, Oysters, mussels, scallops, Chicken
(New Zealand meats are often grass fed with fewer pesticides)
Bone broth or premade gelatin

Liver 1-2 x per week

Fish: white fish no more than once per week

- Ice cream such as Häagen-Dazs has the least amount of additives and is a good source of carbohydrate, fat and protein.
- Coffee 1-3 cups per day only with food or sugared.
- Salt

- Remember meal choices should contain carbohydrates, fats and proteins, with fat probably taking the smallest ratio of the macronutrients. Generally, between 10-30% of energy intake and certainly lower when

Environment

What exactly can we do to respond to our environment in a more favourable manner? Here are a few key things that I recommend to clients to start chipping away at all the factors that can potentially decrease their levels of health.

Get on top of exposure to chemicals. It is virtually impossible to remove exposure to pollutants, but decreasing levels can certainly be beneficial. Exposure to chemicals in perfumes and makeup can be potently estrogenic. Perfume is usually applied to the neck, close to the thyroid gland. This may or may not have an impact through the skin, directly on the gland itself, but the compounds can be absorbed through the skin and each time you smell or breathe in that scent, the body is certainly being exposed to its effects, and the body will attempt to excrete them via detoxification.

If you live in an urban area, I often suggest getting a good quality air filter to help remove much of the compounds that you are exposed to in polluted air. Sure you have to breathe it outside, but make the place where you rest and recuperate your temple. Make it a place of relaxation.

Blue light and Wi-Fi reduction are key to improving circadian stress, so make a few rules. Ensure that you avoid computer or Wi-Fi technology after 8 pm. The effects of blue light and Wi-Fi are becoming clearer on human health and it doesn't look great. If you do need to use your computer, you can download a program called f.lux which removes the blue light spectrum during hours of darkness, or you can simply get orange-tinted glasses. Yes, you might look silly but that's better than damaging the cells of your eyes, or messing up your circadian rhythm, isn't it? OK f.lux it is then!

Switch the damn Wi-Fi off at night. If you do live in an apartment block, it is hard to get away from The Jones's Wi-Fi signal upstairs, but turning yours off decreases the EMF stress that you are exposed to. Make sure that you do not have your mobile phone switched on, or have the phone or any electric items preferably not in the bedroom. Do you have electric clocks by the side of the bed? Are they really needed? You can set an Alarm on a device outside of your bedroom if you really need help waking up.

Ionising radiation and aspirin.

Increasingly I have worked with a number of pilots and cabin crew who are frequently exposed to altitude and, consequently, increased exposure to radiation. If you travel by air frequently, then you may consider yourself as receiving a higher dose too. A common theme among cabin-crew members is a decrease in energy output, compromised digestion and, generally, features of the high estrogen, low progesterone and often low thyroid state. Generally the ladies that I have worked with often work pretty long hours in these environments and perhaps don't get enough food and anti-stress type nutrients to offset the long days and exposure to ionising radiation.

In addition to eating food that will help sustain energy levels, salting foods and the use of aspirin may be effective ways of attenuating the negatives of this work environment. The use of aspirin has courted many followers for many decades but of late, seems to have gained some negative exposure. Part of me (yes, OK, even I have a little conspiracy theorist inside me) might suggest that the positives, which can be achieved from taking a cheap preventative compound fail when it comes to allowing companies to ensure large profits compared to their patented medications. Akin to my earlier suggestions when comparing natural progesterone to progestins.

The role of aspirin in cardiovascular protection is also well documented. One of the most often cited negative side effect of aspirin is its potential for causing gastrointestinal discomfort and bleeding. But it's important to point out that often extremely high doses of aspirin (perhaps a 100 fold, and in the studies where aspirin has been found to be chemo-protective, doses have generally ranged between 75mgs to 1200mgs) have been administered, usually on an empty stomach. Taking aspirin with a meal can certainly alleviate this potential side effect and doses between 70mgs and 325mgs have been reviewed as part of a considerable meta-analysis (review of a number of studies) and seem to offer long-term protective features such as a reduction of cancers. There seems to be little difference in the recommendation of these doses, vs. the higher doses of 1200mgs.

Another consideration regarding aspirin use is that its effectiveness as an anti-cancer compound seems to be more effective with long-term use. There are a number of studies that suggest a positive change related to duration. For example, after five years, the incidence of rectal cancer decreased twenty-one per cent, and after ten years, doubled to over forty per cent.

Aspirin has protective characteristics that compare to compounds like caffeine and vitamin E, and enhance cellular function much like thyroid hormones. Salicylic acid, a component of aspirin, inactivates the prostaglandins, which are involved in the inflammatory cascade. During exposure to radiation, an increase in damage to cells, and oxidation of compounds like unsaturated fatty acids, create inflammation. Whilst short-term exposure and inflammatory responses are unavoidable and produce products such as reactive oxygen species or ROS (the role of ROS is still not clear, but does involve part of the signalling process that may alert the body of on-going damage), long-term unchecked inflammation can produce changes to our body and how it functions.

During stress, the cyclooxygenase or COX enzymes, trigger the inflammatory prostaglandins, which then increase oxidation/ROS. Aspirin seems to be effective at diminishing the effects of the COX enzymes and subsequent inflammation.

Another feature of aspirin use is its role in mitochondrial uncoupling. The mitochondria are the energy-producing structures found within our cells. When

they work well, they utilise both fat and carbohydrate as discussed, when we reviewed the Randall cycle. When optimal respiratory function and use of oxygen is lost, a permanent feature of cell function becomes the elevated use of fatty acids, sparing of glucose and an inefficient use of fuels. Aspirin helps to promote the decrease of fatty acids as a fuel, back to glucose, which increases cellular efficiency and decreases stress and stress hormone production. The compound niacinamide acts in a similar manner.

To summarise, aspirin has anti-estrogen/serotonin like effects that lower excessive inflammation, decrease the production of harmful compounds and help to improve thyroid and function of the cells.

You are my sunshine
My only sunshine
You make me happy
When skies are grey

It's free. It's one of the most potent enhancers of health yet once again, the sellers of sun blocks have made us believe that we are at the mercy of this cancer-inducing behemoth.

An excess of UV light can precipitate aging of our skin but we also do need adequate levels of UV for the production of Vitamin D, as discussed when we broached osteoporosis.

UV light is essential for producing vitamin D. When UV light hits the skin 7 hydroxycholesterol is converted to previtamin D3. Once transported to the liver, 25 OHD is converted at the kidneys (and other sites, like the colon, prostate and bone) to 1,25 D3. This form of vitamin D has many functions related to calcium levels, bone structure, immune system function and even body fat levels.

Melanin, which is the pigment in skin responsible for skin colour can impact UV exposure and vitamin D synthesis. Essentially the darker skinned you are the increased need for exposure to UV rays to gain adequate vitamin D. People with the darkest coloured skin may require six times more exposure to sunlight and UV, than a fair skinned person. It has been suggested that fair skinned people are 70 times more likely to develop skin cancer compared to those with darker skins. It would be a reasonable suggestion to investigate the dietary habits in those who develop skin cancer. I certainly noticed the difference in my own skin and have clients inform that they didn't burn in the sun, when decreasing consumption of unsaturated fatty acids in the diet, despite spending longer periods in the sun.

What is often not discussed in literature is the life-enhancing qualities of other spectrums of light, such as the red and orange rays.

Believe it or not, here in the Middle East, vitamin D deficiency is rife, in both local and expat communities. Many Drs and nutritionists recommend the use of vitamin D supplements despite an abundance of it in the sunlight. Of course, yes, at certain times of the year, the sun is oppressive but not so much that getting 15–20 minutes per day, either in the morning or evening, is still not achievable. I have even heard some Drs suggesting that the sunlight here is not the same as sunlight in other parts of the world! I would love to know how it differs?

It's hotter generally at the equator, it emits the same light frequencies and due to people not spending enough time in the sun, low vitamin D levels persist in the face of, low levels of sun exposure, low calcium intake and often the inability of the liver to process vitamin D. This can be quite common in hypothyroidism. It is possible that sunlight may be affected by levels of pollution in the atmosphere, decreasing exposure of UV.

Now if you are reading this from less sunnier climates, then you may be dealing with the very opposite problem: inadequate sunlight. There's a good body of research that clearly shows that the better the Vitamin D status for a given individual, a decreased incidence of cancer is found. There's also data that shows that many cancer rates increase as you move further away from the equator.

So just to clarify, the less sun exposure you have, the less vitamin D, but also the less exposure to the other immune system and health-enhancing light spectrum. But in some cases some of the research has suggested that despite high levels of supplemental vitamin D, even those found in food, cancer rates remained unaffected. So what does the rest of the light spectrum have to offer us?

Enhancing health with red light and LED lighting.

Photobiomodulation, yes you heard that right. I said photobiomodulation or in some circles, Low Level Laser therapy (LLLT). The latter is the use of properties of light to enhance cellular function and well-being. You have probably come across people who, when winter hits, may get particularly low or even become depressed. Perhaps it's why in some eastern European and Scandinavian countries, there are high rates of alcohol consumption and alcoholism. Is that why Henrik Ibsen wrote such hard, depressing plays?

It's clear that vitamin D is an important molecule and some even suggest that its status is more hormone-like. Although there seems to be other forces at work, it's been known for many years that the use of light helps to stimulate the body to repair certain damage.

Light therapy for improving pain, healing and dealing many other issues, has been used for decades. In 1903, a Nobel science prize was awarded to Niels Finsen for ultraviolet-phototherapy. Since that time, the properties of red or near infrared have been extensively studied.

Here are just some of the issues that have seen great improvement using LLLT and Photobiomodulation.

- Pain reduction
- Improved hormone function
- Swelling reduction
- Increased healing
- Neurological issues
- Improved cellular function
- Promote recovery from exercise
- Rehabilitation of injuries
- Decreased inflammation
- Improved hair follicle stimulation

Infrared heat lamps have been used for decades and have often been recommended in rehabilitation or in the cosmetic world as an anti-aging protocol. I have used heat lamps with myself and clients for several years, but it is clear that many gains can be had without the use of heat and just focusing on the use of light alone.

There are many factors that can make the use of light more effective and the various illumination parameters include:

- Wavelength
- Fluence
- Power density
- Pulse structure
- Timing

For many, even finding these variables may prove a difficult task. In fact even using the word Photobiomodulation becomes problematic!

I think the exposure of bright light during the day through incandescent or LED lights is important to offset the lack of natural daylight and healing properties of various waveforms (unless, of course, you do work or spend much of your day outside), with the use of red light after sunset to decrease impact on circadian rhythm.

One of the most prevalent mechanisms that appears to offer an explanation as to LLLT's effectiveness is by its observed effect on increase in cytochrome c oxidase, which improves mitochondrial function, increasing cell efficiency and function and improving energy production (remember how this can be lost via the glucose fatty acid cycle?).

The wavelength of 600-950nm (or optical window) is a general guideline and appears to be where most of the research and the effects of LLLT have been observed.

The toxinless website listed at the end has some great recommendations for

the use of light and ideal set ups, which are very cheap to set up at home.

The use of LLLT for improving hormones and in particular thyroid function has gained a greater following of late.
It's worth noting that in some studies which can be found on Valtsu's website (a great resource for thyroid), the use of LLLT improved thyroid function without the need for thyroid medication. Additional studies corroborate the effectiveness in reducing the need for thyroid medication and addressing autoimmune thyroiditis. The use of LLLT, sunlight or NIR should be considered when trying to improve hormonal, metabolic and mood-related outcomes.

Environmental estrogens and pollutants

Some key areas for managing external estrogenic factors

- Avoid using too much/any perfume and certainly avoid placing perfume/aftershave around the neck, where the thyroid is located. If you can smell it, it is already in your blood stream.
- Air filters can be useful for cleaning your home and lowering exposure to nanoparticles in the air such as fuel, chemical residues and moulds.
- Clean water is a step in the right direction and home filtration systems are useful for assisting with improving water quality. Filters that can remove factors such as chlorine and fluoride, heavy metals and other compounds. You may need to re-mineralise by adding a drop of salt to the water.

Using nature to re-charge.

It seems to be the rarity today that people live in the countryside. Sure, we have parks and some green spaces, but for many we get misled into working harder and longer hours, whilst spending less time in nature. So why is nature important to the human body?

The escalation of urbanised environments is ensuring that humans are packed into industrialised, colour lacking, banal developments, that do little to stimulate the eye and increases tension with hustle and close-knit streets that people rush to and from work. This dense packing of people also accumulates a large number of industrial pollutants, be it Benzene from car fuel, Wi-Fi (for which there is an increasing amount of literature to support its negative effects on hormones and cellular function) and many other factors that test the body to its limits.

There is increasing research that suggests that urbanisation is a prominent factor in rumination/negative thinking and decreasing mental health. To deal with managing aspects of mental health, exercise is often touted to be helpful as a distraction hypothesis and I don't dispute the effectiveness of exercise training to help in this situation. A distraction is positive and exercising is essential for good health. However, how many people actually use quiet

appreciation in exercise to regenerate? We are often so concerned with pushing ourselves in professional life that exercise often becomes wrapped up in the same goal-setting schedules that people religiously stick to. Walking, boating, hiking and taking time to appreciate nature, take in the colours, slowly breathe in the less polluted air, listen to the birds sing, or simply sitting on the beach and absorbing the endless horizon of water. We often don't stop to take in these natural beauties as we are trying to beat those personal bests.

Studies have shown that walking for 90 minutes in a natural environment fares much better than walking in urban settings, the effects associated with additional decreases in negative thinking and activity of the brain. I am a firm believer in the idea that although running and cycling in built-up areas may very well make you fitter, it also probably makes you less healthier. Increased oxidation of pollutants in urbanised areas contributes to health issues and mortality rates are on the rise.

Training efficiently and intelligently would warrant that we should aim to exercise less in this manner. Walking in green spaces and utilising the stress decreasing mechanisms of nature, may have more impact on your health than running or cycling on by without appreciating the spaces surrounding you.

Sleep-the ultimate reset.

Sleep does some wonderful things to the human body. It should come as no surprise that those who do not sleep well have a higher incidence of diabetes, cancer, heart disease and a host of other life affecting conditions. Making an effort to get better sleep during the periods of darkness is key to improving health. Many people don't get adequate sleep due to hormones and neurotransmitters running wild.

Both serotonin and histamine are neurotransmitters that are involved in the waking state. Cortisol is a hormone that increases throughout sleep and if your blood sugar and stored liver glucose levels are low, will be produced to liberate energy from stored fat. Keeping adequate blood sugar levels throughout sleep can be achieved by simply eating a meal that supports your energy requirements at night-time. For those that find it difficult to sleep, a glass of milk with honey, or a glass of juice with gelatin may help you to stay asleep longer, without the jolt of a cortisol kick start around 2-3am.

Hormones

As we explored earlier with our Mongolian meat and dairy-eating ladies, it appeared that despite elevated levels of estrogen, the incidence of cancer was lower, in part due to less urbanisation and an increase in progesterone. The use of supplemental progesterone may be one of the most protective steps that you can take to help stabilise blood sugar levels, improve mood and lessen the problematic features associated with high estrogen.

For many of my female clients I recommend the use of a progesterone supplement developed by Ray Peat called Progest E. There are other brands on the market but I have found this supplement to be the most effective with no problematic ingredients.

These are readily available via a number of nutrition sites and even Amazon in some cases. To be honest, I do recommend working with practitioners so that you can have someone external who can note the reactions to food and supplements such as progesterone. Though this is not always necessary, it is just helpful to have someone observe the reactions. Much like recording a food log and noting temperature and pulse rate, it can be worth noting any changes once you have started taking progesterone. You may feel more balanced, calmer, perhaps experience fewer cravings? One thing that is important to note; progesterone requires an adequate amount of carbohydrates to ensure uptake and assimilation at the cell.

Our prominent progesterone doctor, Katharina Dalton, noted that progesterone will not demonstrate the same affinity with progesterone binding sites in the presence of increased adrenaline and cortisol, both of those being a feature of low blood sugar levels and anxious states. This is especially important to note when either skipping meals, fasting or under excessive stress. Remember that cortisol elevates when blood sugar levels drop, a potentially stressful event. You may notice this correlates with the onset of anxiety. Therefore eating every 3 hours or so can be critical for maintaining adequate progesterone levels, in the face of an estrogen excess.

Dr Dalton also recommended the regular consumption starchy foods in order to maintain progesterone levels. On this point I would be inclined to disagree and recommend the use of carbohydrates in the form of easily digested tropical fruits, being the most useful sources of energy, combined with some form of protein and a small amount of saturated fat. Ray Peat has long suggested a snack of cheese and some fruit as a great option between meals to maintain a balance in blood sugar levels.

Grains, as discussed previously can pose several problems, including levels of insoluble fibre and other un-digestible matter, which can increase the amount of serotonin, contributing to further inflammation, if any exists.

Whilst grain consumption shouldn't be viewed as an issue in everyone, an emerging body of research notes the effects of the global features of stress on the body. This has been termed the Cell Danger Response or CDR.
The CDR has many far-reaching effects, which include changes to minerals, vitamins, the processing of metals, the function of cells and largely constitutes a protective function. Another change in function is how we process the gluten, the protein found in wheat and other grains. You know? The gluten that everyone thinks they are intolerant to? It's quite possible that the increase in stress and the resultant CDR may affect the processing of this grain. It's

possible, but then so are the aspects of types of pesticide used, quality of the soil, use of GMO and other factors.

I do find that removing grains like breads, pasta, cakes and croissants (yes all the good stuff) for a short period of time to be quite beneficial. Especially when digestion is slow, in a low energy or hypothyroid like state, and when serotonin and perhaps endotoxin like effects can be observed.

Exercise: The positive and negatives.

There's no doubt that movement and exercise play a part in longevity. How much and what type remain contextual. My role, really, is to help people to become as energetic and able to do the activities that they really want to do. Considerations should be made as to what might be the best type of exercise will be for you, if you are indeed suffering from hormonal issues. You need to do something, but often pushing yourself against the flow of your own body may not be in your best interest.

If pushing yourself as hard as you can is your thing and it doesn't seem to impede on your health and function, then go do it. Nobody ever climbed Everest without pushing themselves to the limit.

If your goals simply revolve around maintenance of good health and longevity, then you really don't need to push yourself as hard as you think.

If you are reading this book because you have some of the complaints already outlined and want to improve your function, then activities like Cross Fit or marathon running and triathlons are not going to reverse any of these conditions in the long term.

There's a possibility that with supplementation with progesterone or thyroid, that you may find improvements that help you to get back to the activities that you love.

For those who engage in high intensity or long distance activities, the effects of breathless exercise on a stressed hormonal system may cause some problems. During intense exercise, we tend to breathe out carbon dioxide as part of the buffering system, to prevent the cells from becoming too acidic as a result of the production of lactic acid. The loss of carbon dioxide (which is also produced as a by-product of cellular respiration/oxidative metabolism or in lay terms the use of fats and carbohydrates with oxygen to provide fuel),

prevents acidosis and allows the cells to function using oxygen. When we need to work harder and require more energy, we shift from the generation of fuel production with oxygen, to without oxygen, which produces metabolites such as lactic acid.

This poses several issues.

1. The production of lactic acid. Lactic acid, when elevated, can be shuttled back to the liver, to be utilised as fuel again, but this is incredibly inefficient.
2. Carbon dioxide loss, especially below a certain threshold, means that the ability of oxygen to dissociate from haemoglobin is reduced and therefore, the ability to utilise the more efficient oxidative metabolism is reduced. The net effect is an increase in non-oxidative or anaerobic paths and therefore, lactic acid continues to be produced, leading to a vicious cycle.

As a rule of thumb, I tend to recommend the following types of exercise for those with deep-seated hormonal and energy challenges.

Walking: One of those greatest exercises for stress relief and keeping you moving. Even better, if you can do it surrounded by nature and away from the smoggy main roads. There are several studies that show the positive aspects of walking in nature and its effects on rumination and depressive states. Walking in the sunshine for double brownie points! If you live in a built up area, consider spending more time outside of the concrete jungle to help improve.

Short bouts of strength training. Depending on the extent of your symptoms a good 30–60 minutes can be helpful, three times per week. Adequate rest periods are essential between sets. I have had some clients just complete short stretch and stability exercises in some cases, which are equally beneficial to help maintain function without compromising hormone and metabolic interactions.

Yoga, Pilates and other slow controlled exercise routines can be useful activities to focus on during this rebuilding period.

Try to avoid High intensity, circuit or cross fit type sessions. A great way of determining the effect of exercise on hormones like thyroid and adrenaline/cortisol is by taking your temperature and pulse during and after exercise. Temperature drops are a sign that the intensity may not be the most appropriate choice for you.

Ultimately, I want people to participate in activities that they enjoy. But as we get older, we need to focus on aspects of preserving key features of metabolic function. Too often I see people try to go against the grain. Maybe they are interested in trying to keep body fat low or want to keep trying to beat records. Aspects of optimal health start to suffer. Don’t get me wrong. I understand that

to achieve great things, like climbing Mt. Everest, requires human athletic feats. But if you are interested in maintaining your health, you often don't need to keep banging your head against a brick wall. The simple self-diagnostics here can give you a great idea of what is helping to maintain or improve health, or detract from it.

Use of hormones

Using progesterone effectively.

Once again, I will suggest that being effectively coached by someone for diet and health improvements, and the introduction of supplements such as progesterone, can be hugely beneficial when it comes to spotting the nuances from day to day issues that you might be having. Progesterone stimulates respiration and a side effect of that is being able to improve metabolic rate, often by an increase in the use of fats and carbohydrates as a fuel with oxygen.

Progesterone should be routinely used for women suffering estrogen dominance type symptoms. It can be used effectively from days 14–26 of the menstrual cycle. The initial dosing which is taken from most nutritional supplement companies who provide natural progesterone usually recommended it as follows:

A small drop on the pinkie finger that fills about half the tip should be around 3ng's of progesterone and initially a dose no more than 15ng's should be taken as a first dose.

Initial dosing is five times per day for ten days. It would be ideal to do this between days 14–26, so that you get a complete run of the high dose, without any interruptions in your cycle.
Second dosing three times per day for a period of two weeks.
Third dosing 1–2 times per day for a couple of weeks.
Once per day can be maintained days 10–26 if need be.

There are no detrimental side effects to natural progesterone although some high doses, according to Ray Peat are noted with a sense of euphoria.

Eating regular smaller meals can help to offset the production of stress hormones like cortisol and ensure that progesterone enters the cell. I have had a few clients who think that using supplements of various kinds, negates the need for eating food. You are not dieting any more; you are restoring optimal biological function! There's a real difference.

In my experience, the use of progesterone should be considered prior to thyroid hormone, when body temperature fails to change. Some people often notice a clear indication towards increased alertness, energy, emotional balance, and sleep starts to improve, simply by implementing a few of the

simple nutritional tweaks. Adding more carbohydrate into the diet, removing difficult to digest foods, and use of the carrot salad, often provides a much welcomed nudge in the right direction. For women, when this fails to improve body temperature over thirty-six degrees, progesterone should be considered.

Some clients have often been keen to make the jump to supplemental thyroid, but clearing potential blocking factors can be key to general improvements in many areas. As we have seen from the information previously presented, an excess of estrogen has the potential to disrupt many systems, including optimal thyroid, cellular functioning and metabolism.

Using thyroid hormone

If you have any health complaints that need addressing, you should speak to a Dr and someone who understands the biological implications of what we have discussed, prior to commencing thyroid therapy. I firmly believe, for most people, that improving thyroid function can be one of the most protective measures that can be considered for optimizing health. This is especially so for preventing cancer and heart disease. For those with underlying cardiovascular issues, a consultation with a skilled practitioner should be considered as a precautionary measure.

There can be many potential blocking factors to thyroid. Metals, diet, estrogen, stress and other issues all contribute to decreasing thyroid function. It's important to try to address and remove/deal with these factors rather than assuming that adding thyroid to your plan will be a magic pill that transforms you from donkey to unicorn in one quick swoop.

I have taken the lead from Mark Starr's book on hypothyroidism on how to implement the use of thyroid hormone. Starr suggests starting with as little as a quarter of a grain of NDT. You should note the observation of your data of temperature and pulse rate and aim to increase every 10–14 days. The goal, in relation to all that we have discussed, is a temperature of 37 degrees and a pulse of 70–85 beats per minute.

Patience is key; let your body adapt at a controlled pace, rather than wading in with increasing levels. Sometimes achieving 37 degrees can be hard for some people, especially if there have been parts of your life where your metabolism and hormones have been under large amount of stress, or perhaps a certain amount of damage to some aspects of your biology. Simply taking more supplements or more hormones isn't necessarily going to take you any further and its important to note how far your own strategies can take you.

As someone who has experimented extensively with NDT, I can tell you from my own experience that more is definitely not better. An excess of thyroid can lead to a feeling of discomfort, accompanied by sweating and perhaps even heart palpitations. If you do have the misfortune of taking too much, my advice would be to eat your way through the day. Keep carbohydrates steady and

the negative effects should wear off by late afternoon, early evening. DO NOT attempt to go and do any intense exercise. Anxiety may be a key feature of this event and needs to be dealt with for a short period of time. In reality, if you simply stick to the slow methodical increases and observations, this can be avoided.

In some cases, you may feel that you have reached a ceiling with your dose. Despite reaching a steady temperature that refuses to go any higher but the observation of increased heart rate of 85 plus bpm. Perhaps it may leave you feeling a little spaced out too? You may want to drop back to the dose that you first noticed the effects of feeling warmer, more focused, and observe the differences over time. It may be that another blocking factor still needs more work in order to achieve a better reaction to enhanced thyroid function.

In much the same mechanism of progesterone use, eating and maintaining blood sugar levels are key to improving thyroid outcomes. If you choose to skip meals, you run the risk of increasing hormones that stimulate the breakdown of fat, that inhibit thyroid function, and you are back to square one.

Summary:

I hope that you have enjoyed reading this short book, which is a summary of the major factors that I help clients address, to help resolve energy, digestion and hormone related issues. I can appreciate that some of the ideas may run counter to the traditional information that you may have been exposed to. You may have even felt confused by some of the contradictory information that is constantly being churned out by the gurus of the health and fitness world?

Hopefully what I have managed to do is to spur you on, to experiment with much of the biological mechanisms that I have talked about, thanks to the great work of the scientists that I have mentioned throughout the book. There will be some ups and downs, but generally most people start to notice relatively quick changes to digestion, mood, energy and overall wellbeing. It's worth noting that in some long standing cases of stress and exposure to estrogens, patience is key and can take longer. What you are doing is laying the foundation for better function, in the years ahead.

Some people may find that a restoration of normal metabolic processes is achieved. You may find that eating three meals a day is something that you can achieve, without the need to regularly balance your blood sugar levels. One of the main objectives of writing this book is to help people to understand that you have some simple tools to assess what is going on and to observe what is working for you.

I wish you good health and encouragement in exploring the topics addressed in my brief attempt at summarising some great minds.

Best wishes

Keith

Useful tests for interpreting thyroid function and advanced testing for poor response to nutritional and lifestyle change

These tests still remain accurate and reliable forms of testing, but clarifying problematic areas may be necessary.

- Basal temperature test with thermometer
- Resting pulse rate
- Achilles return reflex

Blood tests:

- TSH— produced when thyroid needed
- T4- inactive form of circulating thyroid hormone
- Free T4- unbound form of inactive thyroid hormone
- T3 — active form of thyroid hormone
- Free T3
- rT3- reverse T3 — the braking mechanism of thyroid hormone
- ATPO — Thyroid antibodies – present in Hashimotos disease
- ACTH – Adrenal hormone precursor for cortisol
- CBC — complete blood chemistry – not essential for thyroid
- Estrogen, testosterone, progesterone/17OH progesterone
- Prolactin – useful for impact of estrogen and pituitary function
- SHBG or sex hormone binding globulin
- Cholesterol HDL-LDL
- Triglycerides
- Blood glucose
- Iodine

Additional diagnostics if problems persist

- Urinary porphyria — Heavy metal and plastics
- Organic acids — energy, pollutants and heavy metals
- CDSA stool test if digestive problems do not abate with nutrition or thyroid therapy.

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