

Women & Hormones: Mid-Life Endocrine Balance

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Reproductive hormone imbalance, especially in women, is a widespread phenomenon, deeply impacting the quality of life for those affected. It often begins before puberty and continues on through and beyond menopause. Symptoms vary widely in type, number, and severity and tend to increase as women approach mid-life. They may include, but are not limited to:

- ▶ forgetfulness
- ▶ irritability
- ▶ depression
- ▶ anxiety
- ▶ insomnia
- ▶ restless legs
- ▶ heavy or erratic periods
- ▶ sore breasts
- ▶ hot flashes
- ▶ night sweats
- ▶ bloating
- ▶ bowel habit changes
- ▶ fluid retention

And this is the short list.



A Functional Medicine approach, emphasizing the *Eating For Health™* holistic model of nutrition, can promote relief by nourishing overstressed organs.

The holistic, functional approach to hormone balance involves looking as deeply as possible into the cause(s) of the underlying imbalances, rather than concentrating on symptom relief alone. To attempt simply to alleviate uncomfortable symptoms may provide relief in the short term, but the process that is creating the symptoms would continue to progress, potentially causing worse and far-reaching health consequences in the future. Working to restore overall hormone balance gets to the source of the problem AND relieves symptoms – a win-win situation.

The body is an integrated whole and each *endocrine* (hormone-secreting) organ – adrenals, pancreas, thyroid, parathyroid, and ovaries – communicates with the others, helping determine a woman's sense of well-being. The endocrine system is also intricately linked to the nervous and immune systems, and is nourished and cleansed by the primary organs of elimination – liver, kidney, and digestive tract.

Hormone imbalance is universal in both men and women, reflecting exposure to endocrine disruptors in



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our food, air and water supplies, through genetic predispositions and through lifestyle factors, including nutrient deficiencies and stress. Stress in this case refers not only to the emotional factors usually associated with the term, but also to the way our bodies react to toxins, food intolerances and sensitivities, pain and discomfort, and illness.

When faced with the complexities and intricacies of so many intertwining systems, getting to the root of the problem can feel like trying to hit a moving target. Where do we begin? The answer is the adrenal glands. Since they can steal from the other hormone-making processes in order to produce *cortisol*, the necessary-for-life hormone, supporting them first can often bring quick, sustained symptom relief.

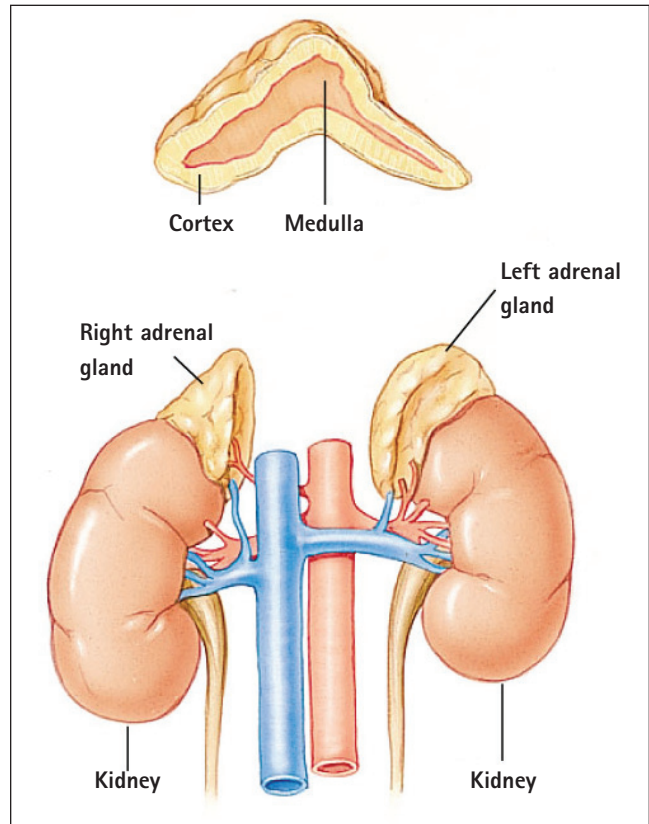
Our Overworked Adrenal Glands

The adrenal glands are two small, cap-like organs that sit atop the kidneys and mediate our response to stress. They are composed of two parts that perform separate functions:

The medulla—secretes the stimulatory neurotransmitters, *adrenaline* (epinephrine), and *nor-adrenaline* (nor-epinephrine).

The cortex—synthesizes steroid hormones, including cortisol, DHEA, aldosterone, and testosterone (in women).

Endocrinologist Hans Selye, in his work entitled *The Stress of Life*, identified three stages of adaptation to stress (alarm, resistance, exhaustion), which he called the *general adaptation syndrome* (GAS). The first of these, alarm, is marked by the secretion of *epinephrine* (adrenaline) in what is well-known as the "fight-or-flight response". Epinephrine causes the conversion of glycogen stored in the liver into glucose, and of triglycerides into free fatty acids, in an effort to provide the body with the extra energy required to overcome whatever challenge has presented itself. This release quickens the pulse, raises blood pressure, shuts down peripheral



activities such as digestion, and stimulates the *central nervous system* (CNS). Epinephrine also accelerates blood coagulation to protect against excessive hemorrhage. This adaptation response is indicative of the stimulation of the sympathetic nervous system, the "red-alert" defense unit of our CNS.

Unfortunately, while the stress response is supposed to be a short-lived phenomenon, modern life seems to present us with a non-ending stream of stressors to which our bodies must constantly respond, providing a continuing assault on our adrenal resources. The result is an ongoing adaptation response that can lead to the exhaustion of our adrenal glands, thwarting their ability to react appropriately to stress and creating imbalance in other hormones. In mid-life, ovarian function declines and the adrenal glands pick up the production of estrogen and progesterone. If there is already strain on the adrenals from chronic stress, menopausal symptoms will worsen.



Insulin

There is a direct connection between insulin/blood glucose balance and variations in sympathetic response, also known as our release of stress hormones. Insulin levels are influenced by many hormones – adrenaline, glucagon, cortisol, and growth hormone. Of these, cortisol – our hormone of chronic stress – exerts the strongest antagonism against the effects of insulin.

Research studies have demonstrated that secretion of cortisol can increase levels of glucose in the bloodstream even when no extra glucose has been produced, and it can decrease glucose uptake in the cells by 15%. The result is *hyperglycemia* – high blood sugar.

Chronic hyperglycemia leads to insulin resistance in the liver, with resulting uncontrolled glucose production and uptake in cells throughout the body via extra insulin secretion. This *hyperinsulinemia* eventually causes cells to lose their ability to respond to insulin, resulting in insulin resistance. If this continues, *Metabolic Syndrome* can result.

Metabolic Syndrome

Metabolic Syndrome is characterized by a constellation of symptoms:

- ▶ Excess abdominal weight
- ▶ Uncontrollable carbohydrate and sugar cravings
- ▶ *Dyslipidemia* – high cholesterol (high LDL; low HDL), high triglycerides
- ▶ *Hypertension* (high blood pressure)

It is associated with an increased risk of:

- ▶ Type II diabetes
- ▶ Heart disease
- ▶ Breast cancer
- ▶ *Polycystic ovary syndrome* (PCOS)
- ▶ Uterine cancer
- ▶ Nervous system disorders, including Alzheimer's Disease

The prevalence of Metabolic Syndrome is significantly higher in menopausal women than in the population as a whole. And since fat tissue has been shown to synthesize estrogen, any increase in body fat increases a woman's chances of becoming estrogen dominant relative to her progesterone levels. This in turn is a risk factor for both breast and uterine cancers.

Many of the symptoms seen in disordered blood sugar control – tremors, irritability, headaches and lack of concentration when glucose levels suddenly drop (hypoglycemia) – are those seen in PMS, perimenopause, and menopause, making it clear that both insulin and reproductive hormones are affected by adrenal dysfunction.

Adrenal Influence on the Thyroid

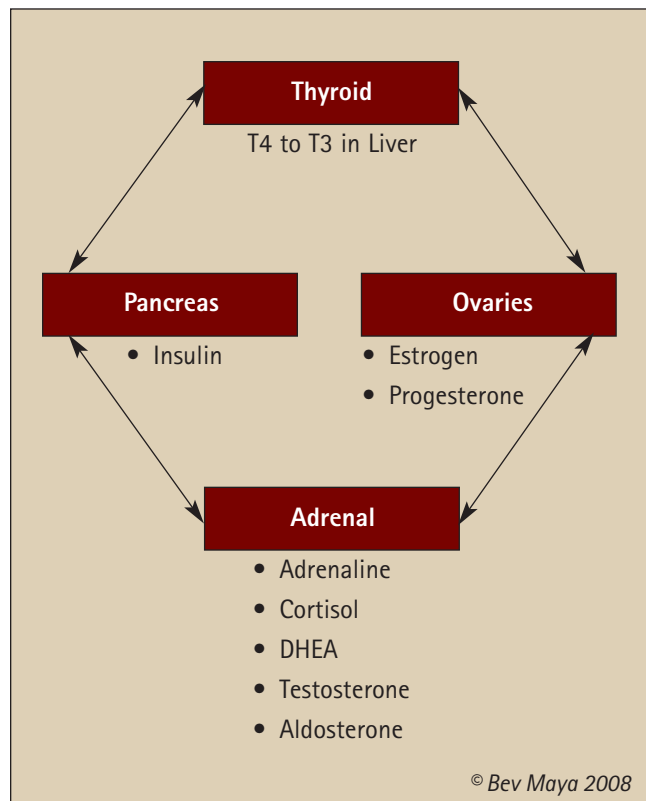
The thyroid gland is the grand regulator of our metabolisms. If it malfunctions, almost every process in our bodies can be affected. The thyroid gland produces mostly T4, the inactive storage form of thyroid hormone. T4 must be converted in the liver and kidneys, and to a lesser extent in the pituitary gland and nervous system, into the main active form of thyroid hormone, T3. This is accomplished via an enzyme pathway dependent on the mineral selenium. T3 stokes the fires of our metabolisms, exerting a strong effect in the brain, heart, lungs, and skin, and in the sensory organs involved in vision and hearing.

T4 can also be converted into the biologically inactive reverse T3 (rT3). Under normal conditions, approximately 45-50% of T4 is converted into rT3. Under conditions of chronic stress/sympathetic stimulation, when cortisol levels remain elevated, more T4 will be converted to rT3, resulting in symptoms of hypothyroidism. Hypothyroidism in turn is a leading cause of high cholesterol, hypertension, and heart disease in midlife women, and can be extremely difficult to diagnose because thyroid lab values often reflect normal hormone ranges.

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Balance

The adrenal glands impact every other hormone-producing organ through a multi-directional communication network, as illustrated in the diagram below:



The synthesis of adrenal and reproductive hormones – estrogen, progesterone, cortisol, DHEA, and testosterone – flows from the proto-hormone (or mother hormone) *pregnenolone*, which is produced from cholesterol manufactured in the liver. This hormone production is dependent on the optimal functioning of the two phases of *hepatic* (liver) detoxification pathways and on adequate metabolic enzyme production. Under conditions of chronic stress, the body will preferentially produce cortisol from the pregnenolone, since cortisol is required for life itself, over any of the other hormones, in what is known as pregnenolone steal. The bottom line:

Chronic stress will result in reproductive hormone imbalances.

Chronically elevated cortisol levels keep releasing sugar into the bloodstream, thereby keeping blood sugar levels too high. This in turn causes excess release of insulin in order to manage these levels. This can result in weight gain and the consequent inability to lose the extra fat, sugar and carbohydrate cravings, and far worse conditions if it is not controlled.

Long-term high cortisol will also decrease the amount of circulating T3, the most active of the thyroid hormones, resulting in lowered thyroid function. Lowered thyroid function equals a slower metabolism, which can contribute not only to weight gain, but also to lowered body temperature, resulting in a slowing of critical enzyme processes. Optimal thyroid function is required for good health.

As is obvious from all of the above, getting all of the endocrine organs back in balance is of great importance. Because the adrenal glands exert such a profound influence on the rest of these organs, however, first supporting the adrenals – through diet, herbs, and stress-reducing lifestyle choices – is imperative.

REFERENCES

Adapted from an article by Bev Maya, Bsc (Hon), E. Phyt., MNIMH, AHG. , "Demystifying Women's Midlife Hormonal Imbalance: The Endocrine Symphony. *Unified Health Journal*, Spring 2009, Volume 5. *With additional information provided by the author of this article.*

