



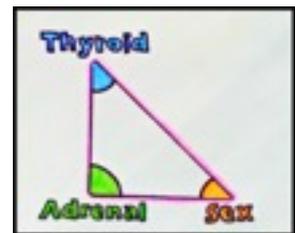
What are hormones?

Hormones are the chemical messengers that tell particular cells or organs how to behave to regulate activity throughout the various systems of the body. Human hormones can be split into three categories:

- ▶ Sex Hormones, such as Oestrogen and Testosterone which are predominantly made in the gonads (ovaries or testes). They are responsible for regulating everything to do with our sexual organs.
- ▶ Thyroid Hormones, such as Thyroxine, are predominantly made in the thyroid gland in the throat. They are responsible for regulating our metabolism (how we turn food into energy or store nutrients).
- ▶ Adrenal Hormones, such as cortisol and adrenaline, are predominately made in the adrenal glands above our kidneys. They are also known as our ‘stress’ hormones and are responsible for changing our body chemistry, such is increasing the heart rate and blood-sugar balance, when we are under stress so that we can act (such as the ‘fight or flight’ response).

The Hormone Triangle and the ‘Greedy Adrenals’:

These hormones are all made from the same building blocks and require many of the same nutrients as co-factors in their production. If we imagine the three hormonal categories as a right-angled triangle, the Adrenal Hormones are the dominant group, taking the lion’s share of the building blocks, with the Thyroid and Sex hormones making do with what is available after stress-hormone production. In a body that doesn’t produce an excessive amount of stress hormones, there is plenty to go around, but if the balance tips, both Thyroid and Sex hormone function will suffer.



The Stress Response and Sex Hormones:

Cholesterol is the ‘raw material’ for hormones. Cholesterol gets converted to Pregnenolone, which then either gets converted to the stress hormone Cortisol, or the sex hormones Testosterone and Oestrogen. Because in terms of survival, it is far more important to have our stress response functioning, the body will always choose the pathway to create Cortisol to the exclusion of manufacturing our sex hormones. A finite amount of Pregnenolone can be made in the human body per day, and if the body is under stress, it will need all the available Pregnenolone to manufacture the required amount of Cortisol. All recreational drugs induce this stress response, which means that prolonged or frequent use of drugs can result in underproduction of sex hormones. In people who are Testosterone dominant this may manifest as low libido, erectile dysfunction, hair loss, muscle loss, fatigue, low mood, swelling or tenderness in breast tissue and sleep disturbances. In people who are Oestrogen dominant this may manifest as mood disturbance, menstrual cycle disturbance, hot flushes, weight gain and sleep disturbances. If whatever is causing the elevated stress levels continues over a long period; be that from drug use, a stressful job or extreme exercise, eventually the building blocks that make the stress hormones will also become depleted resulting in adrenal fatigue.

The Stress Response and Thyroid Hormones:

The biomechanical mechanism that links the system that controls the Thyroid hormones with the Adrenals is less well understood, and more complex. Both sets of hormones are controlled by a complex positive and negative feedback loop system that starts and ends in the brain. We call these systems Axis. The Adrenal

hormones are controlled by the Hypothalamic-Pituitary-Adrenal Axis (HPA-Axis), and the Thyroid hormones are controlled by the Hypothalamic-Pituitary-Thyroid Axis (HPT-Axis).

In response to stress, the Hypothalamus (in the brain) releases the chemical CRH (corticotropin-releasing hormone), which signals the pituitary gland to release ACTH (adrenocorticotropin-releasing hormone) which in turn stimulates Cortisol from the Adrenal Glands. The presence of CRH in this part of the brain inhibits the production of TSH (thyroid stimulating hormone) thereby inhibiting the production of Thyroxine, the hormone responsible for metabolism. Cortisol itself inhibits the conversion of the Thyroid hormones from their inactive form to their active form. In short, the stress response inhibits Thyroid function, and prolonged or frequent adrenal action, as seen in drug use, may have implications for the Thyroid.



Nutritional Support for Hormone Balance

What to do with this information

The primary function of these hormonal systems is to adapt to the changing environment and maintain homeostasis – the body's 'happy medium'. The body does this incredibly well, even under extreme stress. However, the imbalance of one can invariably impact another – therefore, if you are finding yourself with symptoms of Sex Hormone Dysfunction (low libido, erectile dysfunction, hot flashes, etc) Adrenal Fatigue - more aptly known as HPA-Axis dysfunction – (Sleep disturbance, brain fog, depression, exhaustion) or Thyroid Dysfunction (weight loss or gain, sensitivity to the cold, tiredness, aches and pains), it is important to assess all three.

Requesting a full blood count from a GP or health professional will be useful in determining which systems are suffering. The support for those with hormonal imbalances vary depending on the system impacted and the individual so seeking out a Nutritional Therapy consultation is advised. The general advice for hormonal support is to maintain good blood-sugar balance, ensure adequate gentle exercise, reduce external stressors such as extreme sports, drug use, stressful situations, practise good sleep hygiene, and ensure a balanced diet with plenty of good quality protein, Omega-3 fats, and sufficient vitamins and minerals (A good quality multi-vitamin such as Biocare's Once A Day is advised.)