



# RESTORING THE BALANCE

Upper Cervical Chiropractic and  
the Endocrine System

By Keith Wassung



The word "homeostasis" describes the body's ability to maintain relatively stable internal conditions even though the outside world is constantly changing.

Homeostasis indicates a dynamic state of equilibrium or a balance in which internal conditions change and vary but always within relatively narrow limits. Communication within the body is essential for homeostasis and is accomplished chiefly by the nervous and endocrine systems.

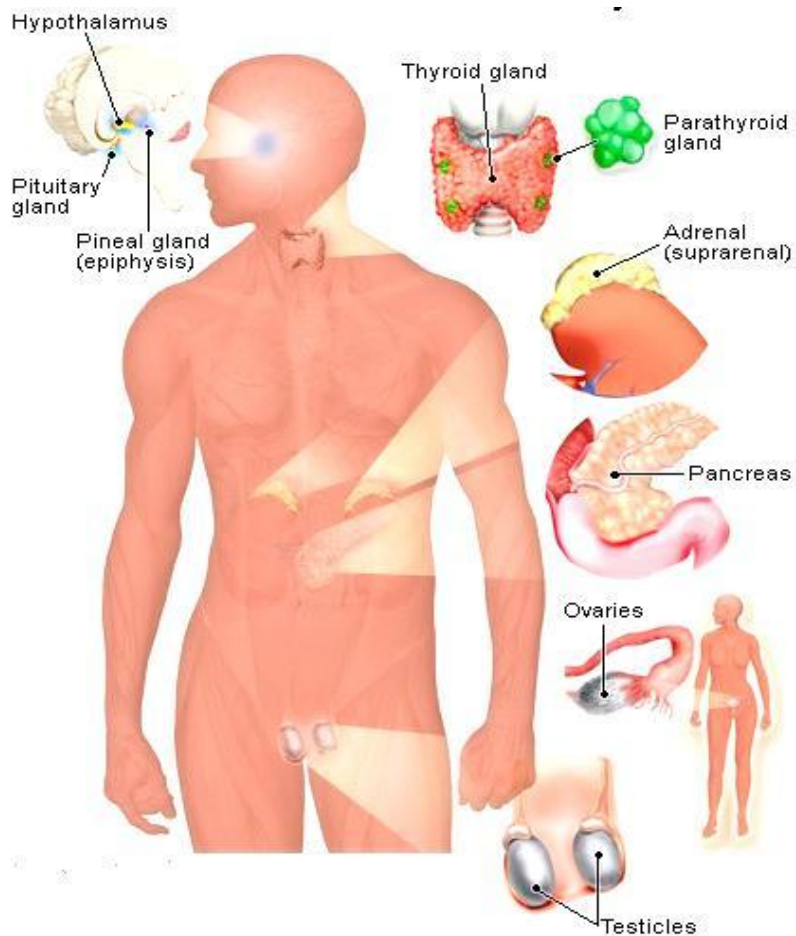
**HOMEOSTASIS** (ho'meo-o-sta'sis) a tendency to stability in the normal body state (internal environment). It is achieved by a system of control mechanisms activated by negative feedback<sup>1</sup>

Many of the most vital functions of the human body are influenced by the endocrine system, which consists of glands that secrete hormones, or chemical messengers into the bloodstream.

The hypothalamus, located in the brain, acts like radar, receiving incoming information from the nervous system. It then uses this information to manufacture hormones that either target specific part of the body, or to target other glands to produce specific hormones for homeostatic regulation.

The endocrine system consists of the **hypothalamus, pituitary gland, pineal gland, the thyroid gland, the parathyroid gland, the pancreas, the adrenal glands, the ovaries and the testes.**

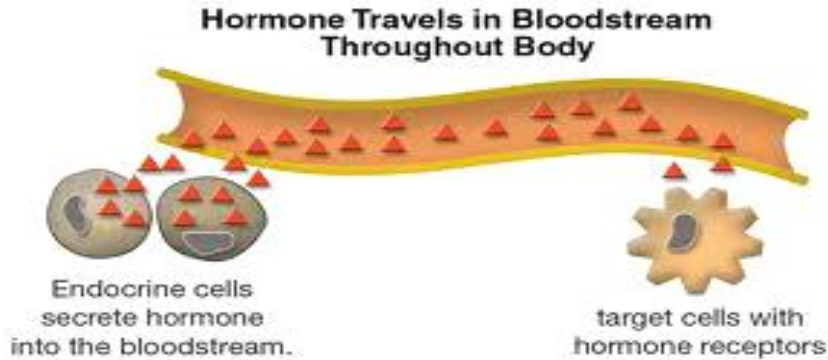
All of the organs of the endocrine system are glands, but not all glands are part of the endocrine system.



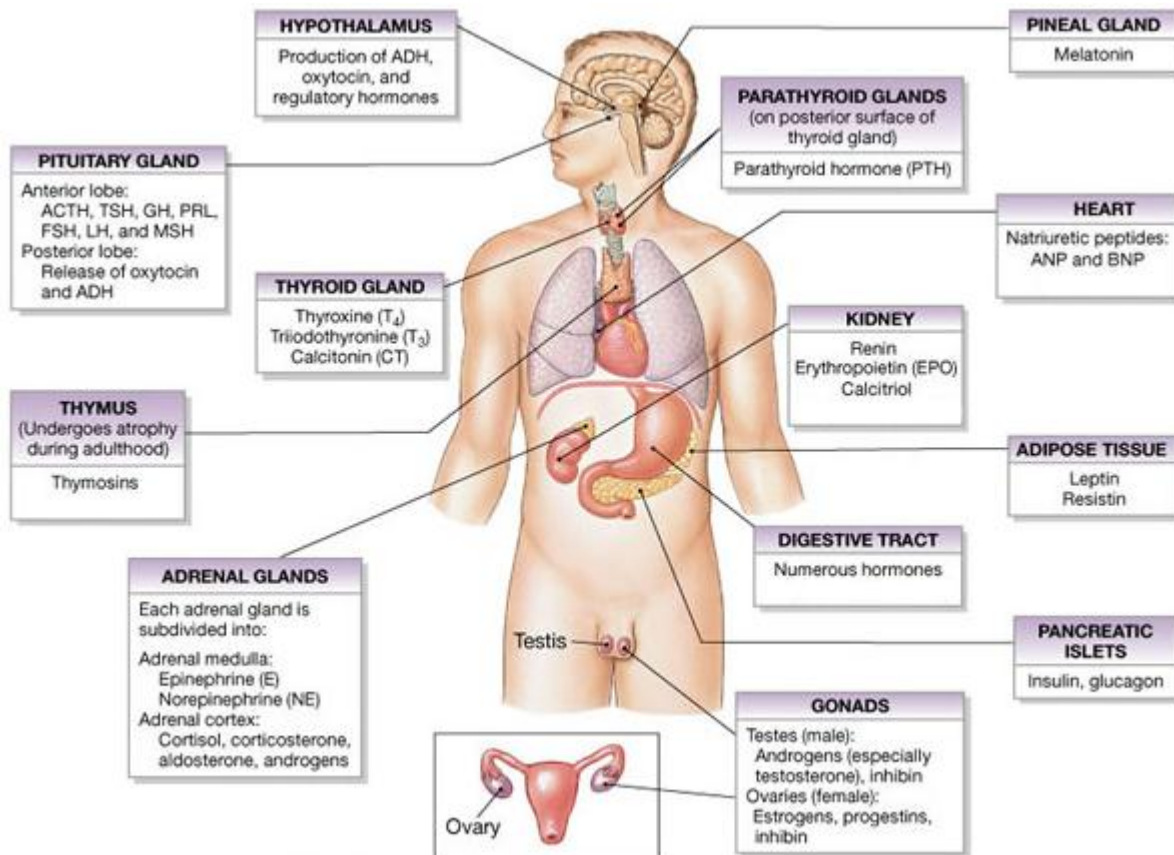
Other organs that produce hormones, but are not part of the endocrine system include the placenta in the pregnant female, glands in the gastro-intestinal tract, structures in the heart and blood vessels,

and structures in the kidneys.

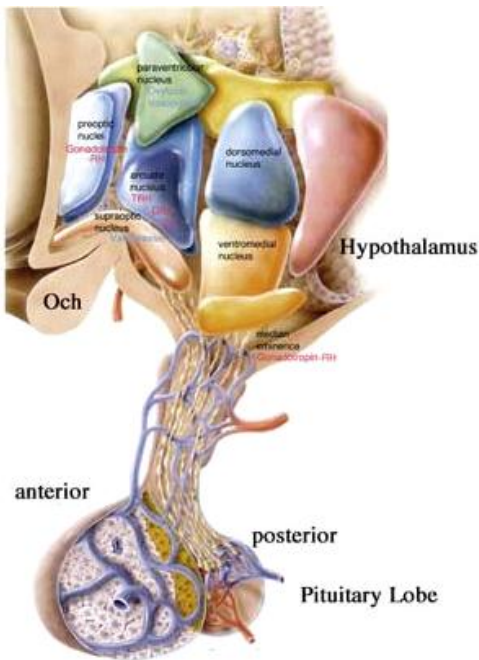
Hormones are the body's internal chemical messengers. They carry the information that controls the function of almost all of the body's cells and tissues. Most hormones are themselves are controlled by a mechanism called feedback, which is similar to a thermostat in a central heating system. When a gland is working harder than the body needs it to, the hormone system switches off; when the body needs the gland to speed up, the nervous system turns on the switch again.



The word *hormone* comes from the Greek work, *hormaein*, meaning to excite or to urge on. Each hormone is a complex chemical substance produced and secreted into the bloodstream by an endocrine gland, or secreted by specialized cells in other organs, such as parts of the gastro-intestinal tract or the heart.



Hormones reach every part of the body, and the membrane of every cell has receptors for one or more hormones that stimulate or retard a specific body function. The hypothalamus, located at the base of the brain, acts as the mastermind that coordinates hormone production, producing regulatory or releasing hormones; these travel a short distance through special blood vessels and nerve



endings to the pituitary gland, which is often referred to as the "master gland".

**Attached to the hypothalamus by a short stalk, the pea-sized pituitary gland hangs from the base of the brain and is composed of two parts, an anterior and a posterior lobe.**

**Some of its hormones act indirectly by stimulating target glands to release other hormones. Others have a direct effect on the function of target glands tissues.**

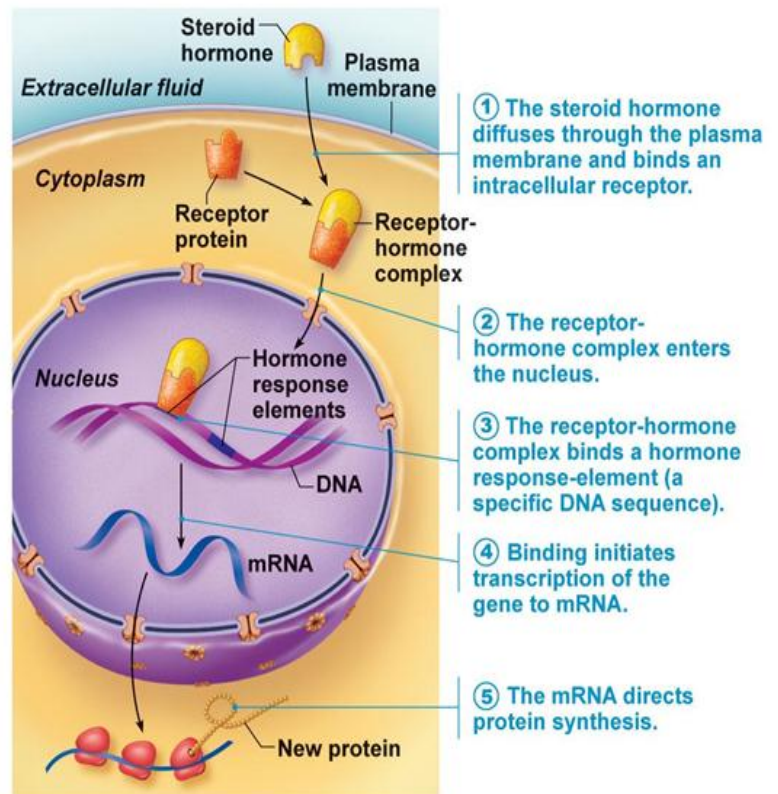
Hormones can work in astonishingly small concentrations. On the high end, the ratio of hormone molecules to blood molecules is 1 to 5 billion, and on the low end side the ratio is 1 to 5 zillion, (1 in 5,000,000,000,000,000)

This would be the equivalent of putting one drop of liquid in a swimming pool that was filled with the water of 660 railroad boxcars. A train with 660 boxcars would be six miles in length.

Hormones are able to influence the activities of the body, but they must first bind with specific tailored protein cells called receptors. There are hundreds of different kinds of receptors, although each one is designed for a specific chemical signal within a cell. There are more than 10,000 different types of receptors, although it takes only a small number to obtain a response. The receptor and its hormone have an intricate and precise fit, like a key and a lock and this hormone receptor complex then binds to specific regions of DNA in the cell nucleus to activate specific gene.

“Steroid hormones can easily diffuse into their target cells. Once inside, they bind to a receptor most likely located within the nucleus. The activated hormone-receptor complex then interacts with the nuclear chromatin, where the hormone binds to a DNA-associated receptor protein specific for it. This interaction “turns on” DNA transcription of messenger RNA, which in turn directs the synthesis of specific protein molecules.”<sup>2</sup>

### HUMAN ANATOMY AND PHYSIOLOGY



## SIGNS OF HORMONAL IMBALANCE

- Hot Flashes & Night Sweats
- Weight Gain
- Insomnia
- Fatigue
- Low Libido
- Vaginal Dryness
- PMS
- Mood Swings
- Depression
- Fibrosis
- Mood Swings
- Anxiety



- Irritability
- Incontinence
- Yeast Infections

- Headaches
- Memory lapse
- Inability to focus
- Hot flashes
- Sugar Cravings
- Rapid or irregular heartbeat
- Autoimmune disorder

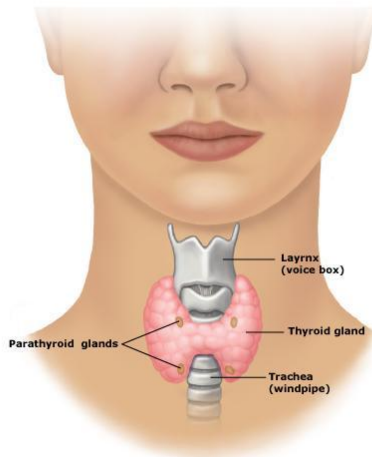


# HORMONAL IMBALANCES AND HEALTH PROBLEMS

When the body is in a state of homeostasis, the precise amount of hormones are released into the bloodstream and the body functions smoothly; but when the control mechanism malfunctions-either too much or too little of a particular hormone is secreted, or when an organ or tissue does not respond efficiently-the results can be severe and even fatal.

## THYROID DISORDERS

Thyroid disorders are classified as either “hypo-thyroid” meaning too little thyroid activity, or “hyper-thyroid” mean too much thyroid activity.



“At any given time in the U.S., more than twenty million people suffer from a thyroid disorder. More than ten million women have a low grade thyroid imbalance and nearly eight million people with the imbalance are undiagnosed. More than 500,000 new cases of thyroid imbalance occur each year.”<sup>3</sup>

**Dr. Ridha Arem**  
**The Thyroid Solution**

“15.7 Million Americans have diabetes and it is estimated that 5 million of them are undiagnosed. Each year there are 789,000 new cases of diabetes. Diabetes is the 7th leading cause of death in the U.S. and total direct and indirect costs of diabetes in the U.S is over 100 billion dollars”.<sup>4</sup>

### National Diabetes Foundation

*“The endocrine pancreas is regulated by hormonal activity controlled by the hypothalamus. The dysfunction of the regulation of islet hormone secretion as well as its mechanisms and the pathophysiology of the islet dysfunction is primarily a breakdown in the neuroendocrine control.”<sup>5</sup>*

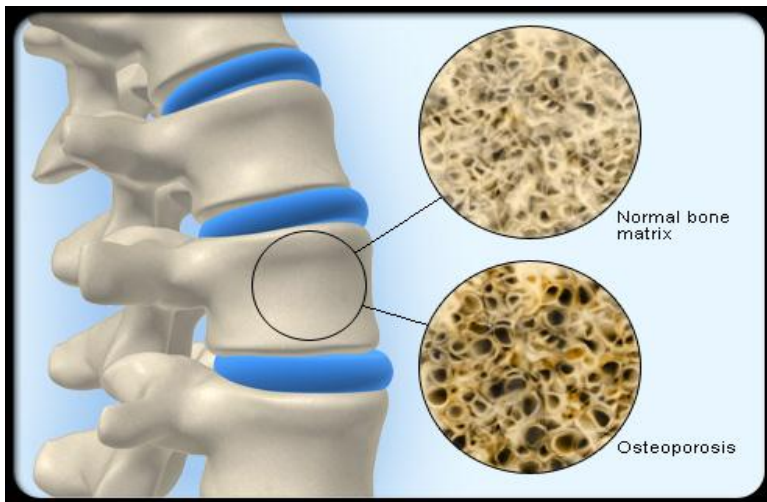
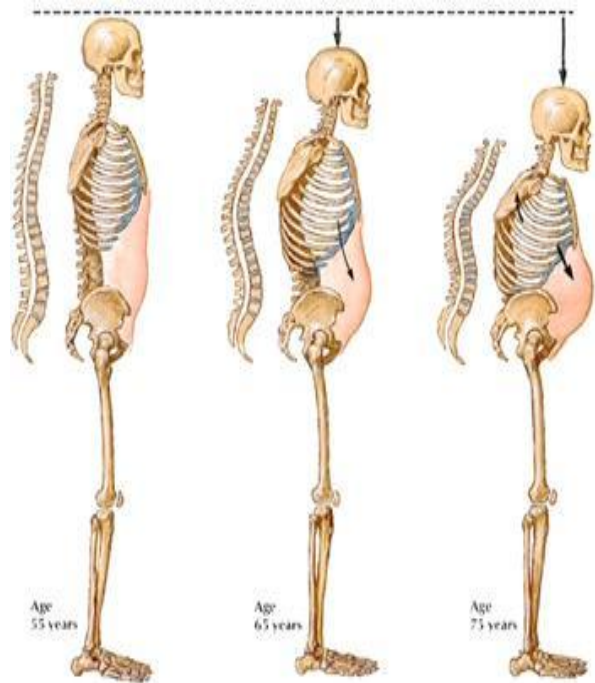
**Journal of Endocrinology**



Osteoporosis is a major health threat for 28 million Americans, 80% of which are women. Annual treatment costs for osteoporosis exceeds 15 billion dollars. One out of every two women and one in eight men will have an osteoporosis-related fracture at some time in their life.

"Interference with bone remodeling-that is, the imbalance between bone formation and bone reabsorption-underlies nearly every disease that influences the skeleton. Most such disorders are caused by imbalances in hormones and related chemicals in the blood." <sup>6</sup>

### Human Anatomy and Physiology



*"The key to stopping osteoporosis lies in balanced body chemistry and a delicate balance of minerals in order to maintain a calcium homeostasis in the blood" <sup>7</sup>*

**Dr. Nancy Appleton,  
Healthy Bones**

### PRE-MENSTRUAL SYNDROME (PMS)

"Fluctuations in the hormones that regulate calcium levels over the course of a menstrual cycle may set off a host of PMS symptoms including irritability, depression, food cravings, headaches and bloating." <sup>8</sup>

**Science**

*"Women with PMS might have disturbances of their hypothalamus and adrenal glands" <sup>9</sup>*

**Journal of Clinical Endocrinology**



Depression is on pace to be the world's second most disabling disease (after heart disease) by the year 2012; already the World Health Organization ranks it first among women and fourth overall. In the United States, depression afflicts 18 million people at any given time, one in five over the course of a lifetime and costs over 40 billion dollars a year in lost work time and health care. <sup>10</sup>

### US News and World Report



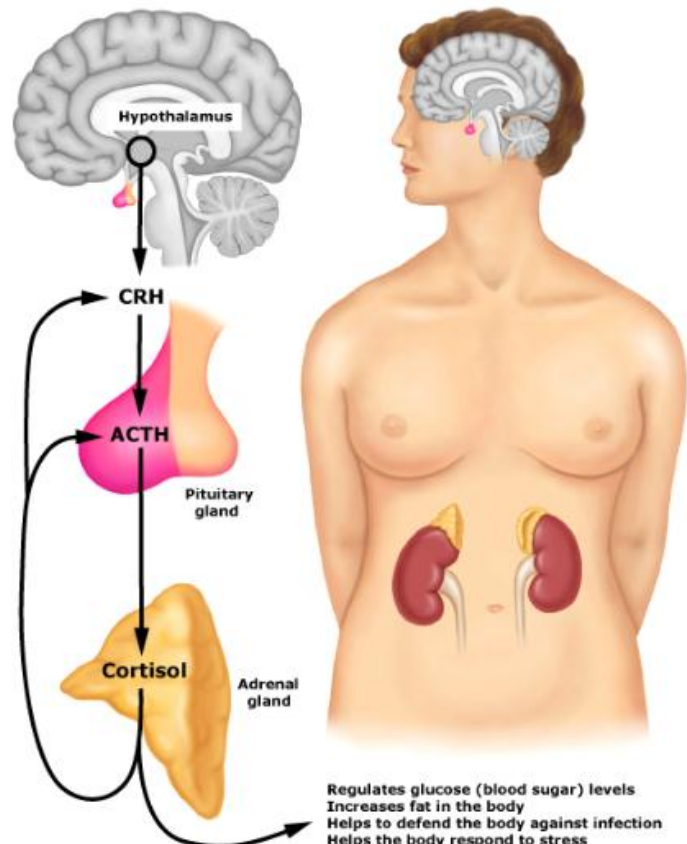
The term "depression" often carries a stigmatism with it that denotes a certain sort of sadness, but research has revealed that the majorities of the cases of clinical depression are due to imbalances in hormonal levels and are related to a dysfunction in neurological signaling and chemistry.

"Today, neuroscientists know that in many cases, psychopathology (ie depression) arises because of dysfunctions in particular brain structures or particular brain chemicals" <sup>11</sup>

### American Scientist

"In fact, it takes an incredibly strong person to bear the burden of the depression condition. The name, "hypothalmo-pituitary-adrenal-axis dysfunction" is an appropriate jargony medical description that is accurate but would never make it into the headlines" <sup>12</sup>

**Dr. Philip Goldsmith,  
Neuroscientist**





# TRADITIONAL APPROACH TO HORMONAL HEALTH

The medical approach to endocrine disorders and hormonal imbalances is to use a variety of drugs in an attempt to artificially compensate for a hormone deficiency. In the case of an overactive gland, radiation and surgical procedures are used.



**Primarin, from PREgnany MAREs, uRINE, is the single most prescribed drug in the United States. An estimated ten million women in the United States use Premarin and that number is expected to increase dramatically as the number of baby boomers reach menopause. Premarin is responsible for sales in excess of one billion dollars annually.**



Drugs and related synthetic chemicals may be necessary and appropriate in certain situations, but they do little to correct the cause of the disorder or imbalance since they can do nothing to correct the original cause of the problem, which is often in the system of the control mechanism. Drugs often create an even greater chemical imbalance, which can result in harsh side effects that are much worse than the original condition.

*"Too many medical remedies get in the way of the body's ability to heal itself" <sup>13</sup>*

## Hormone Replacement Therapy

The General Accounting Office, an investigative branch of Congress, released a report in the 1990's stating that more than one-half of the new drugs developed and approved by the FDA, had severe or fatal side effects that were not found or not reported until years after the drug had been in widespread use. The GAO reviewed all drugs (198 in all) released from 1985-1990 discovered that 102 of them had side effects serious enough to warrant either withdraw from market or major re-labeling.<sup>14</sup>

**U.S. Statistical Abstract**

***"Millions of post-menopause women are currently being treated with drug therapies whose long term effects are virtually unknown" <sup>15</sup>***

North American Menopause Society

"The strongest argument for the widespread use of estrogen is that is supposedly delays the development of osteoporosis. The absence of osteoporosis in elderly women in many other counties is never discussed in the professional meetings on osteoporosis that are subsidized by the pharmaceutical companies"<sup>16</sup>

**Ellen Brown, Menopause and Estrogen**



***“There is no evidence that estrogen replacement therapy restores bone mass to premenopausal levels. It merely slows down bone loss and the dose necessary to do this is considerably higher that is needed to control other post-menopausal symptoms and from increasing cancer risk”***<sup>17</sup>

### Estrogen Warning Insert

“A 1990 study from the University of Tennessee found that indeed there was a link between estrogen therapy and lowered coronary heart disease but only in women who already had a history of heart disease. In women with normal coronary vessels, estrogen benefits were insignificant”<sup>18</sup>

### Archives of Internal Medicine



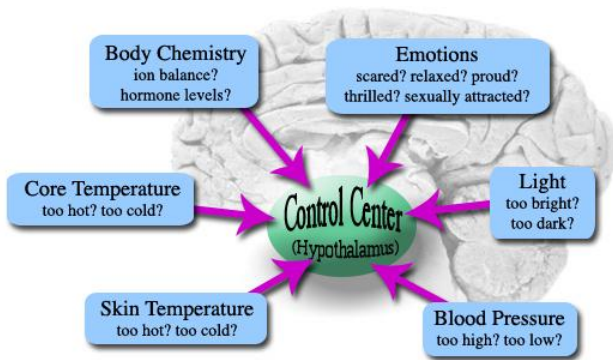
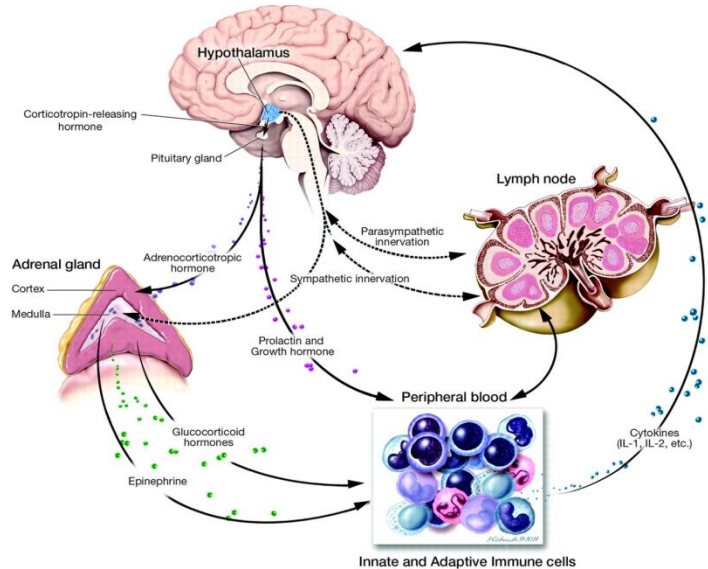
Research from the American Cancer Society has conclusively shown Hormone Replacement Therapy to lead to an increased chance of Breast & Uteran Cancer.

# The Central Nervous System, Hypothalamus and Hormones

The limbic system is the area of the brain that maintains homeostasis and the hypothalamus is perhaps the most important part of the limbic system. It is the "brain" of the brain and is the single most intricate and amazing part of the brain. The hypothalamus controls homeostasis in the brain by way of feedback. The combined neurological and endocrine function of the hypothalamus allows it to play a prominent role in the regulation of numerous body functions.

The main function of the hypothalamus is homeostasis, or maintaining the body's status quo. Factors such as blood pressure, body temperature, fluid and electrolyte balance, and body weight are held to a precise value called the set point. Although the set point can migrate from day to day it is remarkably fixed.

To achieve this task, the hypothalamus must receive inputs about the state of the body, and must be able to initiate compensatory changes if anything drifts out of range. The Hypothalamus constantly receives millions of nerve messages from complex areas of the rest of the nervous system including the nucleus of the solitary tract, reticular formation, the retina, the circumventricular organs, the limbic and olfactory systems, sense organs, neocortex, osmoreceptors, as well as numerous touch receptors.



"The hypothalamus receives signals from all possible sources in the nervous system, thus, the hypothalamus is a collecting center for information concerning the internal well-being of the body, and in turn, much of this information is used to control secretions of the globally important pituitary gland." <sup>19</sup>

## Guyton's Physiology

This input into the hypothalamus allows it to regulate and integrate heart rate, blood pressure, respiratory rate, digestion, emotional responses, behavior, sex drive, body and skin temperature, appetite, thirst and body fluids, sleep cycles, metabolism, and much more.

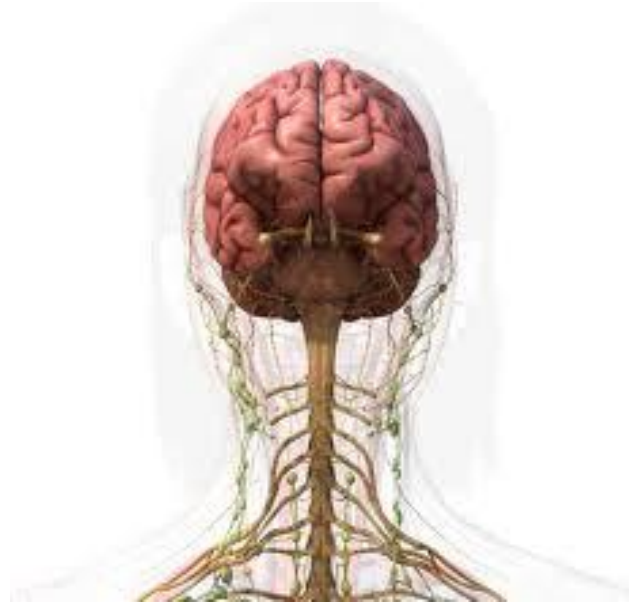
**The effectiveness of the hypothalamus is directly proportional to the functional capability of the nervous system to send and receive nerve messages and especially to maintain the integrity of those nerve messages as they travel along the spinal cord.**

# SPINAL CORD & NERVE INTERFERENCE

The spinal cord is both a cable and a switchboard. As a cable, it connects the brain with the rest of the nerves in body.

**As a switchboard, it coordinates muscle movements, reflexes and other activities under its direct control.**

The spinal cord is actually a direct extension of the brain, composed of the same kind of nerve cells, nerve fibers and supporting glial cells as those of the brain. It is also protected by the same three coverings (the meninges) and the same fluid (cerebral spinal) that house and protect the brain



The spinal column is composed of 24 movable vertebrae. The spine is straight when looked at from the front or the rear. When viewed from the side, the spine forms a series of geometric curves or arcs. When the spine is in its optimum structural position, the nervous system is protected, and the integrity of nerve impulses traveling to and from the brain is at an optimum level. This is when the control system of the body can best achieve homeostasis.

Because the vertebrae are moveable, they are also susceptible to certain stresses and forces which can cause them to lose their proper position. This leads to stress in the vital nervous system.

This condition is known as a "vertebral subluxation". Subluxations interfere with the normal flow of nerve impulses and can cause either an increase or decrease of nerve activity.

Other references in the scientific literature which describe subluxations are: **spinal lesions, nerve dysfunction, dysponesis, nerve impingement, neuritis, double crush phenomenon, spinal nerve irritation, facet joint dysfunction, neuroma, neuropathy, visceral nerve sub-trauma, & polyneuritis.**

Hormonal imbalances can be the result of either too much or too little glandular activity.

**Spinal nerve interference and its resulting decrease in function may be a significant cause of endocrine dysfunction and hormonal related health problems.**

"Lesions of the hypothalamic input region may produce a variety of symptoms, including diabetes, insipidous, obesity, sexual dystrophy, somnolence, and loss of temperature control"<sup>20</sup>

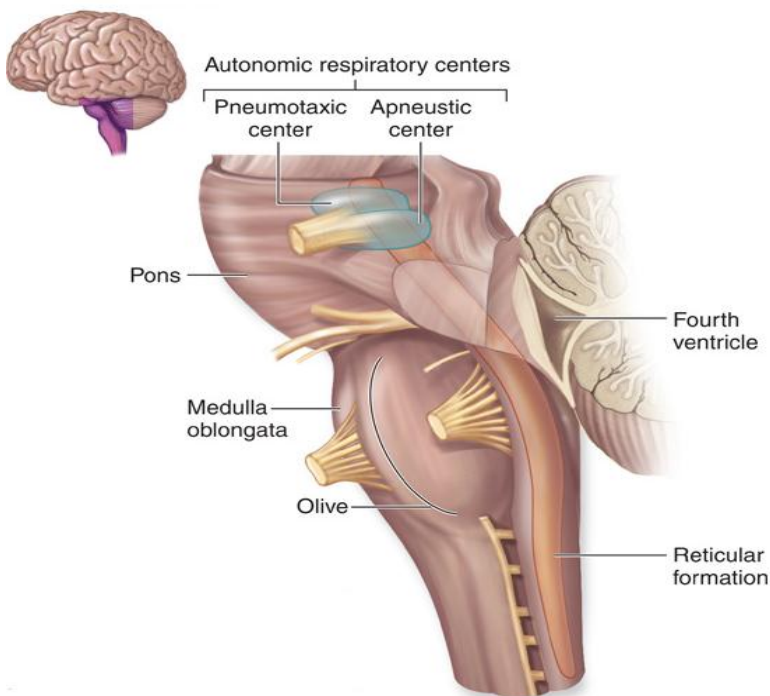
### **Correlative Neuroanatomy and Functional Neurology**



*"Studies have shown that more than fifty percent of hyperthyroid patients have damage to the pathways in their nervous system"* <sup>21</sup>

### **Journal of Neurology, Neurosurgery & Psychiatry**

Research at the Still Institute showed that spinal lesions resulted in pathological changes in the blood, urine, and tissue fluids. Spinal lesions of the atlas and axis (C1& C2) were associated with abnormal function of the pituitary which resulted in abnormal hormone secretions. <sup>22</sup>

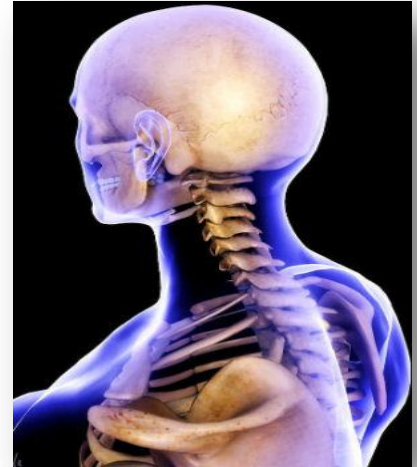


“With few exceptions, hormone deficiency or hormone excess is the result of pathologic manifestations in the neural pathways that supply the hypothalamus.” <sup>23</sup>

### **Harrison's Principles of Internal Medicine**

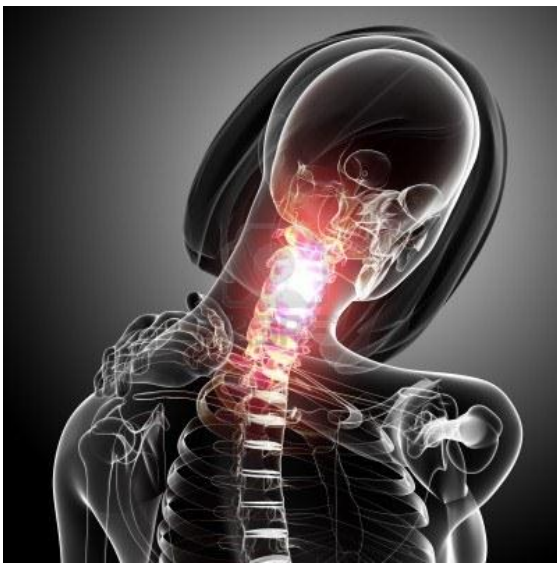
# CAUSES OF VERTEBRAL SUBLUXATIONS

Vertebral subluxations can be caused by any force or stress to which the body is unable to adapt. Examples of this would include automobile accidents, work related injuries repetitive motions events, sports and recreational pursuits, poor posture, poor bending, lifting and sleeping habits, and various types of chemical and emotional stress. The body can adapt to the stress as long as the nervous and endocrine systems are capable of responding normally. All types of stress can not only cause vertebral subluxations, but it creates a vicious cycle in which the body can no longer adapt to stress as a result of a compromised nervous system.



## VERTEBRAL SUBLUXATIONS AND STRESS

Since the 1950's the word "stress" has changed from an engineering term to a cultural construct. In 2010, American spent over eight billion dollars on stress related products.



### **More Americans stressed than ever before**

The proportion of Americans who say they have felt the threat of a nervous breakdown provoked by stress, depression and anxiety is on the rise. A recent survey by Prevention magazine found that 73% of Americans report experiencing a great amount of stress on a weekly basis. Recent studies at John Hopkins reveal that the average American experiences more stress in one month than their grandparents did in their lifetime.<sup>24</sup>

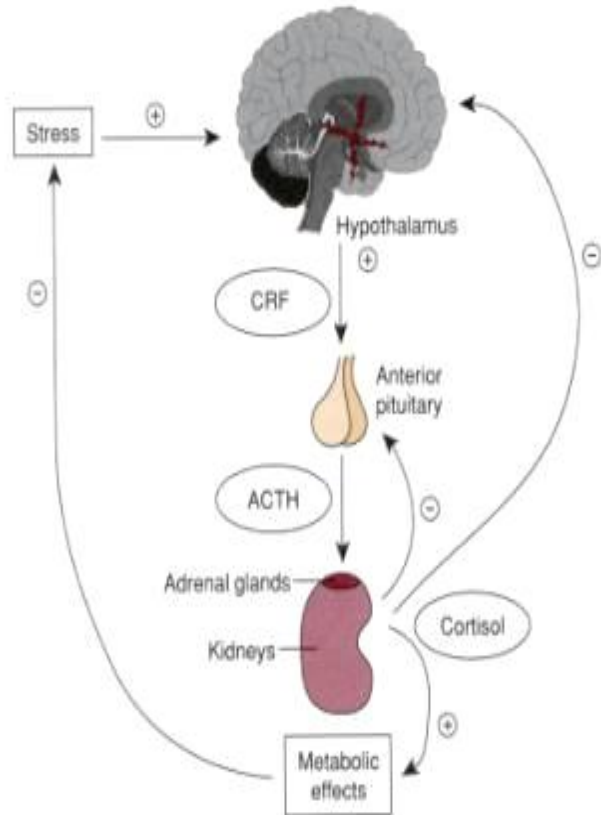
Stress has been defined as a "distress caused by a demand of the body to all non-specific demands" Although stress is generally associated with negative connotations, it is a double-edged sword. The body would not be able to survive without the acute stress response as in the "fight or flight" phenomena. This type of response gears the body up for action. It provides focused energy to either flee from danger or to stand ground and fend off a crisis.

During an emergency, stress hormones are produced and they are utilized. However, the kind of stress we face on a daily basis is of a completely different kind. Emergency physical responses are rarely needed yet the brain perceives stress as such and prepares the body for fight or flight. As the stress is almost continuous, the stress hormones are not utilized; they remain in the body and cause biological damage.

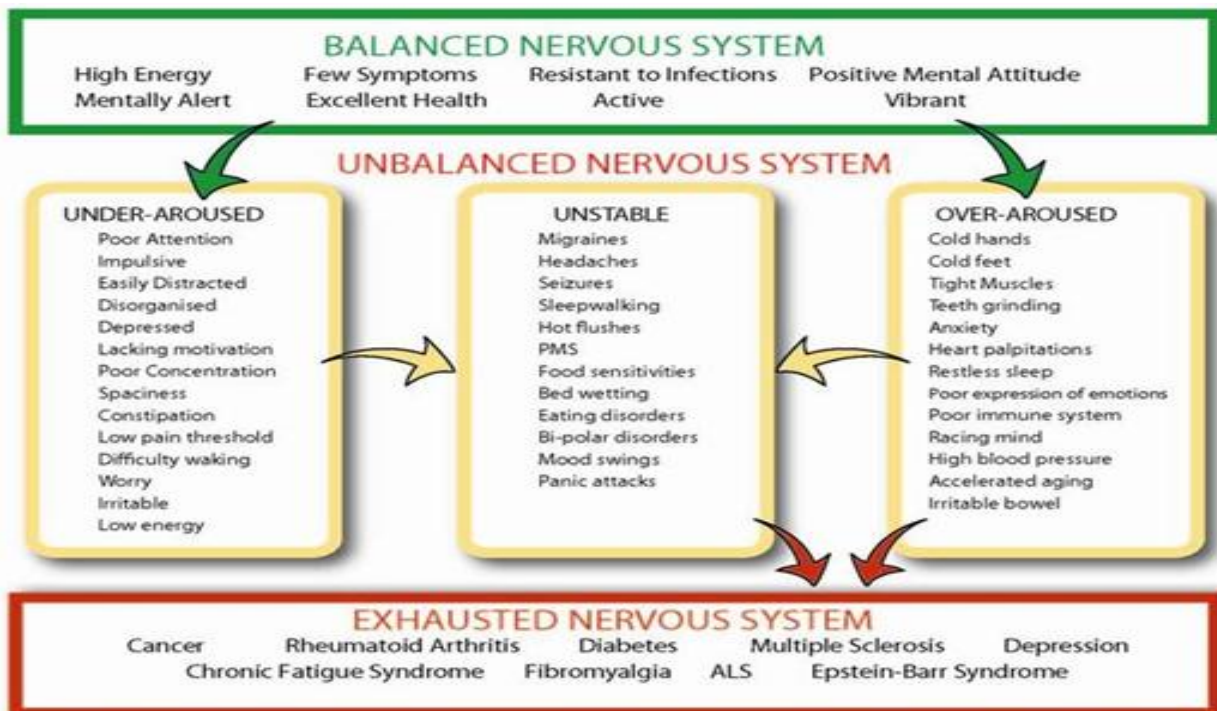
The work of Hans Selye, who compiled thousands of studies demonstrated that exposure to stress, can cause “disease of adaptation.

The “**General Adaptation Syndrome or GAS** begins with an alarm reaction (AR) when the body is first exposed to stress. It then shifts to “stage of resistance” (SR).

At this point, the body can adapt to the stress, known as physiologic adaptation syndrome, or succumb to the stress and allow it to manifest itself into what is known as “disease of adaptation” which can result in hypertension, rheumatic disease, vascular lesions, ulcers, certain types of liver conditions, rheumatoid arthritis, nephritis, as well as a host of problems with the endocrine system and hormonal imbalance.



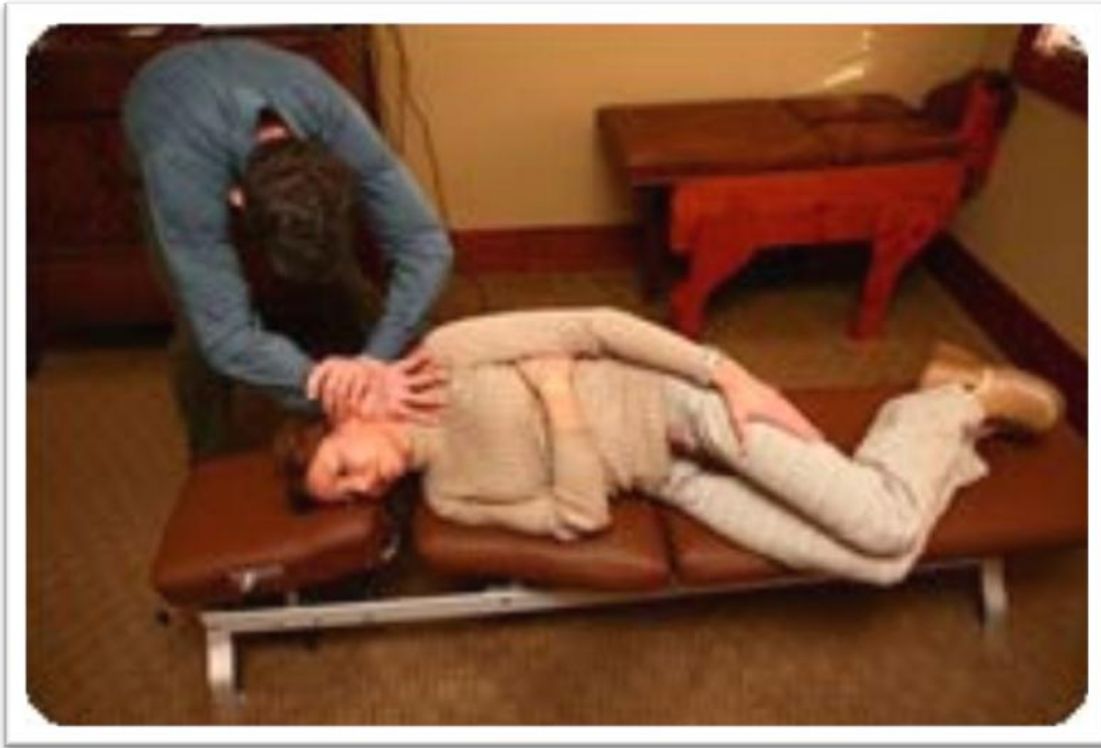
The body can adapt to stress as long as the nervous system and endocrine systems are capable of responding normally. All types of stress can cause vertebral subluxations, but it creates a vicious cycle in which the body can no longer adapt to stress as a result of a compromised nervous system.



# CHIROPRACTIC

The purpose of Chiropractic is the detection and correction of vertebral subluxations which is accomplished by physically adjusting the spine. This restores the nervous system pathways to an optimum level of function, which maximizes homeostasis and the body's inherent healing ability.

**Chiropractic is not a treatment for disease, nor do Doctors of Chiropractic claim to cure disease. Chiropractors simply remove nerve interference from the spine, and with a restored nervous system, the body is able to restore and maintain its own optimum level of balance.**



Research studies as well as tens of thousands of case studies done in Chiropractic clinics have demonstrated that the correction of vertebral subluxations improves neurological function and health and allows the body to recover from a wide variety of health conditions, including many endocrine disorders.

*“Chiropractic is effective as a preventive treatment because it relieves nerve pressure as the spine is properly adjusted. The build-up of this pressure is cumulative in its erosion of the health and integrity of specific body organs or regions. If one vertebra is out of relationship to the ones next to it, a state of disharmony is said to exist. This causes loss of normal nerve energy and upsets both local and systemic homeostasis or balance”<sup>25</sup>*

**Gary Null, Complete Guide to Healing Your Body**



*“Eleven women with histories of PMS underwent Chiropractic care and showed improvement of all measured symptoms including variation in sex drive, social impairment and depression”.*<sup>26</sup>

### **Chiropractic Research and Clinical Investigation**

*While a routine medical exam to rule out serious pathologies is always good idea, researchers have suggested that Chiropractic are might be a viable alternative for women suffering from menstrual pain and discomfort.*<sup>27</sup>

### **Neurological Fitness**

*“Subluxation alone is a rational reason for Chiropractic care throughout a lifetime from birth”*<sup>28</sup>

**Dr. Lee Hadley, Syracuse Memorial Hospital**



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