

VITAMIN D: THE GATEWAY NUTRIENT

Observing Vitamin D in a context other than for strong bones is the basis for this essay. Vitamin D is known to help the body use calcium from the diet, but it does much more. It will explain other



Vitamin D responsibilities as a hormone, a gateway to the pineal gland and Hypothalamus-Pituitary-Adrenal (HPA) axis. And, it will prove that vitamin D activation has a significant impact on regulating the circadian rhythm which is significant to the wellness of the HPA axis (mind), skeletal system (body), and endocrine system (spirit).

Most articles along with many allopathic doctors and specialists only discuss vitamin D in the perspective of being crucial for strong bones. After all its major function is to help the body absorb calcium from food. That being said, vitamin D, along with calcium, is prescribed to help prevent brittle bones which can lead to fractures. As more research is conducted, it beseeches the question, "If you're Vitamin D deficient (meaning there isn't enough vitamin D to optimally perform), why take extra calcium

that cannot get absorbed?

Vitamin D is produced by the body in response to skin being exposed to sunlight (see Figure 2). It is responsible for strong healthy bones and helping ward off infections of the muscles, heart, lung and brain. Vitamin D is imperative for the intestinal absorption of calcium, phosphorus and magnesium from our food. Two types of vitamin d are derived at its activation: 1) calciferol (vitamin D_2), and 2) cholecalciferol (derived from a steroid - *vitamin D_3*). Structural adaptation of cells for specific functions in the body such as preventing diseases and helping the body heal wounds is accomplished by *Vitamin D_2* . *Vitamin D_2* impedes rapid production of cells and stimulates the cell differentiation that in turn regulates blood pressure and is crucial in controlling insulin levels, weight management, depression and virility. Above all it is the "Master Hormone" *vitamin D_3* that regulates and directs the rest of the body's hormones.

A hormone is a class of signaling molecules produced by glands and transported by the circulatory system to target distant organs to regulate physiology and behavior. With that said, vitamin D is a nutrient that can be said to perform like a gland. Michael Holick, MD, PhD, of Boston University, said "*By definition, vitamin D is a hormone. No other vitamin goes through the process of activation that D does before it can be used by the body*". This confirms that vitamin D is more than a nutrient and is vital to the health of other organs and systems in the body.

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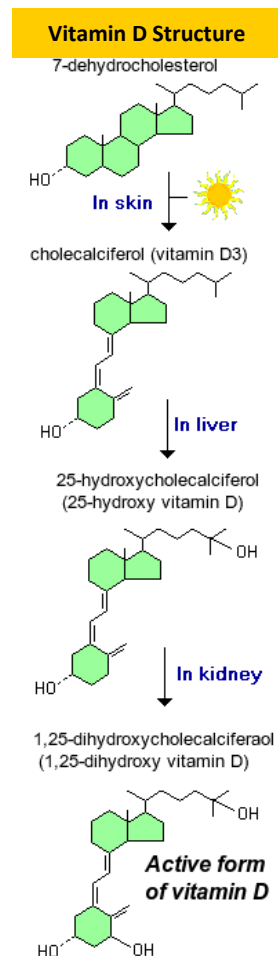
Vitamin D as a hormone plays a complimentary role to the pineal gland (3rd eye or eye to the soul). The pineal gland secretes the hormone melatonin (not to be confused with melanin). Melatonin helps maintain your sleep-wake patterns that is dictated by daylight and darkness. Light exposure stops the release of melatonin, and in turn, this helps control your internal biological clock. Said another way, during daylight vitamin D is at work converting sunlight into energy within your body. This process stops the production of melatonin. When the sun goes down vitamin D halts its process and signals the pineal gland to secrete melatonin and start its process. If vitamin D stops or slows production it has an effect on the production of melatonin. Research from Journal of Biological Rhythms discovered that *vitamin D₂*, has a controlling influence on the manifestation and coordination of two genes involved in the circadian rhythm. The circadian rhythm is a 24-hour biological cycle characterized by sleep-wake patterns.

This correlation demonstrates that these two hormone systems are complimentary and appear to connect biological activities with the daily and seasonal changes of our solar environment. The Department of Cell Biology and Anatomy at the University of North Carolina Medical School documented that *“evidence supports the new concept that the skin-derived hormone of sunlight and the pineal hormone(s) of darkness are messengers with comprehensive actions on endocrine, autonomic, sensory, skeletal, and motor functions. A close link to the pineal hormone system is apparent. In a complementary fashion, both hormone systems appear to correlate biological activities with the daily and seasonal changes of our solar environment.”*

The above statement necessitated a closer look at the effects of vitamin D on the endocrine system. More specifically, the HPA axis (hypothalamus-pituitary-adrenal axis) which is responsible for preparing the body for taking action in a stressful situation. Stress is known to be the underlying cause of a plethora of ailments and dis-eases. After additional research the HPA axis was found to play a role in our sleep cycles through the hypothalamus. The hypothalamus produces releasing and inhibiting hormones that are responsible for the stop and start of other hormones throughout the body. The hypothalamus helps stimulate or inhibit many of the following processes:

- Heart rate and blood pressure
- Body temperature
- Fluid and electrolyte balance, including thirst
- Appetite and body weight
- Glandular secretions of the stomach and intestines
- Production of substances that influence the pituitary gland to release hormones
- Sleep cycles

For the discussion of this essay the hypothalamus is related to vitamin D when it comes to maintaining sleep cycles through the release of the hormone oxytocin. When oxytocin is released normal stress free



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conditions it is known to advocate sleep. In recent ground breaking research, vitamin D was identified as an activator of oxytocin. The Vitamin D Council shared how vitamin d effects autism and with that discovery shared, "...that oxytocin is also directly controlled by vitamin D."

In conclusion it was proven that the mind, body and spirit are effected by the body's circadian rhythm, especially when there are imbalances in the hypothalamus, pineal gland and the skeletal system. Below is a summary of the relationship these glands and systems have with vitamin D along with their effect on your sleep-wake pattern.

The effects of our thoughts and how we handle stress is impacted by vitamin D and that is managed by the Hypothalamus-Pituitary-Adrenal (HPA) axis. The HPA axis is responsible for secreting the hormones cortisol and adrenalin when your body is under stress. Stress has been categorized through two types. Type 1 is our normal behavior associated with the flight-or-fight response. The second type, Type 2, is more long term effects of our day-to-day experiences or how we cope with life's challenges. Type 2 stress best demonstrates how the body reacts to your thoughts and will not work optimally if the hormones are imbalanced, especially any one of the HPA axis hormone secretions. The hypothalamus is a part of the axis that would be impaired with less than optimal vitamin D. This idea further provides evidence that the hypothalamus is hindered in regulating oxytocin and other hormones effecting the sleep-wake cycle.

There was never a doubt the body's bones and muscles require vitamin D to prevent bones from being brittle or fracturing. *Vitamin D₂* specialization and differentiation of cells for specific functions in the body and *vitamin D₃* being proved to be the "Master Hormone" regulating and directing the rest of the body's hormones. Vitamin D activation into these 2 forms prior use in the body confirms it is a hormone and not just a nutrient.

And last but not least, our connection to the Creator or Spiritual Realm through the pineal gland also effects the circadian rhythm. It does this through its' complimentary relationship to vitamin D and its' start stop process. Melatonin is secreted when vitamin d stops its process which is managed by the daylight and darkness along with seasonal changes of our solar environment.

Research is broadening today to further understand the depth of vitamin D's role throughout the major systems within the body. Today vitamin D is being prescribed more and more to cancer, autism and other disease patients due to its importance to the entire body's systems which is showing major health improvements. The sun plays a major role in regulating the circadian rhythm in humans and being proved regularly that imbalances of vitamin D and its' coordination of other hormones are contributors to many of the body's dis-ease. That being said, this essay has proved that vitamin D activation has a significant impact on the mind, body and spirit. It touches all areas due to its participation in the regulation of the circadian rhythm.

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