

## Hotline

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### Vitamin D Not Just the Sunshine Vitamin

Is vitamin D deficiency contributing to major illness? Vitamin D has long been associated with its role in bone formation, but now it is recognized that vitamin D works throughout the body, having a powerful effect on the immune system. It was known as the sunshine cure in the early 1800's before antibiotics, and was the only known treatment for tuberculosis. Even though no one understood why it worked, people sent to sunny climates often were restored to health. It was also found that cod-liver oil was an excellent treatment for rickets, the terribly deforming childhood condition caused by the inability of bones to harden. This influenced research involving vitamin D for the next several decades. We now understand its role in bone building and how it acts in the kidneys, intestines and the skeleton itself to help control the flow of calcium into and out of bones. Vitamin D refers to two slightly different molecules: D3 which is manufactured in the skin exposed to UVB light and D2 which originates from plants and can be eaten or taken as a supplement.

Both versions of vitamin D must undergo conversion in the liver to become 25D. Most is further converted in the kidneys to become the biologically active form known as 1,25D. This form of vitamin D turns on certain genes, leading to the manufacturing of the proteins they encode. Those proteins may have local or far reaching physiological effects. More than 1,000 different genes in as many as a dozen or more tissues and cells are regulated by 1,25D. Many of the genes in D were discovered by human genome projects.

The fact that we now recognize the role of 1,25D in many biological activities may help explain why epidemiologists have shown that low vitamin D levels correlates strongly with many diseases, including cancer, autoimmune conditions, and many infectious diseases such as influenza as well as seasonal colds. The research indicates that physiological responses to vitamin D both in the lab and in clinical trials are optimized only when circulating 25D levels are higher than found in many population studies. Therefore members of the scientific community are now coming to the conclusion that a substantial number of people have levels of vitamin D that are well below concentrations that are optimal for health, especially in the winter months.

### Tissues affected by Vitamin D

