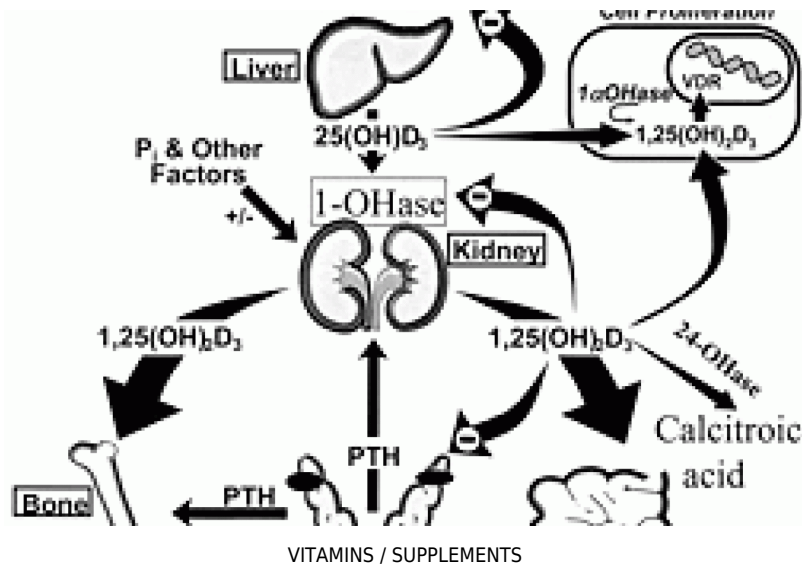


Dynamic Chiropractic



Vitamin D Alert

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Generally, osteopenia seems to be increasing in my film stack. Nearly half of the women over the age of 50 seem to have some osteopenia, and it seems to be increasing even in younger women. I've even seen several cases of middle-aged men with osteopenia. This article serves as a brief alert regarding vitamin D deficiency and its link to many disease processes, some of which many of us do not recognize. After only a brief review of recent literature, I was surprised to discover that this is not a common problem. Partly due to poor nutrition and partly to the lack of sun exposure, vitamin D insufficiency is increasingly associated with a multitude of other disease processes I am guilty of not recognizing, too.

Conditions Associated With, Caused by and/or Contributing to Vitamin D Deficiency (partial list)

- Chronic pain
- Multiple sclerosis
- Type I diabetes
- Systemic lupus erathematosus
- Malabsorption syndromes
- Cancers: prostate, colon, breast
- Long-term: use of prednisone, anti-convulsant meds
- Use of medications with photosensitivity precautions
- Lack of sun exposure and sunscreen use
- Liver and kidney disease
- Congestive heart failure
- Peripheral arterial disease
- Rickets
- Osteoporosis
- Osteomalacia

Amazingly, more than 50 percent of women already receiving treatment for osteoporosis are vitamin D deficient.¹ This fact alone is so astounding that I think we should re-evaluate how we assess this group of patients. Other patients at an extremely high risk for deficiency include those on long-term prednisone, certain anticonvulsant medications and any medication that has

photosensitivity precautions. Additionally, individuals with medical conditions that require sun avoidance, such as systemic lupus erythematosus or sickle cell disease, are at an extremely high risk. People with significant kidney or liver disease, congestive heart failure, or peripheral arterial disease are at risk for unrecognized, clinically significant deficiency. In fact, any patient whose medical condition significantly limits their sun exposure or fat absorption is at risk for significant deficiency.

Vitamin D insufficiency is common among people over 50 years of age, with reported prevalence between 25 percent and 50 percent of the population. Of course, with institutionalized elderly populations, the prevalence is much higher. Clinically significant vitamin D deficiency is common worldwide. Numerous international medical authorities have emphasized its seriousness.²⁻⁷ Yet clinicians are still not evaluating patients at risk for vitamin D deficiencies. This is not just a problem in developing countries; it is prevalent in the U.S. and Europe. It often goes unrecognized.

This is unfortunate because vitamin D plays an important role in bone development and muscle function. It also facilitates absorption of calcium and phosphate from the gut and kidney, suppresses parathyroid hormone (PTH), and acts on osteoblasts to stimulate bone formation. We are well aware of the role of vitamin D deficiency as a risk factor for osteoporosis, osteomalacia and rickets, but new discoveries are finding its functions include a role in muscle strength and the prevention of autoimmune diseases and some cancers. Epidemiologic and *in vitro* data have generated provocative hypotheses regarding vitamin D deficiency and the increased risk of 13 types of cancer, including breast, colon and prostate. Along with cancer, the disease is being linked to type I diabetes, multiple sclerosis, hypertension, rheumatoid arthritis and chronic, unexplained musculoskeletal pain.^{2,3,7,8}

An interesting statistic I was not aware of until recently is that chronic, nonspecific pain is estimated to occur in up to 20 percent of adults. Over the past 30 years, European studies have documented this type of pain syndrome in patients with severe hypovitaminosis D. A study reported by G.A. Poltnikoff and J.M. Quigley in the 2003 *Mayo Clinic Proceedings* evaluated patients with chronic pain, unresponsive to standard pharmaceutical agents and who did not have a diagnosis for their pain or any significant medical conditions which would interfere with production and absorption of vitamin D.⁷ The patients were between the ages of 10 and 65; none was housebound or elderly. Ninety percent of the patients in the study were found to have deficient levels of vitamin D.⁹

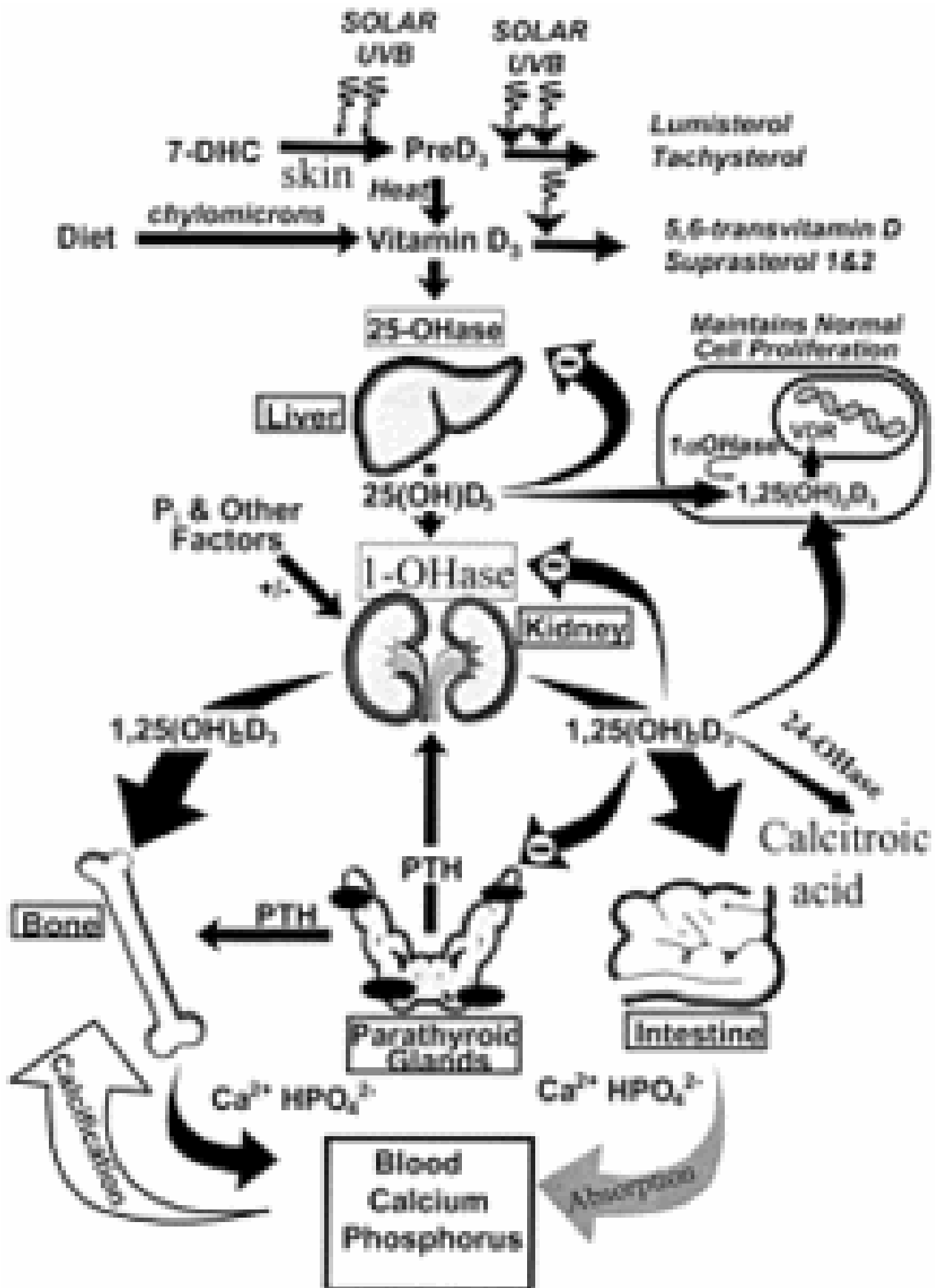
Do you think we as chiropractors should assess blood levels of vitamin D? It should be noted that none of these patients had been diagnosed with vitamin D deficiency before the study. Vitamin D deficiency is not asymptomatic and results indicate that a clinical syndrome consisting of persistent musculoskeletal pain, later progressing to bone pain, is associated with the level of deficiency in these patients. In this study, a failure in development of peak bone mass in the younger patients and an excessive loss of skeletal integrity in older patients was documented.

The assessment of vitamin D status requires measurement of circulating 25-hydroxyvitamin D. The present opinion is that the optimal 25-hydroxyvitamin D concentration needs to be greater than 30 ng/mL. Several facts suggest that the current norms are too low. It has been documented that parathyroid hormone (PTH) is secreted by the body in response to insufficient calcium absorption. Elevated levels indicate long-standing inadequacy and a high bone-remodeling rate. PTH levels minimize with 25-OHD serum levels of at least 20 ng/mL. The fractional oral calcium absorption is optimized at approximately 30 ng/mL.^{10,11} Several experts who attended the November 2004 NIH Vitamin D and Cancer Conference asserted that the physiologic lower end of normal should be set

at 32 ng/mL based on *in vitro* and randomized controlled trial data.¹⁰⁻¹⁴ We should keep this range in mind when assessing patients for vitamin D deficiencies.

Vitamin D is found in numerous dietary sources, including fish, eggs, fortified milk and cod liver oil. The sun is also a significant contributor to our daily production of vitamin D, and as little as 10 minutes of daily exposure is thought to be enough to prevent deficiencies in young healthy individuals. However, it is rare to find true recommendations for patients who are compromised by health issues or degenerative diseases, or for elderly patients whose production of vitamin D₃ decreases with age.

The term "vitamin D" refers to several different forms. Two forms important in humans are: ergocalciferol (vitamin D₂) and cholecalciferol (vitamin D₃). Vitamin D₂ is synthesized by plants. Vitamin D₃ is synthesized by humans in the skin when it is exposed to ultraviolet B (UVB) rays from sunlight or diet. Vitamin D₃ is preferred to D₂ as a supplement because the half-life is longer. Also, D₃ is more potent and its bind to the vitamin D binding protein is stronger and ingestion does not result in unique biologically active metabolites.



Adequate levels of vitamin D, as recommended by the U.S. Institute of Medicine of the National Academy of Sciences, are presently at 200 IU daily for all individuals (male, female, or pregnant/lactating women) under the age of 50, 400 IU for all individuals between the ages 50 and 70, and 600 IU for those who are over the age of 70. The daily "upper limit" for vitamin D is 1,000 IU for infants up to 12 months of age and 2,000 IU for children, adults, and pregnant and lactating

women. The most effective way of ensuring adequate vitamin D levels is to take a daily multivitamin, which usually contains 400 IU. However, experts now believe that the current norms are too low. More study is needed to identify both prevalence and adequate daily intake. In addition, sun exposure guidelines that take into account geographic latitude, season, age, and factors such as race and clothing are needed.

Since I am not a biochemist or clinical nutritionist, I invite you to review the recent literature and assess this topic more with others who are more qualified. I recommend visiting www.vitamindcouncil.com and www.sunarc.org/index.htm. You might even consider assessing your own levels of serum 25-hydroxyvitamin D. I encourage you to inform me if you have information on this topic that you would like to share with our colleagues.

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