Patient Handout

Vitamin D in Blood Spot

Vitamin D Deficiency – A Real Problem

Most people are familiar with vitamin D's role in preventing rickets in children[1] and in helping the body absorb calcium from the diet. Recently, research has shown that vitamin D is important in protecting the body from a wide range of diseases. Disorders linked with vitamin D deficiency include stroke, cardiovascular disease, osteoporosis, osteomalacia, several forms of cancer, some autoimmune diseases such as multiple sclerosis, rheumatoid arthritis, type I diabetes, type II diabetes, depression and even schizophrenia[2-12].

Vitamin D is actually a prohormone and not technically a vitamin: a vitamin is defined as a substance that is not made naturally by the body but must be supplied in the diet to maintain life processes. But in fact, we make most of our vitamin D by the action of ultraviolet light (sunlight) on the vitamin D originator that is found in our skin. We only get very small amounts of vitamin D from our diet, although increasingly it is added to foods eaten by children, in an attempt to prevent rickets in the population.

A major cause of deficiency is not getting enough sun. This is very common in northern climates where people don't spend much time outdoors, but even in countries near the equator, women in particular often have much of their skin area covered for cultural reasons, and the use of sunscreen also blocks the formation of vitamin D in the skin.

Vitamin D is metabolized by the liver to a storage form of the vitamin, which circulates in the blood until needed. Enzymes in the kidneys metabolize it further to form the highly active hormone that is involved in essential biochemical processes throughout the body.

Testing for of vitamin D is therefore an important screening test, especially if you spend much of your time indoors, or live in a colder climate. The ZRT blood spot test measures both the natural form of Vitamin D (D3) as well as D2, the form that is used in many supplements. So testing can be used to monitor vitamin D supplementation to ensure you are getting the right amount for optimum health.

A useful website for more information about vitamin D is www.vitamindcouncil.org.

Who is at Risk?

The Elderly
Amounts of the vitamin D originator in the skin decrease with age, therefore elderly people are particularly prone to deficiency[13-16], and living in rest homes or becoming home-bound can limit exposure to sunshine. Muscle weakness and osteoporosis associated with vitamin D deficiency make the elderly more susceptible to falling and fracture risk[17,18] and studies show that vitamin D supplementation may decrease the risk of fractures[19]

Dark-Skinned People
Because people with darker skin have higher levels of melanin which can block the action of sunlight on vitamin D originators, they may require much longer sunlight exposure than people who are fair skinned.

People with Limited Sunlight Exposure
People living at northern latitudes or who have limited sunlight exposure because of their working environment or cultural dress rules may have low vitamin D levels.

Musculoskeletal Pain Sufferers
People with symptoms of hypothyroidism[20], non-specific musculoskeletal pain[21], chronic low back pain[22], or fibromyalgia[23] are frequently found to have low vitamin D levels and show clinical improvement after supplementation. Vitamin D screening is strongly recommended in people with muscle and joint pain[24].

Overweight or Obese People
Vitamin D can be locked up in the fat stores of obese people, who have been found to have lower levels of circulating vitamin D and are at risk of deficiency[25].

Breast-Fed Infants, and Children with Limited Sunlight Exposure
All children require adequate circulating vitamin D to prevent rickets. Dark-skinned children and those who spend much of the day inside daycare centers are at risk of deficiency, and breast-fed children often receive inadequate amounts of vitamin D, particularly when their mothers are deficient. Giving vitamin D supplements to the nursing mother[26] or the use of cod liver oil or other vitamin D supplements in infants and children can reduce the risk of developing type I diabetes in childhood[27].

Vitamin D screening has been recommended as a routine part of the annual physical examination[3,5]. **Deficiency does not have obvious symptoms, but increases your risk for more serious diseases.**

Advantages of a Simple Blood Spot Test

Whole blood is collected with a simple nick of the finger using the lancet provided in the collection kit. Blood drops are dropped on the filter card provided and allowed to dry. The lab measures the vitamin D in the dried blood spots, which correlate closely with conventional blood tests done in serum.

Your doctor has chosen this blood spot test because:

- It is less expensive and more convenient than going to a phlebotomist or clinic for a blood draw, and samples are simply mailed in for analysis requiring no special storage conditions
- It is suitable for babies and children, since heelstick is already used in routine neonatal screening and it's easy to collect a few extra drops of blood at the same time
- Collection is minimally-invasive and nearly painless

Clinical Utility

Blood spot testing of Vitamin D can help your doctor:

- Identify vitamin D deficiency as a potential cause of health problems – levels below 20 ng/mL indicate deficiency, while levels below 32 ng/mL are "low"; optimal levels are 32-100 ng/mL (research is ongoing to establish definitive recommendations)
- Recommend the right dose of vitamin D as a supplement and monitor your D levels during supplementation to ensure you have adequate levels without overdosing – toxicity may be expected at levels >150 ng/mL
- Recommend appropriate ways to safely increase sunlight exposure and modify your diet to include more vitamin D-containing foods and/or supplements
- Track treatment progress with follow-up testing

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