

**VITAMIN D DEFICIENCY: a dinosaur reborn ?**

Vitamin D has long been recognized for its beneficial effect on bone health; however, the function of Vitamin D is now known to extend well beyond skeletal integrity and may affect neuromuscular function, cancer risk, cardiovascular risk and inflammatory disease processes. In recent years, there has been an increased understanding of the role that Vitamin D plays in the regulation of cell growth, immunity, and cell metabolism. It is certain that in the absence of meaningful sun exposure (UVB), the current adequate intake of 200 to 400 IU Vitamin D (which is what is in most prenatal vitamin tablets) is by far less than enough. In fact, despite having Vit D fortified foods, the prevalence of Vitamin D deficiency appears to be increasing in the general population. Patients at significant risk for Vitamin D deficiency include those who are obese, have GI malabsorption problems (e.g. S/P gastric bypass, Crohn's) or who have diabetes. Vitamin D deficiency is especially prevalent among women of color, whose ability to synthesize Vitamin D from UV light requires much greater exposure than for white women. Vitamin D deficiency during pregnancy may also pose risks to the developing fetus. Vitamin D receptors are found in most tissues and cells in the body. Vitamin D deficiency during pregnancy is not only linked to maternal skeletal preservation and fetal skeletal formation, but also may increase the susceptibility to fetal chronic disease later in life as well as soon after birth. Although rare, severe maternal Vitamin D deficiency can lead to rickets (soft bones) in the developing fetus and neonate and rates of rickets in the US and worldwide appear to be increasing. Furthermore, insufficient maternal Vitamin D levels may also contribute to low birth weight, and an increased risk of preeclampsia, both having a potential impact on an infant's well-being. In addition, the rising prevalence of asthma, especially among African-American children, may also be a result from low levels of Vitamin D in pregnant women. Vitamin D deficiency also plays an important role in the development of insulin resistance thus, common in patients with glucose intolerance or diabetes. Interestingly, the seasonal timing of pregnancy appears to pose an increased future risk for multiple sclerosis in the developing fetus. Several health risks have been linked to Vitamin D deficiency and are currently under investigation.

**SYMPTOMS of maternal VITAMIN D deficiency:** musculoskeletal pain, weight gain & fatigue.

**SUMMARY of VITAMIN D deficiency HEALTH RISKS:**

**Possible risks to mother:**

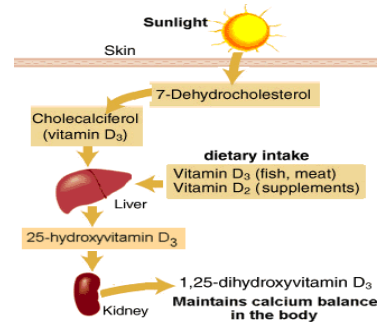
- Osteomalacia/osteoporosis
- PIH & cardiovascular risk
- ? Effect on immune system
- Glucose intolerance/insulin resistance
- ? risk for autoimmune disease: MS, RA, IBS
- Hyperparathyroidism
- Periodontal disease

**Possible risks to baby:**

- Rickets (soft bones)
- Hypocalcemia +/- seizures
- Asthma
- Type I DM
- ? risk for autoimmune disease: MS, RA, IBS
- Low birth weight
- Depression & Schizophrenia
- ? Possible in utero for later chronic disease

**Medications known to prevent absorption:**

- Steroids, Heparin, anticonvulsants (e.g. phenobarb)
- Nicotine, Zantac
- Thiazide diuretics, cholesterol lowering meds & diet aids that impair fat absorption e.g. Alli (not used during pregnancy)



**TESTING** for Vitamin D deficiency should be considered for patients with history of bariatric surgery, Crohn’s disease, celiac disease, cystic fibrosis, chronic renal disease, obesity, pregestational and gestational diabetes, patients on a vegan diet, and taking anticonvulsant medications. We are currently screening all prenatal patients since our patient population is at high risk for Vitamin D deficiency. The most accurate means of measuring the patient’s Vitamin D status is **25-Hydroxyvitamin D [serum 25(OH)D]**.

<b>VALUE (ng/dl):</b>	
≤ 20	Significant deficiency (needs Rx)
21-31	Insufficient (needs Rx)
≥ 32	Normal

**DIETARY SOURCES** include: Oily fish (e.g. salmon, tuna), fortified Milk, eggs & fortified cereals. Frying fish can significantly lower Vit D content.

**TREATMENT** includes:

- Increase sunlight or UV exposure of the hands, arms & face to bright sunlight for a minimum of 10-15 minutes a day at least twice per week (keeping in mind the contending risk of skin cancer).
- Supplementation with oral Ergocalciferol (Vitamin D2) for replacement. Oral Ergocalciferol can be prescribed 50,000 IU capsule po once weekly for 8 weeks or 50,000 IU po twice weekly for 5 weeks followed by maintenance dose of 50,000 IU po every 2 - 4 weeks.
- Re-evaluation is recommended in 8 weeks to ensure adequate Vitamin D absorption targeting-level of at least 32 ng/ml. Consider checking an ionized Ca++ level at 8 weeks since on rare occasion vitamin D supplementation will unmask a previously undiagnosed hyperparathyroid patient. Vitamin D intoxication is rare but can be observed when serum 25(OH)D is greater than 150 ng/ml. If level is still low increase supplement to 50,000 IU po twice a wk for another 8 weeks.
- Pregnant women whose initial screen is “borderline” in early pregnancy may benefit from a repeat screening in the early third trimester. Consideration should be given to having them supplement with an extra 1,000 IU daily of OTC vitamin D.
- Lactating women should probably add an extra 1,000-2,000 IU po Vit D daily along with their supplemental calcium even if Vit D levels are adequate in order to adequately supply the nursing baby.
- Pediatricians should be advised when maternal Vit D deficiency has been diagnosed since neonates should be screened and Vit D supplementation should be offered if clinically indicated.

The current recommended requirement for Vitamin D (200 IU/d) has little scientific support and is widely believed to be well under the optimal amount. A National Institutes of Health clinical trial is currently underway to examine this further. Deficiencies have been prevalent even in studies where over 90% of women took their prenatal vitamins. Until further evidence is published, screening and treatment for Vitamin D deficiency particularly in high risk pregnant women may be advisable.

If you have any questions or suggestions regarding the MFM Newsletter, please contact the editor Sue K. Sayegh, M.D. at [sayeghsk@evms.edu](mailto:sayeghsk@evms.edu)



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Enjoy the sun ...



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