Bio-D-Mulsion® & Bio-D-Mulsion Forte®

The majority of people in the United States do not synthesize sufficient vitamin D in order to meet physiological requirements.

With the discovery of vitamin D receptors in tissues other than the gut and bone - particularly the brain, breast, prostate and lymphocytes - recent research suggests the utilization of higher amounts of supplemental vitamin D3 for a wider range of applications in order to maintain and improve patients health.

Bio-D-Mulsion & **Bio-D-Mulsion Forte** from Biotics Research Corporation both supply vitamin D3 as a micro-emulsion for enhanced absorption and utilization, which is particularly important for those with malabsorption conditions. Clinical use of Biotics' micro-emulsified vitamin D provides significant improvements in serum levels of 25-OH-vitamin D following supplementation.

Bio-D-Mulsion supplies 400 IU of vitamin D3 per drop, while **Bio-D-Mulsion Forte** supplies 2,000 IU of vitamin D3 per drop.

Safe - Conservative regimen of **Bio-D-Mulsion Forte** supplies necessary vitamin D (as emulsified D3) without the increased risk of hypercalcemia commonly associated with single, large dose therapies – especially important in an outpatient setting.

Effective - One (1) drop daily of **Bio-D-Mulsion Forte** (2,000 IU) increased 25(OH)D concentrations in vitamin D deficient children 202% in six weeks, effectively tripling 25(OH)D levels.

Easy to Administer for Greater Compliance - Simply dispense one (1) drop from the bottle directly onto the tongue each day.

* Gordon CM, et al. Treatment of Hypovitaminosis D in Infants and Toddlers J. Clin. Endocrin. Metab. First published ahead of print April 15, 2008 as doi:10.1210/jc.2007-2790

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Bio-D-Mulsion & Bio-D-Mulsion Forte

Micro-Emulsified for Greater Uptake and Utilization

While we are all familiar with the importance of vitamin D in calcium absorption and bone metabolism, many may not be aware of the recent research on vitamin D and the widening range of applications available for cholecalciferol, which can be classified as both a vitamin and a pro-hormone.[1] Additionally, while it has commonly been assumed the upper limit of safe intake is approximately 1,000 IU per day, we now know that the physiologic requirement of vitamin D may be as high as 4,000 IU per day, which is less than half of the 10,000 IU that can be produced endogenously with just a few minutes of sun exposure.[2]

Vitamin D Deficiency and Musculoskeletal Health

Vitamin D deficiency is associated with dull, achy musculoskeletal pain that is incompletely responsive to both pharmacologic and manual therapies. The pain may be widespread or confined to a particular area, most commonly the lower back and lumbar spine. The process by which this occurs has been clearly defined: 1) vitamin D deficiency causes a reduction in calcium absorption, 2) production of parathyroid (PTH) hormone is increased to maintain blood calcium levels, 3) PTH results in increased urinary excretion of phosphorus, which leads to hypophosphatemia, 4) insufficient calcium phosphate results in deposition of unmineralized collagen matrix on the endosteal (inside) and periosteal (outside) surface of bones, 5) when the collagen matrix hydrates and swells, it causes pressure on the sensory-innervated periosteum resulting in pain.[3] Indeed, several clinical investigations have recently shown vitamin D deficiency is particularly common among people with musculoskeletal pain.[4, 5]

Non-Musculoskeletal Manifestations of Hypovitaminosis D

Both the peripheral and central nervous systems have multiple sites of action for vitamin D, and it appears likely that vitamin D modulates serotonin and melatonin synthesis and metabolism. Alterations in vitamin D levels appear to explain, at least in part, the adverse psychological effects of sunlight deprivation that often occur due to geographic location and climate.[6] Preliminary evidence suggests vitamin D deficiency may also be particularly common among patients with inflammatory and autoimmune disorders, and that vitamin D may modulate inflammatory responses.[7, 8, 9]

Bio-D-Mulsion and the Importance of Micro-Emulsification

Biotics Research Corporation s vitamin D is micro-emulsified to enhance absorption and utilization, which are particularly important for those with malabsorption conditions. Independent clinical experience suggests the micro-emulsion form of vitamin D provides significant improvements in serum levels of 25-OH-vitamin D following supplementation.[10] Each drop of **Bio-D-Mulsion** supplies 400 IU of vitamin D3, while each drop of **Bio-D-Mulsion Forte** supplies 2,000 IU of vitamin D3. With an increased knowledge of the importance of maintaining adequate vitamin D levels, many clinicians recommend supplementation and annual screening for 25-OH-vitamin D levels, especially for patients at risk for deficiency as well as those who may benefit from supplementation.[11]

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