LOVE YOUR BONES

VITAMIN D FACT SHEET

Sufficient vitamin D is an essential requirement for healthy bones, strong muscles and fall and fracture prevention. Vitamin D enhances the benefits of staying physically active and a calcium and protein-rich diet.

WHAT DOES VITAMIN D DO?

- assists in calcium absorption
- has a downward regulatory effect on parathyroid hormone level resulting in reduced bone loss
- ensures correct renewal and mineralization of bone
- has a direct stimulatory effect on muscle tissue and thereby reduces the risk of falling
- improves strength and function, increases bone mineral density, and reduces the risk of falls and fractures by about 20%, including fracture of the hip

SOURCES OF VITAMIN D

- The main source of vitamin D is sunlight (UVB irradiation). It is made in our skin from exposure to sunlight.
- For various reasons, sunshine exposure is not a reliable source of vitamin D:
  - Many geographic areas do not get sufficient UVB irradiation intensity during the winter months (e.g. all of Europe from November to end of March). As the half-life of vitamin D is 3 to 6 weeks, even if people get sufficient vitamin D during the summer, this will not secure vitamin D status in the winter months and early spring time.
  - Skin production of vitamin D declines with age, leaving seniors with a 4-times lower capacity to produce vitamin D in their skin compared to younger adults.
  - Seniors tend to avoid direct sun exposure which explains why even in southern areas with ample sunshine a large segment of seniors are vitamin D deficient (e.g. Mediterranean, Northern Australia).
  - The use of sunscreen and sun protective clothing reduces skin production of vitamin D independent of age. A sunscreen factor of 6 already blocks most of the vitamin D production in the skin.
  - Solar elevation angle (i.e. time of day), cloud cover, air pollution, altitude, and surface reflection, all have an impact on vitamin D production in the skin.
  - The UVB exposure time needed to produce 800 IU vitamin D differs by skin type and season. For an 8% body surface exposure (face and hands) during midday the exposure time will vary between about 30 minutes to 1 hour in the summer time, and up to about 20 hours in the winter.
- Vitamin D comes in two forms. Vitamin D_3 (cholecalciferol) is the version of vitamin D that is made in our skin and found in fatty fish and eggs. Vitamin D_2 (ergocalciferol) is a closely related molecule of plant origin. Vitamin D_3 has been shown in clinical trials to be more efficient than vitamin D_2 in reducing falls and fractures.
- Vitamin D supplements are best absorbed if taken with food as it is a fat-soluble vitamin.
- Food sources of vitamin D are limited, and include fatty fish, such as salmon, mackerel, and herring. One would have to eat two servings of fatty fish a day to reach a recommended intake of 800 IU vitamin D per day for fracture reduction.
- Some countries fortify margarines, milk and other foods with vitamin D.

WIDESPREAD PREVALENCE OF VITAMIN D DEFICIENCY

- It is estimated that 50 to 70 percent of the European and 30 to 50 percent of the US adult population is vitamin D deficient.
- In some regions, such as South Asia and Middle East, frank vitamin D deficiency is common in all age groups, from neonates to the elderly.
- Vitamin D status is determined by measuring 25-hydroxyvitamin D in the blood (measured as 25(OH)D levels).
- Vitamin D measurements should be targeted to those at risk for severe vitamin D deficiency and who may need greater doses of vitamin D than generally recommended.
- Severe vitamin D deficiency (at levels below 25 nmol/l :< 10 ng/ml) can lead to rickets in infants and osteomalacia in adults.
- **IOF recommends that those at risk of osteoporosis and generally everyone aged 60 years and older take vitamin D supplements at a dose of 800 – 1000 IU per day.**

References are provided in the IOF publication 'Three Steps to Unbreakable Bones – Vitamin D, Calcium and Exercise" (2011) – available on www. iofbonehealth.org

PEOPLE AT HIGHER RISK OF VITAMIN D DEFICIENCY

- seniors in general (especially those living in nursing homes or institutionalized care)
- individuals living in high latitudes with minimal sunshine exposure
- individuals who are obese
- individuals who have a disease that reduces vitamin D uptake from the intestine (i.e. inflammatory bowel disease)
- individuals who have a darker skin tone
- individuals who for medical or cultural reasons cannot expose their skin to the sun

embrace vitamin D