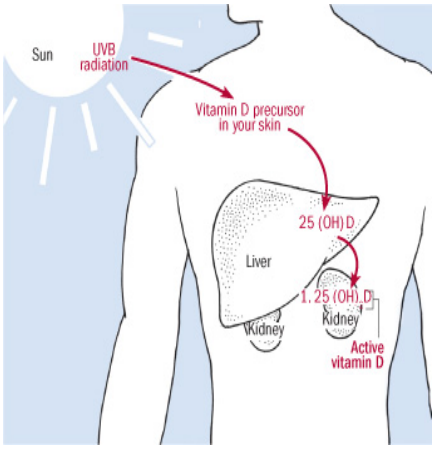
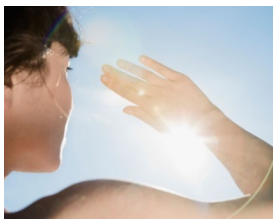
Vitamin D



Vitamin D is a fat-soluble vitamin, which we mainly get from the sun and only moderately from the diet. Vitamin D is formed in the skin when it is struck by the sun's ultraviolet rays. Therefore, it is important how much you are out in the sun. Stay in the sun with bare forearms, hands, feet or face for 30 mins, it is considered enough. Vitamin D is needed to maintain normal blood levels of calcium and phosphate, which are in turn needed for the normal mineralization of bone, muscle contraction, nerve conduction and general cellular function in all cells of the body. Vitamin D is especially important for the absorption and movement of calcium and the bones and muscles. If you are deficient in vitamin D, then you cannot absorb calcium properly, not matter how much calcium you are getting in your diet. People who can not get outdoors (like in some parts of northern Europe during winter) and wear hooded clothing might not get enough vitamin D.

Sources of Vitamin D:

Very few foods in nature contain vitamin D. The flesh of fatty fish, and fish liver oils are among the best natural sources of Vitamin D. Small amounts of Vitamin D are found in beef liver, cheese and egg yolks. Most people meet a least come of their vitamin D needs through exposure to sunlight. Ultraviolet B radiation penetrates uncovered skin and converts to vitamin D. UVB radiation does not penetrate glass, so exposure to sunshine indoors through a window does not produce vitamin D. It is difficult to make guidelines as to how much time should be spent in the sun to have enough vitamin D. It has been suggested that 5-30 mins of sun exposure between 10 am and 3 pm at least twice a week to the face arms, legs or back without sunscreen usually leads to sufficient vitamin D synthesis. Individuals with limited sun exposure need to include good sources of vitamin D in their diet or take a supplement to achieve the recommend intake. Some foods are fortified with vitamin D, including infant formulas and breakfast cereals. However, these may not be readily available in Vietnam. If you are unwilling to expose your skin to the sun, then you will need to take supplements to avoid deficiency.



Vitamin D deficiency:

A vitamin D deficiency can occur when usual intake is lower than recommended levels over time, exposure to sunlight is limited, the kidneys cannot convert vitamin D to its active form, or absorption of vitamin D from the digestive tract is inadequate. Some groups of people are at a greater risk of vitamin D deficiency than others. Vitamin D-deficient diets are associated with milk allergy, lactose intolerance, ovo-vegetarianism, and veganism. Infants are a population at risk for vitamin D deficiency because of relatively large vitamin D needs brought on by their high rate of skeletal growth. Breastfed infants are at risk because of low Vitamin D levels in breast milk if their mother's are deficient. Vitamin D deficiency in infants can lead to rickets. Adolescents also have a period of rapid growth of the skeleton and require more vitamin D. Elderly, pregnant and lactating women also require more Vitamin D.

Symptoms of severe vitamin D deficiency have muscle weakness, such as difficulty in climbing stairs and getting up from a chair, and bone pain, or around the body. You can also have tingling in the hands and feet. Vitamin D deficiency increases the risk of osteoporosis in old age. Rickets and osteomalacia are the classical vitamin D deficiency diseases. In children, vitamin D deficiency causes rickets, a disease characterized by a failure of bone tissue to properly mineralize, resulting in soft bones and skeletal deformities. Prolonged exclusive breastfeeding without the vitamin D supplementation is a significant cause of rickets, particularly in dark-skinned infants breastfed by mothers who are deficient themselves in vitamin D. Additional causes of rickets include lack of sun exposure to ensure infants and children get enough vitamin D. Rickets is also more prevalent among immigrants from Asia, Africa, and the Middle East, possibly because of genetic differences in vitamin D metabolism and behavioral differences that lead to less sun exposure. In adults, vitamin D deficiency can lead to osteomalacia, resulting in weak bones. Symptoms of bone pain and muscle weakness can indicate inadequate vitamin D levels, but such symptoms can be subtle and go undetected in the initial stages.

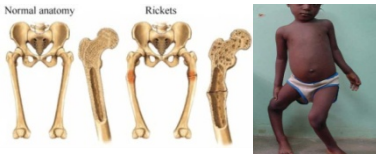


Figure 2: Rickets

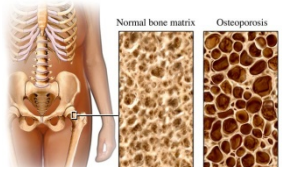


Figure 1: Osteomalacia and osteoporosis

What to do if you are deficient in Vitamin D:

The first thing you should do is to expose your bare skin to the sun more. You should spend 5-30 minutes in the sun twice a week, with your face, arms, legs or back exposed. If you are not willing to do that, then you will have to take supplements, because vitamin D is not readily available in food.

Too much vitamin D:

Because vitamin D is a fat-soluable vitamin, an excess vitamin D is stored in the liver. This means that if you take too much vitamin D through supplements, then you could get a vitamin D toxicity. Vitamin D toxicity causes very non-specific symptoms, such as weight loss, increased urine production and heart arrhythmias. It can also raise levels of calcium in the blood, which leads to calcification (accumulation of calcium), which can damage the heart, blood vessels and kidneys. The use of supplements of both

calcium (1,000mg/day) and vitamin D (400 units) has been associated with increased risk of kidney stones. Excessive sun exposure does not result in vitamin D toxicity.