

The beneficial effect of sunlight and vitamin D on the Health

The energy of the sunlight impacts every aspect of human health directly or indirectly through Vitamin D synthesis.

1. **Hormonal balance-** The eyes perform the unique function of connecting the brain to the sunlight. The blue light of the sun stimulates the retinal membrane of the eyes. That creates the electrical vibrations which stimulate the hypothalamus, the seat of managing all the essential hormones in the body- Insulin, Thyroid, Cortisol, and Growth hormone. Inadequate exposure to sunlight or bright daylight affects the secretion of these hormones. The hormonal imbalance from lack of sunlight exposure may be responsible for hypothyroidism, and many modern metabolic diseases such as Type 2 diabetes.
2. **Improves mood and sleep--** On exposure to morning light, there is a synthesis of Serotonin and Melatonin in the Pineal gland of the brain. The serotonin is a feel-good chemical transmitter which elevates the mood and prevents depression. People who live in geographic areas of the world where there is no sunlight for many days at a stretch have a higher incidence of depression and suicides. The depressed mood from the lack of sunlight exposure is called seasonal affective disorder (SAD) or winter blues. Modern humans who remain locked up in a perpetual indoor lifestyle, create a similar situation of SAD for themselves.

Melatonin is the sleep hormone which is synthesized from serotonin on exposure to sunlight or morning bright light. Like serotonin, it gets stored in Pineal gland. Melatonin is secreted at night at about 9 PM, in response to darkness. Serotonin and Melatonin are closely linked to each other chemically so insomnia will lead to depression and depression to insomnia.
3. **Cancer prevention-**Excess of sun exposure, especially to the midday sun, can cause skin damage and cataracts. However, 30-60 minute exposure to the morning sun, when UV radiation is less intense, protects against many-body cancers. The people living at high latitudes, where sunlight is scarce are more prone to certain types of cancer conditions such as Breast cancer, Hodgkin's lymphoma, Ovarian cancer, Colon cancer, Pancreatic and Prostate cancers. Cancer risk correlates with low vitamin D levels. Cancer rates currently are rising among all populations, including those in the tropical climates because people have a preference for an indoor lifestyle with diminished exposure to sunlight.
4. **Boosts Immune system-** The sun exposure increases the number of protector white blood cells which defend the body against bacterial and viral infections. The common cold and upper respiratory infections are much more common in winter months when sunlight is scarce. Autoimmune diseases are the diseases where the body destroys its healthy cells because of the abnormal immune system. These diseases are-Multiple sclerosis, Rheumatoid arthritis, Type1 diabetes, and many more. Weak sunlight and low levels of vitamin D at higher latitudes are considered to be the risk factors for these diseases. A Finnish study demonstrated that 2000 units of Vitamin D daily in children starting one year of age, reduced the risk of developing Type1 diabetes by 80%.
5. **Bone health and Vitamin D-** The primary function of vitamin D is to maintain blood calcium and phosphorus levels by facilitating their absorption from the digestive tract. Both calcium and phosphorus are essential for bone mineralization. Low Vitamin D levels lead to osteoporosis and pain in bone and joints. In children, Vitamin D deficiency leads to bone softening with bowing of long bones- a condition called rickets.

6. **Skin health**-Balanced exposure to the UV rays of the sun can be helpful in skin conditions such as psoriasis and eczema.
7. **Brain function**- Exposure to sunlight increases cell growth in an area of the brain called hippocampus, which is the seat of forming new memories and awareness of new surroundings. Diminution in size of the hippocampus with aging correlates with loss of memory-dementia, confusion, and spatial coordination.
8. **Reduction in weight and hunger feelings** - The sun energy reduces an individual's need for food energy, thereby taming hunger and appetite. During daylight hours, the body is active and more sensitive to Insulin, so more glucose gets used up for making energy with a little leftover to make reserve fat energy. At night time, the body is inactive and resistant to insulin, so less glucose gets used for energy and excess converted to reserve energy fat.
9. **Vitamin D and cardiovascular health**- Vitamin D deficiency increases the risk of cardiovascular diseases such as high blood pressure, coronary heart disease (heart blockage), high levels of triglycerides, and bad cholesterol.
10. **Metabolic diseases and Vitamin D deficiency**- Normalizing vitamin D levels help in increasing Insulin sensitivity with improved glucose utilization. Insulin resistance is at the root of all metabolic diseases-Obesity, Type 2 diabetes, and Metabolic syndrome.

Sunlight can never cause Vitamin D overdose, but an excess of vitamin D supplements can.

Vitamin D has a fantastic effect on supporting overall health. However, an excess of Vitamin D in the body from excessive oral intake of supplements can have serious side effects. Therefore, one should be careful not to overdose on vitamin D supplements. Natural Vitamin D synthesis in the skin by the UV light, can never produce an overdose of vitamin D. So getting Vitamin D from sunlight is a safe strategy.

Excess of Vitamin D- Most toxic of all the vitamins. The signs and symptoms of overdose are:

- Loss of appetite, nausea.
- Excessive thirst and stupor
- High blood calcium due to increased calcium absorption from the digestive tract and mobilization of calcium from bones.
- Abnormal calcification in the body – This can occur in Kidneys (stones), in blood vessels, lungs, and heart.

Recommended blood levels of Vitamin D in health and disease

The International Osteoporosis foundation estimate that 80% of Urban Indians suffer from Vitamin D deficiency.

- Normal range-20 ng-50 ng/milliliter
- Vitamin D deficiency-Level less than 12 ng/milliliter