



# کراچی یونیورسٹی

## University of Karachi

### THE NGDS PILOT PROJECT

Participating School: Beacon Light Academy, 'O' Levels, Karachi



SF GROWTH-AND-IMAGING LABORATORY

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## Helpful Hints for Overcoming Vitamin-D Deficiency

According to Dr. Laura Tripkovic (Surrey University) and Prof. Richard Cogdell (Glasgow University) vitamin D is needed to maintain our bones and to make sure we absorb enough calcium from our diet. In fact, radiation from the sun can penetrate skin-layers called the epidermis, while there's a chemical called 7-hydro-cholesterol and this is absorbed through ultraviolet light to produce the pre-vitamin-D molecule. Warm skin converts pre-vitamin D3 to vitamin D3, which moves from the skin, pushed out into the capillary system and, eventually, into the blood system, where it can then be activated and used. Air and sun exposure is needed to give students adequate doses of vitamin D\*. This would prevent *rickets* and *tuberculosis* (during early childhood), *scoliosis*, *kyphosis* and *lordosis* (during later childhood and adolescence), *osteomalacia* (during adulthood) and *osteoporosis* (during old age) — a guarded-graduated approach should build up tolerance to sun-exposure, resistance to common colds as well as produce a melanin layer on skin, which protects the students from getting skin cancer (Wikipedia, 2013). Further, such a practice would acclimatize child to heat effects (American Academy of Pediatrics, 1982). During initial exposure, the NGDS Team recommends students to cover their exposed body-parts by an appropriate SPF (Sun-Protection Formula) sun-screen. The importance of skin exposure of primary-school students to the morning (for the morning-shift schools) or the later-afternoon (for the afternoon-shift schools) sun cannot be over-emphasised. A mirror exercise is needed by parents, whereby they should allow younger children to play in the sun stripped to waist, wearing only shorts/miniskirts in the later afternoon (for the morning-shift schools) or the morning (for the afternoon-shift schools). These dressing practices would, also, give the body an opportunity to breathe. There are a lot of cases of vitamin-D deficiency in the Asian countries, in particular, Pakistan. Zahoor (2012) mentioned a UK study, which isolated the problem in the population from Asia. 13 out of 14 found cases of vitamin-D deficiency were found in the Asian children. Untreated deficiency may be the cause of backache, chronic fatigue, muscular and joint pain as well as progressively weakening eyesight. In very young children, it may lead to chronic flu, delayed teething and hardening of the skull-bone. Further, deficiency of this vitamin may cause Alzheimer's disease, autoimmune diseases, cancer, infectious diseases and kidney stones. The NGDS Team does not endorse supplementation via intra-muscular injection, tablets or syrups, as these measures, sometimes, cause severe

\*600 IU daily dose is recommended according to the Consensus Report of the Institute of Medicine (November 30, 2010)

Web address of this document: <http://www.ngds-ku.org/BLA/VDD.pdf>

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vitamin-D toxicity as the vitamin may fail to absorb in the body. Our Team, strongly, advocates that the most natural, the cheapest and the safest way is to expose skins of students to sunshine, at those times when sun rays are inclined and coming from a denser layer of atmosphere, so that intensity is reduced and harmful rays are cut down by absorption or removal from the main beam (Rybicki & Lightman, 1979). Initially, start with a 10-minute exposure, gradually, increase to 20 and, later, to 30 minutes, accompanied with 2-3-hour, fresh-air exposure in the shade (there are no known risks associated with this practice, the duration may be increased), with the students minimally dressed, expo-sing hair (unbraided and separated, spread along their backs), hands, arms, shoulders, backbone and back-skin from external auditory meatus to waistline, legs from mid-thighs to feet. During this period, engage students in light floor activities, involving drawing, singing, scribbling, playing jigsaw puzzles or board games (*e. g.*, ludo), *etc.* Story reading/telling by teacher may form a structured activity. During an outdoor activity, the teacher should sit facing the sun and the students must have their backs towards the sun to protect their eyes. It is, extremely, important that vitamin-D deficiency be overcome, through natural sun-exposure, as soon as possible, because this condition shall prevent calcium to be, properly, absorbed and contribute towards strengthening the bones, preventing scoliosis (Kamal, 2012) and tissue synthesis resulting in height gain (Kamal, 2013a). This would, also, nullify all attempts to introduce calcium-rich-diet items. Any diet-based endeavor to gain weight would, also, be ineffective when the child is vitamin-D deficient (Kamal, 2013b).

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