

Recognizing Vitamin Deficiencies

Vitamins are groups of organic compounds essential for normal growth and function; they must be procured in the diet because they cannot be synthesized by the body

Vitamin functions

Vitamin A (fat soluble)

- Builds and maintains healthy mucous membranes and epithelial tissues
- Acts as an antioxidant within cell tissues

Vitamin B Complex (comprised of 8 water-soluble vitamins: thiamine, riboflavin, niacin, pantothenic acid, pyridoxine, biotin, folic acid, cobalamin)

- Maintains neurological function and reduces neural tube defects
- Maintains periodontal tissue
- Reduces risk of stroke
- Aids in red blood cell production
- Aids in DNA synthesis

Vitamin C (water-soluble)

- Maintains bone, blood vessels, skin, scar tissue, tendons, and ligaments
- Repairs and maintains cartilage and teeth

Vitamin D (fat-soluble)

- Aids the body in using calcium and phosphorus to strengthen bones and teeth
- Aids in preventing hypertension, rheumatoid arthritis, and type II diabetes
- Improves immune function

Oral Clinical Signs of Vitamin Deficiencies

Vitamin A

- Gingival inflammation
- Oral candidiasis (yeast infection)
- Impaired taste



Vit. A deficiency- Oral Candidiasis

Vitamin B Complex

- *B2 (riboflavin)*: shiny red lips, sore tongue, cracked lips, angular cheilitis, glossitis, hyperemia and edema of oral and pharyngeal mucosa
- *B3 (niacin)*: red/swollen apex of tongue with smooth dry edges, angular cheilitis, mouth pain
- *B6 (pyridoxine)*: sore burning mouth, angular cheilitis, smooth tongue
- *B12 (cobalamin)*: halitosis, angular cheilitis, bright red tongue with//without fissures, xerostomia, numb and bleeding gums



Vit. B12 deficiency- Xerostomia

Vitamin C

- Gingival inflammation with smooth appearance
- Bluish-red gingiva
- Soft, friable gingiva
- Scurvy (bleeding gums, loose teeth, petechial hemorrhage of skin and mucous membranes)
- *Calculus acts as an irritant



Vit. C deficiency- Scurvy

Vitamin D

- Softens bones and teeth by decreasing density



Vit. B2 deficiency- Glossitis and Angular Cheilitis

Dietary Sources of Vitamins

Vitamin A

-Beef liver, broccoli, red-orange fruits and vegetables (squash, carrots, apricots, cantaloupe, peaches, papaya, red peppers), dairy products, fortified breakfast cereals

Vitamin B Complex

- Green leafy vegetables (esp. spinach), soy beans, almonds, walnuts, sunflower and sesame seeds, sprouts, fish, beef liver, fortified breakfast cereals

Vitamin C

- Citrus fruits, broccoli, cauliflower, cabbage, and brussel sprouts

Vitamin D

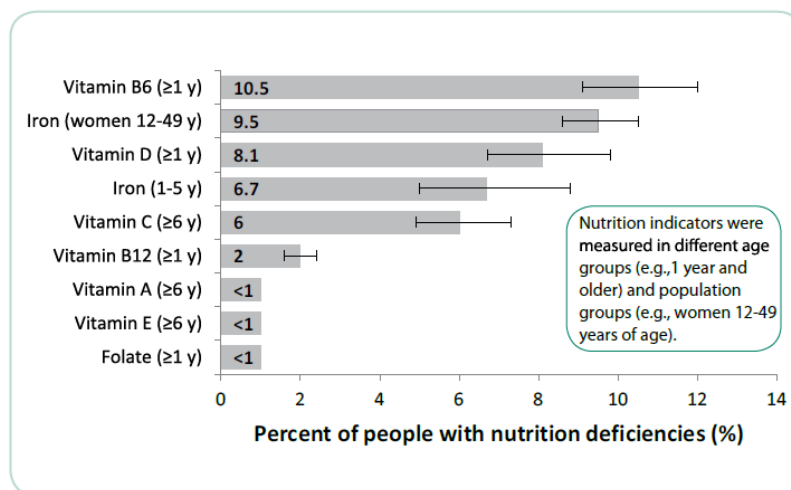
- Fish, fortified dairy products and juices, and eggs

*Synthesized in body by sunlight

Role of the Dental Hygienist

- Utilize the health history interview to establish what vitamin supplements the patient may be taking
- Have the ability to recognize clinical signs of vitamin deficiencies in the oral cavity
- Explain how vitamin deficiencies modify the body's response to dental biofilm and contribute to gingival disease
- Provide patient with diet and nutritional counseling
- During counseling, food-based approaches to diversify diet and increase nutrient intake should be prioritized over vitamin supplementation
- Refer the patient for medical consultation if a serious deficiency is suspected, there may be underlying systemic factors associated

Nutrition deficiencies in the U.S. population



The graph shows prevalence estimates of nutrition deficiencies among people who live in the U.S. (NHANES 2003-2006). Of all the nutrients listed, the most people had vitamin B6, iron, and vitamin D deficiencies, and the fewest people had vitamin A, vitamin E, and folate deficiencies.