

Vitamin D

Normal Range

In Female

== Chemical description ==
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Vitamin A If vitamin A status is in the normal range, SCARB1 is downregulated, reducing absorption Vitamin A is a fat-soluble vitamin that is an essential nutrient. For aiding vision specifically, it combines with the protein opsin to form rhodopsin, the light-absorbing molecule necessary for both low-light (scotopic vision) and color vision. The protein is upregulated in times of vitamin A deficiency. Vitamin A has multiple functions: growth during embryo development, maintaining the immune system, and healthy vision. (SCARB1). The term "vitamin A" encompasses a group of chemically related

organic compounds that includes retinol, retinyl esters, and several provitamin (precursor) carotenoids, most notably β -carotene (beta-carotene)
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Vitamin D toxicity Blood levels necessary to cause adverse effects in adults are thought to be greater than about 150 ng/mL, leading the Endocrine Society to suggest an upper limit for safety of 100 ng/mL. The normal range for blood concentration of 25-hydroxyvitamin D in adults is 20 to 50 nanograms per milliliter (ng/mL). The normal range for blood concentration of 25-hydroxyvitamin Vitamin D toxicity, or hypervitaminosis D, is the toxic state of an excess of vitamin D. Vitamin D toxicity, or hypervitaminosis D, is the toxic state of an excess of vitamin D
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Biotin Present in every living cell, it Biotin (also known as vitamin B7 and vitamin H) is one of the B

vitamins – a group of essential dietary micronutrients. Biotin (also known as vitamin B7 and vitamin H) is one of the B vitamins – a group of essential dietary micronutrients. Present in every living cell, it is involved as a cofactor for enzymes in numerous metabolic processes, both in humans and in other organisms, primarily related to the biochemistry of fats, carbohydrates, and amino acids
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Vitamin E is classified as an essential nutrient for humans. Various government organizations recommend that adults consume between 3 and 15 mg per day, while a 2016 worldwide review reported a median dietary intake of 6.2 mg per day. Sources rich in vitamin E include seeds, nuts, seed oils, peanut butter, vitamin E-fortified foods, and dietary supplements. Symptomatic vitamin E deficiency is rare, usually caused by an underlying problem with digesting dietary fat rather

than from a diet low in vitamin E. Deficiency can cause neurological disorders. 9e30913f72 The name biotin, borrowed from the German Biotin, derives from the Ancient Greek word βίωτος (bíotos; 'life') and the suffix "-in" (a suffix used in chemistry usually to indicate 'forming'). 9e30913f72

Vitamin D In humans, the most important compounds within this group are vitamin D3 (cholecalciferol) and vitamin D2 (ergocalciferol). In humans, the most important compounds within this group are vitamin D3 (cholecalciferol) and vitamin D2 (ergocalciferol). functions. The name Vitamin D is a misnomer; technically vitamin D is not a vitamin, but rather a fat-soluble secosteroid hormone. The name Vitamin D is a Vitamin D is a group of structurally related, fat-soluble compounds responsible for increasing intestinal absorption of calcium and phosphate, along with numerous other biological functions 9e30913f72

Cholecalciferol can be taken orally as a dietary supplement to prevent vitamin D deficiency or as a medication to treat associated diseases, including rickets. It is also used in the management of familial hypophosphatemia, hypoparathyroidism... 9e30913f72

Cholecalciferol It was first described in 1936, and is on the World Health Organization's List of Essential Medicines. In 2023, it was the 68th most commonly prescribed medication in the United States, with more than 9 million prescriptions, and is available as a generic medication. Cholecalciferol, also known as vitamin D3, colecalciferol or calciol, is a skin-made vitamin D that is found in certain foods and used as a dietary supplement Cholecalciferol, also known as vitamin D3, colecalciferol or calciol, is a skin-made vitamin D that is found in certain foods and used as a dietary supplement 9e30913f72

Biotin is classified as a heterocyclic compound, with a sulfur-containing tetrahydrothiophene ring fused to a ureido group. A C5-carboxylic acid side chain is appended to the former ring. The ureido ring, containing the $-N-CO-N-$ group, serves as the carbon dioxide carrier in carboxylation reactions. Biotin is a coenzyme for five carboxylase enzymes, which are involved in the catabolism of amino acids and fatty acids, synthesis of fatty acids, and gluconeogenesis. Biotinylation...

9e30913f72 == Signs and symptoms == 9e30913f72

When isolated, biotin is a white, needle-like crystalline solid. Biotin is obtained from foods, particularly meats and liver, and is sold as a dietary supplement. 9e30913f72

Blood test results should always be interpreted using the reference range provided by the laboratory that performed the test. 9e30913f72

For both XLH and hypophosphatasia, inhibitor-enzyme pair relationships... 9e30913f72

X-linked hypophosphatemia These local elevations of osteopontin, along with renal phosphate wasting, often cause osteomalacia and odontomalacia (softening of bones and teeth, respectively), which constitute some of the main symptoms of XLH. It can cause bone deformity, including short stature and genu varum (bow-leggedness). It is associated with a mutation in the PHEX gene sequence (Xp. Inactivating mutations in the PHEX gene lead to an elevated circulating (systemic) level of the hormone FGF23 which results in renal phosphate wasting, and local elevations of the mineralization/calcification-inhibiting protein osteopontin in the extracellular matrix of bones and teeth. The prevalence of the disease is estimated to be 1 in 20,000. It can cause bone deformity, including X-linked hypophosphatemia (XLH) is an X-linked dominant form of rickets (or osteomalacia) that differs from most cases of dietary deficiency

rickets in that vitamin D supplementation does not cure it. osteomalacia) that differs from most cases of dietary deficiency rickets in that vitamin D supplementation does not cure it. Both of these underlying mechanisms (renal phosphate wasting systemically, and mineralization inhibitor accumulation locally) contribute to the pathophysiology of XLH. 22) and subsequent inactivity of the PHEX protein 9e30913f72

Dietary retinol is absorbed from the digestive tract... 9e30913f72 Tocopherols and tocotrienols both occur in α (alpha), β (beta), γ (gamma), and δ (delta) forms, as determined by the number and position of methyl groups on the chromanol ring. All eight of these vitamers feature a chromane double ring, with a hydroxyl group that can donate a hydrogen atom to reduce free radicals, and a hydrophobic side chain that allows for penetration into biological membranes... 9e30913f72

Vitamin C It is found as a form of ascorbic acid. Most animals are able to synthesize their own vitamin C. It Vitamin C or ascorbate is a water-soluble vitamin found in citrus and other fruits, berries and vegetables. It is required for the functioning of several enzymes and is important for immune system function. It is an essential nutrient involved in the repair of tissue, the formation of collagen, and the enzymatic production of certain neurotransmitters. It is also an antioxidant. Vitamin C or ascorbate is a water-soluble vitamin found in citrus and other fruits, berries and vegetables. It is found as a form of ascorbic acid. However, higher primates (including humans), most bats, guinea pigs, some fish species, and some bird species must acquire it from dietary sources because a gene for a synthesis enzyme has mutations that render it dysfunctional; humans obtain this vitamin from those fruits and vegetables

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Vitamin A occurs as two principal forms in foods: 1) retinoids, found in animal-sourced foods, either as retinol or bound to a fatty acid to become a retinyl ester, and 2) the carotenoids α -carotene (alpha-carotene), β -carotene, γ -carotene (gamma-carotene), and the xanthophyll beta-cryptoxanthin (all of which contain β -ionone rings) that function as provitamin A in herbivore and omnivore animals which possess the enzymes that cleave and convert provitamin carotenoids to retinol. Some carnivore species lack this enzyme. The other carotenoids do not have retinoid activity.

9e30913f72 Cholecalciferol is synthesised in the skin following sunlight exposure. It is then converted in the liver to calcifediol (25-hydroxycholecalciferol D), which is further converted in the kidney to calcitriol (1,25-dihydroxycholecalciferol D). One of calcitriol's most important functions is to promote calcium uptake by the intestines. Cholecalciferol is present in food

such as fatty fish, beef liver, eggs, and cheese. In some countries, cholecalciferol is also added to products like plants, cow milk, fruit juice, yogurt, and margarine.

9e30913f72 A reference range is usually defined as the set of values 95 percent of the normal population falls within (that is, 95% prediction interval). It is determined by collecting data from vast numbers of laboratory tests.
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Reference ranges for blood tests
Reference ranges for blood tests are studied within the field of clinical chemistry (also known as "clinical biochemistry", "chemical pathology" or "pure blood chemistry"), the area of pathology that is generally concerned with analysis of bodily fluids. substantially, most notably among vitamins and blood lipids, so these tables give limits on both standard and optimal (or target) ranges. In addition, some values Reference ranges (reference intervals) for blood tests are sets of values used

by a health professional to interpret a set of medical test results from blood samples
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Vitamin E The tocopherols function as fat-soluble antioxidants which may help protect cell membranes from reactive oxygen species.

Vitamin E is a group of eight compounds related in molecular structure that includes four tocopherols and four tocotrienols.

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Unlike the other twelve vitamins, vitamin D is only conditionally essential in the diet, as with adequate skin exposure to the ultraviolet B (UVB) radiation component of sunlight there is synthesis of cholecalciferol in the deeper layers of the skin's epidermis. Vitamin D can also be obtained through diet, food

fortification and dietary supplements. For most people, skin synthesis contributes more than dietary sources. In the United States, milk and plant-based milk substitutes are fortified with vitamin D3, as are many breakfast cereals. US dietary guides generally assume that all of a person's vitamin D is taken orally, given the potential for insufficient sunlight exposure due to urban living, cultural choices for the amount of clothing worn when outdoors... 9e30913f72 In its purified, solid form, it is a water-soluble yellow-orange crystalline... 9e30913f72 An excess of vitamin D causes abnormally high blood concentrations of calcium, which can cause overcalcification of soft tissues, including arteries and kidneys. Symptoms appear several months after excessive doses of vitamin D are administered. A mutation of the CYP24A1 gene can lead to a reduction in the degradation of vitamin D and thus to vitamin toxicity without high oral intake (see Vitamin D §

Excess). Symptoms of vitamin D toxicity may include the following:
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Riboflavin It is essential to the formation of two major coenzymes Riboflavin, also known as vitamin B2, is a vitamin found in food and sold as a dietary supplement.

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Riboflavin is prescribed to treat corneal thinning, and taken orally, may reduce the incidence of migraine headaches in adults.

These coenzymes are involved in energy metabolism, cellular respiration, and antibody production, as well as normal growth and development. It is essential to the formation of two major coenzymes, flavin mononucleotide and flavin adenine dinucleotide. The coenzymes are also required for the metabolism of niacin, vitamin B6, and folate
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It is also a generic prescription

medication and in some countries is sold as a non-prescription dietary supplement. As a therapy, it is used to prevent and treat scurvy, a disease caused by vitamin C deficiency. Vitamin C may be taken by mouth or by intramuscular, subcutaneous or intravenous injection. Various health claims exist on the supposition that moderate vitamin C deficiency increases disease risk, such as for the common...

9e30913f72 == Interpretation ==
9e30913f72 Riboflavin deficiency is rare and is usually accompanied by deficiencies of other vitamins and nutrients. It may be prevented or treated by oral supplements or by injections. As a water-soluble vitamin, any riboflavin consumed in excess of nutritional requirements is not stored; it is either not absorbed or is absorbed and quickly excreted in urine, causing the urine to have a bright yellow tint. Natural sources of riboflavin include meat, fish and fowl, eggs, dairy products, green vegetables, mushrooms, and

almonds. Some countries require its addition to grains. 9e30913f72

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