Name(s): Retinol. See also: Beta-carotene.

Warning: Iron should not be taken at the same time as antioxidants.

Description: Vitamin A is a fat-soluble compound, meaning that it is insoluble in water yet soluble in fat solvents such as alcohol and ether. Retinol is destroyed in the presence of oxygen and light; however, when in a dry form, this vitamin is stable. Plants have a precursor to vitamin A called Beta-carotene. This molecule splits into two compounds of vitamin A. Animal products include vitamin A because they consume the plants which have two molecules of the vitamin. The production of Ribonucleic acid (RNA) is enhanced by retinol. RNA is a nucleic acid that is a single strand of molecules that is complementary to the strand of DNA (deoxyribonucleic acid). This nucleic acid transfers instructions to each cell, telling it how to function at a particular time. If new RNA is not produced then the cells begin to degenerate.¹

Absorption/Storage: The enzymes that split fat molecules begin working in the duodenum (upper gastrointestinal tract). This is the site where vitamin A is absorbed. Beta-carotene is converted to usable nutrients through the use of a hormone called thyroxin produced by the thyroid gland. Once absorbed, vitamin A enters the bloodstream and is made accessible to various tissues. The liver is the place where 90% of vitamin A is stored. If the diet is lacking retinol, the body will pull from the stores in the liver.¹

Recommended	Dietary	Allowance/Dietary	Reference
Intake: ²			

Persons	U.S.
	mcg
Birth to 3 years of age	300-400
4 to 8 years of age	400
9 to 13 years of age	600
Adolescent and adult males	900
Adolescent and adult females	700
Pregnant females	750-770
Breast-feeding females	1200-1300

Optimum Daily Allowance (Adult): 5,000-10,000 IU.³

Tolerable Upper Intake Levels: None available.

Principal Uses: Bronchitis,⁴⁻⁶ cystic fribrosis,⁷⁻⁸

leukoplakia,⁹⁻¹² night blindness,¹³⁻¹⁸ and viral illnesses.¹⁹⁻²³

Proposed Uses: Celiac disease (for deficiency only), heart attack, immune function, iron-deficiency anaemia (as an adjunct to supplemental iron), measles (for severe cases), menorrhogia (heavy menstruation), peptic ulcer, retinitis pigmentosa, sprains and strains (for deficiency only) and wound healing.²⁴

Traditional Uses: Acne, alcohol withdrawal support, conjunctivitis/blepharitis, Crohn's disease. diabetic retinopathy (in combination with selenium, vitamin C, and gastritis, vitamin E), diarrhoea, HIV support, hypothyroidism, lung cancer, pap smear (abnormal), preand post-surgery health, premenstrual syndrome, retinopathy (in combination with selenium, vitamin C and vitamin E), sickle cell anaemia, urinary tract infection and vaginitis.24

Healthy Food Sources:

High (40%+ US RDA): cooked or raw carrots, cooked kale, raw mango, instant, so-called fortified or prepared oatmeal, cooked peas and carrots, raw red peppers, cooked spinach, squash, baked boiled or canned sweet potato, cooked turnip greens,²⁵ mustard greens, parsley, spinach and Hubbard squash.²⁶

Medium (25-39% US RDA): dried or cooked unsweetened apricots, raw cantaloupe, so-called fortified ready-to-eat cereals and cooked sweet red peppers.²⁵

Contraindications: If you are taking this dietary supplement without a prescription, carefully read and follow any precautions on the label. For vitamin A, the following should be considered:

Allergies--Tell your health care professional if you have ever had any unusual or allergic reaction to vitamin A. Also tell your health care professional if you are allergic to any other substances, such as foods, preservatives, or dyes.

Pregnancy--It is especially important that you are receiving enough vitamins when you become pregnant and that you continue to receive the right amount of vitamins throughout your pregnancy. The healthy growth and development of the foetus depend on a steady supply of nutrients from the mother.

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However, taking too much vitamin A (more than 1800 RE [6000 Units]) during pregnancy can also cause harmful effects such as birth defects or slow or reduced growth in the child.

Breast-feeding--It is especially important that you receive the right amounts of vitamins so that your baby will also get the vitamins needed to grow properly. However, taking large amounts of a dietary supplement while breast-feeding may be harmful to the mother and/or baby and should be avoided.

Children--Problems in children have not been reported with intake of normal daily-recommended amounts. However, side effects from high doses and/or prolonged use of vitamin A are more likely to occur in young children than adults.

Older adults--Problems in older adults have not been reported with intake of normal daily-recommended amounts. However, some studies have shown that the elderly may be at risk of high blood levels of vitamin A with long-term use.

Dental--High doses and/or prolonged use of vitamin A may cause bleeding from the gums; dry or sore mouth; or drying, cracking, or peeling of the lips.

Other medical problems--The presence of other medical problems may affect the use of vitamin A. Make sure you tell your health care professional if you have any other medical problems, especially:

- Alcohol abuse (or history of) or
- Liver disease--Vitamin A use may make liver problems worse
- Kidney disease--May cause high blood levels of vitamin A, which may increase the chance of side effects.²⁶

Interactions:

Decreases Vitamin Availability:	Anticonvulsants, methyltestosterone, thioradazine, ²⁴ bile acid sequestrants, mineral oil, neomycin, ^{24,27} aluminium hydroxide, charcoal, fibre supplements, high fibre diet, sucralfate, ²⁷ vitamin E
	(large doses). ²⁷ and orlistat (xenical). ²⁸

Increases	Choline, essential fatty acids, vitamin	
Vitamin	D, ³ vitamin C, vitamin E (normal	
Availability:	doses), 3,27 zinc, 27,29 and iron. 30	
Is Increased By Vitamin Availability:	Iron, zinc, ³⁰ most chemotherapy drugs, ^{24,31} and warfarin. ^{30,33}	
Adverse Reactions:	Accutane, iron, oestrogen, ²⁷ oral contraceptives, ^{24,27} cisplatin, HMG- CoA reductase inhibitors, minocycline and tretinoin. ²⁷	

Deficiency: Lack of vitamin A may lead to a rare condition called night blindness (problems seeing in the dark), as well as dry eyes, eye infections, skin problems, and slowed growth. Your health care professional may treat these problems by prescribing vitamin A for you.²⁶

Toxicity/Side Effects: Vitamin A is stored in the body; therefore, when you take more than the body needs, it will build up in the body. This may lead to poisoning and even death. Problems are more likely to occur in:

- Adults taking 7500 RE (25,000 Units) a day for 8 months in a row, or 450,000 RE (1,500,000 Units) all at once; or
- Children taking 5400 RE (18,000 Units) to 15,000 RE (50,000 Units) a day for several months in a row, or 22,500 RE (75,000 Units) to 105,100 RE (350,000 Units) all at once.
- Pregnant women taking more than 1800 RE (6000 Units) a day.

Remember that the total amount of vitamin A you get every day includes what you get from foods that you eat and what you take as a supplement.

Along with its needed effects, a dietary supplement may cause some unwanted effects. Vitamin A does not usually cause any side effects at normal recommended doses.

However, taking large amounts of vitamin A over a period of time may cause some unwanted effects that can be serious. Check with your health care professional immediately if any of the following side effects occur, since they may be signs of sudden overdose:

• Bleeding from gums or sore mouth; bulging soft spot on head (in babies); confusion or unusual excitement; diarrhoea; dizziness or drowsiness; double vision;

headache (severe); irritability (severe); peeling of skin, especially on lips and palms; vomiting (severe).

Check with your health care professional as soon as possible if any of the following side effects occur, since they may also be signs of gradual overdose:

• Bone or joint pain; convulsions (seizures); drying or cracking of skin or lips; dry mouth; fever; general feeling of discomfort or illness or weakness; headache; increased sensitivity of skin to sunlight; increase in frequency of urination, especially at night, or in amount of urine; irritability; loss of appetite; loss of hair; stomach pain; unusual tiredness; vomiting; yellow-orange patches on soles of feet, palms of hands, or skin around nose and lips.

Other side effects not listed above may also occur in some individuals. If you notice any other effects, check with your health care professional.²⁶

Treatment For Overdose: Discontinue taking vitamin A.^{31,33} Induce vomiting if large dose (>300,000 IU in children or >1,000,000 IU in adults) recently taken. Take cholestyramine or activated charcoal with a laxative.³³

Storage: To store this dietary supplement:

- Keep out of the reach of children.
- Store away from heat and direct light.
- Do not store in the bathroom, near the kitchen sink or in other damp places. Heat or moisture may cause the dietary supplement to break down.
- Keep the oral liquid form of this dietary supplement from freezing.
- Do not keep outdated dietary supplements or those no longer needed. Be sure that any discarded dietary supplement is out of the reach of children.²⁶

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Compiled by: Michael John Nisbett, HBScN, RN MSc (Nutrition) Candidate