



VIRUS SURVIVAL

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The virus infections can be dangerous, especially in people 65 years or older. Virus symptoms can vary from person to person, but most people with influenza will experience some degree of fever, chills, headaches, body aches, congestion, coughing, and fatigue. While the symptoms are similar to a cold or upper respiratory tract infection, the main difference is that flu symptoms hit you quickly. With the flu, you typically go from feeling fine to miserable in a matter of hours.

The Best Virus Survival Recommendations:

The virus infections can be dangerous, especially in people 65 years or older. Virus symptoms can vary from person to person, but most people with influenza will experience some degree of fever, chills, headaches, body aches, congestion, coughing, and fatigue. While the symptoms are similar to a cold or upper respiratory tract infection, the main difference is that flu symptoms hit you quickly. With the flu, you typically go from feeling fine to miserable in a matter of hours.

Recommendations:

1. Don't get sick – see the prevention steps below.
2. Get plenty of rest. 8 hours a night. The most restorative rest is from 9pm to 12AM.
3. Try to avoid close contact with sick people.
4. While sick, limit contact with others as much as possible to keep from infecting them.
5. If you are sick with flu-like illness, CDC recommends that you stay home for at least 24 hours after your fever is gone except to get medical care or for other necessities. (Your fever should be gone for 24 hours without the use of a fever-reducing medicine.)
6. Cover your nose and mouth with a tissue when you cough or sneeze. After using a tissue, throw it in the trash and wash your hands.
7. Wash your hands often with soap and water for at least 20 seconds. If soap and water are not available, use an alcohol-based hand rub.
8. Avoid touching your eyes, nose and mouth. Germs spread this way.
9. Clean and disinfect surfaces and objects that may be contaminated with germs like flu.
10. Vaccines - become an educated consumer. While traditional medicine and the CDC advocates vaccines, it's not a guarantee that you won't get sick. Like any medical procedure, there is risks involved and it is not benign. Many doctors believe vaccines prevent viral infections and others believe it contributes to other health conditions and other health problems. You need to know both sides of the issue.

YOUR IMMUNE SYSTEM IS GOING TO DETERMINE THE EFFECT OF THE VIRUS INFECTIONS

Your health is determined by your immune system. Simply put, the immune system is a

balanced network of cells and organs that work together to defend you against disease. It stops threats like bacteria or viruses from getting into your body. Think of it as a powerful “search and destroy” task force that sends immune cell forces out to hunt down the

unwanted intruders and get rid of them. The following protocols have worked well at our office for over 100 years.

VITAMIN C - I take 3,000mg

IT IS THE MOST IMPORTANT preventative thing to do to prepare for virus season.

“Vitamin C, or ascorbic acid, is a water-soluble vitamin, which is needed by the body to form collagen in bones, cartilage, muscle, and blood vessels, and aids in the absorption of iron,” Dr. Sherry Ross, M.D., an OB/GYN and women’s health expert at Providence Saint John’s Health Center and author of *Sheology*, tells *Bustle*. We don’t produce vitamin C ourselves, so we have to absorb it from our food. Vitamin C also protects cells against damage from free radicals, including air pollution and cigarette smoke. Its power against influenza, though, comes from its contribution to the immune system.

Humans are one of the few species that cannot manufacture vitamin C. We must depend on our diet, or nutritional supplements, as the source of this vitamin. Vitamin C exists in nature in both its reduced form, L-ascorbic acid, and in its oxidized form, L-dehydroascorbic acid. L-ascorbic acid is the most active form. However, in the body they convert back and forth to each other in a reversible equilibrium, and both prevent scurvy (antiscorbutic). Buffered vitamin C refers to the sodium, calcium, magnesium, and potassium ascorbate salts. These forms of vitamin C are less acidic and may be less likely to cause gastric irritation when taken in higher doses

Immunity: Regular supplementation with Vitamin C is reported to decrease the duration of colds (Hemila et al, 2013) and decrease the incidence of infection (OchoaBrust et al, 2007). Vitamin C supplementation is reported to:

- Increase production of white blood cells (neutrophils, lymphocytes, and natural killer cells)
- Increase levels of antibodies IgA, IgG, and IgM
- Increase production of interferon
- Modulate prostaglandin synthesis and decrease inflammation

There are no known toxicities associated with vitamin C. Diarrhea has been reported from an overdose of vitamin C. Approximately 15% of people taking moderately high doses of vitamin C experience abdominal gas, bloating, and cramping. The mineral ascorbates such as calcium or magnesium ascorbate are not acidic and may solve this problem

VITAMIN D3 - I take 10,000iu

I am taking 5,000iu/day maintenance; 10,000iu/day. Vitamin D supplementation helps boost your

immune system by stimulating naturally occurring antimicrobial peptides, which protect the body by destroying invading microbes. These antimicrobial peptides live in immune cells throughout the body, including cells lining the upper and lower respiratory tract. There they are able to directly fight off viruses and bacteria that cause common immune and respiratory infections like colds and flu.

Vitamin D is known as the “sunshine” vitamin. It is formed in the body by the action of

the sun’s ultraviolet rays on the skin, converting the biological precursor 7-

dehydroergosterol (found in animals and humans) into vitamin D3.

Low levels of vitamin D can result from inadequate dietary intake, insufficient exposure to sunlight, which reduces the body’s synthesis of vitamin D, and kidney or liver imbalances, which inhibit the conversion of vitamin D to its metabolically active forms. Certain prescription and non-prescription drugs can also deplete Vitamin D. Vitamin D does not occur in significant amounts in many foods but does occur in small and variable amounts in milk, butter, cream, egg yolks, and liver, with milk fortified with vitamin D being the major source of this nutrient in the United States.

Low levels of vitamin D is reported in a number of health problems including cardiovascular, insulin resistance and diabetes (both Type I and 2), autoimmune disorders, obesity, cancer and osteoporosis (Thacher et al, 2011). It is estimated that 1 billion people worldwide have Vitamin D deficiency or insufficiency (Holick et al, 2007). A large study that looked at school children and adolescents in the US found that approximately 50.8 million had low levels of vitamin D (Kumar et al, 2009). Age, season, northern latitudes, liver and kidney function, obesity, poor dietary intake, dark skin tone and certain medications (including corticosteroids, anti-ulcer medications) all contribute to low Vitamin D levels.

Immune System: The active form of vitamin D enhances the immune system by stimulating the activity of white blood cells called macrophages. Low vitamin D levels may lead to inflammation and increase the risk for developing autoimmune conditions such as Lupus and rheumatoid arthritis, inflammatory bowel conditions and cancer (including breast, prostate, colon) (Mezawa et al, 2010; Holmoy et al, 2010). Low levels of vitamin D in children may be linked to food allergies and intolerances, possibly due to impaired immune function and microflora (probiotic) imbalances in the digestive tract (Vassallo et al, 2010). Vitamin D plays a role in regulation of the immune system and chronic inflammation. Low vitamin D is associated with several autoimmune diseases including multiple sclerosis, Sjogren's Syndrome, rheumatoid arthritis, thyroiditis and inflammatory bowel conditions (Laverny et al, 2010). Low levels of vitamin D are also associated with chronic pain, such as fibromyalgia, chronic fatigue or peripheral neuropathy (McBeth et al, 2010).

Neurological function: Low vitamin D levels are associated with mood disturbances and depression (May et al, 2010). Activated vitamin D in the adrenal gland regulates tyrosine hydroxylase, an enzyme necessary for the production of brain neurochemicals, including dopamine, epinephrine and norepinephrine. Older adults with low levels of vitamin D appear more likely to experience declines in thinking, learning and memory. People with Parkinson's and Alzheimer's disease have been found to have lower levels of vitamin D (Llewellyn et al, 2010; Anweiler et al, 2010).

Vitamin A - I take 10,000iu

Helps maintain healthy epithelial cells (surface cells of many glands, organs, and skin); helps to facilitate effective barriers to infections.

Vitamin A has been reported uses of:

- Antioxidants
- Skin health, acne, wounds
- Gastrointestinal barrier
- Celiac disease
- Eye health
- Bones and teeth
- Immune balance and infections
- Pancreatic disorders (blood sugar)
- Absorption of fat

Vitamin A requires fats and minerals in order to be properly absorbed from the digestive tract. In my opinion, Vitamin A protects and lubricates the mucous membranes. Plays an important role in maintaining the integrity of epithelial tissue, which are the mucous membrane-secreting cells that line all the glands, and organs of the body. Many studies show that adequate intake of vitamin A is associated with reduced risk to various epithelial-cell cancers (mouth, skin, lungs, bladder, breast, stomach, cervix, etc.)

Zinc - I take 50mg

Zinc is necessary for the functioning of over 300 different enzymes and plays a vital role in a balanced metabolism. In humans, the highest concentrations of zinc are found in the liver, pancreas, kidneys, bone, and muscles. Zinc is highly concentrated in parts of the eye, prostate gland, sperm, skin, hair, and nails.

Zinc imbalanced may include the common cold, respiratory tract infections, wound healing, digestion metabolic syndrome, blood sugar balance, mood disturbances, depression, eye disease, and thyroid balance.

Immune System: Helps regulate a wide variety of immune system activities, including T-lymphocytes, CD4, natural killer cells, and interleukin II. A meta-analysis of 15 clinical trials found that zinc administered within 24 hours of onset of symptoms reduces the duration and severity of the common cold in healthy people (Singh et al, 2011). Another meta-analysis found zinc effective in decreasing the incidence of acute upper respiratory tract infections in children (Roth et al, 2010).

VIRUS TIMELINE

FIRST 48 HOURS

If you think you might have the infection, contact your healthcare provider to determine the best course of action and treatment for you. Anti-viral treatments, especially Vitamin C, Vitamin D, Elderberry, Echinacea etc., taken in the first 48 hours after symptom onset can reduce the severity and duration of flu symptoms.

FREQUENT SYMPTOMS

Viral infections symptoms come on quickly and

typically last a week or two, though sometimes

symptoms can linger mildly for a bit before you feel back to normal. Common symptoms of the virus

include:

1. Fever and chills
2. Exhaustion
3. Aches & Pains
4. Everything hurts

FEVER AND CHILLS

Fever is almost always present with the virus, and it usually comes on suddenly. When you have a high fever, you're also likely to experience chills because the higher your body temperature, the colder the air feels. A fever is the body's defense against the virus.

Viruses thrive at a normal body temperature of 98.6 degrees F, and while uncomfortable, running a fever helps your body fight off the virus. Whether or not to treat the fever depends on how high the temperature is and the person's age.

A low-grade fever (98.7 to 100.4 degrees F) is typically not a concern for adults or most children. It may be best to let a mild fever run its course. However, if you are very uncomfortable or the fever reaches 102 degrees F, bringing the fever down slightly is advised. Consider appropriate fever-reducing medications, such as acetaminophen, ibuprofen (over the age of 6 months), or aspirin (in adults only). Try a lukewarm bath or sponge bath. Avoid

bundling up, as this can increase your body temperature. A very high fever (over 107.6 degrees F) can lead to brain damage and is considered a medical emergency.

EXHAUSTION

One of the most significant symptoms that people describe when they get the flu is pure exhaustion. This is generally an overall feeling of being completely worn out. You probably will be unable to perform daily activities, and fatigue is often so severe that it is hard to just get out of bed. This exhaustion is much more pronounced than the tiredness you may feel from a cold.

ACHES AND PAINS

Feeling "achy" is how many people with the virus infection describe their state. Your muscles are

usually very sore and moving around too much causes discomfort. Body aches and pains are more common with the flu than with many other illnesses.

COUGHING

Coughing may be productive (producing mucus) or non-productive. With the flu, people most often have a dry cough. If you develop a productive cough with fever, contact your doctor. This is especially true if you have had a dry cough, start to feel better, then have a wet or productive cough with a fever. This is often how a secondary infection, like pneumonia, develops.

Mucus color is important. Usually yellow, brown or green is a bacterial infection. White or clear mucous is a sign of viral infection.

HEADACHE

Headaches are common with the flu and can be quite severe, compounding your level of discomfort. Taking an over the counter pain reliever like acetaminophen or ibuprofen may help.

CONGESTION

Severe congestion is more common when you have a cold, but many people will experience some

congestion with the flu as well, it is typically mild.

RARE SYMPTOMS

Vomiting and diarrhea are not common flu symptoms for most people, but some do experience them.

Children are more likely to have vomiting and diarrhea with influenza than adults. If vomiting and diarrhea are your primary and most significant symptoms, you probably have a stomach bug instead of the flu.

WHEN TO SEE A DOCTOR

The viral infection can quickly take a turn for the worse and may require emergency care. If you experience any of these symptoms, seek immediate medical attention as they may be a sign of serious or life-threatening complications:

- Difficulty breathing or shortness of breath
- Persistent pain or pressure in the chest or abdomen
- Persistent dizziness, confusion, inability to arouse
- Seizures
- No urination
- A fever above 105 degrees F that does not respond to medication

If, based on the symptoms, you believe you may have the viral infections, call your doctor right away. Natural therapies can lessen the severity and duration of the flu if started within the first 48 hours of symptom onset. Your doctor may want you to come in to confirm the influenza virus with a rapid in-office test or may prescribe treatments based on your symptoms and flu activity in your area.

You should also contact your doctor if symptoms continue to worsen after a week, or you develop a fever or productive cough after you have started to feel better. This could indicate a secondary infection, such as bronchitis and pneumonia. Other symptoms that require a call to your doctor include severe muscle pain, weakness, or unsteadiness, and any worsening of chronic medical conditions.

IN CHILDREN SEEK IMMEDIATE MEDICAL ATTENTION FOR THESE SYMPTOMS:

Fast breathing or trouble breathing

- Bluish lips or face
- Ribs pulling in with each breath
- Chest pain
- Severe muscle pain (child refuses to walk)
- Dehydration (no urine for eight hours, dry mouth, no tears when crying)
- Not alert or interacting when awake
- Seizures
- A high fever (above 100.3 in infants under 12 weeks of age, above 102.2 degrees F in children under a year, or above 104 degrees F under the age of 12) that does not respond to medication.

WHAT I AM DOING TO PREVENT VIRAL INFECTIONS

I created a personal formula that has the following ingredients. This is a custom formulation, one bottle with everything in it in addition to the above:

- Adrenal Concentrate - 200.00 mg
 - Ashwagandha (*Withania somnifera*) Root Extract - 250.00 mg
 - Biotin- 2,000.00 mcg
 - Choline (as Choline Bitartrate)- 200.00 mg
 - CoQ10 (Ubiquinone)- 100.00 mg
 - Cordyceps (*Cordyceps sinensis*) Extract (8% Cordycepic Acid) - 500.00 mg
 - DHEA (Dehydroepiandrosterone) - 25.00 mg
 - Diindolylmethane (DIM) - 100.00 mg
 - Eleuthero (*Acanthopanax senticosus*) Stem and Root Extract (0.8% Eleutherosides)- 250.00 mg
 - Folate (as Quatrefolic L-5-Methyltetrahydrofolate, glucosamine salt) - 200.00 mcg
 - Methylcobalamin (Vitamin B-12) -250.00 mcg
 - Niacin (as Niacinamide) - 50.00 mg
 - Pantothenic Acid (as Calcium Pantothenate) - 350.00 mg
 - Plant Sterols (95% Phytosterols) -1,000.00 mg
 - Resveratrol (*Polygonum cuspidatum*) Root Extract - 50.00 mg
 - Rhodiola (*Rhodiola rosea*) Root Extract (4% Rosavins, 1% Salidroside)- 100.00 mg
 - Riboflavin (as Riboflavin 5 Phosphate) - 50.00
 - Saw Palmetto (*Serenoa serrulata*) Fruit Extract (45% Total Fatty Acids) - 320.00 mg
 - Trimethyl Glycine (TMG) - Betaine Anhydrous - 200.00 mg
- Schisandra Berry Extract - 100.00 mg
- Vitamin B-6 (as Pyridoxine HCl) - 50.00 mg

IF I HAD THE FLU OR CORONA VIRUS – THIS IS WHAT I WOULD DO:

1. Reduce interaction with others as much as feasible
2. Oral program of the following:
 1. 10,000iu Vitamin A
 2. 10,000iu Vitamin D3
 3. 3-5,000mg Vitamin C
 4. 50mg Zinc
3. Intravenous Vitamin C – this is my favorite treatment for flus, colds, Epstein-Barr, Lyme disease, Staph infections, strep throat . . . 50-75,000mg. Vitamin C helps the immune system. Studies show that vitamin C is essential to stimulate the immune system by increasing the strength and protection of the organism. Due to its role in reducing inflammation, it is essentially for immunity and general health.
4. Ultraviolet Blood irradiation therapy (the cure that time forgot). See the attachment. This is a fantastic German treatment for infections. Combines Vitamin C, oxidative medicine and ultraviolet therapy for blood. FANTASTIC.
5. Take my supplements as listed above 1 dosage every waking hour (8-12 times per day).

DR. JASON WEST

DC NMD FIAMA DCDBN

Dr Jason West runs the world renowned clinic in Pocatello, Idaho and has patients from every state and from every continent. The West Clinic was started in 1916 and celebrates 100+ years of practice with four generations of doctors and six generations of patients. Dr West attended the Southern California University of Health Sciences and was awarded the Outstanding Senior Award (from students) and the Presidential Leadership award from the President. In 2012 and in 2016, Dr Jason West was awarded the Idaho Chiropractor of the Year Award.

Dr West has been relentless in furthering his education. He completed a fellowship in Oriental Medicine, a Diplomate in nutrition and a second doctorate as a Naturopathic Medical Doctor. He uses his diverse educational background and other health care providers (MD, NP, DC, ND, and LAc) at the West Clinic to develop comprehensive treatment plans for all diseases. If it's not an emergency like a heart attack, baby delivery, or surgery, chances are the West Clinic is treating someone with your symptom, diagnosis or condition. They have had excellent results and publish some of the patient outcomes on a digital blog called, www.dailydosevitaminh.com. For more information about clinical treatments or to contact the West Clinic, go to www.westcliniconline.com

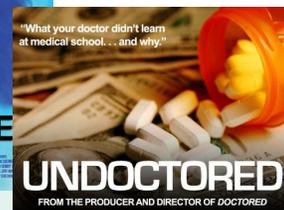
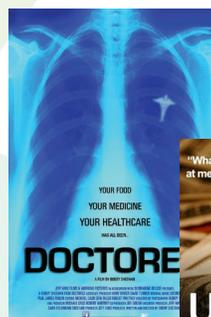
Dr West is a published author in the scientific literature on headaches. He also has several books, 2 of which include Hidden Secrets to Curing Your Chronic Disease, a #1 Amazon Best Seller, and Hidden Secrets to Healthy Living, a health living manual and cookbook.

Dr West has lectured around the world at conferences. He loves teaching seminars for doctors on topics such as clinical nutrition, blood chemistry, chronic disease, and energy deficits as well as motivating staff members and educating patients, and also provides personal consulting with doctors that wish to excel in health care.

Dr West is married to his sweetheart, Maxine and has five sons. His family enjoys snowmobiling and motorcycle riding together. You might find Dr West relaxing by playing the piano or continuing his voracious reading hobby.



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100+ years Clinic Experience
Functional Medicine Collaborator
#1 Amazon Best Selling Author
2x Chiropractor of the Year
5x Best Dad Winner
Peer-reviewed Author





Vitamin A

Snapshot Monograph

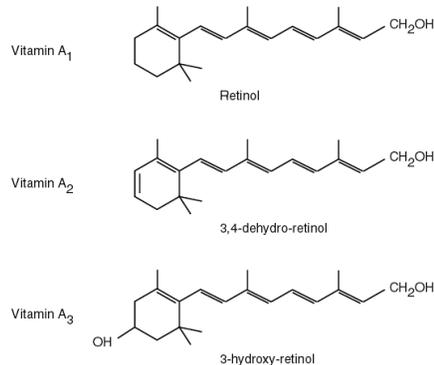
Vitamin A

Most Frequent Reported Uses:

- Antioxidant
- Epithelial skin health; acne, wounds
- Gastrointestinal epithelial barrier health; celiac disease, Crohn's disease
- Ocular health
- Bones and teeth
- Immune balance; infections
- Pancreatic Disorders
- Fat Malabsorption

Nutrient name(s):

Vitamin A
Retinol
Retinyl palmitate
Mixed carotenoids



Introduction:

Vitamin A was the first fat-soluble vitamin to be isolated. Vitamin A is made in the body from retinoids, which occur in animal foodstuff and carotenoids (including beta-carotene, lutein, lycopene, zeaxanthin). Retinoids with vitamin A activity occur in nature in three different forms: a) the alcohol, retinol, b) the aldehyde, retinal or retinaldehyde, and c) the acid, retinoic acid. Beta-carotene, which is also called pro-vitamin A, is found exclusively in plant (fruit and vegetable) sources. Beta-carotene consists of two molecules of vitamin A linked head to head (A-A). Enzymes in the intestinal tract split beta-carotene into two molecules of vitamin A whenever the body needs it.

Vitamin A requires fats as well as minerals in order to be properly absorbed from the digestive tract. Substantial amounts of vitamin A are stored in the liver, and therefore, it does not need to be supplied in the diet on a daily basis.

In order to express the relative levels of vitamin A and beta-carotene in equivalent terms, the retinol equivalent (RE) was created. One RE is equal to 1mcg of all-trans retinol in food, or to 6mcg of all-trans beta-carotene in food.

Functions:

- **Antioxidant**
- **Ocular health** - Required for night vision. Vitamin A combines with the protein opsin to form the photosensitive pigments rhodopsin and iodopsin in the rods and cones of the eyes, which are necessary for night vision. It is also essential for the lubricant from tear glands that prevent drying of the cornea.
- **Epithelial Tissue** - Plays an important role in maintaining the integrity of epithelial tissue, which are the mucous membrane-secreting cells that line all the glands, and organs of the body. Many studies show that adequate intake of vitamin A is associated with reduced risk to various epithelial-cell cancers (mouth, skin, lungs, bladder, breast, stomach, cervix, etc.)
- **Immune System** - Helps maintain healthy epithelial cells (surface cells of many glands, organs, and skin); helps to facilitate effective barriers to infections.
- **Growth and Bone Development:** Essential for the growth of bone and soft tissue. It is also necessary for the formation of tooth enamel in the development of teeth. A 2011 meta-analysis reported that vitamin A supplementation was associated with large reductions in mortality, morbidity, and vision problems in children under 5 years of age (Mayo-Wilson et al, 2011).

Dosage:

DRI*

Women: 2,664 IU daily

Men: 3,330 IU daily

ODA**

5,000 - 35,000 IU daily

* The Dietary Reference Intakes (DRI) are the most recent set of dietary recommendations established by the Food and Nutrition Board of the Institute of Medicine, 1997-2001. They replace previous RDAs, and may be the basis for eventually updating the RDIs.

**The Optimum Daily Allowance (ODA) represents a reference level beyond the RDI, and is often many times higher than the RDI to prevent diseases such as aging or cancer. These numbers are based on clinical use.

Symptoms of Deficiency:

Vitamin A deficiency can be caused by inadequate dietary intake or metabolic dysfunction that interferes with absorption, storage or transport of the vitamin.

- Deficiency of vitamin A is associated with the development and promotion of epithelial cell cancers in various glands and organs in the body.
- Vision problems: Night blindness (nyctalopia) is the classic vision problem resulting from vitamin A deficiency. Xerophthalmia (a drying and hardening of the epithelial cell membranes in the eye) can also develop. This condition causes blindness in hundreds of thousands of infants and children yearly world wide, but seldom occurs in the United States.

- Long-term vitamin A deficiency causes a condition known as follicular hyperkeratosis in which the skin becomes dry, scaly, and rough. Small hard bumps develop on the skin because hair follicles plug up with a hard protein called keratin.
- Vitamin A deficiency in infants and children hinders growth and development. Bone deformities and dental problems often occur.
- The following drugs can cause a depletion of vitamin A, which may increase an individual's need for vitamin A:
 - Cholestyramine
 - Colchicine
 - Colestipol
 - Mineral oil
 - Neomycin
 - Corticosteroids

Side Effects and Warnings:

- Since vitamin A is fat soluble, excesses can accumulate in fatty tissues to toxic levels. Signs of vitamin A toxicity include dry itchy skin, brittle nails, hair loss, bone pain, gingivitis, headaches, muscle and joint pains, anorexia, fatigue, diarrhea, increased infections, enlarged liver and abnormal liver function. Symptoms are reversible when vitamin A is discontinued.
- Hypervitaminosis A has been reported in adults taking in excess of 50,000 IU daily for several years, and in a case of taking a water soluble synthetic vitamin A at 18,500 to 60,000 IU for several months.
- Doses greater than 10,000 IU of Vitamin A have caused birth defects, especially during the first 7 weeks of pregnancy. Women who could potentially become pregnant should limit their daily vitamin A levels to less than 10,000 IU daily.

Food Sources:

- Good food sources of vitamin A include liver, kidney, butter, egg yolk, whole milk and cream, and fortified skim milk. Good food sources of beta-carotene (pro-vitamin A) include yellow and dark leafy green vegetables (carrots, collards, spinach, sweet potatoes, squash) and yellow fruit (apricots, peaches, cantaloupe). Cod liver oil and halibut fish oil contain high levels of vitamin A.

Vitamin A Patient Snapshot

Uses:

- Vitamin A is an important antioxidant vitamin for your body.
- Vitamin A helps prevent night blindness, promotes growth and is needed for healthy skin.

Dosage:

DRI*

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**The Optimum Daily Allowance (ODA) represents a reference level beyond the RDI, and is often many times higher than the RDI to prevent diseases such as aging or cancer. These numbers are based on clinical use.

Special Concerns:

- If you are taking prescription or non-prescription medications, have a pre-existing medical condition, or are pregnant and/or breastfeeding, talk with your healthcare provider before taking any dietary supplement.
- Doses greater than 10,000 IU of Vitamin A have caused birth defects, especially during the first 7 weeks of pregnancy. Women who could potentially become pregnant should limit their daily vitamin A levels to less than 10,000 IU daily.
- Do not take if there is an allergy to any component of this dietary supplement.
- The following medications may deplete vitamin A from the body. When taking these medications, it is best to supplement your diet with vitamin A:
 - Cholestyramine (Questran)
 - Colchicine
 - Colestipol (Colestid)
 - Mineral oil
 - Neomycin
 - Corticosteroids (prednisone, methylprednisolone)

DISCLAIMER: Statements made are for educational purposes and have not been evaluated by the US Food and Drug Administration. They are not intended to diagnose, treat, cure, or prevent any disease. If you have a medical condition or disease, please talk to your doctor prior to using the recommendations given.

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Vitamin C (Ascorbic Acid)

Snapshot Monograph

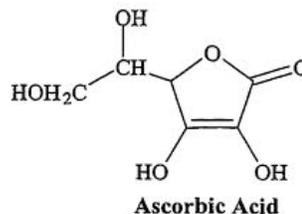
Vitamin C (Ascorbic Acid)

Most Frequent Reported Uses:

- Antioxidant
- Immunity
- Cardiovascular health
- Cancer prevention
- Common cold prevention
- Wound healing
- Neurodegenerative diseases, including Alzheimer's disease
- Scurvey

Nutrient name(s):

Vitamin C
Ascorbic Acid
Ascorbate



Introduction:

Vitamin C cures the world's oldest known nutritional deficiency disease, scurvy. It was first isolated by Albert Szent-Gyorgyi in 1928 from pork adrenal glands and called hexuronic acid. In 1933, its chemical structure was established. It was successfully synthesized, and the name was changed to ascorbic acid.

Vitamin C is a water-soluble vitamin that is stored in many tissues throughout the body, but the adrenal glands contain the highest concentration.

Humans are one of the few species that cannot manufacture vitamin C. We must depend on our diet, or nutritional supplements, as the source of this vitamin. Vitamin C exists in nature in both its reduced form, l-ascorbic acid, and in its oxidized form, l-dehydroascorbic acid. L-ascorbic acid is the most active form. However, in the body they convert back and forth to each other in a reversible equilibrium, and both prevent scurvy (antiscorbutic). Buffered vitamin C refers to the sodium, calcium, magnesium, and

potassium ascorbate salts. These forms of vitamin C are less acidic and may be less likely to cause gastric irritation when taken in higher doses.

Functions:

- **Antioxidant:** Ability to donate hydrogen atoms from the 2-hydroxyl (OH) positions to neutralize free radicals. Capable of regenerating the antioxidant form of vitamin E.
- **Immunity:** Regular supplementation with Vitamin C is reported to decrease the duration of colds (Hemila et al, 2013) and decrease the incidence of infection (Ochoa-Brust et al, 2007). Vitamin C supplementation is reported to:
 - a) Increase production of white blood cells (neutrophils, lymphocytes, and natural killer cells)
 - b) Increase levels of antibodies IgA, IgG, and IgM
 - c) Increase production of interferon
 - d) Modulate prostaglandin synthesis and decrease inflammation
- **Enzyme Activity:** Involved in oxidation-reduction reactions, energy production, tyrosine metabolism, reduction and storage of iron, and the activation of folic acid. It is essential in the synthesis of collagen, serotonin, norepinephrine, thyroxine, and some of the corticosteroids.
- **Collagen and Elastin:** Plays a role in the synthesis of collagen and elastin, the major structural components of skin, tendons, bone matrix, tooth dentin, blood vessels, and connective tissues between cells.
- **Stress:** Required for the synthesis of the body's stress response hormones in the adrenal glands, including epinephrine, norepinephrine, cortisol, and histamine. Stresses, such as fever, burns, exposure to cold, physical trauma, fractures, high altitude and radiation all require larger doses of vitamin C.
- **Cancer Prevention:** Prevents the formation of cancer causing nitrosamines. Increased vitamin C intake is reported to decrease the incidence of breast cancer in women (Hutchinson et al, 2012).
- **Neurodegenerative Diseases:** Oxidative stress is suggested to play a major role in the pathogenesis of Alzheimer's disease (AD), and although the use of vitamin C in treating Alzheimer's patients has equivocal results, vitamin C has been reported to decrease β -amyloid generation and acetylcholinesterase activity and prevent endothelial dysfunction by regulating nitric oxide (Heo et al, 2013).
- **Fat Synthesis:**
 - a) Aids in the conversion of cholesterol to bile acids for excretion
 - b) Necessary for synthesis of collagen and elastin which maintains strength and elasticity of blood vessels
 - c) Decreases free radical oxidation of cholesterol
 - d) Decreases levels of lipoprotein(a) or Lp(a)
- **Cardiovascular health:** A 2012 meta-analysis reported that vitamin C supplementation reduces systolic and diastolic blood pressure in short-term trials (Juraschek et al, 2012).
- **Histamine Inhibitor:** Functions as both a histamine inhibitor (it inhibits the release and enhances the degradation of histamine) and as a phosphodiesterase inhibitor.
- **Antiviral:** Reported to have antiviral activity.

- **Wound healing:** Increases the healing of scars, pressure ulcers, bone fractures, burns, bacterial infections.
- **Detoxifies:** Heavy metal toxins such as mercury, lead, cadmium, and nickel.
- **Misc.:** Vitamin C supplementation is reported to significantly lower serum uric acid and may be beneficial in those with gout (Jurasheck et al, 2011). Vitamin C supplementation is reported to enhance the absorption of iron (Hurrell et al, 2010). Conditions reported to benefit from vitamin C supplementation but need more research include:
 - Asthma
 - Age related macular degeneration and diabetic retinopathy
 - Anemia
 - Osteoarthritis
 - Autism
 - Chronic venous insufficiency
 - Cystic fibrosis
 - Exercise recovery
 - Helicobacter pylori infection
 - Type 2 diabetes/insulin resistance

Dosage:

DRI*

Women: 75mg

Men: 90mg

ODA**

250 - 3000mg daily

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**The Optimum Daily Allowance (ODA) represents a reference level beyond the RDI, and is often many times higher than the RDI to prevent diseases such as aging or cancer. These numbers are based on clinical use.

Symptoms of Deficiency:

- Scurvy is rare in the United States, but sub-clinical deficiencies are common. Deficiency symptoms include capillary fragility, hemorrhage, muscular weakness, easy bruising, gums that bleed easily, poor wound healing, anemia, poor appetite and growth, and tender, swollen joints.
- Stressful situations (both physical and emotional) tend to deplete the body's stores of vitamin C quickly.

- Individuals most likely to experience deficiencies include elderly people on poor diets, alcoholics, people who are severely ill or under chronic stress, and infants who are only fed cow's milk.
- Those with an increased need for vitamin C include:
 - Dialysis Patients
 - Age>55
 - Burns or Injuries
 - Tobacco or Alcohol Abuse
 - Chronic Illnesses
 - Current Infection
 - Prolonged Stress
 - Post Surgery
 - Exposure to Toxins
- The following drugs can cause a depletion of vitamin C, which may increase an individual's need for vitamin C:
 - Aspirin and salicylates
 - Corticosteroids
 - Indomethacin
 - Loop diuretics including furosemide, bumetanide, ethacrynic acid, torsemide
 - Oral contraceptives
 - Tetracycline antibiotics

Side Effects and Warnings:

- There are no known toxicities associated with vitamin C. Diarrhea has been reported from an overdose of vitamin C. Approximately 15% of people taking moderately high doses of vitamin C experience abdominal gas, bloating, and cramping. The mineral ascorbates such as calcium or magnesium ascorbate are not acidic and may solve this problem.
- While vitamin C has not been proven to cause kidney stones, in some individuals its metabolic pathway produces high amounts of oxalic acid, which could increase the risk of stones (Allison 2013). Therefore, people with a history of gout, kidney stones, or kidney disease should not take more than 500mg of vitamin C daily without medical supervision.
- Large doses of vitamin C may interfere with:
 - a) Tests to determine occult blood in the stool
 - b) Tests to monitor blood glucose levels in diabetics

Food Sources:

- The best sources of vitamin C are fresh fruits, especially citrus fruits, strawberries, cantaloupe and currants, and fresh vegetables, especially Brussels sprouts, collard greens, lettuce, cabbage, peas, and asparagus.

Vitamin C Patient Snapshot

Uses:

- Vitamin C is an important antioxidant for the body, helping to decrease the effects of aging and on the development of long-term diseases such as heart disease, diabetes and cancer.
- Vitamin C helps improve the health of your immune system, and can decrease your chances of catching viruses such as colds and influenza.

Dosage:

DRI*

Women: 75mg

Men: 90mg

ODA**

250 – 3000mg daily

* The Dietary Reference Intakes (DRI) are the most recent set of dietary recommendations established by the Food and Nutrition Board of the Institute of Medicine, 1997-2001. They replace previous RDAs, and may be the basis for eventually updating the RDIs.

**The Optimum Daily Allowance (ODA) represents a reference level beyond the RDI, and is often many times higher than the RDI to prevent diseases such as aging or cancer. These numbers are based on clinical use.

Special Concerns:

- If you are taking prescription or non-prescription medications, have a pre-existing medical condition, or are pregnant and/or breastfeeding, talk with your healthcare provider before taking any dietary supplement.
- If you are prone to kidney stones, do not take high doses of vitamin C without consulting your doctor.
- Do not take if there is an allergy to any component of this dietary supplement.
- Those with an increased need for vitamin C include:
 - Dialysis patients
 - Age >55
 - Burns or Injuries
 - Tobacco or Alcohol Abuse
 - Chronic Illnesses
 - Current Infection
 - Prolonged Stress
 - Post Surgery
 - Exposure to Toxins
- The following medications may deplete vitamin C from the body. When taking these medications, it is best to supplement your diet with vitamin C:
 - Aspirin and salicylates
 - Corticosteroids
 - Indomethacin
 - Loop diuretics including furosemide, bumetanide, ethacrynic acid, torsemide
 - Oral contraceptives
 - Tetracycline antibiotics

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Vitamin D

Snapshot Monograph

Vitamin D

Most Frequent Reported Uses:

- Bone health/osteoporosis
- Cardiovascular health
- Decrease mortality
- Pain
- Increase calcium absorption
- Immune support
- Cancer prevention
- Insulin resistance/blood sugar regulation
- Seasonal depression
- Multiple sclerosis
- Allergy
- Asthma
- Insulin and Thyroid receptor activation.
- Weight loss

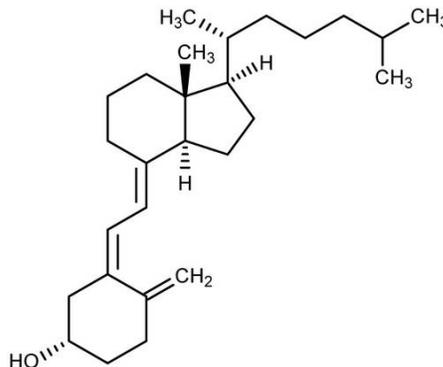
Nutrient name(s):

Vitamin D

Vitamin D₂ (ergocalciferol)

Vitamin D₃ (cholecalciferol)

Calcitriol (1,25 dihydroxy cholecalciferol)



Vitamin D-3

Introduction:

Vitamin D is a fat-soluble vitamin that was isolated in 1930 and named calciferol. Since then more metabolites have been found, and the two major forms of this vitamin are now known to be vitamin D₂ (ergocalciferol) and vitamin D₃ (cholecalciferol). Vitamin D is actually a hormone precursor, which can be manufactured by the body. Therefore, in a classical sense, it is not actually an essential nutrient. However, since the disease rickets is related to vitamin D deficiency, it has been traditionally classified as a vitamin.

Vitamin D is known as the “sunshine” vitamin. It is formed in the body by the action of the sun’s ultraviolet rays on the skin, converting the biological precursor 7-dehydroergosterol (found in animals and humans) into vitamin D₃. Vitamin D₃ is converted in the liver to 25-hydroxycholecalciferol (25-HCC), which is five times more

active than vitamin D₃. 25-HCC is then converted in the kidneys to 1,25-dihydroxycholecalciferol (1,25-HCC), which is 10 times more potent than vitamin D₃. The active 1,25-HCC form of vitamin D is also called calcitrol. Since calcitrol is produced in the kidney and functions elsewhere in the body, it is considered a hormone, with the intestines and bone as its target.

Low levels of vitamin D can result from inadequate dietary intake, insufficient exposure to sunlight, which reduces the body's synthesis of vitamin D, and kidney or liver imbalances, which inhibit the conversion of vitamin D to its metabolically active forms. Certain prescription and non-prescription drugs can also deplete Vitamin D. Vitamin D does not occur in significant amounts in many foods but does occur in small and variable amounts in milk, butter, cream, egg yolks, and liver, with milk fortified with vitamin D being the major source of this nutrient in the United States.

Low levels of vitamin D is reported in a number of health problems including cardiovascular, insulin resistance and diabetes (both Type I and 2), auto-immune disorders, obesity, cancer and osteoporosis (Thacher et al, 2011). It is estimated that 1 billion people worldwide have Vitamin D deficiency or insufficiency (Holick et al, 2007). A large study that looked at school children and adolescents in the US found that approximately 50.8 million had low levels of vitamin D (Kumar et al, 2009). Age, season, northern latitudes, liver and kidney function, obesity, poor dietary intake, dark skin tone and certain medications (including corticosteroids, anti-ulcer medications) all contribute to low Vitamin D levels.

Functions:

- **Bones and Teeth:** Involved in both the formation (mineralization) of bone, as well as in the mobilization (de-mineralization) of bone. The most active form of vitamin D, 1,25-dihydroxycholecalciferol, requires the intestinal absorption of calcium and phosphorus, which are important for the development of bones and teeth. For this reason, vitamin D is an important growth nutrient for infants and children. Vitamin D deficiency is linked to poor bone mineral density (Harwood et al, 2004).

With an estimated 10 million individuals in the US already with osteoporosis and almost 34 million more estimated to have low bone mass, the importance of adequate vitamin D levels cannot be overemphasized (National Osteoporosis Foundation, 2010). Vitamin D deficiency is prevalent in the US, 60% of nursing home residents and 57% of hospitalized patients being vitamin D deficient (Hoeck et al, 2008). Vitamin D supplementation has been reported to reduce bone fractures by at least 20% in individuals aged 65 and older and to reduce the risk of falls (Kalyani et al, 2010; Bischoff-Ferrari et al, 2009). Low levels of vitamin D can also lead to calcium, magnesium, iron and zinc deficiencies.

- **Cardiovascular system:** In humans, low vitamin D has been strongly linked to heart and vascular problems including high blood pressure, blood vessel

problems, atherosclerosis, heart attack and stroke (Melamed et al, 2008; Pilz et al, 2008; Sugden et al, 2008). In addition, low Vitamin D is linked to death associated with heart problems (Dobnig et al, 2008). Vitamin D supplementation is reported to reduce systolic blood pressure and decrease the risk of cardiovascular disease (CVD) in humans (Wu et al, 2010; Wang et al, 2010).

- **Metabolic health:** Vitamin D also has anti-inflammatory effects that may indirectly help improve insulin sensitivity. Blood sugar control in people with type 2 diabetes has a seasonal variation, being worse in the winter, in part explained by variation in exposure to sunlight and vitamin D levels (Dasgupta et al, 2007). Research suggests that low levels of vitamin D may contribute to or be a cause of metabolic syndrome with associated hypertension, obesity, diabetes and heart disease (Beydoun et al, 2010).

Research has found an association between endotoxemia (circulating lipopolysaccharide in the systemic circulation) and low-grade inflammation in adipose tissue, which may contribute to obesity (Lee et al, 2009). Vitamin D is important in immune system health and colonic mucosa, and vitamin D deficiencies contribute to endotoxemia and chronic inflammation. The parathyroid-vitamin D axis is altered in obesity, with circulating vitamin D levels being lower in obese individuals. With excess adipose tissue, vitamin D is deposited into the fat stores, where it becomes less available for use in the body - a suggested mechanism leading to insulin resistance.

Vitamin D also plays a role in the production of estrogen in men and women, partly by helping maintain calcium homeostasis and also expression of the aromatase gene (Brodowska et al, 2009). PCOS (Polycystic Ovarian Syndrome) has been corrected by supplementation of D and calcium (Selimoglu et al, 2010). Vitamin D supplementation has been reported to increase levels of testosterone in healthy men (Pilz et al, 2011).

- **Immune System:** The active form of vitamin D enhances the immune system by stimulating the activity of white blood cells called macrophages. Low vitamin D levels may lead to inflammation and increase the risk for developing autoimmune conditions such as Lupus and rheumatoid arthritis, inflammatory bowel conditions and cancer (including breast, prostate, colon) (Mezawa et al, 2010; Holmoy et al, 2010). Low levels of vitamin D in children may be linked to food allergies and intolerances, possibly due to impaired immune function and microflora (probiotic) imbalances in the digestive tract (Vassallo et al, 2010). Vitamin D plays a role in regulation of the immune system and chronic inflammation. Low vitamin D is associated with several autoimmune diseases including multiple sclerosis, Sjogren's Syndrome, rheumatoid arthritis, thyroiditis and inflammatory bowel conditions (Laverny et al, 2010). Low levels of vitamin D are also associated with chronic pain, such as fibromyalgia, chronic fatigue or peripheral neuropathy (McBeth et al, 2010).

- **Neurological function:** Low vitamin D levels are associated with mood disturbances and depression (May et al, 2010). Activated vitamin D in the adrenal gland regulates tyrosine hydroxylase, an enzyme necessary for the production of brain neurochemicals, including dopamine, epinephrine and norepinephrine. Older adults with low levels of vitamin D appear more likely to experience declines in thinking, learning and memory. People with Parkinson’s and Alzheimer’s disease have been found to have lower levels of vitamin D (Llewellyn et al, 2010; Anweiler et al, 2010).

Dosage:

DRI*

Vitamin D3 - 200 I.U. daily

ODA**

Vitamin D3 - 200 – 5,000 I.U. daily; 25,000 IU daily can be used for short periods of time.

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Laboratory Reference Values

| | |
|--|---------------|
| Vitamin D3 - [25(OH)D] <i>(in nanograms per milliliter = ng/ml)</i> | |
| Normal Range [adults, 25(OH)D] | 10 - 55 ng/mL |

Symptoms of Deficiency:

- Rickets is the classical childhood vitamin D deficiency disease. Insufficient deposition of calcium phosphate into the bone matrix creates bones that are not strong enough to withstand the ordinary stresses and strains of weight bearing. In adults, vitamin D deficiency can result in osteomalacia and osteoporosis.
- Vitamin D deficiency can result from inadequate dietary intake, insufficient exposure to sunlight, which reduces the body’s synthesis of vitamin D, and kidney or liver malfunctions, which inhibit the conversion of vitamin D to its metabolically active forms.
- Osteoporosis increases the risk of skeletal fractures.

- Osteomalacia is the adult equivalent of rickets where vitamin D deficiency causes softening of the bones, which can lead to deformities. This condition occurs more frequently in the elderly. It can cause rheumatic pain, muscle weakness, and increases the likelihood of fractures of the hip and pelvis.
- Vitamin D deficiency can also cause a gradual hearing loss because demineralization of the bones in the middle ear inhibit the transmission of vibrations to the nerves that communicate sound waves to the brain.
- Vitamin D is connected to a variety of other diseases that include different cancer types, muscular weakness, hypertension, autoimmune diseases, multiple sclerosis, type 1 diabetes, schizophrenia and depression.
- Vitamin D deficiency also causes muscle weakness, severe tooth decay, and phosphorus retention in the kidneys.
- Those with an increased need for vitamin D include:
 - Lack of Sunlight
 - Pregnancy and Breastfeeding
 - Substance Abusers
 - Prolonged Stress
 - Partial Removal of GI Tract
 - Dark Skinned
 - Vegetarians
 - Cystic Fibrosis
 - Obese/overweight individuals
- The following drugs can cause a depletion of vitamin D, which may increase an individual's need for vitamin D:
 - Anticonvulsants including barbiturates, carbamazepine, fosphenytoin and phenytoin
 - Bile acid sequestrants including cholestyramine and colestipol
 - Corticosteroids
 - H-2 receptor antagonists including cimetidine, famotidine, nizatidine, and ranitidine
 - Isoniazid
 - Mineral oil
 - Rifampin

Side Effects and Warnings:

- Vitamin D can be toxic. Excessive intake of this nutrient results in hypercalcemia, which causes calcium deposits in soft tissues such as kidneys, arteries, heart, ears, and lungs. Signs of vitamin D toxicity include headache, weakness, nausea and vomiting, and constipation.

Food Sources:

- Vitamin D does not occur in significant amounts in many foods. It occurs in small and highly variable amounts in butter, cream, egg yolks, and liver. Milk fortified with vitamin D is the major source of this nutrient in the United States.

Vitamin D Patient Snapshot

Uses:

- Vitamin D is important in helping to decrease the effects of aging and on the development of long-term imbalances in metabolism such as thyroid and sex hormones, weight gain, heart disease, diabetes/insulin resistance and cancer.
- Vitamin D is especially important for healthy bones and teeth.
- Vitamin D may help improve the health of your immune system, and can decrease your chances of catching viruses such as colds and influenza.
- Vitamin D has also been reported useful in helping manage seasonal depression.

Dosage:

DRI*

Vitamin D3 - 200 I.U. daily

ODA**

Vitamin D3 - 200 – 5,000 I.U. daily

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Special Concerns:

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 - Bile acid sequestrants including cholestyramine and colestipol
 - Corticosteroids
 - H-2 receptor antagonist including cimetidine, famotidine, nizatidine, and ranitidine
 - Isoniazid
 - Mineral oil
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Zinc

Snapshot Monograph

Zinc

Most Frequent Reported Uses:

- Immune balance, including the common cold; respiratory tract infections; wound healing
- Digestive problems including diarrhea, Crohn's Disease, PUD
- Metabolic syndrome
- Insulin resistance/type 2 Diabetes
- Prostate health
- Mood disturbances, including depression
- Ocular health including macular degeneration, diabetic retinopathy, cataracts
- Thyroid hormone balance

Nutrient name(s):

Zinc

Nutrient Form(s):

Zinc arginate, ascorbate, aspartate, citrate, gluconate, glycinate, histidinate, methionate, oxide, picolinate, and sulfate.

Introduction:

Zinc is necessary for the functioning of over 300 different enzymes and plays a vital role in a balanced metabolism. In humans, the highest concentrations of zinc are found in the liver, pancreas, kidneys, bone, and muscles. Zinc is highly concentrated in parts of the eye, prostate gland, sperm, skin, hair, and nails.

Cooking acidic foods in galvanized cookware used to be a possible source of excess zinc intake. The widespread use of stainless steel and plastic materials to prepare and store foods has largely eliminated this problem. Galvanized pipes in older plumbing systems are known to leach zinc into drinking water supplies, but modern plumbing have phased out the use of galvanized pipes.

Functions:

- **Enzyme catalyst**
- **Immune System:** Helps regulate a wide variety of immune system activities, including T-lymphocytes, CD4, natural killer cells, and interleukin II. A meta-analysis of 15 clinical trials found that zinc administered within 24 hours of onset of symptoms reduces the duration and severity of the common cold in healthy people (Singh et al, 2011). Another meta-analysis found zinc effective in decreasing the incidence of acute upper respiratory tract infections in children (Roth et al, 2010).
- **Antioxidant:** Cofactor for the antioxidant enzyme Zn/Cu superoxide dismutase.
- **Wound Healing:** Facilitates wound healing, especially in burns, surgical, and other types of scars. Helps improve DNA, protein and cell synthesis.

- **Diarrhea:** A 2013 meta-analysis reported that oral zinc administration significantly decreased diarrhea duration and improved health of malnourished children (Galvao et al, 2013).
- **Depression:** A 2013 meta-analysis reported that low levels of zinc correlate with an increased incidence of depression (Swardfager et al, 2013). A population-based epidemiological study (n=2,163) reported that low dietary zinc intake was associated with an increase of depression in women and that zinc supplementation helped to decrease the incidence of depression (Maserejian et al, 2012). However, a 20-year prospective study (n=2,317) reported that zinc levels and dietary zinc intake did not have relevance for the prevention of depression in men (Lehto et al, 2013).
- **Blood sugar regulation:** Studies have reported that zinc plays an important role in insulin synthesis, storage, secretion, and action, while also being involved in various stages of carbohydrate and protein metabolism (Chausmer et al, 1998). Studies report diabetics have an increased need for zinc (Foster et al, 2013). A 2012 systematic review and meta-analysis on the effects of zinc supplementation in those with diabetes reported that zinc supplementation helped to reduce blood glucose, total cholesterol, and LDL cholesterol while improving glycemic control as demonstrated by a reduction in HbA1c (Jaywardena et al, 2012). A 2013 meta-analysis (n=3978) reported similar results (Capdor et al, 2013).
- **Prostate Health:** The prostate epithelial cells in men contain uniquely high zinc level. Zinc transporters are altered in those with prostate cancer, leading to decreased levels of zinc (Franz et al, 2013).
- **Ocular health:** Zinc is reported in laboratory and human studies to be an important mineral for ocular health, including cataracts, macular degeneration and diabetic retinopathy. A 2013 review reported that zinc was important in the prevention of diabetic retinopathy (Miao et al, 2013). A 2013 systematic review reported zinc is also important in age-related macular degeneration, although more research should be performed (Vishwanathan et al, 2013).
- **Thyroid hormone Balance:** Thyroid hormones influence zinc metabolism by affecting zinc absorption and excretion, and zinc levels affect thyroid hormone function. Low levels of zinc correlate with an increase in thyroid autoantibodies, suggesting a zinc and autoimmunity relationship (Ertek et al, 2010).
- **Other Uses:** In a 2013 meta-analysis, zinc was reported to help improve the overall performance of patients with hepatic encephalopathy, although morbidity and quality of life were not reported (Chavez-Tapia et al, 2013).

Dosage:

DRI*

15mg daily

ODA**

15 - 100mg daily

* The Dietary Reference Intakes (DRI) are the most recent set of dietary recommendations established by the Food and Nutrition Board of the Institute of Medicine, 1997-2001. They replace previous RDAs, and may be the basis for eventually updating the RDIs.

**The Optimum Daily Allowance (ODA) represents a reference level beyond the RDI, and is often many times higher than the RDI to prevent diseases such as aging or cancer. These numbers are based on clinical use.

Symptoms and Causes of Deficiency:

Marginal zinc deficiencies are reported to be common in the United States. Because of its extensive range of biological activities, zinc deficiency can cause a wide range of deficiency symptoms. The symptoms of zinc deficiency are: acne, impaired sense of smell and taste, delayed wound healing, anorexia, decreased immunity, frequent infections, depression, photophobia, night blindness, problems with skin, hair and nails, menstrual problems, joint pain, and involuntary, cyclical movements of the eyeball (nystagmus).

- Increased levels of copper (Cu) is associated with decreased levels of zinc (Mao et al, 2013).
- Zinc deficiency conditions were first reported in the 1950s in growing children and adolescent males from Iran, Iraq, and Turkey. Diets low in animal protein and high in phytate-containing grains produced symptoms of dwarfism, hypogonadism and failure to mature sexually.
- Pregnant women have greater zinc needs. Deficiency can cause impaired fetal development, low birth weight infants and birth defects. Stretch marks during pregnancy are also partially due to zinc deficiency.
- Zinc deficiency can be caused by inadequate dietary intake due to foods grown on zinc-depleted soils. Food processing also removes zinc, so fast foods and processed foods are also zinc depleted.
- Protein and/or calorie-restricted diets can lead to zinc deficiency.
- Zinc depletion is frequently seen in the following medical conditions: alcoholism, macular degeneration, diabetes, malignant melanoma, liver and kidney diseases, malabsorption syndromes such as celiac sprue, and inflammatory bowel diseases such as Crohn's disease.
- Those with an increased need for zinc include individuals with:
 - Acne
 - Arthritis
 - Benign Prostatic Hyperplasia and prostate cancer
 - Common Cold
 - Crohn's Disease
 - Diabetes; insulin resistance
 - Immune Function
 - Eye conditions including macular degeneration and diabetic retinopathy
 - Skin Conditions
 - Ulcers
 - Vegetarians (Foster et al, 2013)
 - Wound Healing
- The following drugs can cause a depletion of zinc, which may increase an individual's need for zinc:
 - ACE Inhibitors
 - Clofibrate

- Corticosteroids
- Ethambutol
- Loop Diuretics
- Oral Contraceptives
- Penicillamine
- Thiazide Diuretics
- Valproic Acid
- Zidovudine
- H₂ Antagonists
- Tetracyclines
- Copper
- Iron

Side Effects and Warnings:

- Zinc is relatively non-toxic, and although toxicity has been reported in humans, it is uncommon. Ingestion of high levels of zinc can induce a copper deficiency. Doses of 45mg/day are safe, but regular intake greater than 150mg/day could be a problem. Zinc toxicity can cause diarrhea, dizziness, drowsiness, vomiting, loss of muscle coordination, and lethargy. Inhalation of zinc oxide in certain industrial environments can also be a source of excess exposure.

Food Sources:

- The best dietary sources of zinc are lean meats, liver, eggs, and seafood (especially oysters). Whole grain breads and cereals are also good sources of zinc.

Zinc Patient Snapshot

Uses:

- Some of the uses of zinc as a dietary supplement for your health include:
 - Antioxidant
 - Blood sugar regulation
 - Immune balance
 - Prostate health
 - Eye health, including night-blindness, macular degeneration and diabetic retinopathy

Dosage:

DRI*

15mg daily

ODA**

15 – 100mg daily

* The Dietary Reference Intakes (DRI) are the most recent set of dietary recommendations established by the Food and Nutrition Board of the Institute of Medicine, 1997-2001. They replace previous RDAs, and may be the basis for eventually updating the RDIs.

**The Optimum Daily Allowance (ODA) represents a reference level beyond the RDI, and is often many times higher than the RDI to prevent diseases such as aging or cancer. These numbers are based on clinical use.

Special Concerns:

- If you are taking prescription or non-prescription medications, have a pre-existing medical condition, or are pregnant and/or breastfeeding, talk with your healthcare provider before taking any dietary supplement.
- Do not take if there is an allergy to any component of this dietary supplement.
- Zinc levels are in balance with copper (Cu) levels; if you are taking a multiple vitamin with copper if it best if you take extra zinc
- Those with an increased need for zinc include individuals with:
 - Acne
 - Arthritis
 - Benign Prostatic Hyperplasia
 - Common Cold
 - Crohn's Disease
 - Diabetes
 - Immune Function
 - Macular Degeneration
 - Skin Conditions
 - Ulcers
 - Wound Healing
 - Vegetarian
- The following drugs can cause a depletion of zinc, which may increase an individual's need for zinc:
 - ACE Inhibitors
 - Clofibrate
 - Corticosteroids
 - Ethambutol
 - Diuretics
 - Oral Contraceptives (birth control pills)
 - Penicillamine
 - Valproic Acid
 - Zidovudine
 - H₂ Antagonists (cimetidine, ranitidine)
 - Tetracyclines
 - Copper
 - Iron

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