Vitamin D

What is it?
Vitamin D is required for the regulation of the minerals calcium and phosphorus found in the body. It also plays an important role in maintaining proper bone structure.

Sun exposure is an easy, reliable way for most people to get vitamin D. Exposure of the hands, face, arms, and legs to sunlight 2-3 times a week for about one-fourth of the time it would take to develop a mild sunburn will cause the skin to produce enough vitamin D. The necessary exposure time varies with age, skin type, season, time of day, etc. Just 6 days of casual sunlight exposure without sunscreen can make up for 49 days of no sunlight exposure. Body fat acts like a kind of storage battery for vitamin D. During periods of sunlight, vitamin D is stored in fat and then released when sunlight is gone.

Vitamin D deficiency is more common than you might expect. People who don't get enough sun, especially people living in Canada and the northern half of the US, are especially at risk. However, even people living in sunny climates might be at risk, possibly because people are staying indoors more, covering up when outside, or using sunscreens to reduce skin cancer risk.

Older people are also at risk for vitamin D deficiency. They are less likely to spend time in the sun, have fewer "receptors" in their skin that convert sunlight to vitamin D, may not get vitamin D in their diet, may have trouble absorbing vitamin D even if they do get it in their diet, and may have more trouble converting dietary vitamin D to a useful form due to kidney problems. In fact, some scientists suggest that the risk for vitamin D deficiency in people over 65 years of age is very high. As many as 40% of older people living in sunny climates such as South Florida might not have optimal amounts of vitamin D in their systems.

Vitamin D supplements may be necessary for older people, people living in northern latitudes, and for dark-skinned people who need extra time in the sun, but don't get it. Talk to your health care provider about whether a supplement is best for you.

Is it Effective?

Natural Medicines rates effectiveness based on scientific evidence according to the following scale: Effective, Likely Effective, Possibly Effective, Possibly Ineffective, Likely Ineffective, Ineffective, and Insufficient Evidence to Rate.

The Effectiveness ratings for Vitamin D are as follows:

Natural Medicines Comprehensive Database rates effectiveness based on scientific evidence according to the following scale: Effective, Likely Effective, Possibly Effective, Possibly Ineffective, Likely Ineffective, Ineffective, and Insufficient Evidence to Rate.

The effectiveness ratings for are as follows:

- **Low levels of phosphate in the blood due to an inherited disorder called familial hypophosphatemia.** Taking vitamin D in forms known as calcitriol or dihydrotachysterol by mouth along with phosphate supplements is effective for treating bone disorders in people with low levels of phosphate in the blood.

- **Low levels of phosphate in the blood due to a disease called Fanconi syndrome.** Taking vitamin D in the form known as ergocalciferol by mouth is effective for treating low levels of phosphate in the blood due to a disease called Fanconi syndrome.

- **Low blood calcium levels due to low parathyroid hormone levels.** Low levels of parathyroid hormone can cause calcium levels to become too low. Taking vitamin D in forms known as dihydrotachysterol, calcitriol, or ergocalciferol by mouth is effective for increasing calcium blood levels in people with low parathyroid hormone levels.

- **Softening of the bones (osteomalacia).** Taking vitamin D in a form known as cholecalciferol is effective for treating softening of the bones. Also, taking vitamin D in a form known as calcifediol is effective for treating softening of the bones due to liver disease. In addition, taking vitamin D in a form known as ergocalciferol is effective for treating softening of the bones caused by medications or poor absorption syndromes.

- **A bone disorder called renal osteodystrophy, which occurs in people with kidney failure.** Taking vitamin D in a form known as calcitriol by mouth manages low calcium levels and prevents bone loss in people with kidney failure.
• **Rickets.** Vitamin D is effective for preventing and treating rickets. A specific form of vitamin D, calcitriol, should be used in people with kidney failure.

• **Vitamin D deficiency.** Vitamin D is effective for preventing and treating vitamin D deficiency.

**Likely Effective for...**

• **Bone loss in people taking drugs called corticosteroids.** Taking vitamin D in forms known as calcifediol, cholecalciferol, calcitriol, or alfalcacidol by mouth prevents bone loss in people taking drugs called corticosteroids. Also, taking vitamin D alone or with calcium seems to improve bone density in people with existing bone loss caused by using corticosteroids.

• **Osteoporosis (weak bones).** Taking a specific form of vitamin D called cholecalciferol along with calcium seems to help prevent bone loss and bone breaks.

• **A type of psoriasis called plaque psoriasis.** Applying vitamin D in the form of calcitriol, calcipotriene, maxacalcitol, or paricalcitol seems to help treat plaque-type psoriasis. Applying vitamin D along with corticosteroids seems to work better than applying vitamin D or corticosteroids alone.

**Possibly Effective for...**

• **Cavities.** Analysis of clinical research suggests that taking vitamin D in forms known as cholecalciferol or ergocalciferol reduces the risk of cavities by 36% to 49% in infants, children and adolescents.

• **Heart failure.** Some early research suggests that people with low vitamin D levels have an increased risk of developing heart failure compared to those with higher vitamin D levels. Also, most research suggests that taking vitamin D supplements, including vitamin D in a form known as cholecalciferol, may decrease the risk of death in people with heart failure.

• **Bone loss caused by having too much parathyroid hormone (hyperparathyroidism).** Taking vitamin D in a form known as cholecalciferol by mouth seems to reduce parathyroid hormone levels and bone loss in women with a condition called hyperparathyroidism.

• **Multiple sclerosis (MS).** Early research shows that taking vitamin D long-term can reduce the risk of developing MS in women by up to 40%. Taking at least 400 IU daily, the amount typically found in a multivitamin supplement, seems to work the best.

• **Respiratory infections.** Most research shows that taking vitamin D helps prevent respiratory infections in children and adults. A respiratory infection can be the flu, a cold, or an asthma attack triggered by a cold or other infection. Some research shows that taking vitamin D during pregnancy reduces the risk of these infections in the child after birth. But conflicting results exist.

• **Tooth loss.** Taking calcium and vitamin D in a form known as cholecalciferol by mouth appears to prevent tooth loss in elderly people.

**Possibly Ineffective for...**

• **Breast cancer.** Evidence on the effects of vitamin D on breast cancer risk is not clear. The best evidence comes from a large study called the Women's Health Initiative, which found that taking 400 IU of vitamin D and 1000 mg of calcium per day does not lower the chance of getting breast cancer when taken by postmenopausal women. However, the possibility remains that high doses of vitamin D might lower breast cancer risk in younger women.

• **Cancer.** Although some research shows that people who take a high-dose of vitamin D have a lower risk of developing cancer, most research does not support this.

• **Heart disease.** Early research suggests that people with low levels of vitamin D in their blood are more likely to develop heart disease, including heart failure, than people with higher vitamin D levels. However, taking vitamin D does not seem to extend the life of people with heart disease.

• **Fractures.** Vitamin D doesn't seem to prevent fractures in older people when used alone or in low doses with calcium. Vitamin D also doesn't seem to prevent fractures in older people who still live in the community when used in higher doses with calcium. But it might help prevent fractures in older people living in a nursing home.

• **High blood pressure.** Early research suggests that people with low blood levels of vitamin D have a higher risk of developing high blood pressure than people with normal blood levels of vitamin D. However, most research suggests that taking vitamin D does not reduce blood pressure in people with high blood pressure.

• **Bone loss in people with kidney transplants.** Taking vitamin D in a form known as calcitriol by mouth along with calcium does not decrease bone loss in people with kidney transplants.

• **Tuberculosis.** Taking vitamin D by mouth does not appear to help cure tuberculosis infections.
- **Alzheimer’s disease.** Early research suggests that people with Alzheimer's disease have lower blood levels of vitamin D than patients without Alzheimer's disease. It's not clear if taking vitamin D benefits people with Alzheimer's disease.

- **Asthma.** People with asthma and low blood levels of vitamin D seem to need to use an inhaler more often and have a higher risk of asthma complications. However, the role of vitamin D supplements in treating asthma is unclear. Best evidence to date shows that taking vitamin D by mouth for up to one year can reduce the rate of severe asthma attacks by about 31% to 36% in adults and children with asthma. But it's still too soon to know which, if any, people with asthma are most likely to respond to treatment with vitamin D.

- **Overgrowth of bacteria in the vagina (bacterial vaginosis).** Early research suggests that taking vitamin D does not prevent bacterial vaginosis in women at high risk for sexually transmitted disease when taken along with standard therapy.

- **Kidney disease.** Research suggests that vitamin D decreases parathyroid hormone levels in people with chronic kidney disease. However, taking vitamin D does not appear to lower the risk of death in people with kidney disease. Also, taking vitamin D might increase calcium and phosphate levels in people with kidney disease.

- **Chronic obstructive pulmonary disease (COPD).** People with COPD seem to have lower vitamin D levels that people without COPD. But there is not enough information to know if taking a vitamin D supplement can decrease symptoms of COPD.

- **Mental function.** Early research shows low vitamin D levels are linked to worse mental performance compared to high vitamin D levels. However, it's not clear if taking vitamin D can improve mental function.

- **Colorectal cancer.** It is not clear if vitamin D might benefit colorectal cancer. Some research shows that vitamin D might be an important factor in developing colorectal cancer. But other research shows that taking vitamin D with calcium doesn’t lower the risk of colorectal cancer.

- **Critical illness requiring intensive care in the hospital.** Early research shows that giving vitamin D to people who are hospitalized in an intensive care unit with a critical illness might improve survival. The benefit of vitamin D might be limited to those people with very low vitamin D levels. More research is needed.

- **Dementia.** Early research suggests that people with dementia have lower blood levels of vitamin D than people without dementia. However, it's not known if taking vitamin D benefits people with dementia.

- **Diabetes.** Early research shows that people with lower vitamin D levels may be more likely to develop type 2 diabetes compared to people with higher vitamin D levels. However, evidence is unclear if taking vitamin D supplements can treat or prevent type 2 diabetes. Early research suggests that giving vitamin D supplements to infants daily during the first year of life is linked to a lower risk of developing type 1 diabetes later in life.

- **Preventing falls in older people.** The role of vitamin D for fall prevention is confusing and controversial. Clinical practice guidelines published in 2010 recommend that elderly people who have low levels of vitamin D or who are at an increased risk of falling take 800 IU of vitamin D per day to reduce the risk of falling. These recommendations are supported by both population research and some clinical studies. People who do not have enough vitamin D tend to fall more often than people who do. Some research shows that taking vitamin D reduces the risk of falling and the rates of falls in elderly people. It's not known if vitamin D works better when taken alone or with calcium. There is also some speculation that vitamin D only reduces falls in people who are vitamin D deficient. Despite these positive findings, some research shows that vitamin D doesn't prevent falls in elderly people. The best evidence to date shows that vitamin D does not reduce the risk of falling in elderly people. Current clinical practice guidelines do not recommend vitamin D for fall prevention in older adults who live at home and do not have osteoporosis or low vitamin D levels. There is some belief that the conflicting results regarding the effects of vitamin D on fall prevention result from the way in which clinical trial data is reported. Also, the size of the clinical trial may affect the results. It is possible that some patients may still benefit from vitamin D supplementation for reducing fall risk. But who exactly might benefit and what dose or duration of treatment is optimal, if any, remains unclear. For those who are at risk for vitamin D deficiency, a vitamin D supplement should still be considered.

- **A condition of chronic pain called fibromyalgia.** Early research suggests that taking vitamin D might decrease pain in people with fibromyalgia and low vitamin D levels in the blood. However, taking vitamin D does not seem to help mood or quality of life.

- **High cholesterol.** People with lower vitamin D levels seem to be more likely to have high cholesterol than people with higher vitamin D levels. Limited research shows that taking calcium plus vitamin D daily, in combination with a low-calorie diet, significantly raises "good" (HDL) cholesterol and lowers "bad" (LDL) cholesterol in overweight women. However, taking calcium plus vitamin D without dietary restrictions does not reduce LDL cholesterol levels. Other research suggests that vitamin D might actually increase LDL and have no beneficial effect on HDL, triglycerides, or total cholesterol.

- **Low birth weight.** The effect of taking vitamin D during pregnancy on the risk of low birth weight or small gestational age birth is inconsistent. Additional studies are needed to determine who might benefit, if any, and what dose or formulation of vitamin D is optimal to prevent low weight at birth.
• **Metabolic syndrome.** There is conflicting evidence about the link between vitamin D and metabolic syndrome. Some research suggests that women aged at least 45 years who consume high amounts of vitamin D or take vitamin D supplements do not have a lower risk of developing metabolic syndrome. However, other research suggests that higher vitamin D levels are linked to a lower risk of metabolic syndrome.

• **Muscle strength.** Taking vitamin D by mouth does not appear to improve muscle strength in people with sufficient blood levels of vitamin D. However, taking vitamin D by mouth, alone or in combination with calcium, may improve hip and leg muscle strength in people who have low levels of vitamin D, especially the elderly. Single injections of vitamin D do not seem to have beneficial effects.

• **A blood cell disease called myelodysplastic syndrome.** Taking vitamin D in forms known as calcitriol or calcifediol by mouth seems to help people with myelodysplastic syndrome.

• **Overall death risk.** Early research suggests that having low vitamin D levels is linked with an increased risk of death from any cause. Some research suggests that people who take vitamin D supplements daily have a lower risk of death only when taking together with calcium.

• **Gum disease.** Early research suggests that higher blood levels of vitamin D are linked with a reduced risk of gum disease in people 50 years of age or older. However, this does not seem to be true for adults younger than 50 years. It is not known if taking vitamin D supplements reduces the risk of gum disease.

• **Pain.** Early research shows that taking vitamin D might reduce pain in people with long-term pain. More research is needed to confirm these results.

• **Parkinson's disease.** Higher levels of vitamin D have been linked to milder symptoms of Parkinson's disease. But taking vitamin D supplements doesn't seem to improve Parkinson's disease symptoms, although it might help prevent the disease from worsening. More studies are needed.

• **Pregnancy-associated complications.** Some research shows that taking vitamin D during pregnancy might lower the chance of preterm birth. But these studies were low quality. Taking vitamin D during pregnancy might reduce the risk of developing diabetes during pregnancy. Taking vitamin D doesn't seem to prevent pre-eclampsia or pregnancy-related high blood pressure.

• **Cysts on ovaries or polycystic ovary syndrome (PCOS).** Early research shows that taking vitamin D might improve ovulation in women with PCOS. Vitamin D taken together with metformin might improve menstrual cycle regularity but not when vitamin D is taken by itself.

• **Premenstrual syndrome (PMS).** Some early research suggests that consuming more vitamin D from the diet might help to prevent PMS or reduce symptoms. Taking vitamin D supplements does not seem to prevent PMS. However taking vitamin D plus calcium might reduce PMS symptoms.

• **A muscle disease called proximal myopathy.** Taking vitamin D in a form known as ergocalciferol by mouth or administering it as a shot into the muscle seems to help treat a muscle disease associated with vitamin D deficiency.

• **Rheumatoid arthritis (RA).** Early research suggests that older women who consume more vitamin D from foods or supplements have a lower risk of developing rheumatoid arthritis.

• **Seasonal depression (seasonal affective disorder).** Early research suggests that taking a large dose of vitamin D in a form known as ergocalciferol improves symptoms of seasonal depression.

• **Non-cancerous wart-like growths on the skin (seborrhic keratosis).** Early research suggests that applying vitamin D in a form known as cholecalciferol to the skin might reduce tumor size in some people with seborrhic keratosis.

• **Muscle pain caused by medications called statins.** Some reports suggest that taking vitamin D supplements can decrease symptoms of muscle pain in people taking statin drugs. But higher quality research is needed to confirm these results.

• **Thinning of the walls of the vagina (vaginal atrophy).** Early research shows that taking vitamin D supplements for a least one year improves the surface of the vaginal wall. However, it does not seem to improve symptoms of vaginal atrophy.

• **Warts.** Reports suggest that applying maxacalcitol, which comes from vitamin D3, to the skin, can reduce viral warts in people with weakened immune systems.

• **Weight loss.** Early research shows that people with lower vitamin D levels are more likely to be obese than those with higher levels. Women taking calcium plus vitamin D are more likely to lose weight and maintain their weight. However, this benefit is mainly in women who did not consume enough calcium before they started taking supplements. Also, other research shows that taking vitamin D only helps with weight loss when blood levels are increased in post-menopausal overweight or obese women. When vitamin D is taken by people who are overweight and normal weight, it does not seem to help with weight loss or fat loss.

• **Breathing disorders.**

• **Bronchitis.**

• **Other conditions.**

More evidence is needed to rate vitamin D for these uses.
How does it work?
Vitamin D is required for the regulation of the minerals calcium and phosphorus found in the body. It also plays an important role in maintaining proper bone structure.

Are there safety concerns?
Vitamin D is **LIKELY SAFE** when taken by mouth or given as a shot into the muscle in recommended amounts. Most people do not commonly experience side effects with vitamin D, unless too much is taken. Some side effects of taking too much vitamin D include weakness, fatigue, sleepiness, headache, loss of appetite, dry mouth, metallic taste, nausea, vomiting, and others.

Taking vitamin D for long periods of time in doses higher than 4000 units daily is **POSSIBLY UNSAFE** and may cause excessively high levels of calcium in the blood. However, much higher doses are often needed for the short-term treatment of vitamin D deficiency. This type of treatment should be done under the supervision of a healthcare provider.

Special Precautions & Warnings:

**Pregnancy and breast-feeding**: Vitamin D is **LIKELY SAFE** during pregnancy and breast-feeding when used in daily amounts below 4000 units. Do not use higher doses unless instructed by your healthcare provider. Vitamin D is **POSSIBLY UNSAFE** when used in higher amounts during pregnancy or while breast-feeding. Using higher doses might cause serious harm to the infant.

"Hardening of the arteries" (atherosclerosis): Taking vitamin D could make this condition worse, especially in people with kidney disease.

**Histoplasmosis**: Vitamin D may increase calcium levels in people with histoplasmosis. This could lead to kidney stones and other problems. Use vitamin D cautiously.

**High levels of calcium in the blood**: Taking vitamin D could make this condition worse.

**Over-active parathyroid gland (hyperparathyroidism)**: Vitamin D may increase calcium levels in people with hyperparathyroidism. Use vitamin D cautiously.

**Lymphoma**: Vitamin D may increase calcium levels in people with lymphoma. This could lead to kidney stones and other problems. Use vitamin D cautiously.

**Kidney disease**: Vitamin D may increase calcium levels and increase the risk of "hardening of the arteries" in people with serious kidney disease. This must be balanced with the need to prevent renal osteodystrophy, a bone disease that occurs when the kidneys fail to maintain the proper levels of calcium and phosphorus in the blood. Calcium levels should be monitored carefully in people with kidney disease.

**Sarcoidosis**: Vitamin D may increase calcium levels in people with sarcoidosis. This could lead to kidney stones and other problems. Use vitamin D cautiously.

**Tuberculosis**: Vitamin D might increase calcium levels in people with tuberculosis. This might result in complications such as kidney stones.

Are there any interactions with medications?

**Aluminum**
Interaction Rating = **Moderate** Be cautious with this combination.
Talk to your health provider.

Aluminum is found in most antacids. Vitamin D can increase how much aluminum the body absorbs. This interaction might be a problem for people with kidney disease. Take vitamin D two hours before, or four hours after antacids.

**Atorvastatin (Lipitor)**
Interaction Rating = **Moderate** Be cautious with this combination.
Talk to your health provider.

Vitamin D might decrease the amount of atorvastatin (Lipitor) that enters the body. This might decrease how well atorvastatin (Lipitor) works.
Calcipotriene (Dovonex)
Interaction Rating = Moderate Be cautious with this combination.
Talk to your health provider.
Calcipotriene is a drug that is similar to vitamin D. Taking vitamin D along with calcipotriene (Dovonex) might increase the effects and side effects of calcipotriene (Dovonex). Avoid taking vitamin D supplements if you are taking calcipotriene (Dovonex).

Cimetidine (Tagamet)
Interaction Rating = Minor Be watchful with this combination.
Talk to your health provider.
The body changes vitamin D into a form that it can use. Cimetidine (Tagamet) might decrease how well the body changes vitamin D. This might decrease how well vitamin D works. However, this interaction probably isn't important for most people.

Digoxin (Lanoxin)
Interaction Rating = Moderate Be cautious with this combination.
Talk to your health provider.
Vitamin D helps your body absorb calcium. Calcium can affect the heart. Digoxin (Lanoxin) is used to help your heart beat stronger. Taking vitamin D along with digoxin (Lanoxin) might increase the effects of digoxin (Lanoxin) and lead to an irregular heartbeat. If you are taking digoxin (Lanoxin), talk to your doctor before taking vitamin D supplements.

Diltiazem (Cardizem, Dilacor, Tiazac)
Interaction Rating = Moderate Be cautious with this combination.
Talk to your health provider.
Vitamin D helps your body absorb calcium. Calcium can affect your heart. Diltiazem (Cardizem, Dilacor, Tiazac) can also affect your heart. Taking large amounts of vitamin D along with diltiazem (Cardizem, Dilacor, Tiazac) might decrease the effectiveness of diltiazem.

Heparin
Interaction Rating = Minor Be watchful with this combination.
Talk to your health provider.
Heparin slows blood clotting and can increase the risk of breaking a bone when used for a long period of time. People taking these medications should eat a diet rich in calcium and vitamin D.

Low molecular weight heparins (LMWHs)
Interaction Rating = Minor Be watchful with this combination.
Talk to your health provider.
Some medications called low molecular weight heparins can increase the risk of breaking a bone when used for a long periods of time. People taking these medications should eat a diet rich in calcium and vitamin D.

These drugs include enoxaparin (Lovenox) or dalteparin (Fragmin).

Medications changed by the liver (Cytochrome P450 3A4 (CYP3A4) substrates)
Interaction Rating = Moderate Be cautious with this combination.
Talk to your health provider.
Some medications are changed and broken down by the liver. Vitamin D may increase how quickly the liver breaks down some medications. Taking vitamin D along with some medications may decrease the effectiveness of some medications. Before taking vitamin D, talk to your health care provider if you are taking any medications that are changed by the liver.

Some of these medications changed by the liver include lovastatin (Mevacor), clarithromycin (Biaxin), cyclosporine (Neoral, Sandimmune), diltiazem (Cardizem), estrogens, triazolam (Halcion), and others.

Verapamil (Calan, Covera, Isoptin, Verelan)
Interaction Rating = Moderate Be cautious with this combination.
Talk to your health provider.
Vitamin D helps your body absorb calcium. Calcium can affect the heart. Verapamil (Calan, Covera, Isoptin, Verelan) can also affect the heart. Do not take large amounts of vitamin D if you are taking verapamil (Calan, Covera, Isoptin, Verelan).

Water pills (Thiazide diuretics)
Interaction Rating = Moderate Be cautious with this combination.
Talk to your health provider.
Vitamin D helps your body absorb calcium. Some "water pills" increase the amount of calcium in the body. Taking large amounts of vitamin D along with some "water pills" might cause to be too much calcium in the body. This could cause serious side effects including kidney problems.
Some of these "water pills" include chlorothiazide (Diuril), hydrochlorothiazide (HydroDIURIL, Esidrix), indapamide (Lozol), metolazone (Zaroxolyn), and chlorthalidone (Hygroton).

**Are there any interactions with Herbs and Supplements?**

**Calcium**
Taking vitamin D along with calcium increases absorption of calcium. This might increase the risk of calcium levels becoming too high in some people.

**Magnesium**
Taking vitamin D can raise the level of magnesium in people who have low magnesium and low vitamin D levels. In people with normal magnesium levels, this doesn't seem to happen.

**Are there interactions with Foods?**

*There are no known interactions with foods.*

**What dose is used?**

The following doses have been studied in scientific research:

**ADULTS**

**BY MOUTH:**

- **For vitamin D deficiency:** 50,000 IU per week for 6-12 weeks has been used. However, some patients require higher doses for longer periods of time to maintain optimal blood levels of vitamin D.
- **For preventing osteoporosis:** 400-1000 IU/day of vitamin D in a form known as cholecalciferol has been used in older adults. Usually it is taken along with 500-1200 mg of calcium per day. Some experts recommended higher doses of 1000-2000 IU daily, and 0.43-1.0 mcg/day of calcitriol have been used for up to 36 months.
- **For preventing bone loss due to use of corticosteroids:** 0.25-1.0 mcg/day of vitamin D in forms known as calcitriol or alfacalcidol have been used for 6-36 months. In many cases, these forms of vitamin D are used along with calcium. Also, 50-32,000 mcg/day of vitamin D in the form of calcifediol has been used for 12 months. Finally, 1750-50,000 IU of vitamin D has been taken in daily or weekly doses for 6-12 months.
- **For preventing cancer:** 1400-1500 mg/day of calcium plus 1100 IU/day of vitamin D in a form known as cholecalciferol has been used for up to 7 years.
- **For heart failure:** 800 IU/day of vitamin D in a form known as cholecalciferol has been taken alone or along with 1000 mg/day of calcium for 3 years.
- **For bone loss caused by having too much parathyroid hormone (hyperparathyroidism):** 800 IU/day of vitamin D in a form known as cholecalciferol has been used for 3 months.
- **Multiple sclerosis (MS):** 400 IU/day of vitamin D has been used to prevent MS.
- **For preventing respiratory tract infections:** 300-4000 IU of vitamin D in a form known as cholecalciferol has been used for 7 weeks to 13 months.
- **For preventing tooth loss in the elderly:** 700 IU/day of vitamin D in a form known as cholecalciferol has been taken in combination with calcium 500 mg/day for 3 years.

**APPLIED TO THE SKIN:**

- **For a specific type of psoriasis called plaque psoriasis:** A form of vitamin D known as calcipotriol has been applied to the skin alone or along with corticosteroids for up to 52 weeks. Typically calcipotriol is gen at a dose of 50 mcg/gram. Specific products used in clinical studies include Daivobet and Dovobet. These products contain 50 mcg/gram of calcipotriol and 0.5 mg/gram of betamethasone dipropionate.

**AS A SHOT:**

- **For vitamin D deficiency:** 600,000 IU of vitamin D (Arachitol, Solvay Pharma) given as a single shot into the muscle has been used.

**CHILDREN**

**BY MOUTH:**
• For preventing respiratory tract infections: 1200 IU/day of vitamin D in a form known as cholecalciferol has been given to school-aged children during the winter to prevent the flu. Also, 500 IU/day of cholecalciferol has been used to prevent worsening of asthma symptoms caused by respiratory tract infections.

Most vitamin supplements contain only 400 IU (10 mcg) vitamin D.

The Institute of Medicine publishes recommended daily allowance (RDA), which is an estimate of the amount of vitamin D that meets the needs of most people in the population. The current RDA was set in 2010. The RDA varies based on age as follows: 1-70 years of age, 600 IU daily; 71 years and older, 800 IU daily; pregnant and lactating women, 600 IU daily. For infants ages 0-12 months, an adequate intake (AI) level of 400 IU is recommended.

Some organizations are recommending higher amounts. In 2008, the American Academy of Pediatrics increased the recommended minimum daily intake of vitamin D to 400 IU daily for all infants and children, including adolescents. Parents should not use vitamin D liquids dosed as 400 IU/drop. Giving one dropperful or mL by mistake can deliver 10,000 IU/day. The US Food and Drug Administration (FDA) will force companies to provide no more than 400 IU per dropperful in the future.

The National Osteoporosis Foundation recommends vitamin D 400 IU to 800 IU daily for adults under age 50, and 800 IU to 1000 IU daily for older adults.

The North American Menopause Society recommends 800 IU to 1000 IU daily for all.

Guidelines from the Osteoporosis Society of Canada recommend 400-1000 IU of a specific form of vitamin D called cholecalciferol for people up to age 50, and 800-2000 IU per day for people over 50.

The Canadian Cancer Society recommends 1000 IU/day during the fall and winter for adults in Canada. For those with a higher risk of having low vitamin D levels, this dose should be taken year round. This includes people who have dark skin, usually wear clothing that covers most of their skin, and people who are older or who don’t go outside often.

Many experts now recommend using vitamin D supplements containing cholecalciferol in order to meet these intake levels. This seems to be more potent than another form of vitamin D called ergocalciferol.

What other names is the product known by?

Calcipotriène : Calcipotriène, Calcipotriol.
Cholecalciferol: 7-déhydrocholestérol Activé, Activated 7-dehydrocholesterol, Cholécalfiérol, Colecalciferol, Colécalciférol, Vitamin D3.
Dihydrotachysterol: DHT, Dihydratáchystérol, dihydrotachysterol 2, dichysterol, Vitamine D3.
Fat-Soluble Vitamin, Vitamina D, Vitamine D, Vitamine Liposoluble, Vitamine Soluble dans les Graisses.