Partners in Research
Creighton University
The Creighton University Osteoporosis Research Center
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Vitamin D: Frequently Asked Questions

Why do we need vitamin D?

Every tissue in our bodies needs vitamin D and will not work correctly if we do not get enough. In its most extreme forms, vitamin D deficiency produces rickets in children and osteomalacia (bone softening) in adults. Growth is disrupted, and bones become malformed. This happens because the concentration of minerals in the blood stream is not adequate to support the mineralization of new bone. This deficiency occurs because efficient absorption of dietary calcium requires vitamin D.

Milder degrees of deficiency are now understood to be one of the causes of a vast array of chronic diseases, including osteoporosis, impaired immune competence, various autoimmune diseases (such as diabetes and multiple sclerosis), several cancers (breast, colon, lung, lymphoma, and prostate, among others), high blood pressure, pregnancy complications, and cardiovascular disease. All may develop because of, or be exacerbated by vitamin D deficiency. Asking the body to deal with these disorders without adequate vitamin D is like asking a fighter to enter battle with one hand tied behind his back.

What is vitamin D?

Vitamin D is one of the chemicals that the tissues of our body use to unlock the DNA blueprints which each tissue contains and which are needed for our cells to produce the many biochemical products required for their day-to-day functioning.

Where do I get vitamin D?

The principal source of vitamin D is your own skin. A chemical compound naturally present in the superficial layers of skin is converted, on exposure to UV-B radiation, to cholecalciferol (vitamin D_3). However, we manufacture this vitamin D only if we expose our skin to UV-B radiation. If we spend all of our time indoors or go out only in the early morning or late evening, then we simply do not get sufficient ultraviolet radiation from the sun to make enough vitamin D.

What about latitude?

Those who live in northern latitudes have less chance to make vitamin D since, in wintertime, even at mid-day, the sunlight is so weak that it does not produce significant vitamin D synthesis in our skins.

Robert P. Heaney, M.D.
John A. Creighton University Professor

How long should I be outdoors, and how much skin should I expose?

There is no single right answer. But a light-skinned person, wearing a bathing suit, will make about 15,000 IU of vitamin D in 15–20 minutes in July at mid-day. Darker-skinned individuals can do the same, but it will take about twice as long.

What is the effect of sunscreen?

Sunscreen blocks the UV-B radiation and prevents the manufacture of vitamin D.

What about skin cancer?

The brief exposure needed to produce adequate vitamin D is not enough to cause skin cancer. However, if you are worried about that risk, apply sunscreen after the first 15 minutes of exposure.

Can I get vitamin D from food?

For the most part, the answer is no. The few natural exceptions include oily fish, caught in the wild, and a few sun-dried mushrooms. Today, vitamin D is also added to many foods, including milk, many yogurts, some orange juices, cheeses, and breakfast cereals. Check the labels.

Does the body have to "process" vitamin D before it becomes active?

The body converts vitamin D, whether taken by mouth or made in the skin, to a compound called 25-hydroxyvitamin D [25(OH)D]. This compound circulates in the blood and is the measure physicians or scientists use to assess vitamin D status. High levels of serum 25(OH) D show that you are getting enough vitamin D, while low levels indicate deficiency. The body also converts some 25(OH)D each day into calcitriol, which acts as a hormone and signals the intestine to absorb calcium more efficiently, thus helping us get by on typical calcium intakes.

How much vitamin D do I need?

The body needs at least 4,000 IU per day in order to maintain a healthy concentration of 25(OH)D in the blood. Because most of us do not get enough sun exposure, the little vitamin D we get that way, plus food and fortified food sources, totals no more than about 2,000 IU/day. Thus, in order to meet the body's need for about 4,000 IU/day, most adults in North America should take supplements providing 1,000–3,000 IU/day.

How can I tell if I need vitamin D?

Chances are you do need more vitamin D. Most children and adults in North America and Europe need extra vitamin D. If you want to know for certain, ask your physician to request a blood test for serum 25(OH)D. Most clinical investigators today would recommend the result be at least 40 ng/mL.

A recent, informal survey of the principal clinical scientists working in the vitamin D field revealed that each of them, to a person, considered himself or herself to be vitamin D deficient and took vitamin D supplements in doses ranging from 3,000 IU/day to over 5,000 IU/day.

Is vitamin D safe?

Vitamin D is safe, it consumed in reasonable quantities (See "How much vitamin D do I need?). Serum 25(OH) D values up to as high as 200 ng/mL are safe; it is instructive to know that outdoor summer workers at the end of summer will typically have values of 60–80 ng/mL. However, vitamin D is an extremely potent compound, and if taken in high enough doses, can produce severe toxicity leading even to death. There have been no reported cases of vitamin D toxicity at serum levels of 25(OH)D below 200 ng/mL.

Is there more than one form of vitamin D?

There are two main forms of vitamin D – ergocalciferol and cholecalciferol. Ergocalciferol is also known as vitamin D_2 and cholecalciferol as vitamin D_3. Vitamin D_3 is substantially more potent than vitamin D_2. Vitamin D_3 is the natural form, typically made in our bodies when given the opportunity to do so. Vitamin D_2 supplements are mainly a synthetic product and often require a doctor's prescription.

Is it important to take vitamin D daily?

As long as the total dose is sufficient, vitamin D does not have to be taken every day. Some physicians prescribe weekly or monthly dosing. Unlike most medicines, vitamin D does not have to be taken in any particular fashion. The important thing is to achieve and maintain a normal level of 25(OH)D in the blood.

How do I know if I am taking too much?

You can tell you are getting too much vitamin D in the same way that you know when you are getting enough – by measuring the blood concentration of 25(OH)D. This is seldom necessary, as the doses discussed elsewhere in these FAQs would never produce toxicity in otherwise healthy adults, even if you're taking supplements in combination with fortified foods.

Why are the published requirements for vitamin D so much lower than the levels mentioned in these FAQs?

The officially recommended intakes are based solely on the amounts needed to prevent clinically apparent osteomalacia in adults. No consideration has been given to the prevention or control of the other diseases in which vitamin D is believed to be involved. As mentioned in an earlier FAQ, most working vitamin D scientists themselves take vitamin D in doses averaging over 5,000 IU/day.

How do I know what kind of vitamin D is in my combination tablet/capsule?

If it is vitamin D_3, the label will usually say "vitamin D_3" or "cholecalciferol". If it does not, ask your pharmacist. If he/she cannot get that information, ask the manufacturer or switch to a product that provides those details.

Do vitamin D supplements expire?

Yes. An expiration date will be printed on the label; look for it and use it while it is fresh. "Expire" means the supplement has lost some of its potency. If you use expired vitamin D, you won't be harmed, but you may no longer be getting as much as the label says.

Vitamin D & Calcium: The Key to Bone Health

Vitamin D

Calcium and vitamin D are two nutrients that are essential not only for healthy bones, but also for overall physical health. Vitamin D helps the body absorb calcium. Current research suggests that calcium and/or vitamin D have a role in lowering blood pressure, reducing weight and excess body fat, and reducing the risk of certain cancers, including breast cancer and colon cancer. Good nutrition for the bones is good nutrition for the whole body.

The Importance of Calcium

A well-balanced diet containing the recommended amount of calcium is an important component of bone health. Calcium is essential for building and maintaining bone in the early years of life and for slowing the rate of bone loss later in life. National nutrition surveys indicate that many women and young girls consume less than half the amount of calcium recommended to grow and maintain healthy bones. Many men do not get the recommended amount of calcium in their diet either.

How much do you need each day?

The Creighton University Osteoporosis Research Center recommends the following guidelines established by the Institute of Medicine Dietary Reference Intakes from 1998:

Age Group	Calcium Intake (mg/day)
Children (1 - 3 years)	500
Children (4 - 8 years)	800
Teenagers (9 - 18 years)	1,300
Pregnant/breastfeeding women (younger than 18)	1,000
Pregnant/breastfeeding women (18 and older)	1,000
Women (19 - 50 years)	1,000
Women (51 and over)	1,200
Men (19 - 50 years)	1,000
Men (51 and over)	1,200

Reading the Nutritional Facts Label for Calcium

Look for the Daily Value % (DV) for calcium. To convert DV% to milligrams of calcium, simply replace the % sign with a zero. For example, on this Nutrition Facts label from a carton of yogurt, the calcium DV of 20% would be equal to 200 mg calcium per serving.

(Note: This conversion works only for calcium, not for other nutrients on the label.)

Nutrition Facts
Serving Size 1 container (170g)

Amount Per Serving	
Calories 100	Calories from Fat 0
	% Daily Value*
Total Fat 0g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 5mg	**2%**
Sodium 70mg	**3%**
Total Carbohydrate 6g	**2%**
Dietary Fiber 0g	**0%**
Sugars 4g	
Protein 17g	
Vitamin A 0% • Vitamin C 0%	
Calcium 20% • Iron 0%	

*Percent Daily Values are based on a 2,000 calorie diet.

An adequate intake of calcium and vitamin D is only one part of an osteoporosis prevention or treatment program.

Along with weight-bearing exercise, getting enough calcium and vitamin D is a strategy that helps strengthen bones at any age. These approaches may not be enough to stop bone loss; other therapies may be prescribed. In addition to diet and exercise, it is important to speak to your doctor about keeping your bones strong throughout your life.

Opportunities to Participate

The Creighton University Osteoporosis Research Center would like you to consider participating in one of our research studies. Below is a list of our current studies in which you might be interested. Please feel free to pass this letter on to friends, family and co-workers who may also be willing to participate.

The Dairy Diaries

This study is looking to see if including dairy foods in diet helps to maintain a healthy weight.

- 13-14 year old teenage girls
- 5 visits in 1 year (one visit every 3 months)
- $60 gift cards will be given for each completed visit

Diabetes & Bone Health

This study is looking to see how Type 1 diabetes affects bone.

- Men and women, age 19-50
- Type 1 diabetic for at least 3 years, has had a broken bone after age 18
- $350 stipend for completion of the study

Bone Quality in Postmenopausal Women

This study is looking for the causes of osteoporosis in postmenopausal women.

- Females, 45-80 years of age
- Postmenopausal women
- $300 stipend for completion of the study

Young Women's Osteoporosis Screening Study

This study is working on developing treatment options for premenopausal women with osteoporosis.

- Females, 20-45 years of age
- Premenopausal women with regular menstrual periods
- $400 monetary stipend for study completion

If you are interested in learning more about any of these studies, please contact us at 402-280-2663 (BONE) or toll free 1-800-368-5097. Please leave a message with your name, phone number and best time for us to call. For additional information regarding the studies, you can also log on to our website at http://osteoporosis.creighton.edu and click on ORC research opportunities on the left hand side.

PLEASE PASS IT ON...

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Just mail this form to:
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In memory of Sister Anne Evers
601 North 30th Suite 4820
Omaha NE 68131

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