



Vitamin D Test

RESULT REPORT

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Sarah Mustermanns result report

Patient	Sarah Mustermann	Sample No.	QAMTQN / P062762
Date of Birth	12.09.1994	Receipt of Sample	12.09.2017
Weight	170 lb	Posting of Report	12.09.2017

Dear Sarah Mustermann,

Upon your request, we have measured the concentration of vitamin D in your blood (in the form of the storage molecule hydroxycholecalciferol (25(OH)D) - this storage form of vitamin D is also called calcidiol or calcifediol).

1. Your individual result report

We have measured a vitamin D concentration (25(OH)D) of 50,0 ng/ml in your blood sample.

For your information: "ng/ml" means nanograms per milliliter. Sometimes, vitamin D concentrations are also given as µg/l or nMol/l. The conversion is: 1 ng/ml = 1µg/l = 2,5 nMol/l

25-OH-vitamin-D concentration	Rating
below 10 ng/ml	critically low level of vitamin D
11-30 ng/ml	insufficient supply of vitamin D
31-40 ng/ml	sufficient supply of vitamin D
41-60 ng/ml	good supply of vitamin D
61-90 ng/ml	optimal supply of vitamin D
91-150 ng/ml	excessive supply of vitamin D
>150 ng/ml	vitamin D intoxication

Assessment:*

According to this table - based on the opinion of the orthomolecular medicine - this value implicates that your vitamin D level is very good. You should try to keep this level in the range of 40-90 ng/ml.

*please note: the stated reference values are valid for adults only.

2. Optimizing your vitamin D level

2.1 How to optimize your vitamin D level

Your current vitamin D level of 50,0 ng/ml is sufficient. In order to keep this level, you should take in a daily maintenance dose of 2.000 IU.

Why?

As the vitamin D taken up through food is insufficient. Thus, the vitamin D synthesized by the skin would be the only source for your vitamin D intake which is not sufficient for the following reasons:

- too low UV index
- use of sunscreen
- too much time spent indoor

Those 2.000 IE can be covered with various vitamin supplements. Especially easy to dose are vitamin D preparations in the form of droplets. Every drop contains 1.000 IE.

If you have questions concerning your test results, please don't hesitate to contact us either via mail to questions@cerascreen.co.uk or by dialing +49-385-48592233.

2.2 When should you supplement Vitamin D?

From the physician's point of view, a direct supply of vitamin D is recommended, when your the vitamin D level drops below 20 ng/ml. Some body functions are already affected at levels below 31 ng/ml. Below a level of 11 ng/ml, severe diseases such as osteomalacia (bone softening) must be reckoned with. According to the orthomolecular medicine, a good supply is reached when the vitamin D level is between 40-90 ng/ml.

! In order to keep your vitamin D level stable, you need to administer 2.000 IU of vitamin D every day. !

Occasionally, it is recommended to increase the supply to 5.000 IU per day during the **winter months** in order to compensate the increased needs of your body and to keep the vitamin D level stable.



You can raise your vitamin D level by increased exposition of your skin to solar irradiation (UVB-rays) or by an external supplementation. Please note that the vitamin D synthesis is already blocked by low-factor sunscreens.

Your **skin pigmentation** also protects your skin against UV radiation of the sun. In territories with low solar irradiation, dark-skinned people, in particular, cannot produce enough vitamin D.

In addition, it should be noted that the skin gets thinner with **increasing age** and that, therefore, less vitamin D can be produced. Especially at this age, a sufficient vitamin D supply is important to counteract the development of osteoporosis. According to a study by MacLaughlin and Holick (1985), the level of 7-dehydroxycholesterol in the skin decreases with age and hence the vitamin D synthesis. They found that 8-18 year-olds can produce more than double the amount of vitamin D compared to 77-82 year-olds.

Recommended intake

The recommended doses vary considerably. The German Association for Nutrition (DGE) recommends a daily intake of 800 IU. According to available studies, this is far too low. The Canadian Paediatric Society recommends 2.000 IU for expectant mothers.

Studies have shown that a supplementation of 2.000 IU per day can stabilize the vitamin D level. During the winter, orthomolecular physicians even recommend up to 5.000 IU. However, this dosage is insufficient to balance a vitamin D deficiency as the vitamin D store needs to be filled first.

2.3 Regular check of the vitamin D level

It is quite normal that the vitamin D levels fluctuate throughout the year as your body can produce vitamin D from cholesterol, if the skin is exposed to the sun (UVB-rays). If you want to optimize your vitamin D intake, your vitamin D level should be checked several times during the year, because the vitamin requirement can vary per person. The dosage we calculate is thus the average dose needed to raise your body's vitamin D concentration to an optimum level.

According to the quantity and type of supplementation, as well as your intestinal health, your body can absorb and metabolize more or less vitamin D.

Vitamin D is fat-soluble. Depending on the amount of fat tissue, vitamin D is depleted from the systemic circulation and thereby creating an increased demand of vitamin D to keep up an optimal blood level. This means that the necessary supply can be calculated based on the body weight, but it is, nevertheless, advisable to perform a control measurement on a regular basis.

If you supply vitamin D by food supplements, an overdosage can occur in extreme cases. If your weight (especially the percentage of body fat) or the duration of sun exposure change, this may also influence your individual vitamin D level. For these reasons, a regular check of your vitamin D level is recommended. Concentrations of more than 150 ng/ml can lead to a vitamin D intoxication.

2.4 What makes a good supplement?

Which chemical form of the vitamin is preferable?

The active form, i.e. it can be quicker and easier absorbed and metabolized by the body to obtain optimal effect. The active form of vitamin D3 is cholecalciferol.



Which ingredients should be contained?

As few as possible, so that the vitamin's positive effect is not affected and so that it can be applied by as many people as possible. The vitamin product should best be lactose-free, gluten-free, vegetarian and vegan. The ingredients contained should have a merely positive effect on the body's vitamin absorbance. Fat-soluble vitamins (vitamin A, D, E, K) should be administered in conjunction with fat. Olive oil, coconut oil or peanut oil facilitate the intestinal absorbance of the vitamins. .

A tasteless product is preferable and should at best be free from flavouring substances.

How should the vitamin supplement be manufactured?

Without genetic engineering and not highly processed, so that it can work optimally. The supplement is easy to handle and easy to dose. The presentation in capsules and drops is most suitable.

2.5 Additional intake of vitamin K?

At present, we don't recommend the intake of vitamin K2. The reason is, that available studies are in dispute. As long as there is no clear scientific basis, we won't recommend vitamin K2 as a supplement in conjunction with vitamin D. Moreover, vitamin K2 is naturally present in many foods, therefore, we don't see a reason for a supplementation.

3. Vitamin D effects

Vitamin D plays an important role in a large number of bodily functions. Actually, vitamin D is not a vitamin, but a hormone which explains the large number of its control functions.

The multitude of positive effects that are achieved by an optimal vitamin D supply emphasizes its central role. Some of these effects are listed below.

Muscles

A vitamin D deficiency leads to a reduction of jumping power, maximum power and maximum speed. An increased vitamin D intake promotes the generation of new muscle fibers and muscle cells. Furthermore, the calcium release in the muscle is enhanced.



Reduction in the risk of falling

The strengthening of muscles and bones is of particular importance in people of old age. A premature need for nursing care can be prevented by a sufficient supply of vitamin D. Furthermore, vitamin D can lower the risk of falls and thereby decreases the danger of femoral neck fracture.

Nervous system

The insufficient supply of vitamin D negatively influences illnesses such as Alzheimer's disease, Parkinson's disease, multiple sclerosis, depression, schizophrenia and autism. In general, an optimised level of vitamin D leads to an improved mood.

Immune system

Vitamin D stimulates the production of the body's own defence system (kallikrein, defensin). It has a positive impact on the activity of the immune system. Malfunctions

in case of an overreaction of the immune system, such as autoimmune disorders or allergies, are attenuated.

Diabetes

Type 1 diabetes is an autoimmune disorder that leads to the destruction of the insulin-producing cells. A vitamin D supply of 2.000 IU per day can lower the risk of developing type 1 diabetes by 78 %. This is attributed to the positive effect of vitamin D on the normal functioning of the immune system. For pregnant women, a preventative dose of 6.000 IU per day is recommended in order to supply the embryo with a sufficient amount of vitamin D.

Type 2 diabetes is caused by insulin resistance of the cells which may be caused by overweight, inactivity, lack of sleep, by stress or smoking. Vitamin D can have a positive effect by stimulating the insulin receptors of the cells. A vitamin D concentration of 32 ng/ml can lower the risk of developing type 2 diabetes by 75 % compared to a concentration of 14 ng/ml.

Vascular tension, arteriosclerosis

Vitamin D leads to an improved elasticity of the vascular walls and decreases the inclination to inflammations. Vitamin D levels of more than 30 ng/ml lower the risk of high blood pressure by 600 %, compared to people with a vitamin D level of only 15 ng/ml.

Heart function

Vitamin D positively influences the function of the heart muscle. The risk of heart and cerebral infarctions is 200 % higher in people with at vitamin D concentration lower than 15 ng/ml compared to people with a vitamin D concentration of more than 30 ng/ml.



Asthma, COPD

The increasing rate of asthma is associated with low levels of vitamin D. A deficiency of vitamin D can also lead to a restricted pulmonary function. Furthermore, it can weaken the immune system and increase the inclination to inflammations.

Rachitis (rickets)

In small children, vitamin D deficiency can lead to bone softening with deformations (rachitis). Nowadays, the recommended daily dose of vitamin D for children is 400 or 500 IU. This leads to average blood concentrations of in average more than 11 ng/ml. Mother's milk cannot secure the vitamin D demand, in case the mother does not take at least (!) the recommended daily dose of 2.000 IU per day. For pregnant women, a preventative dose of 6.000 IU is recommended in order to prevent damages to the

embryo.

Bone Structure

In adults, vitamin D deficiency combined with a calcium deficiency, can lead to a different form of bone softening (osteomalacia) and to a lack of hardening of the bony matrix which is routinely turned over. Signs of osteomalacia can be: fatigue, weakness, muscle aches, insomnia or pressure sensitivity. There is an increased risk of falling and bone fractures.

4. Vitamin D synthesis and intake

The major natural source of the vitamin is synthesis of cholecalciferol in the skin from cholesterol through a chemical reaction that is dependent on sun exposure. In case of direct solar radiation, the body can produce 10.000 to 20.000 IU vitamin D within 10 minutes if no sunscreen is used. Sunscreen with a sun protection factor of at least 8 is able to more or less completely block the vitamin D synthesis.

Therefore, it seems to be very unlikely that a supplementation of 2.000 IU vitamin D per day leads to an overdosage.

Vitamin D Intake with food

Vitamin D is contained in large quantities in fatty sea fish (herring, salmon, sardines), mussels, egg yolk and mushrooms. Small quantities of the vitamin are also present in milk products.

- Fish: Eel 25 µg/100g, herring 18 µg/100g, salmon 18 µg/100g, sardines 10 µg/100g
- Mussels: scallops 5 µg/100g
- Egg yolk: 4 µg/100g
- Milk products: Gouda 1 µg/100g, butter 1 µg/100g
- Mushrooms: porcini (vit. D2) 3 µg/100g, champignons (vit. D2) 3 µg/100g

Please note: 25 µg vitamin D correspond to 1.000 IU vitamin D.

It is not possible to cover the vitamin D demand only by food as the vitamin D levels in food are too low.

5. How to calculate your personal vitamin D dosage

Below, we are demonstrating to you by an exemplary calculation how to calculate the vitamin D loading dosage in order to reach a good vitamin D supply.

Formula: $10.000 \text{ IU} \times (40 - \text{measured blood level}) \times (\text{weight lb} / 154)$

Example: Per 35 lb body weight, further 10.000 IU are necessary to increase the level by 1 ng/ml.

We assume an initial value of 20 ng/ml and a target serum level of 40 ng/ml (lower limit of a good vitamin D level). Thus, we want to increase the level by 20 ng/ml. For a person weighing 35 lb, this is calculated as follows: $10.000 \text{ IU (per lb } 71,45 \text{ IE)} \times 20 \text{ ng/ml} = 200.000 \text{ IU vitamin D}$.

By means of these 200.000 IU, that are taken in over a period of several weeks (in addition to the daily maintenance dosage), the target vitamin D serum level of 40 ng/ml can be reached as follows:

- a) daily intake of 5.000 IU vitamin D in the form of a balanced diet or in the form of an otc product with e.g. 1.000 IU per dose (5 x 1 capsule/tablet à 1.000 IU per day) for 40 days
- b) intake in the form of a pharmacy-only product of 10.000 (e.g. 2 capsules/tablets à 5.000 IU per day) for 20 days
- c) intake of vitamin D tablets with a higher dosage, e.g. 20.000 IU per tablet (needs to be prescribed by a physician in most countries), 1 tablet per day for 10 days

We are proud of you! You have taken your health
in your own hands.



6. References

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