

Latest Information on VITAMIN 

THE ONLY  
  
APPROVED BRANDS  
IN PAKISTAN



# Miracle

*Defend Your Life*

Let's make Pakistan D Positive

**"I believe Vitamin D is the number one public health advance in medicine in the last twenty years."**

Dr. John Whitcomb  
Aurora Sinai Medical Centre

**Vitamin D<sub>3</sub> - A Miracle Vitamin**

brought to you by



VITAMIN  COUNCIL (USA)





# Miracle

*Defend Your Life*



[Ref :JUMDC, Vol.1, Issue 1, Jan-Jun 2010]

VITAMIN D<sub>3</sub> may improve

**95%**  
Population is  
VITAMIN   
**Deficient**



BONES AND TISSUE HEALTH



DENTAL HEALTH

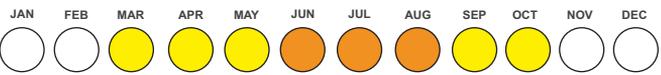


IMMUNE SYSTEM MAINTENANCE



MODULATION OF CELL GROWTH

## Sunshine Calendar



No Sunshine - Not enough sun for adequate amounts of Vitamin D



Low Sunshine - 30 minutes to produce sufficient Vitamin D



Moderate Sunshine - 20 minutes to produce sufficient Vitamin D



Shadow is Shorter than you are tall

Getting Vitamin D from the sun?



Shadow is longer than you are tall

Majority of Pakistani population is Vitamin D3 Deficient (VDD) having Vitamin D3 levels less than 20 ng/ml

### Vitamin D3 LEVELS 25 HYDROXY D

Deficient	Optimal*	Treat Cancer or heart Disease	Excess
< 50ng/ml	50-70ng/ml	70-100ng/ml	>100ng/ml

\*optimum levels for the prevention of viral infections



APPROVED BRAND

IN PAKISTAN



VITAMIN  COUNCIL (USA)



# What is Vitamin D<sub>3</sub>?

**Vitamin D** is important for good overall health and strong healthy bones. It is also an important factor in making sure your muscles, heart, lungs and brain work well, and that your body can fight infection.

Your body can make its own **Vitamin D** from sunlight. You can also get **Vitamin D** from supplements and a very small amount comes from a few foods you eat.

The **Vitamin D** that you get in your skin from sunlight, and the **Vitamin D** from supplements, has to be changed by your body a number of times before it can be used. Once it's ready, your body uses it to manage the amount of calcium in your blood, bones and gut and to help cells all over your body to communicate properly.

## Main Causes of Vitamin D Deficiency Nowadays

Obesity



Old Age



Avoiding Sunlight



Location



- In cases of obesity, **Vitamin D** essentially becomes sequestered by fat cells leaving it unavailable for mobilization when needed.
- Older people have thinner skin than younger people and this may mean that they can't produce as much **Vitamin D**.
- Avoiding sunlight or the use of sun block, both reduce the natural production of **Vitamin D**.
- Indoor lifestyle reduces production of **Vitamin D** in human body.

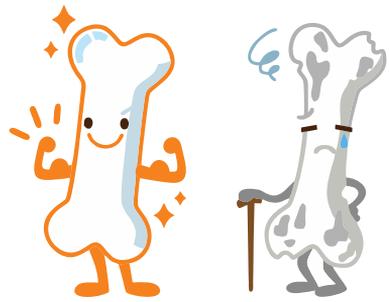
## Vitamin D Council Mission Statement

The **Vitamin D** Council is a 501(c) (3) non profit organization in California, United States. We're here to educate patients, families, doctors and health professionals on **Vitamin D** and safe, sensible sun exposure to improve the quality and longevity of lives.

# Vitamin D<sub>3</sub>

(Cholecalciferol)

## & Osteoporosis



If you already have osteoporosis, the main goal in managing your condition is to avoid breaking a bone. There is a lot of research studying the role of **Vitamin D** in preventing broken bones in people with osteoporosis or osteopenia. A research study from the United States looked at whether or not giving **Vitamin D** supplements to people would make their bones denser and stronger to prevent them from breaking. Many of the people already had osteoporosis but some did not.

### The main results were:

People older than 65 who took **Vitamin D** supplements were less likely to break a bone than those who didn't. **Vitamin D** supplements helped prevent people from breaking a bone.

A research study from Denmark looked at a large group of people to see if taking **Vitamin D** supplements or **Vitamin D** with calcium reduced their chance of breaking a bone.

### The main results were:

People who took **Vitamin D** and calcium supplements together reduced their chance of breaking a bone.

### Key points from all the research:

- ▶ People diagnosed with osteoporosis tend to have lower blood levels of **Vitamin D** than other healthy people of their age.
- ▶ There is some evidence that **Vitamin D** prevents fractures in amounts equal to or more than what the institutes recommend. If you have osteoporosis, preventing fractures is the main goal.

### STATISTICS



About 200 million people worldwide have **Osteoporosis**

### Risk Factors



Above the age of 40



Smoking



Low Vitamin D & calcium intake

### What you can do... to avoid

### Osteoporosis



Exercise regularly



Use Vitamin D & calcium supplements



Spread awareness about osteoporosis in your community

# Vitamin D<sub>3</sub>

May Improve (Cholecalciferol)  
**Musculoskeletal Health**  
Among Children With Inflammatory Bowel Disease



A new study published in the journal *Inflammatory Bowel Diseases* found that **Vitamin D** supplementation led to improved bone mineral density and muscle power among children with inflammatory bowel disease (IBD).

**Vitamin D** plays an important role in proper growth among developing children. In fact, a recent study suggests that low **Vitamin D** can be a major cause of short stature among children. Research has also shown that children with IBD experience an increased risk of **Vitamin D** deficiency compared to their healthy counterparts. However, there is a lack of research regarding the relationship between IBD and musculoskeletal health among children with IBD.

Therefore, researchers conducted a prospective cohort study to evaluate whether **Vitamin D** supplementation improved bone mineral density and muscle strength in pediatric IBD patients. A total of 55 pediatric IBD patients between the ages of 5-19 years old were included in the study. All participants received 2,000 IU **Vitamin D3** daily for 13 months. The participants had their 25(OH)D levels measured every 2-3 months during each follow up. The researchers observed the participants disease state, bone mineral density and muscle strength at baseline and completion of the study.

IBD activity was measured by indicators of inflammation from their serum analysis and a self-administered questionnaire, the pediatric ulcerative colitis activity index (PUCAI) or the pediatric Crohn's disease activity index (PCDAI). The patients bone mineral densities were evaluated via computed tomography scans (CT scans). Muscle function was assessed by jumping mechanography, which measures the ground reaction forces for motion patterns.

## Here is what the researchers discovered:

- At baseline, median 25(OH)D increased from 23.2 ng/ml (58 nmol/l) at baseline to 34 ng/ml (85 nmol/l) at completion of the study.
- No patients experienced symptoms of **Vitamin D** toxicity. Disease activity did not significantly change throughout the duration of the study.
- Trabecular (porous) and cortical (dense) bone mineral density significantly improved upon completion of the study.

## The Researchers Concluded:

“We observed an improvement in bone and muscle parameters after cholecalciferol substitution in pediatric patients with IBD. Therefore, **Vitamin D** substitution can be considered in such patients.”

# Vitamin D<sub>3</sub>

(Cholecalciferol)

## Deficiency Can Increase The Issues of Fibromyalgia Pain & Balance



A newly published study shows that people with fibromyalgia (FM) and low levels of **Vitamin D** have significantly more balance problems and pain.

Turkish researchers published a study titled, “The Relationship Between Balance and **Vitamin 25(OH)D** in Fibromyalgia Patients” in the journal Modern Rheumatology, which endeavored to investigate the relationship between **Vitamin 25(OH)D** levels and pain. Balance and daily activities in patients with fibromyalgia syndrome. The study included people aged 35 to 65 years who had been diagnosed with FM (N=70) and a healthy control group (N=60) that was matched by age and gender. They used the fibromyalgia impact scale (FIQ), Berg Balance Scale (BBS), the Nottingham Health Profile (NHP), and visual analog scale (VAS) to measure their findings.

The participants were divided into two groups by **Vitamin D** levels being above or below 30 ng/ml. A statistically significant difference was shown between VAS, BBS value, as well as all NHP subscale and NHP total values of FMS patients and health control.

“The researchers found that **Vitamin D** status was significantly associated with improved balance.”

### The Authors Wrote:

“The results indicated that there was a statistically significant difference between FMS patients with low and those with normal levels by pain and balance tested with BBS. A positive significant correlation was established between balance and **Vitamin D**”.

### The study concluded:

“It was observed that low **Vitamin D** levels affected balance in both FMS group and healthy control group. It should be kept in mind that **Vitamin D** level is likely to negatively affect balance and VAS values in FMS.”



# Vitamin D<sub>3</sub>

(Cholecalciferol)

## & Multiple Sclerosis Outcome in Pregnant Women



Multiple sclerosis (MS) is a demyelinating disease of unknown cause, which is most common in women of childbearing age. Low serum level of **Vitamin D3** appears to be a risk factor for both the development and the progression of MS. No well-designed clinical trial has used high dose **Vitamin D3** supplementation for routine care in pregnant women with MS. Some test tube and animal studies have also suggested that **Vitamin D3** has multiple effects on the immune system. There is accumulating evidence for a possible protective role of **Vitamin D3** in the development and disease course of MS. Several studies have reported that low serum 25(OH)D levels may increase the risk of relapses in non-pregnant patients with MS. Until recently, no research has properly evaluated whether treatment with **Vitamin D** in pregnant women with MS has any effects on the course of MS. In order to do so, the study must enroll pregnant women with MS who also have low serum 25(OH)D levels, and then, treat the women with large enough doses of **Vitamin D3** to achieve sufficiency.

In a recent study, scientists gave 50,000 IU/week of **Vitamin D3** and routine care to 6 pregnant women with MS in an open-label trial, in which both patients and investigators were aware of the type of treatment each patient received. The 9 pregnant women in the control group received routine care.

Participants were evaluated by a qualified neurologist at baseline, every 8 weeks after the start of the therapy until delivery and 6 months after delivery to evaluate disease activity.

The authors found that 5 women in the routine care group had a relapse of their MS within 6 months after delivery. However, no woman relapsed within 6 months after delivery in the **Vitamin D3** group. Obviously this is a small study, but the results were dramatic. Normally, these results would warrant larger randomized controlled trials. However, it is unlikely this study will be replicated as ethics committees at universities may not allow pregnant women in the placebo group to be identified as **Vitamin D** deficient but not be treated. Perhaps some uninformed ethics committees will allow control groups to get the meager 600 IU/day for pregnant women.



### The authors advise:

**“A daily supplement of 10,000 IU of Vitamin D3 is considered advisable for all adults with normal renal function and this dose should be routinely recommended to all women during pregnancy and lactation.”**

# Vitamin D<sub>3</sub>

(Cholecalciferol)

## Improved Treatment Response in Breast Cancer



Breast cancer is the second leading cause of death in women. Therefore, steps need to be taken in order to help prevent breast cancer and improve treatment outcome. According to research, **Vitamin D** could be part of the solution.

Overall, numerous studies have pointed out **Vitamin D's** role in reducing risk of breast cancer, improving treatment outcomes and survival. **Vitamin D** is thought to mediate some forms of cancer by controlling cell functions, including cell proliferation. Additionally, **Vitamin D** has also been associated with both inflammatory and estrogen-related pathways that have been linked to incidence of cancer. In a recent study, researchers evaluated the effect of **Vitamin D** status during neoadjuvant chemotherapy on responsiveness to treatment. Researchers included a group of 144 women with stage I, II or III breast cancer. In order to be included in the study, the women had to have their **Vitamin D** levels tested at diagnosis of their cancer and undergone surgery between October of 2009 and December of 2015 at the University of Iowa Holden Comprehensive Cancer Center or between March 2007 and August 2008 at the Institut Régional du Cancer in Montpellier, France. The participants had undergone neoadjuvant chemotherapy (NAC), which is a treatment designated to shrink tumors prior to surgical removal. Additionally, all participants had available pathological complete response status (PCR) available. This is the measurable response of tumors to chemotherapy treatment, and is a common predictor for long-term survival.

### This is what the researchers found:

- Average **Vitamin D** status was 23 ng/ml (57.5 nmol/l).
- Approximately all of the women achieved complete response to NAC, meaning the treatment was effective in reducing tumor size.



# Vitamin D<sub>3</sub>

(Cholecalciferol)

## Deficiency Increases Risk of Obesity



A new study published in the European Journal of Nutrition reports that **Vitamin D** deficiency may increase your chances of becoming obese in later years.

The study looked at 1,226 people enrolled into the Pizarra study, a cohort established in 1996. The participants were then followed over the next 12 years, with three evaluations spanning across the 12 years. Initial evaluations took place between 1996-98, second evaluations took place between 2002-04, and final evaluations took place in 2005-07.

What the researchers found is that those who had low **Vitamin D** levels in the second evaluation were much more likely to become obese in the final evaluation compared to those with higher **Vitamin D** levels. Specially, those with levels lower than 17 ng/ml had a 2.35 times higher risk of becoming obese than those with levels over 17 ng/ml.

Obesity is a known risk factor for **Vitamin D** deficiency because the more you weigh the more **Vitamin D** you need. This makes understanding the exact relationship between obesity and **Vitamin D** difficult to study and understand. Researchers are trying to find out if **Vitamin D** makes you more susceptible to becoming obese, or if obesity just makes you deficient or a combination of both.

The advantage of this present study is that the researchers had the benefit to see **Vitamin D** levels at a baseline evaluation, and then assess whether people with various **Vitamin D** levels gained weight, lost weight or stayed the same.

### The researchers concluded:

“The results of the present study suggest that lower **25-OHD** values in obese subjects may not have been secondary to obesity, but may in fact precede obesity.”



## How much

# Vitamin D<sub>3</sub>

(Cholecalciferol)

## Do Children Need Daily ?



### Vitamin D for babies and children:

The American Academy of Pediatrics searched for all of the research carried out in the US, and the rest of the world, about rickets and **Vitamin D**. Having looked at all the research and analysed it, the Academy has said that to prevent rickets infants, children and adolescents need to have at least 400 IU of **Vitamin D** a day.

### They recommend that:

Babies that are being breastfed or partly breastfed should have a **Vitamin D** supplement of 400 IU a day.

Babies should keep having a supplement until they are drinking at least one litre of whole milk or formula milk a day (children shouldn't drink whole milk until they are over one year old). All babies and children drinking less than one litre of infant formula or whole milk a day should also take a supplement of 400 IU of **Vitamin D** each day. Adolescents who don't get enough **Vitamin D** from fortified milk or foods should take a **Vitamin D** supplement of 400 IU a day. Giving babies and children **Vitamin D** supplements has been preventing rickets for many years. However, there isn't much research that has looked at whether the amount that babies and children are given is actually the right amount. For example, doctors used to recommend that babies and children should have 200 IU **Vitamin D** a day to prevent rickets, and this worked. 18 Guidelines in Canada recommend that children should be given 400 IU a day, but this should be increased to 800 IU in the winter months for children in the country. The Endocrine Society in the US recommends that the infants and children should have 400IU or 600 IU of **Vitamin D** a day, and that can be the best effect from **Vitamin D**, they may need as much as 1,000 IU a day.

### What the Vitamin D Council says?

The **Vitamin D** Council recommends that infants have 1,000 IU per day and children have 1,000 IU a day per 25lbs of their body weight. Breast milk can provide most or all of this for infants, if the mother is getting enough **Vitamin D** herself. If she isn't, then breast milk cannot provide



# Vitamin D<sub>3</sub>

(Cholecalciferol)

## SAVIOR OF CHILDREN From Rickets



### The Main Causes of Rickets:

A severe lack of **Vitamin D** or calcium or both can cause nutritional rickets. The most common cause of rickets is an extreme lack of **Vitamin D** or a lack of calcium, or both together.

**Vitamin D** is produced naturally in your child's body when bare skin is exposed to sunlight. Your child can also get **Vitamin D** from most infant milk formulas, supplements and a small number of foods. Calcium comes from the food and drink your child has. Milk and dairy foods are a good source of calcium as well as some green vegetables, tofu, sardines and canned salmon. Some foods such as soya and other non dairy milks, bread and breakfast cereals, have calcium added to them. Both calcium and **Vitamin D** are essential for strong, healthy bones. If you breast feed your baby, and you don't have a **Vitamin D** supplement, then he or she is more likely to be lacking in **Vitamin D**. When breastfeeding mothers don't have high levels of **Vitamin D**, their breast milk doesn't contain much **Vitamin D** and many breastfeeding women don't get enough themselves to pass on to their baby. Therefore children that are breastfed are more likely to develop rickets than children that are bottle fed (infant formula has **Vitamin D** added to it). If your child eats a vegetarian or vegan diet, he or she may also be more likely to develop rickets, because they may not be getting enough calcium.

### What is the link between rickets and Vitamin D?

The link between **Vitamin D** and rickets has been known for many years and is well understood by doctors and scientists. In the late 19th and early 20th centuries, doctors realized that taking cod liver oil, which contains **Vitamin D**, helped to prevent and treat rickets in children. In the 1930's **Vitamin D** was added to infant formula milk for the first time.

However, rickets does still develop in some children and the numbers of children affected has started to rise. The reasons why the number of children with rickets is rising aren't clear.

### What does the research say about Vitamin D and rickets?

The links between **Vitamin D** and rickets are very clear and have been known for a long time, so there has been quite a lot of research in this area by following institutes:

- American Academy of Pediatrics
- Endocrine Society
- Vitamin D Council USA

### Preventing Rickets

Research has shown that the type of rickets that is caused by a lack of **Vitamin D** and other minerals can be totally prevented by making sure your child gets enough **Vitamin D** and calcium.

# Vitamin D<sub>3</sub>

(Cholecalciferol)

## Deficiency The Biggest Cause of "Short stature" in Children of Pakistan



A recent study published in the **Pakistan Journal of Medical Sciences** found that growth hormone deficiency and **Vitamin D** deficiency constituted the major causes of short stature among children and adolescents in **Pakistan**.

Short stature is defined as height below the 3rd percentile. This means that out of 100 children, the three shortest children would be considered to have short stature.

Short stature can result from normal variants of growth, such as genetics, delayed growth and puberty. It can also be a result of chronic disease, hormonal disorders, malnutrition and skeletal abnormalities. Early detection and treatment of remediable causes of short stature, such as malnutrition and hormonal imbalances, may lead to proper growth among children. In **Pakistan**, **33%** of children under five years of age are underweight, and **53%** have stunted growth.

Research has discovered that up to 94% of **Pakistani children** are **Vitamin D** deficient, leading to reduced bone mineralization and growth rate.

Limited information regarding the etiology of short stature among **Pakistani children** exists. However, current data suggests delayed growth and puberty, along with genetics represent the major cause. A new study sought to determine the major remediable causes of short stature among **Pakistani children**. To do this, the researchers enrolled 70 children and adolescents attending WILCARE Center for Diabetes, Endocrinology & Metabolism, a location in which the researchers expected to find a broader range of hormonal causes for short stature.

Here is what the researchers found:

- ▶ The weight for age was below the 3rd percentile in **81%** of the patients.
- ▶ Growth Hormone deficiency was the leading cause of short stature with **69%** of patients considered deficient.
- ▶ **Vitamin D** deficiency was the second most common hormonal abnormality, present in **63%** of all patients.
- ▶ Other abnormalities seen in the patients included primary hypothyroidism (**9%**) and pan hypopituitarism (failure of the pituitary gland) (**6%**).

### The researchers concluded:

"Growth hormone & **Vitamin D** Deficiency constitute the major causes of short stature in **Pakistan**."



Enlarged view of pituitary gland



# Vitamin D<sub>3</sub>

(Cholecalciferol)

May Improve

## Condition of Fatigue



A new randomized controlled trial published in the journal *Medicine* found that **Vitamin D** supplementation significantly improved fatigue. Fatigue characterizes unrelenting exhaustion that cannot be relieved by sleep.

It reduces one's motivation, concentration and energy, impacting both emotional and psychological health. It can lead to impaired quality of life and reduced productivity. Most diagnoses of fatigue are idiopathic, meaning they have unknown causes.

Researchers have suggested that **Vitamin D** deficiency and fatigue are closely related. In fact, fatigue is considered a potential side effect of **Vitamin D** deficiency. A previous study found that **Vitamin D** supplementation improved fatigue symptoms. However, the study lacked a control group, which greatly limited the strength of the results. Furthermore, the study used vitamin D2 opposed to **D3**, a less effective form of **Vitamin D**.

Now, researchers have conducted a randomized controlled trial, a study that possesses both a control group and an experimental group, to determine the effects of **Vitamin D** supplementation on fatigue. The study included 120 adults with fatigue and **Vitamin D** deficiency, 25(OH)D levels less than 20 ng/ml. Participants were randomized to receive a single oral dose of 200,000 IU **Vitamin D** or placebo.

The researchers used the fatigue assessment scale (FAS) to evaluate the effects of **Vitamin D** supplementation on fatigue symptoms. The FAS is a self-reported assessment with lower scores indicating less fatigue. Average FAS decreased significantly more in the **Vitamin D** group compared to the placebo. Improvement of fatigue was reported more frequently in the **Vitamin D** group than in the placebo group.

### The researchers concluded:

The researchers also discovered that the improvement in fatigue scores was correlated with the rise in **Vitamin D** level. "Our study shows that a single dose of oral 200,000 IU **Vitamin D3** is an effective, well-tolerated, and economical treatment strategy for healthy adults who report fatigue."

# Vitamin D<sub>3</sub>

(Cholecalciferol)

## Helpful in The Patients of Asthma



The Cochrane organization is an independent, non-profit, non-governmental entity consisting of a group of more than 37,000 volunteer scientists in more than 130 countries. The group was formed to publish medical research information in a systematic, easy to read manner, in order to help health professionals, patients, policy makers and others make decisions about treatment. Cochrane reviewers are active in all areas of medicine. Asthma is a chronic disease involving the airways in the lungs. These airways, or bronchial tubes, allow air to come in and out of the lungs. If you have asthma, your airways are always inflamed. They become even more swollen and the muscles around the airways can tighten when something triggers your symptoms. This makes it difficult for air to move in and out of the lungs, causing symptoms such as coughing, wheezing, shortness of breath and/or chest tightness.

In 2013, 242 million people globally had asthma; the prevalence has risen from 183 million in 1990. Asthma affects approximately 7% of the population of the United States. It caused about 489,000 deaths in 2013, most of which occurred in the developing world. It often begins in childhood.

The analysis showed that **Vitamin D** had little or no effect on lung function or day-to-day asthma symptoms (high-quality evidence). “We found that **Vitamin D** did not increase the risk of serious adverse events at the doses that were tested (moderate-quality evidence).”

### The authors concluded:

“**Vitamin D** is likely to offer protection against severe asthma attacks.”



# Vitamin D<sub>3</sub>

(Cholecalciferol)

## May Improve Lung Function in Smokers



Currently, one in five individuals die from cigarette smoking in the United States. Though smoking rates have significantly decreased in recent years, 16 million Americans are living with a smoking-related condition. These comorbidities span from bronchitis and pneumonia to asthma, COPD and lung cancer. Unsurprisingly, these conditions can negatively impact overall state of health and decrease quality of life. In severe lung disease, breathing becomes strained and painful as typical functioning of the lung decreases. Often, doctors will measure the severity of a lung condition by forced expiratory volume or forced vital capacity (FEV1 and FVC). Lower FEV1 and FVC scores indicate increased disease severity and poorer lung functioning, while higher scores indicate the opposite. According to research, **Vitamin D** status is associated with some aspects of lung functioning and health. Due to **Vitamin D's** role in cell regulation and apoptosis, much of this research has covered the effect of **Vitamin D** supplementation on lung cancer. Other effects of **Vitamin D** on the lungs and respiratory system may be related to its role in the immune system, muscle health and inflammation, although it is not investigated as extensively. Therefore, a recent RCT evaluated the effect of long-term, bolus-dose **Vitamin D** supplementation on the lung function in a population of older adults. Researchers included a total of 442 individuals between the ages of 50-84 from Auckland, New Zealand. The participants were randomly assigned to one of two groups: the first group received 200,000 IU for month one, followed by 100,000 IU per month for 12 months after, while the second group received an identical placebo. Demographic data as well as medical history was reported in self-administered questionnaires. In addition, blood draws were taken at baseline, month 6 and 12. Additionally, FEV1 and FVC were measured at the same intervals.

### After 12 months, this is what the researchers found:

The increase of **Vitamin D** status from baseline to 6 and 12 months was significantly higher in the supplement group compared to the placebo group. No cases of hypercalcemia were reported. FEV1 was significantly improved by **Vitamin D** supplementation compared to the placebo, but only in those who reported a history of smoking. This association was strengthened for smokers who were **Vitamin D** deficient or who had asthma/COPD.

### They Concluded:

“In subgroup analyses, we found that **Vitamin D** supplementation improved lung function (FEV1 and FEV z -score) in ever-smokers, particularly those with **Vitamin D** deficiency (FEV1 only) or asthma/COPD.”

# Vitamin D<sub>3</sub>

(Cholecalciferol)

## May Reduce Severity of Heart Failure



A new clinical trial published in the Pakistan Journal of Medical Sciences found that **Vitamin D** may improve the severity of heart failure. Heart failure (HF) occurs when the heart cannot pump enough blood to the body. This results in a diminished quality of life due to frailty, muscle weakness, shortness of breath and death. Nearly 5 million Americans currently live with HF. Despite the increase in understanding of HF, the prognosis of HF remains poor with only a 35% chance of surviving five years after diagnosis. Researchers have expressed an interest in **Vitamin D** and HF, because HF patients tend to have lower **Vitamin D** levels compared to healthy adults. Furthermore, low **Vitamin D** levels can cause muscle weakness, potentially exacerbating patients HF symptoms.

A previous open label trial found that **Vitamin D** supplementation helped heart failure severity. To evaluate these findings, researchers conducted a non-randomized clinical trial. The trial included 43 patients with HF who were not showing any signs of improvement in physical performance despite using medication. All patients had **Vitamin D** levels below 30 ng/ml. The patients received 200,000 IU of **Vitamin D** on a weekly basis for 12 weeks in addition to their standard heart failure treatment. Researchers evaluated the success of **Vitamin D** supplementation by measuring 6 minutes walk distance and Pro-BNP level. The six-minute walk test measures the distance an individual can walk on a hard, flat surface within six minutes. The test assesses one's physical fitness. Pro-BNP are substances that are produced in the heart when it is working very hard. Therefore, a high pro-BNP level indicates a greater severity of HF.

### Here is What the Researchers Found:

Average vitamin D levels increased significantly from 16.59ng/ml at the beginning of the study to 31.97ng/ml after 12 weeks. The average six minute walk distance significantly increased after **Vitamin D** supplementation from 806 feet before supplementation to 945 after supplementation. The average pro-BNP level of the patients was 1024 before the study and improved to 149 after supplementation.

#### The researchers concluded:

“**Vitamin D** supplementation decreases the severity of HF as reflected by reduction in serum pro-BNP levels and significant increase in six minutes walk distance.”



# Vitamin D<sub>3</sub>

(Cholecalciferol)

## & Prostate Cancer



Research has shown that there is a link between prostate cancer and **Vitamin D**. Studies have found that men with prostate cancer tend to have lower levels of **Vitamin D**. However, the relationship between prostate cancer and **Vitamin D** is complex and still being researched.

**Vitamin D** receptors are found on the surface of a cell and **Vitamin D** can attach themselves to these receptors. By binding to a receptor, **Vitamin D** sends chemical signals that direct a cell to do something, such as divide or die. There are **Vitamin D** receptors in prostate tissue, and **Vitamin D** can bind to these receptors. This may cause cancerous cells to die, stop growing, or stop from spreading to other parts of the body. Therefore, it is thought that **Vitamin D** may help in protecting against the progression of prostate cancer. Cells in the prostate are able to take the inactive form of **Vitamin D** and activate it. Some of the cancerous cells in the prostate lose this ability, but they still have receptors for **Vitamin D**, which could mean that supplementing with **Vitamin D** may help to slow the growth of cancerous cells.

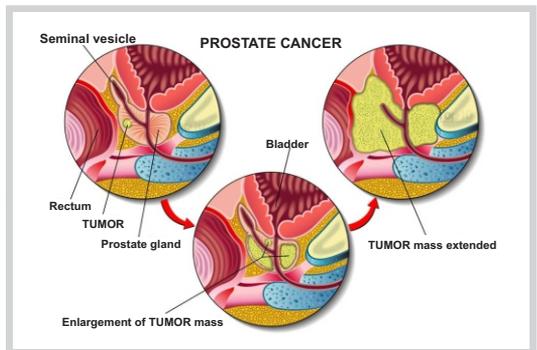
### What does the recent research say about prostate cancer and Vitamin D?

#### Preventing prostate cancer

A study done in the United States in 2014 looked at men who were having their first prostate biopsy. Biopsies remove a small portion of tissue to look at the cells and see if they are cancerous. The researchers wanted to know if there were differences in **Vitamin D** levels between men who had positive and negative biopsies. They found that

- African-American men with low levels of **Vitamin D** had higher odds of having prostate cancer.
- Caucasian and African-American men with positive biopsies had a higher tumor stage if they had low levels of **Vitamin D**.

Although they didn't find an important difference in the **Vitamin D** levels between positive and negative biopsies, they did discover that the more aggressive and advanced tumors were linked to lower levels of **Vitamin D**.



# Vitamin D<sub>3</sub>

(Cholecalciferol)

May Improve Condition of  
**AUTISM** in Children



Dr. John Cannell, MD, Founder of **Vitamin D** Council published the first paper suggesting a relationship between low **Vitamin D** status and increased risk of autism. He created his hypothesis based on the data that illustrated an increased prevalence of autism in the regions of greater cloud cover and rainfall. Only observational studies had confirmed his hypothesis until now. In a groundbreaking study, researchers proved that **Vitamin D** supplementation reduces the symptoms of autism among children. More than 3.5 million Americans live with autism spectrum disorder (ASD), affecting approximately 1 in 68 people. The prevalence of autism among U.S. children increased by nearly 120% from 2000 to 2010, coinciding with the increased prevalence of **Vitamin D** deficiency in the U.S. ASD describes a range of conditions categorized as neuro-developmental disorders. Characteristics of autism include deficits in social skills, impairment in verbal and nonverbal communication and repetitive patterns of behavior, interests or activities. Currently, there are no effective treatments for the core symptoms of autism. Thus, researchers all over the world are seeking solutions. **Vitamin D** plays an essential role in neuro-development and gene regulation. More than 2,700 genes contain **Vitamin D** receptors, and **Vitamin D** regulates the expression of over 200 genes. Furthermore, **Vitamin D** deficiency during pregnancy is associated with adverse effects for the baby, including an increased risk of autism. This evidence led researchers to recently conduct a randomized controlled trial (RCT), the gold standard of research, to evaluate the effects of **Vitamin D** supplementation on autism in children. The RCT consisted of 109 children with ASD, ages three to ten years. Half of the children were randomized to receive a daily **Vitamin D** dose of **300 IU** per kg of body weight, equivalent to 136 IU per pound, but no greater than 5,000 IU daily. The other half received a daily placebo pill. The experiment lasted for a total of four months. The researchers assessed **Vitamin D** levels, autism severity and social maturity of the children at the beginning and end of the study. After four months, **Vitamin D** supplementation significantly improved the core manifestations of ASD, which include irritability, hyperactivity, social withdrawal, stereotypic behavior and inappropriate speech. Whereas, the placebo group did not experience any significant improvements.

## The Researchers concluded:

“This study is the first double-blinded RCT proving the efficacy of **Vitamin D3** in ASD patients. Oral **Vitamin D** supplementation may safely improve signs and symptoms of ASD and could be recommended for children with ASD.”

# Vitamin D<sub>3</sub>

(Cholecalciferol)

## & Depression



The amount of research about **Vitamin D** and depression, as well as other mental health problems, is rapidly growing. Recently that large scaled studies on **Vitamin D** and depression have been conducted. But the research in this area has given some conflicting results.

Some of the reasons why mixed results have been produced from studies on **Vitamin D** and depression include:

- The use of different dosages of **Vitamin D** supplements for different lengths of time
- Varying parameters defining **Vitamin D** sufficiency and efficacy of treatment
- Different study populations
- The use of different tools to measure depression and mental health
- **Vitamin D** every day, whereas in other studies, people take vitamin once a week or once a month.

There are a number of strong research studies from the last few years that looked specifically at **Vitamin D** levels and depression. For example, in a review of the research about **Vitamin D** and depression, researchers analyzed all of the published research about depression and **Vitamin D**. They included the high-quality research studies that explored whether:

- A lack of **Vitamin D** in the blood increases the likelihood an individual will develop depression
- Taking a **Vitamin D** supplement can improve or prevent depression

A cross-sectional study in Finland found a significant inverse correlation between depressive disorder and **Vitamin D** status. Those with **Vitamin D** levels above 22 ng/mL (56 nmol/L) had a 35% lower risk of depressive disorder than those with **Vitamin D** levels below 14 ng/mL (34 nmol/L).



# Vitamin D<sub>3</sub>

(Cholecalciferol)

## Deficiency is Associated With The Intensity of Schizophrenia



A new study found that low **Vitamin D** status was significantly associated with increased symptom severity in schizophrenia. Schizophrenia is a chronic severe mental illness that affects approximately 3.2 million Americans, about 1% of the population. It is characterized by a range of behaviors, including hallucinations, delusions and paranoia. Symptoms of schizophrenia are categorized into two categories: positive and negative symptoms. Positive symptoms are those behaviors that are present in schizophrenia but absent in healthy individuals, such as hallucinations and delusions. Positive formal thought disorder is delusion for those affected by schizophrenia, in which one has disorganized thoughts and speech. Negative symptoms describe behaviors that are normally present in individuals but are absent in schizophrenic individuals, including poor grooming, stilted language and affective flattening. Affective flattening refers to reduced expression of emotions, manifesting itself as unchanging facial expression, poor eye contact and lack of vocal inflections.

The research on this topic has only just begun. Current research indicates that low **Vitamin D** levels during the prenatal period and early childhood are significantly linked to schizophrenia. One small study found **Vitamin D** status is significantly associated with schizophrenia. Since the study consisted of such a small sample size, the researchers wanted to know if they could result in a larger sample in a larger sample, and further illustrating the potential role of schizophrenia in **Vitamin D**.

To do this, the researchers included 80 patients diagnosed with schizophrenia and 74 age and sex matched healthy individuals. The study compared symptom severity to **Vitamin D** status. The Scale for the Assessment of Negative Symptoms (SANS) and the Scale for the Assessment of Positive Symptoms (SAPS) measured severity of symptoms. Higher scores indicate greater severity. Here is what the researchers found:

- There were no significant differences in **Vitamin D** status between individuals with and without schizophrenia.
- **Vitamin D** levels were inversely associated with SANS total and affective flattening among schizophrenic patients.

### The researchers concluded:

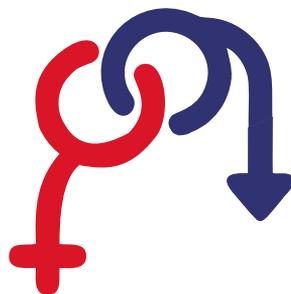
“Our results, show that lower **Vitamin D** levels were related to positive and negative symptom severity and as the vitamin deficiency became greater, patients symptom scores increased, suggesting that it is advisable to monitor the levels of patients being treated for schizophrenia.”

# Vitamin D<sub>3</sub>

(Cholecalciferol)

May Improve

## Erectile Function



A total of 102 male patients aged 35–64 years (average of 53) with 25(OH)D <30 ng/mL (mean baseline 25(OH)D was 15 ng/mL) were included in the study. Participants were followed up for one year, with monitoring at 3, 6, 9 and 12-months. At the initial baseline visit, a complete medical examination was conducted and blood was drawn for laboratory tests assessing biochemical and hormonal variables. The same protocol was followed every three months for one year.

Once the patients' serum **Vitamin D** level reached > 30 ng/mL, the authors switched the dose to 600,000 IU/2 months and continued monitoring the patients. Their target 25(OH)D serum level range was 30–80 ng/mL. If any man's level reached 80 ng/mL, the researchers further decreased the dose to 600,000 IU/3 months. At the four follow-up visits (3, 6, 9 and 12 months), blood was collected and subject's erectile function was evaluated by the IIEF-5. Average **Vitamin D** levels increased from baseline (15 ng/mL) to 32 ng/mL at 3 months, 37 ng/mL at six months, 45 ng/mL at 9 months and 49 ng/mL at one year. Erectile function scores increased in a stepwise fashion from 14 at baseline to 20 at one year. Serum testosterone increased from 12 nmol/mL at baseline to 16 nmol/L at 3 months and maintained that level for the year. The researchers also observed significant stepwise decreases in serum estradiol (88 to 70 nmol/L). Furthermore, parathyroid hormone levels (PTH) went from 59 to 38 pg/mL at six months and maintained that level over the course of the study. Obviously, a randomized controlled trial using daily adequate doses, such as 10,000 IU/day, would be helpful. Furthermore, **cholecalciferol (D3)** has been proven to be more effective in raising **Vitamin D** levels than ergocalciferol (D2). Since the researchers administered ergocalciferol opposed to cholecalciferol, this may have also limited the observed improvements in erectile function. Serum testosterone decreases as men age, and low testosterone is associated with depression. In addition, low serum testosterone levels may be linked to cardiovascular disease (CVD) however, research has produced conflicting results.

### Vitamin D Council Recommendation

We recommend that you receive safe, sensible, full body sun exposure during solar noon. However, when that is not possible, we recommend supplementing with 5,000 to 10,000 IU/day, depending on your 25(OH)D level. Keep in mind, multiple factors affect **Vitamin D** status, such as genetics, weight, sun exposure and oral intake. Therefore, it is essential to test your **Vitamin D** levels to ensure you are receiving the optimal **Vitamin D** intake for your body.

# Vitamin D<sub>3</sub>

(Cholecalciferol)

## May Improve Muscle Mass in Old Age People



Sarcopenia is characterized by a gradual loss of muscle mass and strength as a natural part of aging. This progressive decline typically begins around the age of 50, with a 1-2% decrease in muscle mass per year. Individuals with Sarcopenia are at an increased risk for impaired recovery from chronic illness and experience an increased rate of hospital stays and nursing home admissions. Although several factors contribute to the development of sarcopenia, inadequate intake of high quality protein and low **Vitamin D** status are important modifiable risk factors. Research suggests whey protein (milk based protein) is beneficial for enhancing muscle-protein synthesis (MPS) among older adults. MPS is a process responsible for maintaining and gaining muscle mass. Furthermore, research has shown that leucine, an essential amino acid, may further stimulate MPS when taken alongside a high quality protein source.

**Vitamin D** plays a crucial role in improving muscle strength. Like whey protein, **Vitamin D** has been shown to increase the rate of MPS. Additionally, research has found that **Vitamin D** increases fast-twitch muscle fiber size and decreases muscle inflammation. One study found that supplementing obese older individuals with a combination of whey protein and **Vitamin D** decreased the risk of developing sarcopenia during intentional weight loss. Over the years, researchers have attempted to provide nutritional interventions for the treatment of sarcopenia, including the use of a combination of **Vitamin D** and high quality protein. However, the results were conflicting. The researchers conducted a study utilizing the data from the PROVIDE study, a randomized controlled double blind trial that compared the effects of a **Vitamin D (800 IU)** and leucine-enriched whey protein drink to a placebo among 380 older adults with sarcopenia.

### The researchers concluded:

“Sarcopenic participants may need serum 25(OH)D concentrations exceeding 50 nmol/L and a fairly high dietary protein intake (> 1g/kg body weight/day) in order to experience meaningful muscle mass gain from a **Vitamin D** and protein supplement in long term interventions.”

### DISCLAIMER & DOSAGE

The Publisher and the Authors have made every effort to ensure that drug/supplement selection and dosage detailed in this text are in accordance with current recommendation and practice at the time of publication. Due to ongoing research, changes in government regulations, and the constant change in available information relating to therapy and drug/supplement reactions, you are urged to check the prescribing information for each drug/supplement and any approved indications and for added warnings and precautions.





Let's Make  
**PAKISTAN**



**D** Positive



scotmann  
[www.scotmann.com](http://www.scotmann.com)