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December 2010

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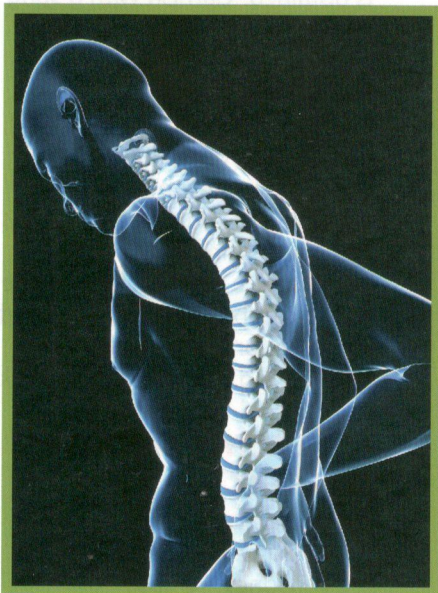
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# The importance of Calcium in Osteoporosis

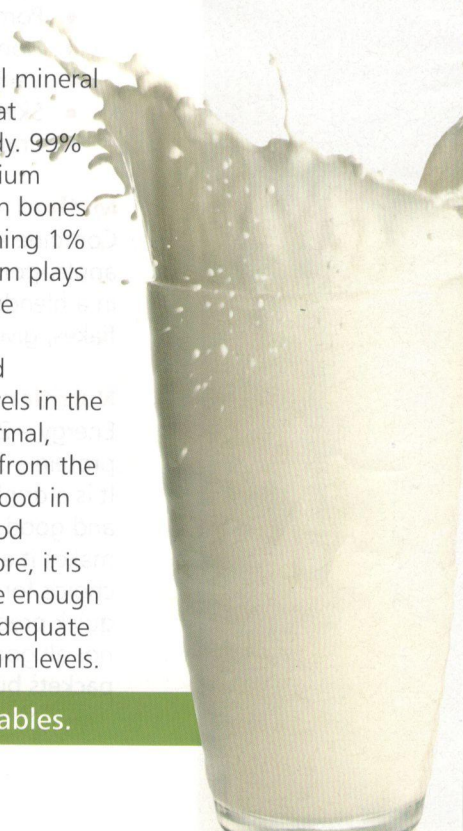


Bone is a living tissue and they require nutrients just like rest of the body. Osteoporosis is thinning and weakening of bones that lead to their breaking even with minimum force. Getting older, having a small & thin skeletal structure, family history of osteoporosis, side effects of certain medicines, time post menopause & having osteopenia (low bone mass) are all risk factors which can lead to osteoporosis. A bone mineral density test is the best way to check your bone health. More over the need for mineral rich diet persists even after the bone growth has ceased. It plays a major role in the prevention and treatment of osteoporosis. To keep bones strong, eat a diet rich in calcium with adequate protein, vitamin D, magnesium, manganese, phosphorus, zinc, copper & vitamin k along with exercise.

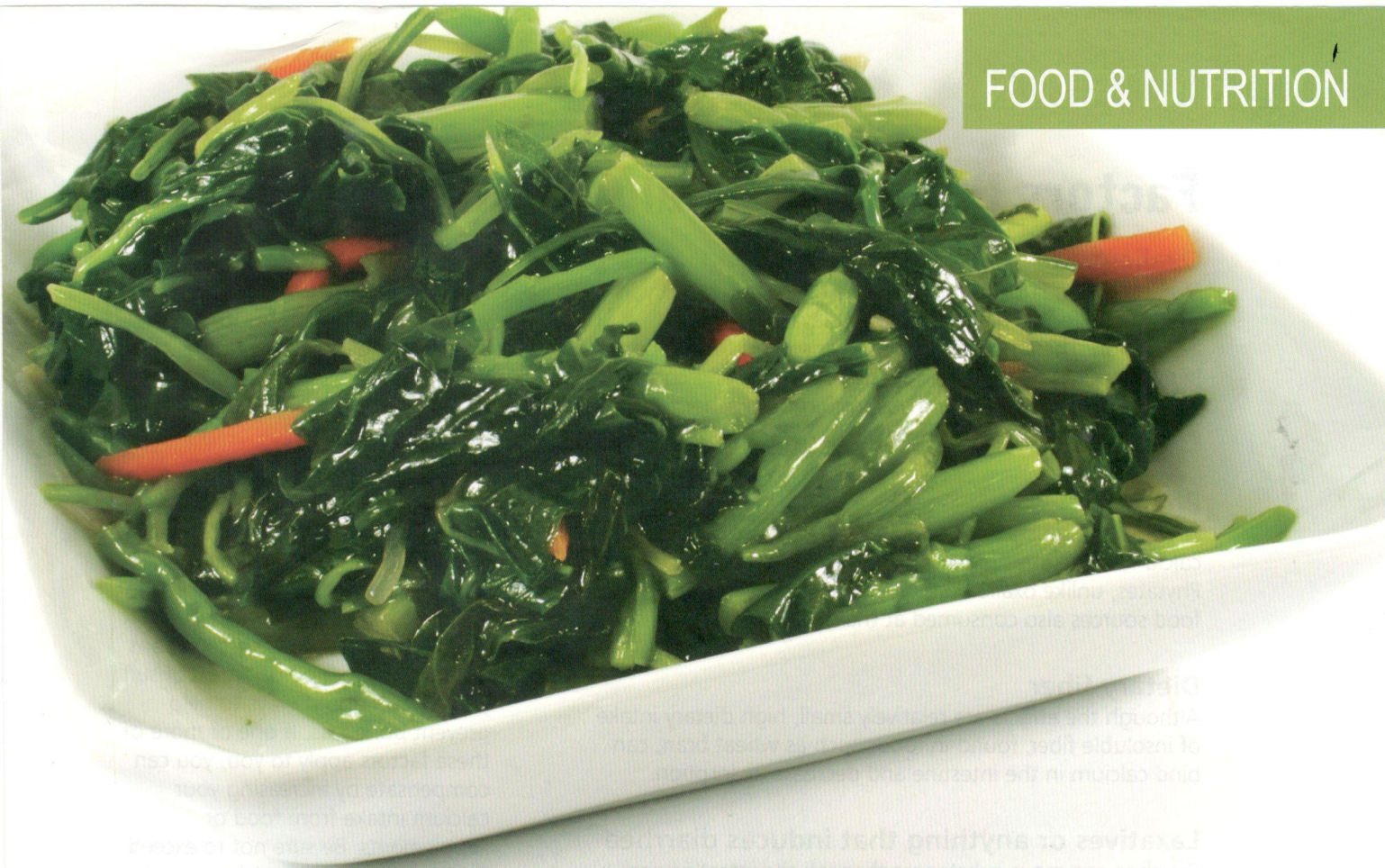
## Recommended calcium intake

To avoid calcium toxicity, it is recommended not to take more than 2,500 milligrams of calcium per day. High calcium intake can lead to constipation, an increased chance of developing calcium kidney stones and may inhibit absorption of iron and zinc from food. The National Institute of Health Consensus Conference and The National Osteoporosis Foundation support a higher calcium intake of 1,500 milligrams per day for postmenopausal women not taking estrogen and for adults 65 years or older.

Calcium is an essential mineral which is found in great abundance in the body. 99% percent of all the calcium found in the body is in bones and teeth. The remaining 1% is in the blood. Calcium plays important role in nerve conduction, muscle contraction and blood clotting. If calcium levels in the blood drop below normal, calcium will be taken from the bones and put into blood in order to maintain blood calcium levels. Therefore, it is important to consume enough calcium to maintain adequate blood and bone calcium levels.



**Sources:** Milk and Milk products, nachni, dark green leafy vegetables.



## Factors Increasing Calcium Absorption

Calcium consumed through food or as a supplement is absorbed by the body in the small intestine. Not all the calcium you eat will be absorbed. Some will pass through your digestive system and will be excreted as waste. Amount of calcium absorbed by the body depends on the type of calcium you consume, how well the calcium dissolves in the intestines and the amount of calcium in your body.

### Acidic conditions in the intestine

Calcium carbonate requires an acidic environment in order to dissolve in the intestine and get absorbed into the blood. Stomach acid production increases in the presence of food, creating an acidic environment. Therefore, calcium carbonate supplements should be taken with a meal or after a meal. Calcium citrate does not require the presence of extra stomach acid to dissolve and get absorbed and hence can be taken on an empty or full stomach before or after a meal.

### Vitamin D

Calcium absorption is dependent on an adequate level of active form of vitamin D. Often vitamin D is supplemented along with calcium. Vitamin D has been shown to produce adverse side effects at above 50 micrograms a day. Vitamin D supplements are usually not necessary because vitamin D is available from foods such as fish and egg yolks and from exposure of skin to sunlight. In general, you only need 15 minutes of sunlight exposure to maintain an adequate level of vitamin D. However, the amount of sunlight that your skin absorbs is dependant on the weather, latitude, time of the year, the amount of skin exposed and use of sunscreen.

### Estrogen

Estrogen is a hormone that plays an important role in increasing the absorption of calcium. After menopause, estrogen levels drop and so does calcium absorption.

### Low calcium intakes

Body absorbs calcium less efficiently as your intake increases. Therefore it is best to take calcium in smaller doses throughout the day to aid absorption rather than a single large dose. You should not take more than 500 milligrams of calcium at one time and should allow 4 to 6 hours between doses.

## Factors Decreasing Calcium Absorption

### Oxalic Acid

Oxalic acid is a substance that binds to calcium directly in some plant-foods making calcium unavailable for absorption. The amount of calcium absorbed from foods high in oxalic acid, such as spinach, soybeans and cocoa, is small. However, the calcium absorption from other food sources consumed at the same meal, will not be affected.

### Phytates

Phytates are substances found in pulses that can bind calcium in the intestine and decrease its absorption. Phytates, unlike oxalic acid, will bind the calcium from other food sources also consumed at the same meal.

### Dietary fiber

Although the effects are relatively small, high dietary intake of insoluble fiber, found in foods such as wheat bran, can bind calcium in the intestine and decrease absorption.

### Laxatives or anything that induces diarrhea

Diarrhea can move substances through the intestine very rapidly, not leaving enough time for calcium to be absorbed.

### Excess consumption of minerals phosphorous and magnesium in proportion to calcium

The absorption of both magnesium and phosphorous requires vitamin D. If these minerals are consumed in excess, there will be less vitamin D available for aiding calcium absorption.

### Tannins in tea

Tannins are substances found in tea which can bind with calcium in the intestine, therefore decreasing its absorption.

### Medications

Long term use of medications, such as corticosteroids and anti-convulsants can be damaging to bone. These medications are used for chronic conditions such as asthma, rheumatoid arthritis and psoriasis. If you need to take these medications for extended period of time, consult your doctor about ways to help prevent bone loss. If one or more of these factors apply to you, you can compensate by increasing your calcium intake from food or supplements. Be sure not to exceed 2,500 milligrams of calcium per day.

### Calcium supplements

Supplement Form	Percent Elemental Calcium	Comments
Calcium Citrate	21 %	Best absorbed supplemental form of calcium. It does not require the presence of extra stomach acid to dissolve. Calcium citrate can come in colloidal form. This is a liquid form of calcium that may be less irritating to the intestinal wall.
Calcium Carbonate	40 %	Most common type of calcium supplement on the market. Usually requires extra stomach acid for digestion, so should be taken with a meal.

