

# Evidence-based Calcium Usage

**Name(s):** Calcium carbonate, dolomite, oyster shell calcium, calcium citrate, calcium citrate malate, tricalcium phosphate, calcium lactate, calcium gluconate, calcium aspartate, calcium orotate, calcium chelate and bonemeal.

**Warning:** Calcium supplements should be avoided by prostate cancer patients.

**Description:** This trace mineral is the most abundant in the body. Calcium has many biological functions. Involved in bone structure, this mineral precipitates in the bone making it stronger. For blood to coagulate, calcium must be present. This mineral increases cell permeability as well. When in abundance, calcium helps other nutrients into the cells. Transmission of nerve stimuli is also effected. Calcium is deposited at the ends of muscle fibres effecting the contraction of the muscle, especially the long muscles and heart muscles. When calcium flows through the circulatory system it aids in the relaxation of muscles. Calcium also works as an enzyme activator telling the catalysts what to do.<sup>1</sup>

**Absorption/Storage:** Calcium needs an acidic environment to be absorbed. Therefore, the best time to take calcium is during a meal because when food is eaten the stomach releases hydrochloric acid (HCl) making the absorption of calcium more efficient. The duodenum is the site of the initial absorption, then ceasing in the lower intestinal tract. Phosphorous and vitamin D must also be present for the absorption of this mineral.<sup>1</sup>

Calcium absorption studies have found that your body can't absorb more than 500 mg of calcium at one time.<sup>2</sup> Therefore, it is most efficient to take your total daily calcium in two or more doses.

**Recommended Dietary Allowance/Dietary Reference Intake:**<sup>3</sup>

Persons	U.S. (mg)
Birth to 3 years of age	210-500
4 to 8 years of age	800
9 to 18 years of age	1300
Adult males	1000-1200
Adult females	1000-1300
Pregnant females	1000-1300
Breast-feeding females	1000-1300

Form of Calcium	Strength of each tablet (mgs)	Elemental calcium per tablet (mgs)	Tablets needed to provide 1,000 mgs of calcium
Calcium carbonate	625	250	4
	650	260	4
	750	300	4
	835	334	3
	1250	500	2
	1500	600	2
Calcium citrate	950	200	5
Calcium gluconate	500	45	22
	650	58	17
	1000	90	11
Calcium lactate	325	42	24
	650	84	12
Calcium phosphate, dibasic	500	115	9
Calcium phosphate, tribasic	800	304	4
	1600	608	2

**Optimum Daily Allowance (Adult):** 1500-2000 mg.<sup>4</sup>

**Tolerable Upper Intake Levels:**<sup>3</sup>

Persons	U.S. (mg)
Birth to 3 years of age	ND-2500
4 to 8 years of age	2500
9 to 18 years of age	2500
Adult males	2500
Adult females	2500
Pregnant females	2500
Breast-feeding females	2500

**Principal Uses:** High cholesterol,<sup>5-9</sup> colon cancer prevention,<sup>10-15</sup> osteoporosis (with vitamin D supplementation),<sup>16-24</sup> preeclampsia,<sup>25-36</sup> pregnancy-induced hyper-tension,<sup>37-47</sup> premenstrual syndrome,<sup>48-51</sup> and rickets.<sup>52,53</sup>

**Proposed Uses:** Celiac disease (for deficiency only), high blood pressure and high triglycerides.<sup>54</sup>

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**Traditional Uses:** Amenorrhoea (calcium for preventing bone loss), depression, dysmenorrhoea (painful menstruation), gingivitis (periodontal disease), insulin resistance syndrome (Syndrome X), kidney stones, migraine headaches, multiple sclerosis, pregnancy and postpartum support.<sup>54</sup>

**Healthy Sources:**

High (40%+ US DRI): Dried agar, raw firm [and extra firm] tofu.<sup>55</sup>

Medium (25-39% US DRI): Amaranth, carob (St. John's bread) flour, dried figs, dried oriental radishes, frozen raw rhubarb, toasted and roasted whole sesame seeds and raw defatted soy meal.<sup>55</sup>

**Contraindications:** If you are taking this dietary supplement without a prescription, carefully read and follow any precautions on the label. For calcium supplements, the following should be considered:

**Pregnancy--**It is especially important that you are receiving enough calcium when you become pregnant and that you continue to receive the right amount of calcium throughout your pregnancy. The healthy growth and development of the foetus depend on a steady supply of nutrients from the mother. However, taking large amounts of a dietary supplement during pregnancy may be harmful to the mother and/or foetus and should be avoided.

**Breast-feeding--**It is especially important that you receive the right amount of calcium so that your baby will also get the calcium needed to grow properly. However, taking large amounts of a dietary supplement while breast-feeding may be harmful to the mother and/or baby and should be avoided.

**Children--**Problems in children have not been reported with intake of normal daily-recommended amounts. Injectable forms of calcium should not be given to children because of the risk of irritating the injection site.

**Older adults--**Problems in older adults have not been reported with intake of normal daily-recommended amounts. It is important that older people continue to receive enough calcium in their daily diets. However, some older people may need to take extra calcium or larger doses because they do not absorb calcium as well as younger

people. Check with your health care professional if you have any questions about the amount of calcium you should be taking in each day.

If this dietary supplement has been ordered for you by your health care professional and you will be taking it in large doses or for a long time, your health care professional should check your progress at regular visits. This is to make sure the calcium is working properly and does not cause unwanted effects.

Do not take calcium supplements within 1 to 2 hours of taking other medicine by mouth. To do so may keep the other medicine from working properly.

Unless you are otherwise directed by your health care professional, to make sure that calcium is used properly by your body:

- Do not take other medicines or dietary supplements containing large amounts of calcium, phosphates, magnesium, or vitamin D unless your health care professional has told you to do so or approved.
- Do not take calcium supplements within 1 to 2 hours of eating large amounts of fibre-containing foods, such as bran and whole-grain cereals or breads, especially if you are being treated for hypocalcaemia (not enough calcium in your blood).
- Do not drink large amounts of alcohol or caffeine-containing beverages (usually more than 8 cups of coffee a day), or use tobacco.

Some calcium carbonate tablets have been shown to break up too slowly in the stomach to be properly absorbed into the body. If the calcium carbonate tablets you purchase are not specifically labelled as being "USP," check with your pharmacist. He or she may be able to help you determine which tablets are best.<sup>56</sup>

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## Interactions:

Decreases Mineral Availability:	Albuterol, aluminium hydroxide, anticonvulsants, bile acid sequestrants, ciprofloxacin, cisplatin, inhaled and oral corticosteroids, cycloserine, erythromycin, felodipine, flurbiprofen, gentamicin, hydroxychloroquine, indomethacin, losartan, mineral oil, minocycline, risedronate, sulfamethoxazole, thyroid hormones, tobramycin, trimethoprim, <sup>54</sup> caffeine, isoniazid, neomycin, triamterene, <sup>54,57</sup> aminoglycosides, barbiturates, black tea, coffee, digoxin, diuretics, ethacrynic acid, fibre supplementation, furosemide, glutethimide, hemi-cellulose, glucocorticoids, high fat foods, high protein foods, high sodium diet, high sugar diet, isoniazid, methotrexate, oxalates, phenobarbital, phenolphthalein, phenytoin, phosphorus, phytates, strophanthin, tetracycline, <sup>57</sup> bisphosphonates, iron, dairy products, spinach and rhubarb. <sup>58</sup>
Increases Mineral Availability:	Boron, essential fatty acids, phosphorus, manganese, vitamins A, C, and F, <sup>3</sup> vitamin D <sup>3,56</sup> calcitonin, diclofenac, combined oestrogens, indapamide, oral contraceptives, sucralfate, thiazide diuretics, <sup>54</sup> magnesium, vitamin B6, iron, isotretinoin, lysine, oestrogen and sodium bicarbonate. <sup>56</sup>
Is Decreased By Mineral Availability:	Alendronate, doxycycline, minocycline, nadolol, ofloxacin, rofecoxib, sodium fluoride, sotalol, <sup>54</sup> atenolol, ciprofloxacin, calcium channel blockers, chromium, etidronate, iron, magnesium, manganese, Vitamin K, <sup>56</sup> tetracyclines, <sup>54,56</sup> and phenytoin. <sup>58</sup>
Adverse Reactions	Isotrentoin. <sup>57</sup>

**Deficiency:** When deficient in calcium, one of the first signs is a condition called tetany. This is when the muscles cramp and a tingling sensation is felt in the arms and legs. Osteoporosis is the most common ailment associated with a deficiency in calcium. Osteoporosis, "holes in the bone", is

caused by the body's need for calcium; therefore, pulling this mineral from the bones. When you hear, "Grandma fell and broke her hip", it literally means "Grandma broke her hip and then fell". This happens because the bones become very brittle in this condition. Hypertension may result from low levels of calcium because the effects of sodium are counteracted by calcium; therefore, if calcium is not present then sodium cannot be counteracted. Other symptoms of a deficiency include heart palpitations, insomnia, impaired growth, brittle nails, and eczema.<sup>1</sup>

**Toxicity/Side Effects:** Along with its needed effects, a dietary supplement may cause some unwanted effects. Although the following side effects occur very rarely when the calcium supplement is taken as recommended, they may be more likely to occur if:

- It is taken in large doses.
- It is taken for a long time.
- It is taken by patients with kidney disease.

Check with your health care professional as soon as possible if any of the following side effects occur:

### *More common (for injection form only)*

- Dizziness; flushing and/or sensation of warmth or heat; irregular heartbeat; nausea or vomiting; skin redness, rash, pain, or burning at injection site; sweating; tingling sensation

### *Rare*

- Difficult or painful urination; drowsiness; nausea or vomiting (continuing); weakness

### *Early signs of overdose*

- Constipation (severe); dryness of mouth; headache (continuing); increased thirst; irritability; loss of appetite; mental depression; metallic taste; unusual tiredness or weakness

### *Late signs of overdose*

- Confusion; drowsiness (severe); high blood pressure; increased sensitivity of eyes or skin to light; irregular, fast, or slow heartbeat; unusually large amount of urine or increased frequency of urination

Other side effects not listed above may also occur in some patients. If you notice any other effects, check with your health care professional.<sup>56</sup>

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**Treatment for Overdose:** None.

**Storage:** To store this dietary supplement:

- Keep out of the reach of children.
- Store away from heat and direct light.
- Do not store in the bathroom, near the kitchen sink, or in other damp places. Heat or moisture may cause the dietary supplement to break down.
- Keep the liquid form of this dietary supplement from freezing.
- Do not keep outdated dietary supplements or those no longer needed. Be sure that any discarded dietary supplement is out of the reach of children.<sup>56</sup>

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