

## Nutrients to Be Cautious of Supplementing With – Part 2

Okay. Speaking of calcium, let's move on to that and talk about some of the risks there. Calcium is a main structure element of bones and teeth. It also plays a role in cell signaling. Calcium levels are tightly regulated by parathyroid hormone and vitamin D. If calcium intake isn't high enough, calcium levels will be maintained at the expense of bone health. That's something important to understand.

**Recommended RDA:** 600mg minimum,  
preferably above 800mg

Lower D/T increase absorption on  
a '**low in anti-nutrients**' paleo diet

**Vitamin D** is required for optimal  
calcium absorption

**Higher protein diets**  
increase absorption

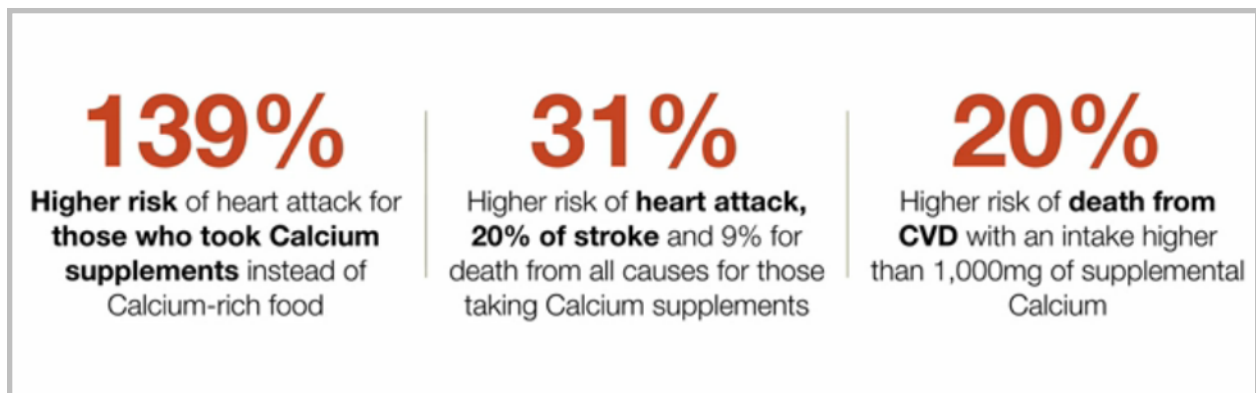
High levels of supplementation can lead to  
**hypercalcemia** (fatal if untreated)

The RDA for calcium is 1,000 to 1,200 mg a day, though other experts have suggested that lower levels are probably adequate, especially if vitamin D and K2 levels are sufficient, because those nutrients help to regulate calcium metabolism. I recommend a minimum of 600 mg and preferably above 800 mg per day. On a Paleo diet low in anti-nutrients, the need for calcium is likely to be lower due to increased absorption of dietary calcium. As I mentioned, vitamin D and vitamin K2 are

both required for optimal calcium absorption. You should be aware that higher-protein diets also increase calcium absorption, and higher intakes of calcium through supplements but not through diet can lead to hypercalcemia, which can be fatal if left untreated.

Calcium supplementation has become popular, especially with older women, to help prevent osteoporosis, given calcium's role in bone health. Most older women who come into my clinic are taking calcium. There was a pretty concerted campaign over many, many years to get this message out, and it definitely worked. Unfortunately, now the overwhelming research shows that calcium supplementation not only doesn't reduce fracture rates in the elderly, it may increase them. After women have been told for decades to increase their calcium intake and take calcium supplements, they finally got the message and started doing that. We now know that that's actually probably harming them. Particularly, it harms men, so this is something we really need to get out there to our clients and patients.

While calcium is a crucial mineral, supplemental calcium has been shown to increase the risk of cardiovascular disease and cardiovascular events. It's not hard to understand why. We want our arteries to be soft and pliant. When our arteries become calcified and they become brittle and hard, that increases the risk of cardiovascular disease. Supplemental calcium has a much greater effect on circulating calcium concentrations than dietary calcium. We evolved to get calcium from diet just like all of the other nutrients, and our body has regulatory mechanisms for handling that, even if we're getting more calcium than we need, but those regulatory mechanisms appear to be less effective with large boluses of supplemental calcium. Make sure that your patients are getting adequate amounts of K2 and consuming enough vitamin D and vitamin A because all of those play a role in regulating calcium homeostasis.



Here is a little more data on the relationship between calcium and cardiovascular disease risk. In a study of 24,000 men and women aged 34 to 65 that was published in *BMJ* in 2012, those who supplemented with calcium had a 139 percent higher risk of heart attack versus those whose calcium intake came from food who had no change in risk.

Meta-analysis in *BMJ* of 12,000 individuals showed that those taking supplemental calcium had a 31 percent higher risk of heart attack, a 20 percent higher risk of stroke, and a 9 percent higher risk of death from all causes.

Finally, another analysis in *JAMA Internal Medicine*, also looking at 12,000 participants, found that intake of more than 1,000 mg of supplemental calcium per day increased the risk of death from cardiovascular disease by 20 percent. So, now you can understand why I'm not a fan of supplemental calcium as a means of reducing iron absorption.

Even without purposefully supplementing calcium, many of your patients may be accidentally supplementing because of fortified foods and multivitamins. Multivitamins almost always have calcium in them. Foods such as orange juice; cereal; non-dairy milks such as almond milk, rice milk, or soy milk; bread; instant oatmeal; and several other foods are often fortified with calcium.

Food	Serving	Calcium (mg)	Food	Serving	Calcium (mg)
Sesame Seeds	0.25 cup	351	Brussels Sprouts	1 cup	56
Sardines (with bones)	3.75 oz can	351	Green Beans	1 cup	55
Yogurt	1 cup	296	Oranges	1 medium	52
Collard Greens	1 cup	268	Cinnamon	2 Tsp	52
Spinach	1 cup	245	Summer Squash	1 cup	49
Cheese	1 oz	204	Fennel	1 cup	43
Turnip Greens	1 cup	197	Parsley	1/2 cup	42
Canned Sockeye Salmon (with bones)	3 oz	188	Asparagus	1 cup	41
Molasses (blackstrap)	1 Tbsp	180	Celery	1 cup	40
Mustard Greens	1 cup	165	Cumin	2 Tsp	39
Beet Greens	1 cup	164	Basil	1/2 cup	38
Bok Choy	1 cup	158	Garlic	6 cloves	33
Almonds (dry roasted)	2 oz	150	Oregano	2 Tsp	32
Cow's Milk	4 oz	138	Leeks	1 cup	31
Swiss Chard	1 cup	102	Romaine Lettuce	2 cups	31
Kale	1 cup	94	Cloves	2 Tsp	27
Cabbage	1 cup	63	Black Pepper	2 Tsp	26
Broccoli	1 cup	62			

I recommend that most patients get their calcium from food if possible, and I've listed the food sources of calcium on this slide based on serving size. Things such as sesame seeds; sardines with the bones in; dairy products, of course; dark, leafy greens such as collard greens and spinach; and sockeye salmon with the bones in are a great source of calcium. Sardines with bones in and canned sockeye salmon with bones in can be obtained from Vital Choice. Those are probably two of the best ways for patients to get calcium. Then some nuts such as almonds are decent sources of calcium as well. You can print this slide out or look at the transcript, and you can keep these tables handy.

Those concerned about bone health should also be encouraged to do weight-bearing exercise, as this is probably one of the most important things you can do to promote healthy bones. If patients are consuming enough dietary calcium as well as other synergistic vitamins and minerals such as K2, D, A, and magnesium and performing weight-bearing exercise, there is probably no need to supplement at all, and supplementing would likely do more harm than good.

Alright, let's talk a little bit about vitamin E. Vitamin E is a potent fat-soluble anti-inflammatory vitamin that protects us from free radicals and reactive oxygen species. It's also involved in immune function, cell signaling, regulation of gene expression, and other metabolic processes.

There are three different types of vitamin E, or isomers. There are phenols, tocopherols, and tocotrienols. Alpha-tocopherol is the form that most supplements contain. While vitamin E is an important nutrient to get in the diet, I definitely don't recommend supplementing with it, with the possible exception of tocotrienols.

**Alpha-tocopherol** shows no benefit, and **may even cause harm.**

At best, alpha-tocopherol shows no benefit, but in several studies, it actually shows harm. For example, in a meta-analysis in *JAMA* with 230,000 total participants, vitamin E supplementation caused increased risk of death from all causes. Another review of 78 randomized controlled trials with almost 300,000 total participants found that vitamin E supplementation increased mortality by a small but significant margin.

Food	Serving	α-Tocopherol (mg)	γ-Tocopherol (mg)
<b>Sunflower Seed Kernels (dry roasted)</b>	1 ounce	7.4	0
<b>Almonds</b>	1 ounce	7.3	0.2
<b>Hazelnuts</b>	1 ounce	4.3	0
<b>Pecans</b>	1 ounce	0.4	6.9
<b>Tomato sauce (canned)</b>	1 cup	3.5	0.2
<b>Cranberry Juice</b>	1 cup (8 fl oz)	3.0	-
<b>Apricots (dried)</b>	1/2 cup (halves)	2.8	0
<b>Avocado (California)</b>	1 fruit	2.7	0.4
<b>Fish, Rainbow Trout (cooked, dry-heat)</b>	3 ounces	2.4	0
<b>Spinach (cooked, boiled)</b>	1/2 cup	1.9	-
<b>Asparagus (canned)</b>	1/2 cup	1.5	-
<b>Swiss chard (cooked, boiled)</b>	1/2 cup (chopped)	1.6	-
<b>Broccoli (cooked, boiled)</b>	1/2 cup (chopped)	1.1	-
<b>Blackberries (raw)</b>	1/2 cup	0.8	0.3

So, again, you want to aim for whole-food sources of vitamin E only. These include nuts and seeds primarily but also tomato sauce, cranberry juice, some fruits such as apricots and avocado, and fish such as trout. The RDA is 15 mg a day. Most Americans get their intake from polyunsaturated vegetable oils. That is perhaps one of the only benefits of these industrial seed oils. Paleo sources for people who are avoiding those oils or minimizing them, again, include nuts and seeds, some greens, and some fish such as trout. It's important, by the way, to eat foods that contain vitamin E, and any fat-soluble vitamin, for that matter, such as D, K2, and A, with fat because they are fat soluble. Fat will be necessary to absorb fat-soluble vitamins such as vitamin E, and studies have consistently shown that when fat is consumed, the absorption of these vitamins is much greater.

Okay. What about beta-carotene? Beta-carotene gives plants an orange or yellow color, and this is a precursor for active vitamin A, retinol. Beta-carotene can also be converted into potentially harmful substances, and it can increase the risk of oxidative stress. It can interfere with vitamin A metabolism. Studies show that beta-carotene supplementation may increase the risk of heart disease and cancer in people who drink heavily or smoke, for example. High levels of beta-carotene may have anti-vitamin A properties. It means it actually works against active vitamin A. It can disrupt the metabolism and action of retinol or active vitamin A. Certain beta-carotene byproducts inhibit the activation of the retinoic acid receptor.

It's better to get just a normal amount of beta-carotene from food, and this is easy to do on a Paleo-type diet. Foods that are rich in beta-carotene include carrots, tomatoes, sweet potatoes, broccoli, cantaloupe, winter squash, bell peppers, spinach, lettuce, pumpkin, and kale. Then you'd

want to balance your dietary intake of beta-carotene with active vitamin A or retinol from liver and egg yolks.

Folic acid. Let's talk about this. Folic acid is an oxidized synthetic compound that is only found in dietary supplements and fortified foods. This is not a natural form of folate found in nature. It was introduced into the food supply to reduce the risk of neural tube defects during a malnourished pregnancy, which it definitely does. It can be converted into natural folate, but unfortunately, that conversion is limited in humans. It undergoes initial reduction and methylation in the liver using dihydrofolate reductase as an enzyme, and if the patient has low activity of this enzyme, she can end up with high levels of unmetabolized folic acid in her system and circulation. Actually, at the time of this recording, just earlier this week, a new study was released that found that nearly all babies, children, adolescents, and adults in the U.S. have measurable levels of unmetabolized folic acid in their systemic circulation, so this is a big problem that has only recently been recognized.

Why are high levels of unmetabolized folic acid in the blood problematic? Well, for one, they can mask vitamin B12 deficiency. They may lead to the deterioration of central nervous system function, especially in the elderly. They can cause anemia and cognitive impairment. They can accelerate the progression of certain cancers, including colon and prostate cancer. They can depress immune function, and they are associated with increased risk of death from all causes.

Folate, natural folate, on the other hand, which is found in foods in nature and in supplements with natural forms of folate such as 5-methyltetrahydrofolate, folinic acid, or metafolin, is not only very necessary for health but is also safe to supplement with. Some of the newer forms of multivitamins from companies such as Designs for Health or Pure Encapsulations, companies with a great reputation that work closely with clinicians, have switched over to using natural folates in their multivitamin formulations, and they also sell folate separately. If your patient is on a multivitamin, especially if it's from Costco or if it's a cheaper type of brand, you want to make sure to look for folic acid. If it says folic acid on it, or it doesn't specifically mention that it is one of the active forms of folate such as 5-MTHF, metafolin, or folinic acid, then it probably has folic acid and should be avoided.

Foods that are naturally rich in folate include beef liver, and chicken liver is actually the highest source of folate and the best source; also dark, leafy greens such as spinach and collards. Lentils are a good source of folate if your patients tolerate legumes, as are beets, cauliflower, parsley, mustard greens, turnip greens, and even some lettuces.

Okay, that's it for now. Thanks for watching, and I'll talk to you soon.