



QUESTIONS AND ANSWERS VIA EMAIL

M. PETERSON

Is it beneficial to take calcium supplements that also include magnesium and/or vitamin K.?

R. HEANEY

There is no direct evidence from controlled trials that such additions make a difference. However, nutrient deficiencies are seldom isolated, and it is generally recognized that Mg intake is below the RDA for most adults. Moreover, the Nottingham (UK) group has shown substantial Mg deficiency in older individuals with osteoporosis. So it would make sense to use supplements that provide both Ca & Mg, especially if there is some underlying element of intestinal malabsorption (such as asymptomatic celiac disease). But, bear in mind, there is little to no evidence that doing so produces better outcomes. Also, it's worth noting that the many successful Ca-supplementation trials were all conducted without giving supplemental Mg as well.

With regard to vitamin K, there is a growing body of evidence suggesting that it does not confer a benefit (in contrast to Mg, where there is mainly a shortage of evidence altogether).

D. FELDMAN

Chinese people tend to be smaller and thinner (and probably more active) than Westerners, at least at the moment. Wouldn't they need less calcium to maintain bone mass?

R. HEANEY

I think you're right, but such a nuance is not reflected in official nutritional policy. The reason a size-based requirement makes sense is that urine Ca loss is a linear function of body size, and urine Ca is at least as important a determinant of Ca status as is Ca intake – probably more important, in fact. My guess is that the minimum requirement for the US (i.e., given our foods and lifestyles) would be about 13-15 mg/kg for adults up to age 50. So, extrapolating to existing mature Chinese women, who might weigh 45-50 kg, the requirement might be 700 mg/d (in contrast to the US value of 1000 mg/d). However, it is worth noting that Ca serves other functions beyond protection of bone mass. Unabsorbed Ca in the intestinal lumen complexes with dietary oxalate (and thereby reduces kidney stone risk), as well as with unabsorbed bile acids and fatty acids (thereby reducing colon cancer risk). Additionally, absorbed Ca lowers blood pressure and protects particularly against pregnancy-associated hypertension. There is probably also an effect on weight. Optimal Ca intakes for these outcome variables are not known, but the luminal effects require substantial amounts of unabsorbed Ca, which would not be possible with a low Ca intake (whatever the systemic requirement). Bear in mind that the primitive human Ca intake, as judged from contemporary hunter-gatherer diets, would have been on the order of 80-100 mg Ca per 100 kCal, or perhaps something like 30-50 mg/kg body weight. I think the burden of proof should fall on those who claim that human health is optimized at intakes well below those that prevailed when human physiology was evolving, or in other words, who claim that low intakes are safe.

D. FELDMAN

Doesn't it overall make more sense to make calcium intake recommendations based on height/weight/expected bone mass of the individual person? I have a friend who is 4'10" and small boned, and her MD told her to take 1500 mg calcium daily.

R. HEANEY

See answer to above.



D. FELDMAN

DEXA scan indicating osteoporosis of spine/osteopenias of pelvis for 57 yr old female with little dairy intake since age 21, breastfed two infants, thin but active. Any research on the effect of breastfeeding on bones long term, if calcium intake was low? Does nursing put women more at risk?

R. HEANEY

Several studies have looked at this question. In general, breastfeeding is, if anything, protective. Women who have had multiple pregnancies and have nursed their babies tend to have more bone mass and lower risk of osteoporosis. The conclusion must be hedged by the fact that they tend to weigh somewhat more as well, and weight, of course, is osteo-protective. Longitudinal studies in women show that they do lose bone while nursing, but that they gain it back (largely by reducing urine Ca loss) after weaning.

C. SILVER

I would like to hear comments about children's bone health and suggestions on how to improve it as we move forward.

R. HEANEY

The best answer here is the one I gave at the outset of my presentation – vigorous exercise and adequate nutrition. There is a large body of evidence indicating that childhood bone mass predicts adult bone mass, and that both exercise and diet can positively affect childhood bone mass. As I showed in my presentation, exercise alone will usually not be enough, and Ca alone, without exercise (and protein, for that matter) will not be enough either. Our skeletons were evolved for physical work and they atrophy (or fail to develop adequately) if exercise is limited. See also Osteoporosis International (2000) 11:985-1009 for a fuller discussion of this matter.

K. BJORHUS

Can you ask Dr. Heaney if he thinks sunscreen use is overdone...preventing absorption of Vitamin D?

R. HEANEY

Yes, I do. The principal reason is the common sense one, i.e., sunscreen use started only about 25 years ago, and has been fairly widely accepted for a shorter time still. Somehow the human race survived for hundreds of thousands of years without it (and for much of that time we exposed a lot of skin to tropical sun). The only significant source of vitamin D prior to use of cod liver oil 70+ years ago was the sun, which converts a compound naturally present in human skin (7-dehydrocholesterol) to pre-vitamin D. Sunscreens block that conversion and, since we don't get much vitamin D from usual food sources, their use renders us vitamin D deficient unless we take large supplement doses. How much sun do we need? The answer isn't entirely clear, but it appears that short exposures (which aren't likely to harm the skin or lead to cancer) may be sufficient. So the most prudent – play it safe – advice we can now offer is to apply sunscreen only after you've been out in the sun for 15 minutes (or so). It surely isn't necessary to use it for taking out the trash.
