

Some of you have been asking me about the latest headlines **warning that calcium supplements may increase the risk of heart attacks**. These headlines were based on an European study that followed 24,000 Europeans aged 34-64 from 1994-1998 and 2005-2009 (Li et al, Heart, 98: 920-925, 2012).

That study was seriously flawed because it did not report how much calcium was in the calcium supplements; did not compare the effect of calcium supplements on subjects with high or low dietary calcium intake; and did not report what was in the calcium supplements besides calcium (I'll talk more about the importance of this in a minute).

In spite of what the news hype would have you believe, a number of health experts have cautioned against reading too much into this study.

The concern is that inadequate calcium intake predisposes to osteoporosis. For example, British health expert Dr. Carrie Ruxton was quoted as saying "**Osteoporosis is real issue for women and it is irresponsible for scientists to advise women to cut out calcium supplements on the basis of one flawed study, particularly when the link between calcium, vitamin D and bone health is endorsed by the European Food Safety Authority**" (that same link is also endorsed by the Food and Nutrition Board of the National Academy of Sciences in this country).

I don't think anyone would disagree with the statement that inadequate calcium intake is undesirable. The question is whether calcium supplements are an important part of assuring adequate calcium intake.

The chief author of the study, Dr. Sabina Rohrmann, said "...the current [calcium] recommendations...can be met by a balanced diet that includes low-fat milk and dairy products". That is, of course, the position of many health experts. In theory, I don't think anyone would disagree with that statement either - but let's look at the facts.

It would take 4-6 servings/day of dairy product to meet the current calcium RDAs (1,300 mg/day between age 13 and 18, 1,000 mg/day between age 19 and 50 and 1,200 mg/day for over 50). **Most people simply don't consume that much dairy. Of course, some dark green leafy vegetables are also good sources of calcium, but most people don't consume enough leafy greens either.** As a result most people in this country simply aren't getting enough calcium in their diet.

I have seen estimates that as many as 86% of teenage girls and 64% of teenage boys aren't getting enough calcium from their diets. And, this statistic is particularly troubling because the teenage years are when 90% of the adult bone mass is formed.

We don't do much better as adults. Somewhere between 35 and 50% of adults aren't getting enough calcium from their diet on a regular basis. **And, of course, a lot of the milk that Americans used to drink has been replaced with soft drinks that actually leach calcium out of the bones.**

So most reasonable people would conclude that, short of a major change in the American diet, calcium supplements can and should play an important role in preventing osteoporosis. **But is it possible to actually use calcium supplements without increasing your risk of heart disease? My answer is that question is yes - provided that the calcium supplement is well designed.**

I have covered the issue of how a calcium supplement should be designed previously in my "Tips From the Professor" entitled "Toxic Calcium?" and "Calcium and Heart Disease Risk Revisited" (see www.socialmarketingconnection.com for free archives of all of my past "Tips").

Basically, my premise is that most of the previous studies on calcium utilization from supplements have focused on how quickly and how efficiently the calcium gets into the bloodstream.

When you combine that with the desire to manufacture the calcium supplements as **cheaply** as possible, many of the calcium supplements that people in the studies in **which heart disease risk was observed contained calcium alone** - in whatever form the manufacturer thought would be best absorbed.

However, that is really the wrong question to ask because if the calcium gets into the bloodstream and isn't used for bone formation right away it can cause bad things to happen. For example, that excess calcium can be deposited in the arteries, and that can lead to hardening of the arteries, which increases the risk of heart attack and stroke.

So the right question to ask is how quickly and efficiently can the calcium in supplements be used for bone formation.

Of course, most people recognize that **vitamin D is important for bone formation.**

However, some of the supplements used in those studies contained no vitamin D at all, and, for those supplements designed prior to the change in vitamin D RDAs in 2011, most contained inadequate levels of vitamin D.

Of course, bone contains significant amounts of **magnesium and phosphorous**, and these minerals are also required for optimal bone formation. **We get plenty of phosphorous from our diet, but 68-80% of Americans aren't getting enough magnesium from our diet - and many of the calcium supplements used in those studies didn't contain magnesium.**

But if we really want to **optimize bone formation, even calcium, magnesium and vitamin D are not enough. I came across a recent study showing that vitamin K is also required for bone formation (Kanellakis et al, Calcified Tissue International, 90: 251-262, 2012).**

This study simply re-confirms a number of previous studies that came to the same conclusion. Those studies have largely been ignored because it had been assumed that vitamin K deficiency is rare, but a recent study (Thrombosis and Haemostasis, 98: 120-125, 2007) showed that vitamin K deficiency is more common than we had previously thought.

And finally, Dr. Paul Saltman, who was my wife's thesis advisor, showed over 20 years ago that the trace **minerals zinc, copper and manganese** were required for optimal bone formation. (Vitamin C is also required but most of us get enough vitamin C from our diet and/or multivitamin).

So what's your bottom line if you want to prevent osteoporosis and minimize your risk of heart attack or stroke?

1) Add as many servings of dairy and dark leafy greens to your diet as possible. If you don't like either of those, go online to search for other good dietary sources of calcium that you do like.

2) Don't just buy the cheapest calcium supplement that you can find. Instead, choose one that has been optimized for bone formation. That would be one containing calcium, magnesium, vitamin D, vitamin K, zinc, copper and manganese. The perfect calcium supplement may be difficult to find, but it's worth the search.

3) Don't be fooled by chelated calcium supplements or other calcium supplements that brag about how efficiently they are absorbed into the bloodstream. Unless the calcium supplement is optimized for bone formation, rapid absorption into the bloodstream may actually cause more harm than good.

3) Don't go overboard with your calcium supplement. Start with the RDA recommendation (see above). Then multiply the number of servings per day of dairy in your diet by 250 mg and subtract that from the RDA. That is normally the amount of supplemental calcium you need for optimal bone health on a daily basis (unless, of course, you have higher than normal calcium needs).

4) Make sure that you are getting RDA levels of vitamin D from diet and supplementation (current RDA recommendations for vitamin D in adults are 600 - 800 IU/day).

5) Finally, spread your calcium supplements out over the day so that you are taking in relatively small amounts of calcium at any one time - just as you would with food.

To Your Health!
Dr. Stephen G Chaney

P.S. Shaklee's OsteoMatrix is a complete calcium supplement that can be used by itself to promote bone health, which is no surprise because Shaklee has consulted experts like Dr. Saltman in the design of their calcium supplements. The Chewable Cal Mag Plus is best used along with Vita-Lea or Vitalizer for optimal bone formation.