



Them Strong Bones: Latest Update for Keeping Your Hip Bone Connected to Your Thigh Bone

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In spite of years of research and recommendations on bone health, we still have considerably high rates of osteopenia and osteoporosis in the US. That leads us to believe we haven't yet uncovered all we need to know about protecting our bones. But, thanks to new research we're learning new strategies for slowing bone loss.

Bone Remodeling

Our bones are continuously being remodeled by way of bone cells called osteoblasts (cells that form new bone) and osteoclasts (cells that break down bone). The rates of bone building and bone breakdown change throughout our lifespan. Our peak bone building years are between birth and age 25 when the bone building osteoblasts lay down more bone than the osteoclasts break down. Between 25 years and 50 years (unless a woman has early menopause), we add and break down bone at an equal rate. After 50, due to hormonal changes of aging and other considerations, women and men begin to break down bone faster than we add it. This is when our risk for osteoporosis is greatly increased so this is especially a time when we need to step up our nutrition and lifestyle strategies for maintaining our bone mass.

Common strategies for building strong bones have come under scrutiny over the past few years leaving folks perplexed about the best practices for bone health. This blog will provide a summary of the latest recommendations for bone health including a few new kids on the block.

Nutrients for Bone Health

Calcium

The National Osteoporosis Foundation in the US recommends the following calcium intake daily.

Men

19 – 70 years 1,000 mg
71 years and older 1,200 mg

Women

19 – 50 years 1,000 mg
51 years and older 1,200 mg

Source: National Osteoporosis Foundation

Calcium recommendations vary worldwide, however. According to bone health expert, Carolyn Dean, MD, ND, the UK recommends a daily allowance of 700 mg for women and men 19+ years and the WHO recommends 500 mg per day.⁽¹⁾ A Swedish study suggested that 700 – 800 mg/day of calcium per day appeared to be the tipping point beyond which further calcium supplementation did not offer additional bone health benefits.^(2,3) In addition, nutrition researcher, Walter Willett, MD, Dr.P.H., chair of the Department of Nutrition at Harvard's School of Public

Health, also suggests that the U.S. calcium recommendation may be higher than needed and Vitamin D is lower than needed. Dr. Willett feels the WHO recommendation of 500 mg per day may be adequate and the UK's recommendation of 700 mg leaves a little safety leeway.⁽⁴⁾

Researchers do agree that when possible, getting your calcium from natural dietary sources is the best advice because a meta-analysis of calcium supplementation studies suggested that taking more than 500 mg per day of supplemental calcium can cause an increased risk of heart attack in some people.⁽⁴⁾

Check out this list of [dietary calcium sources](#) and [non-dairy calcium](#) sources.

For those unable to meet their daily calcium goal with diet, a calcium supplement of up to 500 mg per day of supplemental calcium in a highly absorbable form (i.e. citrate or hydroxyapatite) is ok if your supplement also contains adequate amounts of other important bone nutrients – Vitamin D3, magnesium, boron, zinc, copper and Vitamin K2.

Note: When assessing your daily calcium intake from supplements, remember to include the calcium from the calcium-fortified foods like: calcium fortified juices, cold and hot cereals and tofu. These foods have been supplemented with calcium so they should be included in the 500 mg daily calcium supplement maximum.

Vitamin D

A major role of Vitamin D is to keep blood levels of calcium and phosphorus in the normal range. It also helps your body effectively absorb calcium. Very few foods naturally contain Vitamin D. The major sources of dietary vitamin D are **egg yolk, Vitamin D fortified milk, and fatty fish and their oils (example – cod liver oil)**. For more sources of vitamin D, check out [THIS LIST](#).

Ninety percent of our Vitamin D comes from sunlight exposure which converts cholesterol in our skin to Vitamin D3. Aging, sunscreens and other factors can interfere with this natural conversion which puts many people at risk for Vitamin D deficiency. It is a good idea to know your blood level of Vitamin D to assess whether your current diet and lifestyle are maintaining healthy blood Vitamin D levels.

If you are getting at least 15 minutes of daily sunlight exposure (without sunscreen) and your blood Vitamin D level is still low, talk to your health care provider or Registered Dietitian Nutritionist to determine the dose of supplemental Vitamin D3 that is appropriate to get you to the optimal range. Many practitioners feel optimal serum Vitamin D levels should be between 50 – 80 nmols/L. For some people, short term supplementation may correct the deficiency while for others, daily supplemental Vitamin D3 may be necessary long term. Also, make sure you are getting adequate magnesium in your diet daily.

Magnesium

Magnesium is necessary for over 300 enzyme systems in the body including helping to convert Vitamin D to its active form so it can turn on calcium absorption. A diet low in magnesium can result in low blood levels of Vitamin D in spite of daily supplementation with Vitamin D. Earlier human diets that included a wide variety of whole foods contained much higher levels of magnesium than today's Standard American Diet (SAD) which consists of highly processed foods and only about 200 mg of magnesium daily. The RDA for magnesium is 300 mg for adult women and 350 mg for adult men.

Many foods are good sources of magnesium particularly **beans, greens, grains, nuts and seeds** (remember the acronym **B-G-G-N**). Check out [THIS LIST](#) of magnesium sources and aim for at least 300 mg of dietary magnesium daily.

If you are supplementing with calcium, make sure your calcium supplement contains magnesium. A calcium:magnesium ratio of 2:1 is thought by some researchers to be adequate.

For more information on the benefits of magnesium and bone health, check out [THIS BLOG](#) by Carolyn Dean, MD, ND.

Vitamin K2

Vitamin K2 is one of the newest kids on the block for bone health. You have likely heard of Vitamin K1 which helps with blood clotting. Vitamin K2 helps deposit calcium where it belongs, in the bone and teeth, and prevents it from depositing in places it does not belong like on artery walls and in soft tissue.

Include foods high in Vitamin K2 in your diet daily.

- Fermented foods such as: probiotic sauerkraut, probiotic pickles, organic full fat yogurt
- organic grass-fed, pastured animal products (i.e. meat, chicken, butter/ghee, whole milk)
- natto
- egg yolk (preferably pastured, free range)
- pastured, free range chicken liver
- Certain cheeses like Brie and Gouda

Vitamin C

Vitamin C is essential for collagen formation and bone development. Epidemiological studies have linked low vitamin C intake with bone loss. And, several studies in animals and humans have shown that a diet high in vitamin C prevented or reduced bone loss.

Foods high in Vitamin C include:

- Citrus fruits – orange, grapefruit
- Red and green bell peppers
- Kale
- Brussels sprouts
- Broccoli
- Strawberries
- Potatoes
- Guava
- Kiwi

Omega 3 Fatty Acids

Inflammation can lead to bone loss. Omega-3 fatty acids help reduce inflammation. Omega-3s also increase absorption of calcium and decrease excretion of calcium in the urine. Include omega-3 rich fish in your diet 3 times weekly.

Omega 3 Fatty Acid Rich Foods:

- Cold water fish (low mercury) – wild caught salmon, anchovies, sardines
- Free range, pastured eggs
- Grass-fed pastured meats and poultry

You can also consider taking a high quality omega-3 fatty acid supplement that contains 1000 mg of EPA + DHA combined (read the back label for EPA and DHA content of each pill or teaspoonful). Check with your health care provider or Registered Dietitian Nutritionist to see if an omega-3 fatty acid supplement is appropriate for you.

Lifestyle Factors for Bone Health

- 1. Exercise.** Strive for daily movement and include the following exercises that are good for the bones:
 - Strength Training – at least 2 times weekly
 - Load Bearing Cardio Activity – walking or running – at least 3 times weekly
 - Balance Training – daily yoga practice or several times weekly
- 2. Reduce Stress.** Cortisol is one of the body's stress hormones. Chronic stress can cause chronically high cortisol levels in the body which according to one study could be bad for the bones. Implement the following stress relieving, bone health strategies in your daily life:
 - Meditation or HRV Biofeedback training every day – reduces cortisol.
 - Exercise, but not too much - excessive intense exercise increases cortisol levels
 - Sleep – get 8 hours of restorative sleep each night.
 - Include joyful activities in your life every day.
 - Spend time outdoors daily.
- 3. Reduce Inflammation.** Chronic inflammation causes bone loss. You can reduce inflammation by:
 - eating at least 8 – 10 brightly colored vegetables and 2 fruits daily
 - eating the colors of the rainbow daily - ROY G BIV
 - reducing stress (see strategies above)
 - getting adequate sleep (8 hours per night)
 - eliminating or significantly reducing processed carbohydrates and Added Sugar from your eating plan.

Here's Your Diet and Lifestyle Check List for Healthy Bones

- ❖ Consume at least 700 – 800 mg of calcium daily preferably from [natural dietary sources](#). If supplementation is needed to achieve this goal, choose a high quality calcium supplement with no more than 500 mg calcium that also includes magnesium and Vitamin D3. [HERE](#) is an example of a high quality calcium supplement with balanced magnesium and vitamin D.
- ❖ Choose grass fed, pastured meats, poultry, butter and ghee. They're high in Vitamin K2 and omega 3 fatty acids.
- ❖ Eat [8 – 10 brightly colored vegetables](#) and 2 fruits daily. Eat the colors of the rainbow daily – **ROY G BIV**.
- ❖ Eat [3 – 5 magnesium rich foods](#) daily.
- ❖ Take a [Vitamin D3](#) supplement daily if serum Vitamin D levels are low.
- ❖ Eat [1 – 2 forkfuls of fermented foods](#) daily. They are high in Vitamin K2 that is good for bones and they also contain high amounts of probiotic bacteria that are good for your gut microbiome.
- ❖ Drink 1 – 2 cups of green tea daily. The polyphenols support osteoblasts.
- ❖ Move your body daily including strength training, weight bearing and balancing exercises.
- ❖ Get 8 hours of [quality sleep](#) per night. Melatonin is needed for healthy bones.
- ❖ Eliminate or significantly reduce [processed carbohydrates](#) and [Added Sugar](#). These are inflammatory and inflammation is bad for the bones.
- ❖ Eat 3 servings per week of low mercury, high omega-3 fatty acid fish. Check with your health care provider or Registered Dietitian Nutritionist to see if an omega 3 fatty acid supplement would be appropriate for you.
- ❖ Balance your stress - develop a daily meditation or HRV Biofeedback practice.
- ❖ Create balance in your life. Remove toxic relationships. Balance your work and play. Do joyful activities daily. Spend time outdoors daily.

Resources:

1. Dean, C, "Magnesium is Crucial for Your Bones", Huffington Post Blog. August 14, 2012.
2. Park, Alice, "Study: US Calcium Guidelines May Be Too High", Time, May 25, 2011.
3. Warensjö, E, et. al., Dietary calcium intake and risk of fracture and osteoporosis: prospective longitudinal cohort study, BMJ 2011;342:d1473
4. Harvard Health Publications, "How Much Calcium Do You Really Need?", July 17, 2015.
5. Boland, Mark J, et. al., Calcium Intake and Risk of Fracture: Systemic Review, BMJ 2015;351:h4580.