



## Bone Health: An Important Consideration at Any Age

Amy Kosowski, M.S., LDN

May is women's health month. One of the most common concerns for women is bone health. Unfortunately, most women don't start to consider the condition

of their bones until they are nearing menopause. By then however, the greatest opportunities for maximizing and maintaining bone mass have been lost.

It is important to understand that bone mass in the later years of life is almost entirely dependent on the amount of bone tissue that was formed during the first two decades of life. About 90% of a woman's peak bone mass is attained by the age of 18 (1, 2). Bone mass can continue to increase somewhat until the age of about 30, at which point it plateaus or starts to slowly decrease until menopause (1, 2). Once menopause is reached, there is usually a rapid loss of bone and bone mass becomes more difficult to maintain (1, 2).

Although it is genetics that primarily determines individual peak bone mass, lifestyle choices can have a profound impact on bone accrual until age 30, as well as its maintenance during the middle years (2, 3). Because it is estimated that even a 10% increase in peak bone mass could reduce the risk of osteoporotic fracture risk by 50% (3, 4), a proactive approach aimed toward optimizing peak bone mass and subsequently preserving a healthy skeleton can realistically translate into a better quality of life in the elderly.

The mineralized component of bone comprises about 70% of its structure. Although calcium and phosphorus are the principal constituents of the crystalline portion of bone that give it hardness, magnesium, potassium, sodium, and carbonate molecules are present as well, to prevent brittleness of the calcified structure (9, 13). The remaining portion of bone, the matrix, is made up of collagen fibers that extend primarily along the lines of tensional force, giving bone flexibility and extraordinary tensile strength (9). Bone remodeling involves the continuous removal of bone (bone resorption) followed by synthesis of new bone matrix and subsequent mineralization (bone formation). The cells that mediate the bone forming processes of the skeleton are osteoblasts; the cells that mediate resorption are osteoclasts.

Of the modifiable factors that affect bone mass, nutrition is one of the most obvious. It

is well accepted that dietary habits can directly and indirectly influence bone metabolism and structure through numerous mechanisms (5, 6). This is because the condition of the bones depends not only on the actual metabolism of the bone tissue itself, but also on other factors that affect bone, such as absorption of nutrients by the intestine (1, 2, 5, 6), PTH levels (1, 2), regulation of mineral retention and excretion by the kidneys (5, 6), hormonal status (1, 2, 6), and many others. Skeletal health, then, is the result of a complex interplay of bodily systems and maintenance of whole body homeostasis. Therefore, it is important as practitioners to recognize a number of nutrients, some of which are not traditionally associated with bone health, as key players in the processes of bone formation, resorption, and remodeling.

Calcium (Ca) is the first nutrient most people think of when considering bone health and it is clearly important. Ca is the most abundant mineral in the body and it performs a number of different functions. Ca serves as an essential cofactor in many enzymatic reactions; it is necessary in the blood clotting cascade (9) and muscle contraction (9); and it regulates the permeability of sodium ions across cell membranes (9). Due to the critical nature of these functions, serum Ca levels are tightly regulated. Bone tissue acts as a Ca reservoir off of which the body can draw needed calcium to maintain these functions.

Several factors can affect the body's ability to retain Ca in the body, and therefore in the bones. First, Ca intake must be adequate to compensate for Ca loss. Ca requirement increases with age because intestinal Ca absorption usually declines with age (5). In addition, physical activity is usually decreased, thereby reducing lean muscle mass, which in turn decreases the mechanical load on the skeleton (3). Decreased skeletal load results in bone loss.

Acid/alkaline balance is another key factor in Ca retention (6). The typical Western diet consists of an excess of acid forming foods such as animal protein, refined wheat products, and sugar that contribute to bone loss (10, 11). Alkaline minerals like Ca and potassium are called upon to buffer the acids that are formed by normal metabolic processes (5, 6, 10, 11) and are thereafter excreted by the kidneys. The addition to the diet of alkaline forming, high potassium foods such as fruits and vegetables, appears to reduce urinary Ca loss thereby reducing bone turnover (11).

There are many other nutrients that may act

directly by modifying bone turnover, or indirectly by acting on the hormonal systems that stimulate bone cell activity. For example, zinc, copper, and manganese are involved in the enzymatic systems of bone remodeling (12); Vitamin D signals the cells to calcify or resorb bone, depending on the body's Ca needs (5, 9, 12); Vitamin C is a cofactor for collagen production (5, 9); and Vitamin K is a cofactor for enzymes involved in calcium homeostasis and bone mineralization (5, 12, 14). Iron supports bone metabolism as well, by promoting the production of collagen (15).

There are a number of nutrients that are important for bone health that aren't as obvious. For instance, boron may exert its effects on the skeleton indirectly by promoting the efficacy of bone-associated hormones like estrogen (16, 17). Vitamin B6 is an essential cofactor for the enzyme ornithine decarboxylase, which is involved in osteoblast energy production (14, 18). Animal studies indicate a role for vitamin B6 in fracture healing (18). Vitamin B12 is also important for bone formation because it is a cofactor for the osteoblast-related proteins, alkaline phosphatase and osteocalcin (14). Poor Vitamin B12 status has been associated with low BMD and osteoporosis in recent studies (19, 20).

Recent studies also suggest that omega-3 fatty acids, such as EPA and DHA help to improve the bioavailability of calcium and may help to prevent bone loss. Numerous animal studies have demonstrated the beneficial effects of omega-3 FA on bone mineral density (8). Evidence of these effects in humans has recently emerged, suggesting an important role for omega-3 FA in preserving skeletal integrity (21), bone accrual (22), and decrease in bone resorption in the presence of bone formation (23).

For many years, calcium and Vitamin D have been the primary nutrients recommended for the maintenance of healthy bones. It is now clear that this is not enough. Bone health depends not as much on calcium intake, but rather on its interactions in the context of the whole body, as well as the hormonal systems that affect it. As practitioners, we can go beyond calcium and Vitamin D in order to help our female patients achieve the best health they can. Knowledge of these other factors and knowledge of specific products can help differentiate our practice from the health food store.

*For References, please visit [www.protocolforlife.com](http://www.protocolforlife.com)  
Amy Kosowski, MS, LDN  
Amy Kosowski is a Protocol for Life Balance™ scientist.*

## Bone Strength™



Bone Strength™ is a comprehensive dietary supplement that was developed to incorporate the beneficial effects of today's most well-researched structural support constituents. At the core of this formula, each serving of Bone Strength™ contains 4,000 mg of Microcrystalline Hydroxyapatite complex (MCHA). As a significant source of both phosphorus and three forms of calcium, MCHA is unique in that it provides these key minerals in their most highly bioavailable forms. To provide even greater support, Bone Strength™ has been enhanced with magnesium, Vitamins C, K, and D3 (from cholecalciferol), as well as a glucosamine potassium sulfate complex to aid in the synthesis and maintenance of bone tissues.\*

- *Supports Bone Health*
- *MCHA-Key For Bone & Teeth Strength*
- *With Additional Minerals for Comprehensive Support\**

### Supplement Facts

Serving Size 4 Capsules  
Servings Per Container 45

	Amount Per Serving	% Daily Value
Calories	10	
Total Carbohydrate	< 0.5 g	< 1%*
Protein (from MCHA and AAC)	1.8 g (1,800 mg)	4%*
Vitamin C (from Magnesium Ascorbate)	200 mg	330%
Vitamin D-3 (as Cholecalciferol)	400 IU	100%
Vitamin K-1 (as Phytonadione)	100 mcg	125%
Vitamin B-1 (from Thiamine HCl)	5 mg	330%
Calcium (from MCHA)	1.0 g (1,000 mg)	100%
Phosphorus (from MCHA)	430 mg	45%
Magnesium (from Magnesium Oxide and Ascorbate)	600 mg	150%
Zinc (from Zinc AAC)	10 mg	70%
Copper (from Copper AAC)	1 mg	50%
Manganese (from Manganese AAC)	3 mg	150%
MCHA (Microcrystalline Hydroxyapatite)	4.0 g (4,000 mg)	†
Glucosamine Potassium Sulfate Complex	300 mg	†
Horsetail ( <i>Equisetum arvense</i> ) (Aerial Parts)	100 mg	†
<small>(natural source of min. 5% water-soluble Silicates)</small>		
Boron (from Amino Acid Chelate)	3 mg	†

**New!**

## Cardio Tri-Plex™



This innovative heart support supplement contains three of today's most thoroughly researched cardiovascular support compounds.\* Red yeast rice is a natural product produced through the fermentation of red yeast (*Monascus purpureus*) over white rice. It has been used for thousands of years in traditional Asian medicine, and meticulous care is taken to avoid the presence of citrinin during manufacturing.

- *Cardiovascular Support\**
- *Red Yeast Rice with CoQ10 & Omega-3 Fish Oil*

### Supplement Facts

Serving Size 2 Vcaps®

	Amount Per Serving
Vitamin E (as natural d-alpha Tocopherol)	20 IU
<b>Natural Fish Oil Concentrate</b>	<b>2.0 g (2,000 mg)</b>
<b>Omega-3 Fatty Acids</b>	<b>600 mg</b>
Eicosapentaenoic Acid (EPA)	360 mg
Docosahexaenoic Acid (DHA)	240 mg
<b>Organic Red Yeast Rice (<i>Monascus purpureus</i>)</b>	<b>600 mg</b>
<b>CoQ10 (Coenzyme Q10)</b>	<b>60 mg</b>

## Resveratrol 200 mg

**New!**



Resveratrol is a polyphenol that occurs naturally in the skin of red grapes, as well as certain berries and other botanicals. Recent scientific research has validated the role resveratrol plays in supporting healthy cardiovascular function, as evidenced through its ability to influence a number of cell-protecting mechanisms. When combined with other polyphenols, resveratrol has been shown to exhibit strong anti-aging effects, while further encouraging a more normalized inflammatory response. Protocol for Life Balance™ Resveratrol contains a science-based blend of polyphenols, including natural trans-resveratrol and proanthocyanins (OPC's from grape seed), plus catechins (green tea extract) for exceptional cardiovascular protection.\*

## Ortho Multi™ for Women



This advanced multiple has been formulated to address a woman's complete and evolving nutritional needs. Starting with a foundation of quality vitamins and minerals, Ortho Multi™ also contains a research-inspired complex of antioxidants, digestive enzymes, and standardized herbal extracts to support a wide range of female functions.\* To encourage healthy estrogen and progesterone utilization, Ortho Multi™ contains natural Soy Isoflavones (min. 40%, Genistein, Daidzein, Glycitein), Wild Yam Root Extract (6% Diosgenin), Ipriflavone, and Chasteberry extracts (from Vitex). Each ingredient has been carefully represented based on its role in female health, biologically-balanced for the highest degree of efficacy.\*

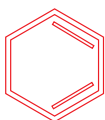
See [www.protocolforlife.com](http://www.protocolforlife.com) for complete ingredient listing.

Code	Products	Size
P0105	5-HTP 100 mg	90 Vcaps®
P0108	5-HTP 200 mg + Tyrosine	60 Vcaps®
P1811	A - Biotic™ Enteric Coated, Potent	60 Gels
P0076	Acetyl-L-Carnitine 500 Vcaps®	100 Vcaps®
P3344	Adrenal Cortisol Support™	90 Vcaps®
P3032	AHCC® 500 mg Vcaps®	60 Vcaps®
P3282	Aller-All™ Seasonal Support	60 Tabs
P3036	Aloe Vera 5,000 Softgels	100 Gel
P3042	Alpha Lipoic Acid 250 mg	90 Vcaps®
P3046	Alpha Lipoic Acid 600 mg Plus	60 Vcaps®
P2958	BioCore® Enhanced Enzymes	90 Vcaps®
P0471	Biotin 5000 mcg Vcaps®	90 Vcaps®
P1228	Bone Strength™	180 Caps
P1720	Borage/GLA 1050 mg	60 Gels
P3303	Brain Regain™	60 Vcaps®
P3063	Brocco Immune™	60 Vcaps®
P2943	Bromelain 2400 gdu/500 mg	90 Vcaps®
P1268	Cal-Mag, Liquid, Lemon	16 oz
P3308	C.Away™	90 Vcaps®
P1675	CardioTri-Plex™ <b>NEW!</b>	120 Gels
P0072	L-Carnitine 500 mg Carnipure®	60 Caps
P3019	Celadrin® Joint Liposome Lotion	4 oz
P9470	Protocol Celadrin® Tabletop Display <b>NEW!</b>	12 Bottles
P1415	ChromeMate® 200 mcg	90 Caps
P1731	CLA Away™	90 Gels
P0405	CoEnzyme B Complex	60 Tabs
P3163	CoQ10 60 mg + Fish Oils	90 Gels
P3208	CoQ10 100 mg Softgels	90 Gels
P3196	CoQ10 200 mg Lozenges	60 Loz
P3198	CoQ10 400 mg Softgels	60 Gels
P3182	CoQ10 600 mg Softgels	60 Gels
P3185	CoQ10 Liquid 100 mg/tsp	1 oz
P3186	CoQ10 Liquid 100 mg/tsp	4 oz
P3158	CoQ10 100% Pure Powder	1 oz/28g
P4632	Cranberry Stand. 6%/Uva Ursi	90 Vcaps®
P4638	Curcumin 665 mg 95% Extract	60 Vcaps®
P3121	D-Flame™ Cox-2 Formula	90 Vcaps®
P2811	D-Mannose Urinary 500 mg	90 Caps
P2956	Dairy Digestion™	90 Vcaps®
P4704	EGCg 400 mg/50%	90 Vcaps®
P1770	Flax Seed Oil 1000 mg Organic	120 Gels
P0498	Flush Free Niacin 500 mg	90 Vcaps®
P4683	Ginkgo Biloba 120 mg/24% Plus	100 Vcaps®
P3048	GliSODin® 100 mg/Wheat Grass	90 Vcaps®
P3170	Gluc/Chond/MSM Caps	90 Caps
P3172	Gluc/Chond/MSM Caps	180 Caps
P3243	Gluc/Chond 2 per day, Extra Strength	120 Tab
P3130	Gluc & MSM, Vegetarian 1000 mg	120 Vcaps®
P3175	Liquid Glucosamine, Chond, MSM	16 oz
P3318	Glucose Balance™	90 Caps
P0094	L-Glutamine 1000 mg	120 Caps
P3274	Grape Seed OPC 250 mg Extract	90 Vcaps®
P3055	Immune Renew™ (Org. Mushrooms)	90 Vcaps®
P1625	Krill Oil 500 mg <b>NEW!</b>	60 Gels
P2448	Liver Detox™ - Dr. Verghese	90 Caps
P3062	LYC-O-MATO® 20 mg Lycopene	60 Gels
P3258	Melatonin 3 mg Lozenge & B-6	120 Loz
P3326	MetaboEnergetics™	90 Caps
P0495	Methyl B-12 1,000 mcg	100 Loz
P0496	Methyl B-12 5,000 mcg	60 Loz
P4739	Milk Thistle 300 mg/80% Plus	90 Vcaps®
P2120	MSM One Gram Caps	180 Caps

P0085	NAC N-acetyl cysteine 600 mg + Antioxidants	100 Caps
P3140	Nattokinase 100 mg/2000 FU units	60 Vcaps®
P3301	Ocu Support™ Clinical Strength	90 Caps
P1659	Omega-3 Lemon Liquid /Molecularly Distilled	7 oz
P1656	Omega-3/Enter 180/120 /Molecularly Distilled	90 Gels
P1657	Omega-3/Enter 180/120 /Molecularly Distilled	180 Gels
P1661	Ultra Omega-3 500/250/Molecularly Distilled	90 Gels
P3281	Ortho Detox™	90 Caps
P2912	Ortho Dophilus™ 8 Strains, 4 Billion	60 Vcaps®
P0950	Ortho-E™ NON-GE	60 Gels
P3772	Ortho Liquid Multi™ - Iron Free/Xylitol	16 oz
P3875	Ortho Multi™ for Men Tabs	90 Tabs
P3878	Ortho Multi™ for Men Caps	90 Vcaps®
P3796	Ortho Multi™ for Women Tabs	90 Tabs
P3798	Ortho Multi™ for Women Caps	120 Vcaps®
P3816	Ortho Multi™ Softgel w/ Flax 400 mg	90 Gels
P3340	Ortho Prostate™	90 Gels
P3368	Ortho Thyroid™	90 Vcaps®
P1413	OsteoBoron® 3 mg, Natural Form/base	90 Vcaps®
P0460	P-5-P 50 mg CoEnzyme B-6	60 Tabs
P0487	Pantethine 300 mg Co-enzyme A	60 Gels
P4727	Peppermint Oil G.I.™ Enteric	90 Gels
P3345	PepZin G.I.® Soothe™	60 Tabs
P2385	Phosphatidyl Serine 100 mg & Ginkgo 60 mg	60 Gels
P3338	Progesterone Cream Pump - 20 mg	3 oz
P5955	ProtoClear™ Berry Flavor	2.55 lbs
P5956	ProtoClear™ Berry Sample Packet	27.5 g
P5957	ProtoClear™ Orange Flavor	2.55 lbs
P5958	ProtoClear™ Orange Sample Packet	27.5 g
P5960	ProtoClear™ Vanilla Flavor <b>NEW!</b>	2.55 lbs
P5961	ProtoClear™ Vanilla Sample Packet <b>NEW!</b>	27.5 g
8931	ProtoClear™ Premium Shaker Cup <b>NEW!</b>	12 oz
P0716	ProtoSorb™ C 500	100 Vcaps®
P0726	ProtoSorb™ C 1000	100 Tabs
P3277	Pycnogenol® 60 mg & Rutin	50 Vcaps®
P3321	Red Yeast & CoQ10 30 mg, ALA	90 Vcaps®
P3500	Red Yeast Rice Extract 600	90 Vcaps®
P3353	Resveratrol 200 mg <b>NEW!</b>	60 Vcaps®
P0138	SAMe 200 mg Enteric + B Complex	60 Tabs
P4756	Saw Prostetto™ 320 mg/85-95% Extract	90 Gels
P1485	Selenium 200 mcg, Yeast-Free	90 Vcaps®
P2954	Serrazimes® 33 mg/20,000 units	90 Vcaps®
P1905	Slimaluma® Plus	60 Vcaps®
P6957	Stevia Complete Packets	100/box
P6955	Stevia Non-Bitter Liquid, Sweet	2 fl oz
P6960	Stevia Non-Bitter Powder, Sweet	1 oz
P3507	Sytrinol® Cholesterol Formula	60 Vcaps®
P0142	Taurine 1000 mg Caps	100 Caps
P3380	True Balance™ Multi	120 Caps
P0166	L-Tryptophan 500 mg	60 Vcaps®
P0167	L-Tryptophan 500 mg	120 Vcaps®
P0169	L-Tryptophan 1000 mg <b>NEW!</b>	60 Tabs
P3145	Ubiquinol CoQH-CF™ 50 mg	60 Gels
P3123	Vein Integrity™ with Trunorin®	90 Vcaps®
P2168	Virility For Men with LJ100®	60 Vcaps®
P0452	Vitamin B-12 Liquid Tri-Formula 5,000 mcg	4 oz
P0690	Vitamin C-1000 Cap+100 Bioflavonoids	120 Caps
P0365	Vitamin D-3 1,000 IU, Natural	120 Gels
P0367	Vitamin D-3 2,000 IU, Natural	120 Gels
P0372	Vitamin D-3 5000 IU, Natural <b>NEW!</b>	120 Gels
P0370	Liquid Vitamin D-3 5000 IU, Natural <b>NEW!</b>	2 oz
P0906	Vitamin E-400 20% Mixed + Selenium	120 Gels

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