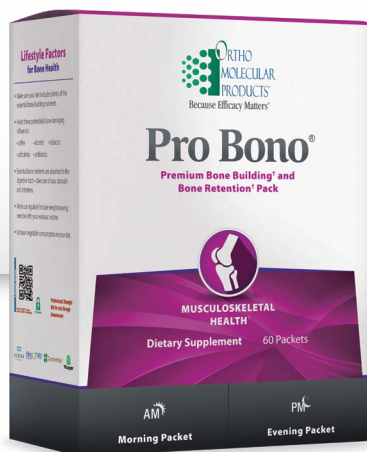


PRO BONO®



CLINICAL APPLICATIONS

- Convenient, Multi-Faceted, Bone-Building Protocol
- Increases Skeletal Strength
- Promotes Healthy Bone Density
- Improves Bone Remodeling
- Provides a Comprehensive Blend of Foundational Micronutrients



MUSCULOSKELETAL HEALTH

Pro Bono® is a targeted bone building protocol specifically designed to increase skeletal strength and help maintain healthy bone density. It provides therapeutic doses of clinically proven, bone-stimulating nutrients in convenient, easy-to-take packets to enhance bone formation. The foundation of Pro Bono® is 1,000 mg of strontium, a well-researched mineral proven to strengthen the bone matrix and support skeletal density. Each serving provides the most bioavailable sources of strontium, calcium, magnesium, vitamin D3, vitamin K2, boron and other trace minerals to support bone health and maintenance. In addition, Pro Bono® includes a full complement of micronutrients, making an additional multivitamin unnecessary.

Overview

Bone mineral density (BMD) is a major determinant of bone mass and is the most commonly measured quality of bone. A number of factors contribute to bone mineral density including lifestyle factors (regular physical activity, not smoking, minimizing stress levels) and maintaining hormonal balance. Consuming a healthy diet and ensuring optimal levels of bone-building vitamins and minerals are a key therapeutic consideration for preserving bone strength.

BMD is determined by a lifelong process called bone remodeling. Bone remodeling occurs when bone tissue is removed from the skeleton (bone resorption) and new bone tissue is formed. *Osteoclasts* are cells involved with breaking down bone, while *osteoblasts* create a protein matrix primarily of collagen, resulting in the remineralization of bone and thereby promoting bone formation. While calcium is an effective starting point for promoting bone health, other nutrients are

required for bone mineralization. Nutrients such as strontium, magnesium, vitamin D, K and C, B complex vitamins, and trace minerals significantly enhance bone remodeling and increase bone strength. Pro Bono® provides a comprehensive approach to bone health by offering a full spectrum of nutrients that are required in the bone mineralization process. Pro Bono® also contains nutrients that help maintain an optimal osteoclast to osteoblast ratio.

Strontium †

Strontium is a mineral that is similar to the physical and chemical properties of calcium. Research has shown strontium provides bone support through its ability to increase the formation of osteoblasts while decreasing the formation of osteoclasts. Strontium is one of the few nutrients with a dual mechanism shown to build bone strength. Recent studies have demonstrated that older women supplementing with strontium citrate (SrC) effectively supported BMD.¹ Two recent clinical studies have demonstrated that SrC in combination with other key nutrients support BMD. The COMB Study demonstrated SrC BMD support in the hip, spine and femoral neck sites with no adverse outcomes noted, even after participants chose to forgo previous treatments. The MOTS Study was a one-year, double-blind, placebo-controlled trial of a nutrient protocol that included SrC. The results showed that in women ages 48-75, BMD of the lumbar spine and femoral neck was effectively supported. The results also demonstrated that bone strength improved by reducing the loss of bone matrix collagen.^{2,3} Long-term trials performed on other forms of strontium have proven safe and effective.

† These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.



Calcium[†]

Nearly 99% of the calcium within the adult skeletal system exists as a complex paired with phosphorus, called hydroxyapatite. It is commonly advised that individuals past early adolescence consume 1,000 to 1,500 mg/ day from dietary or supplement sources to support bone formation. In 1990, the United States Department of Agriculture published a trial comparing calcium carbonate (least expensive) with calcium citrate-malate with respect to improved bone mineral density in older women. In this trial, researchers found the citrate-malate form was significantly better at supporting bone health than the carbonate form.³ Pro Bono[®] is formulated with calcium-citrate-malate, as well as calcium hydroxyapatite, to improve absorption and support optimal bone health.

Magnesium[†]

Magnesium plays a major role in bone formation as approximately 50% of magnesium found in the body is found in the bone. Magnesium plays numerous roles in bone health including increasing calcium absorption, acting as a cofactor for alkaline phosphatase activation, as well as supporting vitamin D3 conversion in the body. Magnesium deficiency is very common— many Americans fail to acquire even the estimated average requirement (EAR).⁴ Magnesium deficiency can also be exacerbated due to factors such as excess consumption of alcohol, salt, coffee, phosphoric acid in sodas, and long-term stress.⁵ In a study examining the effects of magnesium in a group of older women, supplementation with 250 to 750 mg/ day of magnesium for six months followed by 250 mg/day for six to 18 months resulted in significant bone building affects in 71% of the women.⁶ This increase was a significant finding that reflects the importance of magnesium supplementation alone (without calcium) as a crucial mineral for supporting bone health.

Vitamin D3 (Cholecalciferol)[†]

Vitamin D is a steroid vitamin, that is known for its role in supporting bone health and aiding in the absorption of calcium and phosphate from the GI tract. Emerging research is showing a direct correlation between bone mineral density and serum levels of 25(OH)D3, the active form of vitamin D.⁷ In one 2013 study, 52 overweight men and women with suboptimal vitamin D levels were given either 7,000 IU of cholecalciferol (D3) daily or a placebo for 26 weeks. The vitamin D group significantly increased vitamin D levels in the blood and improved biomarkers of bone health.^{8,9}

Vitamin K1 (Phytonadione) & Vitamin K2 (Menaquinone)[†]

Vitamin K is responsible for activating osteocalcin, a protein involved in calcium transport and properly embedding calcium into bone tissue. Vitamin K has also been shown to decrease the activity of osteoclasts, which helps to maintain bone formation and strength.¹⁰ Vitamin K works synergistically with vitamin D3 to improve calcium absorption and helps to bind newly absorbed calcium to the bone matrix. Vitamin K2 (as MK-7) has emerged as the superior form of K2, and has been shown to enhance collagen production in bone which increases bone flexibility and overall quality of bone tissue.¹¹

Boron[†]

Boron supplementation reduced urinary excretion of calcium and magnesium and increased blood levels of 17 beta-estradiol and testosterone in older women.¹² Improving boron levels has been shown to support bone health.¹³

Directions[†]

2 packets per day taking one AM packet in the morning and one PM packet in the evening.

Maintenance: 1 packet per day alternating one AM packet on odd days and one PM packet on even days or as recommended by your health care professional.

Does Not Contain

Gluten, yeast, artificial colors or flavors.

Cautions

Do not consume this product if you are pregnant or nursing. Consult your physician for further information.

All forms of Vitamin K may interact with blood thinning medications. If you are taking such medicines please consult with your physician before taking this product.

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Supplement Facts

Serving Size 2 Packets
Servings Per Container 30

	Amount Per AM Packet	% Daily Value	Amount Per PM Packet	% Daily Value	Amount Per 2 Packets	% Daily Value
Vitamin A	600 mcg	67%	600 mcg	67%	1,200 mcg	133%
(from 2,000 IU per AM and PM Packets, 4,000 IU per 2 Packets as Natural Beta Carotene, Palmitate)						
Vitamin C (as Ascorbic Acid USP)	333 mg	370%	167 mg	186%	500 mg	566%
Vitamin D (D3 as Cholecalciferol)	12.5 mcg (500 IU) 63%		12.5 mcg (500 IU) 63%		25 mcg (1,000 IU) 125%	
Vitamin E	16.8 mg	112%	16.8 mg	112%	33.6 mg	224%
(from 25 IU per AM and PM Packets, 50 IU per 2 Packets as d-Alpha Tocopherol Succinate USP)						
Vitamin K (K1 as Phytanadione)	217.5 mcg	181%	217.5 mcg	181%	435 mcg	363%
Thiamin (Vitamin B1)	25 mg	2,083%	25 mg	2,083%	50 mg	4,167%
(from Thiamine Hydrochloride USP)						
Riboflavin (Vitamin B2 USP)	15 mg	1,154%	15 mg	1,154%	30 mg	2,308%
Niacin	15 mg	94%	15 mg	94%	30 mg	188%
(as Niacin USP, Niacinamide USP)						
Vitamin B6	25 mg	1,471%	25 mg	1,471%	50 mg	2,941%
(as Pyridoxine Hydrochloride USP)						
Folate (from 400 mcg per AM and PM Packets, 800 mcg per 2 Packets Quatrefolic® (6S)-5-Methyltetrahydrofolate acid glucosamine salt)	680 mcg DFE 170%		680 mcg DFE 170%		1,360 mcg DFE 340%	
Vitamin B12 (as Methylcobalamin)	250 mcg	10,417%	250 mcg	10,417%	500 mcg	20,833%
Biotin	150 mcg	500%	150 mcg	500%	300 mcg	1,000%
Pantothenic Acid (as d-Calcium Pantothenate USP)	25 mg	500%	25 mg	500%	50 mg	1,000%
Calcium	0 mg	0%	1,000 mg	77%	1,000 mg	77%
(as Calcium Hydroxyapatite, Albion® Minerals Dicalcium Malate)						
Phosphorus (as Calcium Hydroxyapatite)	0 mg	0%	360 mg	29%	360 mg	29%
Iodine (from Potassium iodide)	75 mcg	50%	75 mcg	50%	150 mcg	100%
Magnesium (as DiMagnesium Malate, Magnesium Citrate USP, Albion® Minerals Magnesium Lysinate Glycinate Chelate)	267 mg	64%	133 mg	32%	400 mg	95%
Zinc (as Albion® Minerals Zinc Bisglycinate Chelate)	7.5 mg	68%	7.5 mg	68%	15 mg	136%
Selenium (as Selenium Glycinate Complex)	100 mcg	182%	100 mcg	182%	200 mcg	364%
Copper (as Albion® Minerals Copper Bisglycinate Chelate)	0.5 mg	56%	0.5 mg	56%	1 mg	111%
Manganese (as Albion® Minerals Manganese Bisglycinate Chelate)	2.5 mg	109%	2.5 mg	109%	5 mg	217%
Chromium (as O-polynicotinate)†	100 mcg	286%	100 mcg	286%	200 mcg	571%
Molybdenum (as Albion® Minerals Molybdenum Glycinate Chelate)	75 mcg	167%	75 mcg	167%	150 mcg	333%
Strontium Citrate	1 g	*	0 mg	*	1 g	*
Boron (as Bororganic Glycine)	2.5 mg	*	2.5 mg	*	5 mg	*
Vitamin K2 (as Menaquinone-7 (MK-7)) (MenaQ7®PRD)	45 mcg	*	45 mcg	*	90 mcg	*

* Daily Value not established.

Other Ingredients: Hypromellose (Natural Vegetable Capsules), Microcrystalline Cellulose, Magnesium Stearate and Silicon Dioxide.

ID# 350060 60 Packets

References

- Moise H, Chettle DR, Pejović-Milić A. Monitoring bone strontium intake in osteoporotic females self-supplementing with strontium citrate with a novel in-vivo X-ray fluorescence based diagnostic tool. *Bone*. 2014;61:48-54.
- Stephen J. Genuis, Thomas P. Bouchard, "Combination of Micronutrient Intervention", *Journal of Environmental and Public Health*, vol. 2012, Article ID 354151, 10 pages, 2012.
- Maria S, Swanson MH, Enderby LT, et al. Melatonin-micronutrients Osteopenia Treatment Study (MOTS): a translational study assessing melatonin, strontium (citrate), vitamin D3 and vitamin K2 (MK7) on bone density, bone marker turnover and health related quality of life in postmenopausal osteopenic women following a one-year double-blind RCT and on osteoblast-osteoclast co-cultures. *Aging (Albany NY)*. 2017;9(1):256-285.
- Patrick Lyn. Comparative absorption of calcium sources and calcium citrate malate prevention for osteoporosis. *Altern Med Review* 1999;4(2):74-85.

- Moshfegh A, Goldman J, Ahuja J, Rhodes D, LaComb R. 2009. What We Eat in America, NHANES 2005-2006: Usual Nutrient Intakes from Food and Water Compared to 1997 Dietary Reference Intakes for Vitamin D, Calcium, Phosphorus, and Magnesium. U.S. Department of Agriculture, Agricultural Research Service.
- Johnson S. The multifaceted and widespread pathology of magnesium deficiency. *Med Hypotheses* 2001; 56(2): 163-70.
- Stendig-Lindberg G, Tepper R, Leichter I. Trabecular bone density in a two year controlled trial of peroral magnesium in osteoporosis. *Magnes Res* 1993; 6:155-163.
- Bischoff-Ferrari HA, Giovannucci E, Willett WC, et al. Estimation of optimal serum concentrations of 25-hydroxyvitamin D for multiple health outcomes. *Am J Clin Nutr* 2006; 84:18-26.
- Wamberg L, Pedersen SB, Richelsen B, Rejnmark L. The effect of high-dose vitamin d supplementation on calciotropic hormones and bone mineral density in obese subjects with low levels of circulating 25-hydroxyvitamin d: results from a randomized controlled study. *Calcif Tissue Int* 2013 Jul;93(1):69-77.
- Cauley JA, Lacroix AZ, Wu L, Horwitz M, et al. Serum 25-hydroxyvitamin D concentrations and risk for hip fractures. *Ann Intern Med* 2008 Aug 19;149(4):242-50.
- Viguet-Carrin S, Garnero P, Delmas PD. The role of collagen in bone strength. *Osteoporosis International*. 2006;17(3):319-336.
- Braam LA, Knapen MH et al. Vitamin K1 supplementation retards bone loss in postmenopausal women between 50 and 60 years of age. *Calcif Tissue Int* 2003 Jul;73(1):21-6.
- Nielson FH. Boron: an overlooked element of potential nutritional importance. *Nutr Today* 1988;Jan/Feb:4-7.
- Nielson FH. The justification for providing dietary guidance for the nutritional intake of boron. *Biol Trace Elem Res* 1998 Winter;66(1-3):319-30.
- Strause I, Saltman P, Smith KT, et al. Spical bone loss in postmenopausal women supplemented with calcium and trace minerals. *J Nutr* 1994;124:1060:1064.

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