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Throughout life, cells known as osteoblasts construct bone matrix and fill it with calcium. At the same time, cells called osteoclasts work just as busily to tear down and resorb the bone. This fine balance is regulated by many factors, including systemic hormones and cytokines. Bone mass reaches its peak by the middle of the third decade of life and plateaus for about ten years, during which time bone turnover is constant, with bone formation approximately equaling bone resorption.

As our bodies age, this fine balance is lost. As the relative hormone levels shift in midlife—more drastically in women than in men—the osteoclasts gain the upper hand and bone mass begins dwindling away. Some bone is already being lost by the time women reach menopause, but the rate of loss can increase as much as tenfold during the first six years after menopause. This is the essence of type I osteoporosis.

From midlife onward, bone health is threatened by overactive osteoclasts. To add to the problem, the osteoblasts may become less active from age 60 onward. Whereas trabecular (spongy-looking) bone in the vertebrae and elsewhere was formerly at risk from excess osteoclast activity, now the cortical (dense) bone of the hip, shin, pelvis, and other sites becomes more prone to fracturing because osteoblasts do not make enough of it.

Adults can reduce their risk of osteoporosis by engaging in regular weight-bearing exercise, eating a variety of healthy foods, avoiding tobacco and alcohol, and minimizing their use of bone-weakening prescription drugs.

Foods that promote bone health include calcium sources—such as dark green leafy vegetables, broccoli, legumes, canned salmon, and sardines—and dairy products like milk and cheese.

Calcium is the most abundant mineral in the body where it is primarily found in bones and teeth. In bone formation, calcium forms crystals that provide strength to maturing bone. Magnesium is one of the body’s most important minerals. In bone mineral health, magnesium (or lack of) influences the bone mineral matrix and its ability to metabolize needed minerals for repair and rebuilding. The scientific literature documents the need for a wide range of minerals that are vital to maintaining strong, healthy bones.

Joint stiffness and discomfort is also a consequence of aging. With advancing age, comes an increase in certain destructive cytokines (immune modulating agents) that contribute to degenerative conditions. Tumor necrosis factor (TNF-a) is one such agent. These pro-inflammatory agents have been implicated in a host of age-related problems—among them health issues related to the joints.

Blocking the actions of these cytokines thus becomes crucial for joint health. Superoxide dismutase (SOD), a naturally-occurring antioxidant enzyme, has shown tremendous promise. Along with protecting the joint from damaging free radicals, replacing naturally occurring joint-supporting nutrients such as glucosamine and chondroitin is also important. These and other crucial nutrients are included in Life Extension’s bone and joint supplements.

*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.
5 capsules contain
Calcium ........................................... 1200 mg
(as dicalcium malate, calcium bis-glycinate,
calcium fructoborate)
Vitamin D3 (as cholecalciferol) .................. 1000 IU
Magnesium (as magnesium oxide) ............ 340 mg
Boron (calcium fructoborate as patented) ...... 3 mg
FruiteX B® (OsteoBoron®)
Zinc (as zinc amino acid chelate) .............. 2 mg
Manganese (as manganese amino acid chelate) .1 mg
Silicon (from horsetail herb, *Equisetum arvense*) .5 mg
Other ingredients: gelatin, magnesium stearate.

Dosage and use
- Take five capsules at dinner or before bedtime, or as recommended by a healthcare practitioner.

Bone Assure 439
180 capsules

Bone Assure is a comprehensive formula designed to help maintain bone density.*

6 capsules contain
Calcium (as calcium bis-glycinate) .......... 1000 mg
Vitamin D3 (as cholecalciferol) ......... 400 IU
Magnesium (as magnesium oxide) ....... 320 mg
Zinc (as zinc citrate) .................. 12 mg
Copper (as cupric sulfate) .............. 1500 mcg
Manganese (as manganese citrate) ....... 1 mg
Boron (as amino acid complex) ........ 2 mg
Vitamin B6 (as pyridoxine HCl) .......... 15 mg
Folate (as folic acid) .................. 200 mcg
Oat straw 10:1 extract .................. 40 mg
(Avena sativa) (aerial part)
Trimethylglycine (as betaine anhydrous) .. 100 mg
Other ingredients: gelatin, magnesium stearate, silicon dioxide.

Dosage and use
- Take six capsules daily in divided doses with meals, or as recommended by a healthcare practitioner.

Bone-UpTM 313
240 capsules

100% of calcium from microcrystalline hydroxyapatite (MCHA) from Australian bovine bone.

6 capsules contain
Calcium ........................................... 1000 mg
(from microcrystalline hydroxyapatite) ........ 4 g
Protein ........................................... 400 mg
Magnesium (as oxide) .................. 600 mg
Zinc (OptiZinc®-zinc monomethionine) .... 10 mg
Phosphorus (elemental) .............. 500 mg
Manganese (elemental) .............. 5 mg
Copper (elemental) .............. 1 mg
Boron (elemental) .............. 3 mg
Vitamin C (as ascorbic acid) .......... 200 mg
Vitamin D3 (as cholecalciferol) .......... 400 IU
Vitamin K1 (phyloquinone) .......... 100 mcg
Glucosamine HCl (from shellfish) .... 300 mg
Other ingredients: cellulose, stearic acid, magnesium stearate.

Dosage and use
- Take six capsules daily in divided doses with meals, or as recommended by a healthcare practitioner.
Free radicals accelerate aging by damaging cell membranes, proteins, and even DNA. Protecting yourself against the ravages of cell-damaging free radicals is essential to promoting health and longevity.

The first line of defense against free radical assault is the body's own internally produced antioxidants, including the enzymes superoxide dismutase (SOD), catalase, and glutathione peroxidase. Research shows that antioxidant enzymes like SOD offer up to thousands of times more protection against certain dangerous free radicals than do dietary antioxidants.

The body's supply of youthful antioxidant enzymes such as SOD rapidly decrease with age. The good news is breakthroughs in nutritional science have enabled researchers to develop an orally ingested supplement that raises and replenishes the body's supply of SOD, thus vastly enhancing its own natural antioxidant defenses.

Life Extension's SODzyme™ with GliSODin® delivers a "one-two punch" against free radical-generated oxidative stress by combining two of the most advanced SOD catalysts available. In one clinical trial, SODzyme™ significantly increased serum and blood levels of SOD and catalase in supplemented volunteers, while reducing hydrogen peroxide.

SODzyme™ with GliSODin® also contains 100 milligrams of GliSODin®, a patented, plant-derived form of SOD bonded to the wheat protein gliadin to protect against degradation in the body and enhance absorption. In extensive animal and human trials, GliSODin® has been shown to raise blood levels of the antioxidant enzymes SOD and catalase, helping to maintain healthy cellular DNA structure.

4 capsules contain
Glucosamine sulfate .......................1000 mg
N-acetyl-D-glucosamine (derived from shellfish) ..................1000 mg
Methylsulfonylmethane (MSM) ..................1000 mg
Proprietary and patented blend of natural citrus ...300 mg
Proprietary and patented blend of natural citrus ...300 mg

Dosage and use
• Take four capsules daily in divided doses with meals, or as recommended by a healthcare practitioner.

Caution: If your total cholesterol levels are below 160 mg/dl or you are unsure of your total cholesterol levels, please consult your physician prior to using this product. Do not take if you are allergic to shellfish. Tangeretin supplements should not be used by individuals being treated with estrogen SERM medications such as Tamoxifen.
Multiple degenerative processes occur during the aging process that allow for undesirable prostaglandin synthesis. These undesirable prostaglandins create a cascade of events that increase cyclooxygenase-2 (COX-2), 5-lipoxygenase (5-LOX), and damage promoting cytokines known as tumor necrosis factor alpha (TNF-α), and interleukin-1 beta (IL-1β). Other harmful enzymes are collagenase and phospholipase. Thus, the goal is to create desirable prostaglandins and the health promoting pathways involved.

The ArthroPro multi-nutrient formula:
- Promotes prostaglandin pathways that limit the production of TNF-α and IL-1β through its super concentrated nettle leaf extract ingredient
- Inhibits 5-LOX with the inflammatory blocker 5-Loxin
- Protects against the age-related damaging effects of the COX-2 enzyme with the agent Nexrutine
- Includes gingerols (from ginger powder extract), which restrain the cyclooxygenase and lipoxygenase cascade and the production of thromboxane and leukotriene, powerful triggers of pain
- Helps to maintain healthy joint cartilage with the addition of glucosamine and chondroitin sulfate, which also controls collagenase and phospholipase

2 capsules contain
Nettle leaf extract (Urtica dioica), powdered extract (leaf) 562.5 mg
Chondroitin sulfate 400 mg
Nexrutine (Phellodendron amurense) (bark extract) 375 mg
N-acetyl-D-glucosamine (from shellfish) 250 mg
Glucosamine sulfate (from shellfish) 250 mg
5-Loxin 37.5 mg [standardized for 3-O-acetyl-11-keto-beta-boswellic acid (AKBA) minimum 30% dried basis (11.25 mg)]
Ginger, powdered extract, (rhizome) 5% gingerols 30 mg
Other ingredients: gelatin and water.

Dosage and use
- Two capsules in the morning and two capsules in the evening with food, or as recommended by a healthcare practitioner.
- Please note that the ArthroMax formula provides newer ingredients and costs less than ArthroPro.

Caution: Do not take if you are allergic to shellfish.

Glucosamine Chondroitin Capsules
500/500 mg • 100 capsules

Glucosamine is a naturally occurring amino sugar synthesized in the body from L-glutamine and glucose. Glucosamine stimulates the manufacture of glycosaminoglycans, important components of the cartilage needed for healthy joints. Aging people seem to lose their ability to produce a sufficient amount of glucosamine, and there are no food sources available. Commercial sources of glucosamine are from the exoskeleton of certain shellfish and are available as glucosamine sulfate, glucosamine hydrochloride, and N-acetyl-glucosamine. The sulfated form may most effectively incorporate sulfur into the cartilage.

Glycosaminoglycans and glycoproteins allow cells in tissues to hold together. They are necessary for the construction and maintenance of virtually all connective tissues and lubricating fluids in the body. In particular, N-acetyl glucosamine is the final form, which together with glucuronic acid, is polymerized to make the joint lubricant, hyaluronic acid.

Chondroitin sulfates provide the structural components of joint cartilage and facilitate the entry of glucosamine into joints. Chondroitin sulfates also inhibit free radical enzymes. Like glucosamine, chondroitin sulfate attracts water into the cartilage matrix and helps to stimulate the production of cartilage.

1 capsule contains
Glucosamine sulfate (from shellfish) 400 mg (from 500 mg D-glucosamine sulfate 2KCl)
Chondroitin sulfate 450 mg (elemental, from 500 mg gross weight)
Other ingredients: gelatin, water, magnesium stearate.

Dosage and use
- Take one capsule, one to eight times daily with food, or as recommended by a healthcare practitioner.

Caution: People who are allergic to shellfish should consult a healthcare practitioner before using this product.

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Chondrox 217

800 mg • 300 capsules

Chondrox has a combination of ingredients that helps to:

• Support or enhance anabolic chondrocyte synthesis

• Support or enhance the synthesis of synovial fluid

• Inhibit enzymes and immune system factors that cause free radical damage throughout the body

2 capsules contain

N-acetyl-D-glucosamine (from shellfish) ....... 500 mg
Glucosamine sulfate K2Cl .................... 500 mg
Chondroitin sulfate .............................. 800 mg
Manganese (as manganese aspartate) ........ 170 mcg
Other ingredients: magnesium stearate, silica, gelatin, water.

Dosage and use

• Take two capsules three times daily with meals, or as recommended by a healthcare practitioner.

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Glucosamine Sulfate 459

750 mg • 30 tablets

1 tablet contains

Glucosamine sulfate ....................... 750 mg
(as glucosamine sulfate potassium chloride)

Supplying:

Glucosamine ................................... 485 mg
Potassium ....................................... 106 mg
Other ingredients: stearic acid, magnesium stearate, sorbitol.

Dosage and use

• One tablet twice daily with meals or as recommended by a healthcare practitioner.

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Chondroitin Sulfate 364

400 mg • 60 tablets

As the knowledge of the efficacy of chondroitin sulfate in particular has become widespread, many people want to take chondroitin sulfate by itself, or augment the Chondrox formula with extra amounts. Chondroitin sulfate is also an antioxidant.

1 tablet contains

Chondroitin sulfate ......................... 400 mg
Supplying:

Glucuronic acid ............................... 210 mg
N-acetyl-galactosamine ...................... 190 mg
Other ingredients: dicalcium phosphate, cellulose, stearic acid, croscarmellose sodium, magnesium stearate, silica.

Dosage and use

• Take one tablet one to three times daily with meals, or as recommended by your healthcare practitioner.

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Mega Glucosamine 460

1000 mg • 100 tablets

This product is from Jarrow Formulas. HCl is included to stabilize the glucosamine.

1 tablet contains

Glucosamine HCl .............................. 1000 mg
(from shellfish)
Other ingredients: calcium phosphate, stearic acid, magnesium stearate, modified cellulose gum.

Dosage and use

• One tablet once or twice daily with meals or as recommended by a healthcare practitioner.

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