

# Why You Should Avoid Osteoporosis Medications

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✓ Fact Checked

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## STORY AT-A-GLANCE

- › Internationally, osteoporosis affects 200 million women, including 1 in 10 women aged 60; 2 in 10 women aged 70; 4 in 10 women aged 80; and two-thirds of women aged 90. Across Europe, the rate of prevalence among men ranges between 6.7% and 6.9%
- › An estimated 34 million Americans also have low bone density, known as osteopenia, which raises your risk of fractures and may progress into osteoporosis
- › Bisphosphonate drugs prescribed for osteoporosis have been shown to weaken bone and cause microcracks that heighten your risk for atypical bone fractures
- › Nutrients that are important for healthy bone growth and strength include vitamin D, vitamins K1 and K2, calcium, magnesium, collagen, boron and strontium
- › Most load-bearing exercises fail to produce sufficient osteogenic load to trigger bone growth. Research suggests the load needed to trigger bone growth in the hip is 4.2 times your bodyweight. Blood flow restriction training is an alternative that not only appears to have a beneficial effect on bone health, but is also viable for the elderly and those who can't lift heavy weights

According to the International Osteoporosis Foundation,<sup>1</sup> osteoporosis affects approximately 200 million women worldwide, including 1 in 10 women aged 60; 2 in 10 women aged 70; 4 in 10 women aged 80; and two-thirds of women aged 90. Prevalence in all age groups is far higher in women than in men. Across Europe, the rate of prevalence among men ranges between 6.7% and 6.9%.

With osteoporosis – brittle bone – comes the risk of bone fractures due to a fall, and hip fractures in particular are notorious for raising an older individual's risk of death.<sup>2</sup> An estimated 34 million Americans also have low bone density, known as osteopenia, which raises your risk of fractures and may progress into osteoporosis. As noted in a StatPearls paper on osteopenia:<sup>3</sup>

*"In the United States, 54% of postmenopausal women are osteopenic, and an additional 30% are already considered osteoporotic. By age 80, this relative trend predictably shifts in favor of osteoporosis as 27% of women are osteopenic, and 70% are osteoporotic ...*

*Fragility fractures significantly compromise a patient's quality of life and financially devastate the healthcare system. Roughly 2 million fragility fractures occur each year in the United States alone, and by 2025 this number is expected to increase to over 3 million ...*

*The overall impact of fragility fractures on the healthcare system is staggering. In 2005, direct costs of care associated with fragility fractures alone tallied \$19 billion, and the direct and indirect costs of care are expected to surpass \$25 billion by 2025.*

*In addition, fragility fractures significantly decrease the quality of life, and hip fractures alone are associated with a one-year mortality rate of greater than 20%."*

## **What's the Best Way to Prevent Osteoporosis?**

In the featured video, Dr. Deborah M. Kado, director of the osteoporosis program at the University of California, gives a lecture on osteoporosis, its treatment and preventive measures you can take to minimize your risk of bone fractures as you age. She points out there are both nonmodifiable and modifiable risk factors for bone fractures.

Nonmodifiable risk factors include age, sex, ethnicity, family history, a history of previous fractures and menopause (among women). Modifiable risk factors include diet,

vitamin D deficiency, balance and lifestyle choices such as smoking, lack of exercise and excessive alcohol consumption.<sup>4</sup> As noted in StatPearl's paper on osteopenia,<sup>5</sup> medical factors can influence your risk as well.

Medical conditions that raise your risk of osteopenia and osteoporosis include "hyperparathyroidism, anorexia, malabsorption syndromes, hyperthyroidism, chronic renal failure, hypogonadism, amenorrhea/oligomenorrhea, early onset menopause, and chronic conditions resulting in calcium and/or vitamin D deficiencies."

Drugs that can trigger or worsen bone loss include "excess glucocorticoids/long-term steroid use, valproic acid, proton pump inhibitors, anti-epileptics and chemotherapy agents." The chemical triclosan has also been shown to increase your risk of osteoporosis.

Kado also touches on the primary treatment in conventional medicine, which is the use of bisphosphonate drugs<sup>6</sup> such as Fosamax. While she doesn't advise people to take them or not, she does point out they have their own set of dangers.

These include a higher risk for thigh bone fractures — the very thing you're trying to avoid. Indeed, Fosamax has been warning about atypical femur fractures on its package insert since 2011.<sup>7</sup>

Bisphosphonate drugs have also been linked to osteonecrosis of the jaw<sup>8</sup> (decay of the jawbone), inflammation of the eye,<sup>9</sup> liver damage,<sup>10</sup> a twofold risk of atrial fibrillation,<sup>11</sup> kidney toxicity<sup>12</sup> and hypocalcemia<sup>13</sup> (low blood calcium level).

In my view, these drugs are to be avoided, as they do not address the underlying problem. While bisphosphonates make your bone thicker, they simultaneously make it mechanically weaker.

## **Bisphosphonate Drugs Make Your Bones More Prone to Fractures**

Evidence for this was presented in a 2017 study,<sup>14,15</sup> which used a particle accelerator to generate exceptionally detailed images of the internal structure of bone samples from 10 hip fracture patients treated with bisphosphonates (BP), 14 samples from naïve fractures (bone fractures in patients that were not treated with the drugs), and six non-fractured controls. Results showed:

*"BP bone was 28% lower in strength than untreated hip fracture bone, and 48% lower in strength than non-fractured control bone ... BP-treated bone had 24% more microcracks than naïve fractured bone and 51% more than non-fractured control ...*

*BP therapy had no detectable mechanical benefit in the specimens examined. Instead, its use was associated with substantially reduced bone strength.*

*This low strength may be due to the greater accumulation of microcracks and a lack of any discernible improvement in bone volume or microarchitecture. This preliminary study suggests that the clinical impact of BP-induced microcrack accumulation may be significant."*

Another paper<sup>16</sup> published that same year in Scientific Reports suggested that "bisphosphonates may oversuppress remodeling resulting in accumulation of microcracks." The authors further explained:<sup>17</sup>

*"Bisphosphonate-treated bone from fracture patients had the highest density and volume of microcracks compared to bone from the untreated fracture patients and healthy ageing individuals. Correspondingly, bisphosphonate-treated samples also had reduced ultimate tensile strength ... compared to the control groups.*

*Our results, therefore, suggest that the reduced bone strength in the bisphosphonate group is due to the accumulation of microcracks. In this subgroup of bisphosphonate-treated patients that suffered a fracture, the accumulation of microcracks following treatment with bisphosphonates may*

*have compromised the trabecular microstructure. As a result, there may have been weakening of the bone and consequently, an increased risk of fracture.*

*Bisphosphonate-treated bone also demonstrated a lower density and volume of perforations compared to osteoporotic bone, which may be reflective of the protective effects of bisphosphonates in limiting the development of perforations through osteoclastic inhibition. However, it is the oversuppression of remodelling that has detrimental effects, as this predisposes to microcrack accumulation and propagation."*

## **Healthy Bones Through Nutrition**

Bone is living tissue constantly undergoing the addition of new bone cells and the removal of old ones. New bone is added faster than old bone is removed until your late 20s.<sup>18</sup>

"Peak bone mass" is a term used to describe how large and strong our bones can get. Reaching peak bone mass typically occurs between the ages of 25 and 30, followed by greater resorption of bone than bone formation.<sup>19</sup>

A foundational aspect of maintaining healthy bone is therefore to be metabolically fit. Your diet in general is a core consideration, with certain nutrients being required for bone health specifically.

As noted in the paper "Naturopathic Approaches to Preventing and Treating Osteoporosis,"<sup>20</sup> published in the Natural Medicine Journal, "The best approach to getting sufficient nutrients to build and maintain strong bones is to consistently make healthy food choices." Among the most important nutrients for bone health are:<sup>21</sup>

**Vitamin D** – Vitamin D plays a regulatory role in the absorption of calcium and phosphorous, which are important for healthy bones. As explained in the Natural Medicine Journal:<sup>22</sup>

*"If vitamin D levels are low, parathyroid hormone (PTH) increases and triggers osteoclasts to release calcium into the blood via bone resorption. If this process continues over time, it weakens bone and leads to osteoporosis ...*

*Deficiency can create secondary hyperparathyroidism, leading to a loss of collagen matrix and minerals, which increases the risk of osteoporosis and fractures. Poor bone remodeling due to higher osteoclast vs. osteoblast activity can occur with low levels of vitamin D ..."*

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**Vitamin K1** – Vitamin K1, phylloquinone, is found in plants and green vegetables. Aside from playing a crucial role in blood clotting, research shows it's also important for bone health. Osteocalcin is a protein produced by your osteoblasts (cells responsible for bone formation), and is utilized within the bone as an integral part of the bone-forming process.

However, osteocalcin must be "carboxylated" before it can be effective. Vitamin K1 functions as a cofactor for the enzyme that catalyzes the carboxylation of osteocalcin.<sup>23</sup> As noted in a 2017 paper<sup>24</sup> in the journal *Metabolism*, "it seems to promote the transition of osteoblasts to osteocytes and also limits the process of osteoclastogenesis."

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**Vitamin K2** – Vitamin K2, menaquinone, which is synthesized by intestinal bacteria, works synergistically with calcium, magnesium and vitamin D to build strong, healthy bone.

Vitamin K2 directs calcium to your bones and prevents it from being deposited in your soft tissues, organs and joint spaces. Vitamin K2 also activates the protein hormone osteocalcin, produced by osteoblasts, which is needed to bind calcium into the matrix of your bone.

The pooled evidence of seven Japanese trials assessing the ability of vitamin K2 (menaquinone-4) to prevent fracture rates found:<sup>25</sup>

*"When we assessed absolute differences in fracture rates, a significantly reduced rate was found at all fracture sites, with hip fractures reduced by 6%, vertebral fractures reduced by 13%, and all nonvertebral fractures by 9%."*

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**Calcium** – Calcium works synergistically with vitamin K2, magnesium and vitamin D, and needs all three of those to function properly.

Vitamin D aids calcium absorption, while vitamin K2 makes sure the calcium ends up in the right place – your bones and not your arteries. Taking a high-dose calcium supplement while being vitamin K2 deficient can thus lead to hardening of your arteries. The Natural Medicine Journal reports that:<sup>26</sup>

*"To maintain bone health, 1,000–1,500 mg/day of calcium (including food sources and supplements) is recommended (varies with age, weight, sex, etc.) by the National Academy of Sciences.*

*Sufficient calcium intake is important in preventing osteoporosis, because if the body's stores of calcium is low, calcium will be leached from bones, which can lead to decreased bone mass and the initiation or worsening of osteoporosis."*

Raw, grass fed yogurt is an excellent calcium source that research has shown can lower your bone loss.

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**Magnesium** – Magnesium works synergistically with calcium, vitamin K2 and vitamin D, and aids calcium absorption. According to the Natural Medicine Journal:<sup>27</sup>

*"Low levels of blood magnesium correlates with low bone density, and several studies have supported the use of oral magnesium supplementation to increase bone density. Even a moderate magnesium deficiency has been documented to cause bone loss in rats.*

*Magnesium deficiency may impair the production of parathyroid hormone and 1,25-dihydroxyvitamin D, which negatively affects bone mineralization. Supplementing with 250–400 mg a day of magnesium is usually recommended."*

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**Collagen** – **Collagen** has been shown to strengthen bones<sup>28,29</sup> and improve osteoporosis.<sup>30</sup>

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**Boron** – The highest concentrations of the trace mineral boron are found in bones and tooth enamel. According to the Natural Medicine Journal,<sup>31</sup> boron "appears to be indispensable for healthy bone function," as it reduces excretion of calcium, magnesium and phosphorous. There may also be other, as yet poorly understood, mechanisms by which it benefits bone-building.

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**Strontium** – Another trace mineral that has some similarities to calcium, is also thought to be important for bone formation and bone strength. At present, the only two forms of strontium that have science backing their use are the nonradioactive strontium ranelate (which is not available in supplement form)<sup>32</sup> and strontium citrate.

A study<sup>33</sup> published in 2017 found postmenopausal osteopenic women taking a combination of 5 mg of melatonin, 450 mg of strontium citrate, 60 micrograms of vitamin K2 and 2,000 IUs of vitamin D per day for one year increased their bone density in the lumbar spine by 4.3% compared to placebo. Bone density in the femoral neck increased by 2.2%.

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## Why Most Resistance Training Is Not Enough

While there's evidence supporting the notion that moderate- to high-impact resistance training will benefit bone health,<sup>34</sup> heavy weightlifting may be unsuitable for the elderly

and those with osteoporosis. Low-impact resistance training, aerobic exercise and walking have all been shown to have little or no effect on bone loss.<sup>35</sup>

The problem with load-bearing exercises is that most simply do not produce sufficient osteogenic load. Research<sup>36</sup> suggests the load needed to trigger bone growth in the hip is 4.2 times your bodyweight. Conventional strength training comes nowhere near that.

Just think about that for a moment. If you weigh 150 pounds, that would mean you would have to deadlift more than 600 pounds. Not many 150-pound people I know can deadlift even half that.

## **Osteogenic Loading – The Key to Strong Bones**

However, there is a system called Osteostrong that I am testing that sets up your body in specific positions that allows most to achieve this level of force without risk or injury and has been shown to consistently increase bone density over a year. Another name for Osteostrong is osteogenic loading therapy,<sup>37,38,39</sup> You would need to have access to a training center or clinic that offers it.<sup>40</sup> This technology is designed to improve your bone density.

In a 2015 study<sup>41</sup> published in the Journal of Osteoporosis & Physical Activity, women diagnosed with osteopenia and osteoporosis (none of whom were on medication for it) who performed osteogenic loading-type resistance training saw a 14.9% increase in the density of the hip bone and a 16.6% increase in the density of the spine after 24 weeks.

## **Blood Flow Restriction Training May Benefit Your Bones**

An alternative that not only appears to have a beneficial effect on bone health, but is also viable for the elderly and those who cannot lift heavy weights is blood flow restriction (BFR) training. BFR is a novel type of biohack that allows you to do strength exercises using just 20% to 30% of the max weight you'd normally be able to lift just once, while still reaping maximum benefits.

It involves performing strength training exercises while restricting venous blood flow return to your heart (but not arterial flow) to the extremity being worked. This is done by wrapping the extremity being worked with a cuff that mildly restricts blood flow.

By forcing blood to remain inside your extremity while it is exercising with light weights, you stimulate metabolic changes in your muscle that result in great improvements in strength with virtually no risk of injury.

While still sparse, some studies also suggest it has an effect on bone metabolism. As noted in a 2018 systematic review of 170 articles looking at BFR's impact on bone metabolism:<sup>42</sup>

*"... only four studies showed that BFR training increases the expression of bone formation markers (e.g. bone-specific alkaline phosphatase) and decreases bone resorption markers (e.g. the amino-terminal telopeptides of type I collagen) ... across several populations."*

A 2012 study, "Blood Flow Restriction: Rationale for Improving Bone," offered the following hypothesis:<sup>43</sup>

*"The studies completed thus far support the hypothesis that training with blood flow restriction may provide not only a novel modality to induce adaptation in muscle but also bone, which was previously thought to only occur with higher intensity/impact exercise."*

*We hypothesize that the main mechanism behind the proposed favorable bone responses observed thus far is through increased intramedullary pressure and interstitial fluid flow within the bone caused by venous occlusion."*

For details about how to do BFR, you can review my recently added instructions in our [Exercise Guide](#). I will publish more interviews, articles, videos and a training guide for BFR in the future.

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