Gerontology & Geriatric Medicine
Volume 9: 1–4

DOI: 10.1177/23337214231204729
journals.sagepub.com/home/ggm
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Making a Move on the Mark of Osteoporosis in Men

Vu H. Nguyen, PhD[1,2]

Keywords
aging, diet and nutrition, global public health, hip fracture, osteoporosis, physical fitness, prevention

Manuscript received: June 30, 2023; **final revision received:** September 12, 2023; **accepted:** September 13, 2023.

Osteoporosis is a skeletal disease of reduced bone mass that greatly increases the risk of fractures, and while the disease is most commonly thought of as an issue for older women, it is a growing concern for older men. In fact, approximately 20% to 25% of osteoporosis cases occur in men (Baron et al., 1996); however, that approximation is an underestimation, as men are underscreened for osteoporosis compared to women (Choksi et al., 2020), meaning that men account for more than a quarter of osteoporosis cases (Figure 1). The literature shows that osteoporosis in men is greatly underestimated and underdiagnosed, and this has left the disease being underinvestigated and undertreated in men, resulting in very few studies on osteoporosis treatment for them, which is alarming considering that men have been found to experience more complications and have higher mortality rates from osteoporosis and osteoporotic fractures compared to women (Rinonapoli et al., 2021). In addition to more adverse health consequences and a reduced lifespan, osteoporosis and osteoporotic fractures also significantly decrease the health-related quality of life in men (Hu et al., 2021).

As the topic of osteoporosis in men is one of the most neglected but major public health problems in society (Szulc et al., 2012), it is already difficult to place more attention on the necessity of older men being screened for osteoporosis and low bone mass, which will consequentially continue the undertreatment of the disease in men and further exacerbate the severe issues they will suffer. This continues the underestimation of men with osteoporosis in clinical practice, which leads to less desire and demand to study osteoporosis treatments for them in research. This has resulted in much fewer medicines registered for osteoporosis treatment in men (Misiorowski, 2017), giving them fewer options to treat the disease. And more options are needed, especially for older men with prostate cancer undergoing androgen deprivation therapy (ADT) that improves cancer survival over time, but causes cancer treatment-induced bone loss (CTIBL) resulting in osteoporosis (A M El Badri et al., 2019).

Older men tend to have poor knowledge of osteoporosis, do not perceive themselves susceptible to the disease, nor typically perform particular health behaviors that prevent it, such as engaging in weight-bearing exercise and consuming adequate calcium and vitamin D (Sedlak et al., 2000). Comparing older men and women, women perceive that they are more susceptible to osteoporosis and have higher self-efficacy to undergo osteoporosis screening than men (Nayak et al., 2010), which may explain why osteoporosis screenings are generally utilized by women but widely neglected by men. For the relatively few men who do undergo osteoporosis screening, another potential problem is men being diagnosed using the same T-scores and database as women. An osteoporosis diagnosis in both men and women is a bone mineral density (BMD) measurement on dual-energy x-ray absorptiometry (DXA) resulting in a T-score of

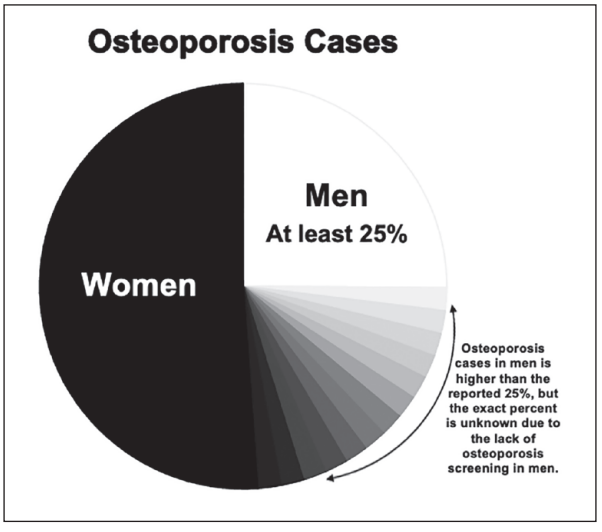

Figure 1. Osteoporosis cases between men and women.

[1]University of Missouri, Columbia, MO, USA
[2]Columbia College of Missouri, Columbia, MO, USA

Corresponding Author:
Vu H. Nguyen, School of Public Health, College of Health Sciences, University of Missouri, 802 Lewis Hall, Columbia, MO 65211, USA.
Email: vhn.health@outlook.com

−2.5 standard deviations (*SD*) below the adult peak mean, taken from a Caucasian female database. There is controversy and concern over men being diagnosed from a female database, although fracture risk is approximately the same with the same DXA-measured BMD and T-scores between men and women, but use of a male database would result in more men with osteoporosis being diagnosed with a mathematically higher to normal T-score (Binkley et al., 2014).

We must be mindful that the purpose of screening for a disease is to catch it early to more easily treat it and successfully limit its consequences. But if men suffer worse from fragility fractures and more is needed to prevent them, then there may be issues regarding the current diagnosis of osteoporosis and/or the approaches toward preventing fragility fractures in men. For instance, although osteoporosis diagnosis in men is also a T-score of −2.5 *SD* below the adult peak mean, as Binkley et al. (2014) note that when using a male database, should it be raised higher and closer to the mean? For example, could the mark of osteoporosis in men be considered for T-scores of −2.0, −1.5, −1.0, or −0.5 *SD* below or at the adult peak mean? The ability to pinpoint a specific numeric value may not be so simple and would require careful examinations of databases and analyses, but it does appear that for men with only average BMD or once it starts to decrease below the mean, they should strongly start to consider making a move toward implementing approaches to prevent osteoporosis and fragility fractures. And this may include the necessity of further evaluations, such as detecting the presence of current fractures, reviewing family history of fractures, and/or using the FRAX fracture risk assessment tool.

Most fragility fractures in older adults occur from falling, and as men are generally larger than women, perhaps the old adage, "the bigger they are, the harder they fall," could be a possible explanation for why men are more prone to fragility fractures due to falls. Therefore, in addition to treatments that increase bone mass, interventions that improve strength, balance, and stability to prevent falls also appear to be crucial. Methods to increase BMD, such as increased consumption of calcium and vitamin D with possible inclusion of anti-osteoporosis drugs, in combination with engaging in exercise programs designed for fall prevention, can help reduce the risk and severity of fragility fractures. In fact, the Lifting Intervention For Training Muscle and Osteoporosis Rehabilitation for Men (LIFTMOR-M) trial has shown that middle-aged and older men with osteoporosis or low bone mass who partake in an intervention that includes increased calcium and vitamin D intake combined with weight-bearing exercise that is high-intensity and high-impact; along with the possible use of medications, such as a bisphosphonate like Alendronate or a receptor activator of nuclear factor-κB ligand (RANKL) inhibitor like Denosumab, if necessary; were shown to have significantly increased BMD with improved muscle strength and function (Harding et al., 2020), all of which can help reduce the risk of falling and fragility fractures.

In order to help more men take action to prevent or treat a disease they have poor knowledge and awareness of, LeBoff et al. (2022) published the *Clinician's Guide* in behalf of the Bone Health and Osteoporosis Foundation that can provide numerous recommendations for health professionals. All men over 50 should be counseled on their risk of osteoporosis and the consequences of fragility fractures, consume adequate calcium (1000 mg/day for men 50–70 years old, 1,200 mg/day for men 71 years old and over), monitor and maintain vitamin D levels (30–50 ng/mL), identify and address risks of falling, avoid smoking and excessive alcohol intake, and engage in weight-bearing and muscle strengthening exercises. These are universal recommendations that should be the foundation for bone health and osteoporosis prevention, and men who are suspected to have osteoporosis should undergo diagnostic assessments, with those diagnosed with osteoporosis and/or have suffered fragility fractures considering pharmacological treatments and monitoring their responses to them (Figure 2).

In conclusion, although the details on how to diagnose men with osteoporosis may remain unclear, it is becoming clearer that men with just average BMD or lower should start to consider taking action toward increasing their bone mass and preventing falls, in order to reduce the risk of experiencing fragility fractures and the severe consequences that accompany them. Men without fragility fractures will live longer and better lives than those who do suffer from them, and that should be reason enough for more men to make the move on preventing or treating osteoporosis.

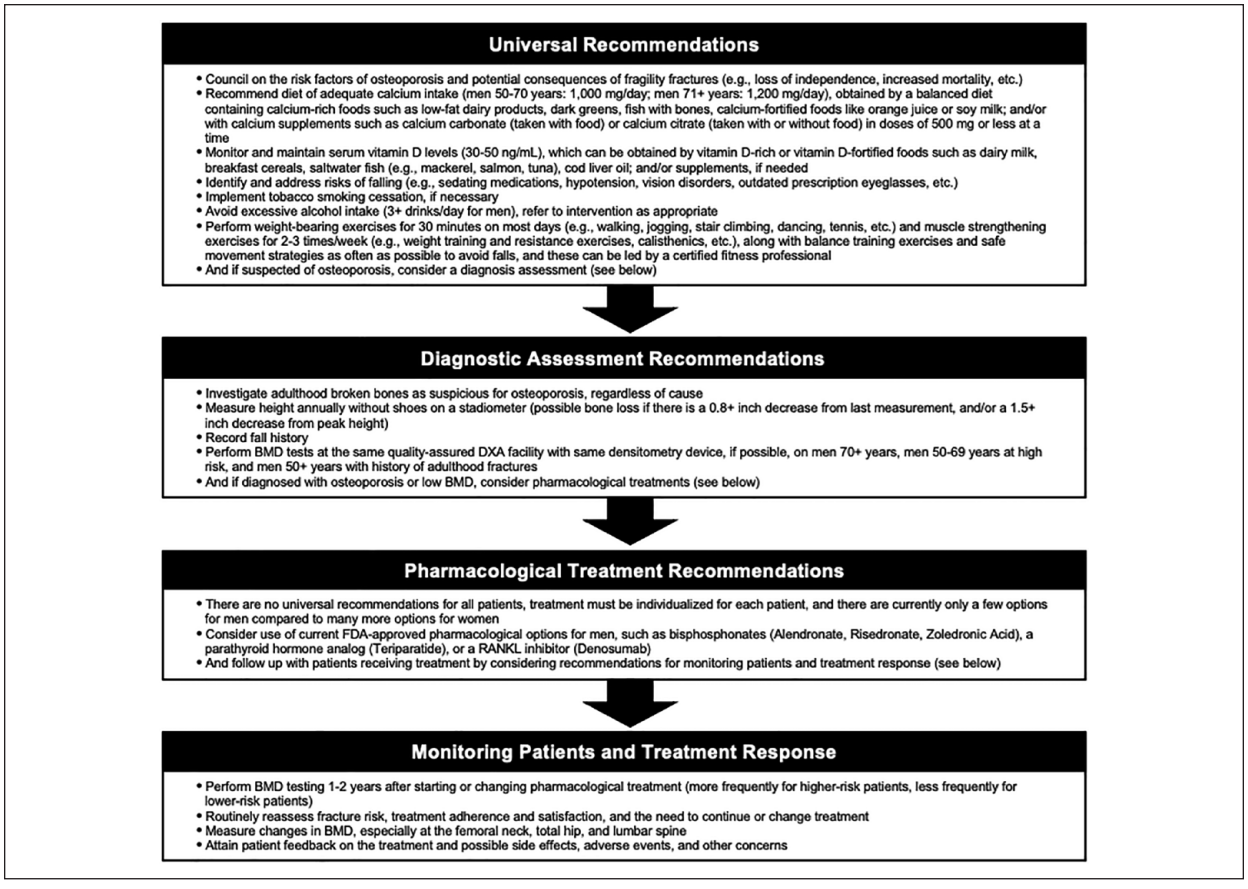

Figure 2. Recommendations for the prevention and treatment of osteoporosis in men.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Vu H. Nguyen https://orcid.org/0000-0003-3974-7040

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