



# The New Yoga for Osteoporosis:

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*New Light on Common  
Osteoporosis Myths*

*A Research-Informed Guide for Women Who Want to  
Understand Their Diagnosis and Take Empowered Action*

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## **Introduction: The Moment the Number Changes Everything**

You're sitting in your doctor's office — or maybe reading a result on a patient portal — and there it is. A T-score. A word: osteoporosis. Or osteopenia. And in an instant, the way you think about your body shifts.

For many women, the feeling is immediate and visceral. In a landmark qualitative study published in *Archives of Osteoporosis*, women described their diagnosis as "traumatizing," spoke of "constant anxiety," and used the phrase "made of glass" to describe how they now moved through the world. One woman, a physically active marathon runner, wrote that she was "doing everything I need to do — working full time, going out with friends — but doing it all in a constant state of anxiety."<sup>[1]</sup>

That experience is real and valid. And it is also, the research increasingly suggests, based on a picture that is significantly incomplete.

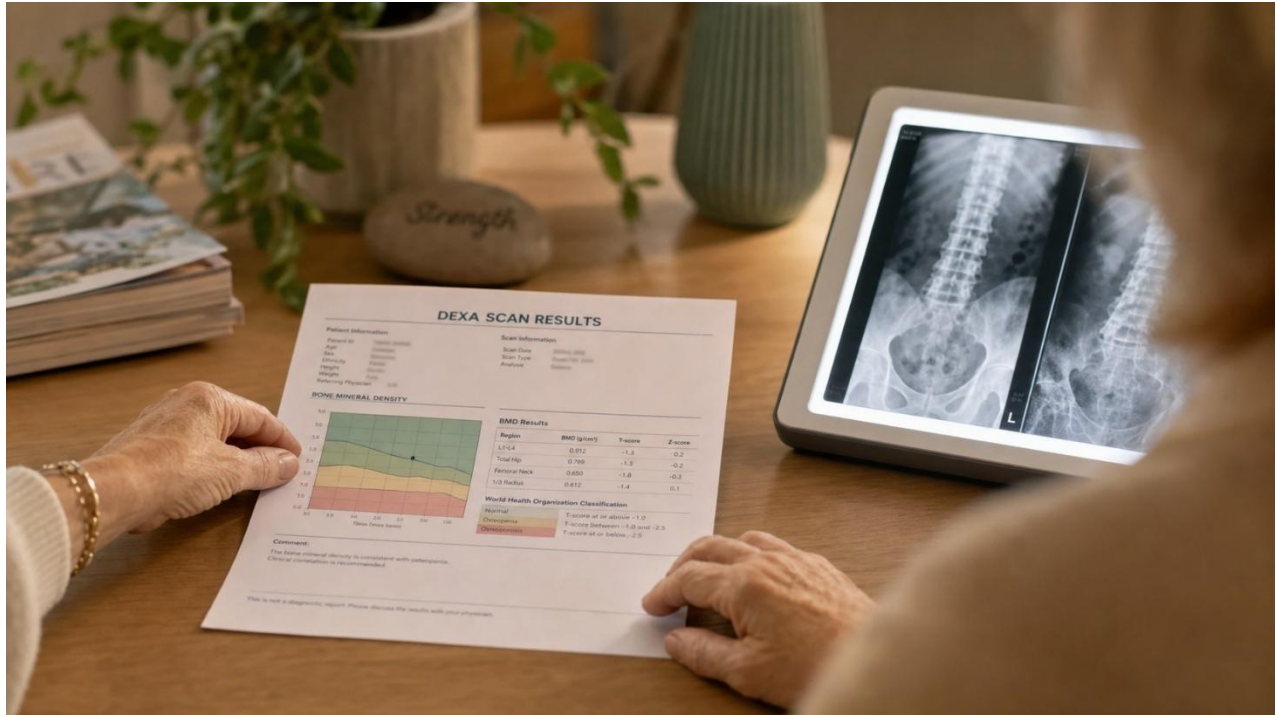
Not because the risks of osteoporosis are imaginary — they are not. Fragility fractures are serious, and hip fractures in particular carry mortality rates of up to 20–24% in the first year. But between the real risks and the full story lies a gap — a gap filled with myths that leave women more frightened, more restricted, and less empowered than the evidence warrants.<sup>[2]</sup>

This report is written to close that gap. It is not anti-medicine, not anti-DEXA, and not dismissive of the real challenges of bone loss. It is a serious, research-grounded examination of eight of the most common misconceptions surrounding osteoporosis — misconceptions that shape how millions of women understand their diagnosis, their options, and their future.

The thread running through all eight myths is this: **you have more agency over your bone health than you have been told.** The science is more nuanced than a single number on a scan. And the most powerful things you can do to protect yourself — building strength, improving balance, training your nervous system, moving intelligently and consistently — are available to you right now, at any age.

That is not wishful thinking. It is what the research shows. And it is the foundation on which the YogaUOnline approach to bone health has been built.

# Myth #1 — Your DEXA Score Is the Definitive Measure of Your Bone Health



*"I always have this fear that in one of my exaggerated movements, I might break something."*  
— Woman, age 62, from a 2025 qualitative study on living with osteoporosis<sup>[^1]</sup>

## What Women Are Typically Told

You receive a DEXA scan. The machine produces a T-score. If it falls below  $-2.5$ , you are told you have osteoporosis. If it falls between  $-1.0$  and  $-2.5$ , you have osteopenia. You are sent home with that number, and for many women, it becomes the lens through which they see their entire bone health — and their entire future.

## What DEXA Actually Measures

A DEXA scan — dual-energy X-ray absorptiometry — works by passing two X-ray beams of different energies through the body and measuring how much of each beam is absorbed. The scan essentially recognizes two types of tissue: bone and soft tissue. Everything else — fat distribution, muscle, bone marrow — is estimated through a mathematical algorithm.<sup>[^3]</sup>

This two-dimensional approach has well-documented limitations. DEXA measures *areal* bone mineral density — a projection of a three-dimensional structure onto a two-dimensional image — which means it cannot capture the true three-dimensional complexity of bone strength. Osteoarthritis in the spine, aortic calcification, and prior fractures can all artificially inflate a DEXA score, making bone appear denser than it is. Conversely, small-framed women can receive artificially low scores that overstate their risk.<sup>[4][5]</sup>

The practical consequence: studies have found the inherent measurement variability in a DEXA-derived T-score can be clinically significant — enough to influence whether a woman receives an osteoporosis or osteopenia classification.<sup>[6]</sup>

### **What DEXA Doesn't Measure: The Racial Paradox**

Perhaps the most striking demonstration of DEXA's limitations is what researchers call the racial paradox in bone health. According to CDC data, Asian women have the *highest* rates of osteoporosis by DEXA diagnostic criteria — yet have *lower* fracture rates than non-Hispanic White women. Black women have the *lowest* rates of osteoporosis by DEXA standards — yet experience *worse* outcomes after hip fracture, including longer hospital stays and lower recovery rates.<sup>[7][8]</sup>

If a T-score truly captured fracture risk comprehensively, those numbers should not be possible. What they reveal is that bone density — as measured by DEXA — is one piece of a puzzle that also includes bone geometry, bone quality, muscle strength, fall history, balance, and coordination. The WHO diagnostic criteria were developed and validated primarily using data from Caucasian postmenopausal women, and the criteria themselves acknowledge this limitation.<sup>[9]</sup>

### **Beyond DEXA: Emerging Tools**

A new generation of bone assessment tools is beginning to address what DEXA cannot see. The Trabecular Bone Score (TBS) is a software analysis that reprocesses existing DEXA images to assess the microarchitecture of trabecular (spongy) bone — the internal scaffolding structure that gives bone much of its resistance to fracture. TBS has been shown to predict fracture risk independently of bone mineral density, meaning it adds information that a T-score alone does not provide. It is now endorsed by the International Society for Clinical Densitometry and is increasingly available in clinical settings.<sup>[10][11]</sup>

Bone turnover markers — blood and urine tests that measure how actively bone is being formed and broken down — can tell clinicians whether bone loss is actively accelerating, which a static DEXA image cannot reveal. High-resolution peripheral quantitative computed tomography (HR-pQCT) provides a three-dimensional view of bone microarchitecture and is increasingly used in research settings.<sup>[4]</sup>

## **A Radiation-Free Alternative: REMS**

Here's a question worth asking: what if there were a way to assess your bone health that doesn't use X-rays at all — and that gives you not just a density score, but a picture of how likely your bone actually is to fracture?

That's the promise of **REMS** — Radiofrequency Echographic Multi-Spectrometry. Currently available under the brand name Echolight, REMS uses ultrasound rather than X-rays to assess bone at the lumbar spine and femoral neck. No radiation. No table positioning. And — importantly — far less affected by the things that commonly distort DEXA results in women over 50.

Here's the thing about DEXA that rarely gets discussed: **arthritis in the spine actually makes your DEXA score look *better* than it really is** — the calcification from arthritic changes registers as bone density. Scoliosis, body positioning on the table, and even small variations in scan technique can all meaningfully shift your result. REMS, because it uses sound waves traveling through bone in multiple planes, is far less susceptible to these distortions.

But perhaps the most clinically interesting feature of REMS is what it measures beyond density. In addition to giving you a T-score, REMS produces a **fragility score** — an assessment of the structural quality of your bone and how it is likely to behave under real-world stress. In other words: not just *how dense* is your bone, but *how likely is it to break?*

That distinction can matter enormously. Consider the story Dr. Doug, a bone health specialist, shared on his podcast: a 63-year-old physician — fit, active, an aggressive skier — received a DEXA T-score of -2.6 at the femoral neck, placing him firmly in the osteoporosis range. His doctors were alarmed. He was told to stop skiing. His estimated 10-year hip fracture risk was 10–20%. Then he got a REMS scan. His femoral neck T-score came back as -1.5, his fragility score landed in the normal range, and his 10-year fracture risk was recalculated at 1–2%. His overall fracture risk was under 1%. He described the experience as lifting “an albatross off my neck.”

Stories like this are becoming more common as REMS becomes more widely available. And practically speaking, accessibility is genuinely good news here: unlike the research-grade HR-pQCT machines found only at major academic centers, REMS technicians are increasingly mobile. In many cities, a technician will come to your home. Cost is typically around \$295 out of pocket — no insurance, no referral required.

MYTH #1

## Your DEXA Score Is the Definitive Measure of Your Bone Health

### What DEXA Actually Measures

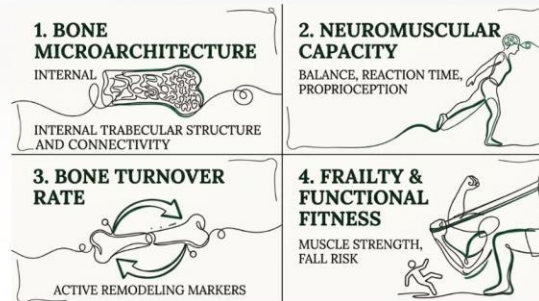
A 2D projection of a 3D structure — it cannot capture true bone strength, internal architecture, or fracture resistance. Inherent T-score measurement variability can be clinically significant — enough to shift a woman between osteoporosis and osteopenia classifications on the same scan.

### The Racial Paradox

Asian women have the *highest* osteoporosis rates by DEXA — yet *lower* fracture rates than White women. Non-Hispanic Black adults have lower DEXA-defined osteoporosis prevalence (6.8%) compared to non-Hispanic White adults — yet experience worse outcomes after hip fracture. If DEXA were the whole story, these patterns could not exist.

### Beyond DEXA

Trabecular Bone Score (TBS) predicts fracture risk *independently* of BMD. Bone turnover markers reveal active bone loss — a dynamic process a static scan cannot detect. Neither is routinely ordered at standard bone density appointments.



**Bottom line:** Your T-score is a starting point, not a verdict — it says nothing about muscle strength, balance, or the dozens of factors that truly drive fracture risk.

**The honest caveat:** REMS is not yet a replacement for DEXA in standard clinical care. Most physicians will not prescribe treatment based on REMS results alone, and one 2026 study raised questions about how much independent information REMS provides beyond age and weight. Dr. Doug himself is careful to say REMS provides *different* information — not definitively *better* information. The head-to-head study comparing REMS, DEXA, and QCT in the same population hasn't been done yet.

Think of REMS the way you might think of a second opinion: it doesn't replace your DEXA, but it can add a meaningful new perspective — especially if your DEXA result and your lived physical reality feel very far apart, or if spinal arthritis, scoliosis, or other factors may be distorting your scan.

## The Yoga Difference

What the research in this chapter makes clear is that fracture risk is multi-dimensional — and that most of the factors that matter most are invisible to any scan. Bone quality, muscle strength, balance, reaction time, neuromuscular coordination, postural integrity — none of these appear in a DEXA result. And yet each one is trainable, at any age, with the right movement practice.

This is exactly where yoga — designed specifically for bone health — steps in. A well-structured yoga practice builds the very capacities that your DEXA score cannot measure and your 15-minute appointment cannot address. The sustained, multi-planar loading of yoga postures trains bone in ways that go beyond simple density. The balance work trains the neuromuscular responses that catch you when you stumble. The postural and breath work addresses the whole-body functional picture that a scan will never capture.

The DEXA result is the beginning of a conversation, not the end of one. And yoga gives you the most comprehensive set of tools available to take empowered action on every dimension of fracture prevention that matters — starting today, in your own body, with your own practice.

## The Empowering Takeaway

**Your T-score is a starting point, not a verdict.** It is a useful screening tool with well-documented limitations. It says nothing about the quality of your bone's internal architecture, the strength and coordination of your muscles, your balance, or the dozens of other factors that research has identified as the true drivers of fracture risk. The most important things you can do to protect yourself — building strength, training balance, improving posture and coordination — are not reflected in that number, and no scan can build them for you. That is where your real power lies.

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## Myth #2 — Osteoporosis Is a Disease



*"So at first, it was a bit like I couldn't recognize myself in this state of... a person who might start having problems."*

— Participant 17, qualitative study, *Archives of Osteoporosis*, 2025<sup>[^1]</sup>

### What Women Are Typically Told

Osteoporosis is a disease. It is diagnosed when your bone density falls below a certain threshold. And like any disease, it needs to be treated — ideally with medication, beginning as soon as possible.

### The 1994 Threshold: How the Diagnosis Was Born

Here is a piece of history that surprises almost everyone: **before 1994, the way osteoporosis is diagnosed today did not exist.**

In 1994, a WHO Study Group published a technical report introducing new diagnostic criteria for osteoporosis based on bone mineral density T-scores. Under this framework, osteoporosis was defined as a T-score at or below  $-2.5$  standard deviations from the mean of a young adult woman — a 30-year-old, specifically, the age at which bone mass is at its lifetime peak. Before this definition, osteoporosis was typically recognized after a fracture had already occurred.<sup>[9]</sup>

The rationale for the  $-2.5$  threshold was not based on clinical evidence per se. The WHO committee acknowledged that the cutoff was chosen in part because it corresponded to a fracture prevalence of approximately 50% in the study population used — a statistical finding that was then translated into a diagnostic standard. Several researchers subsequently noted that the threshold was developed primarily for research classification and epidemiological purposes, and that its application as a universal clinical treatment trigger was not the original intent.<sup>[9]</sup>

## "The Emperor Has No Clothes"

In 2015, four senior researchers — Järvinen, Michaëlsson, Aspenberg, and Sievänen — published a landmark paper in the *Journal of Internal Medicine* with a title that left no room for ambiguity:

**"Osteoporosis: The Emperor Has No Clothes."**<sup>[12][13]</sup>

Their argument was systematic and evidence-based. They challenged three pillars of the current osteoporosis paradigm:

**Most fractures are preceded by a fall:** Most fragility fractures occur in people who do *not* have osteoporosis by DEXA criteria — a fact confirmed by multiple large-scale studies. **The primary driver of fractures in older adults is not low bone density but falls** — and the capacity to absorb or prevent a fall is driven by muscle strength, coordination, and balance, none of which DEXA measures.

**The screening pillar:** Current fracture risk prediction tools, including DEXA-based scoring and multifactorial calculators, fail to identify a large proportion of people who will fracture — while many with high predicted risk never fracture at all. The predictive value is insufficient to justify mass screening as it is currently practiced.

**The treatment pillar:** Evidence for bone-targeted drug therapy preventing hip fractures is largely confined to women aged 65–80 with confirmed osteoporosis. Evidence for older women, men, and women with osteopenia is substantially weaker than prescribing rates suggest.

This paper is freely available via PubMed Central and represents one of the most rigorous peer-reviewed challenges to the current diagnostic framework.<sup>[14]</sup>

MYTH #2

## Osteoporosis Is a Disease

### The 1994 Threshold – A Statistical Choice

Before 1994, osteoporosis was recognized only after a fracture. The WHO committee chose the -2.5 T-score cutoff partly because it corresponded to ~50% fracture prevalence in their study population — a **statistical finding translated into a diagnostic standard**. The definition was never intended as a permanent biological boundary.

### "The Emperor Has No Clothes"

A landmark 2015 paper in the *Journal of Internal Medicine* by four senior researchers challenged the pathophysiology, screening, and treatment pillars of the current paradigm — freely available via PubMed Central. The title alone signals the seriousness of the critique within the research community.

### WHO Is Reviewing Its Own Definition

In 2025, the WHO launched a formal global consultation to assess whether the 1994 criteria still meet present-day scientific needs — an extraordinary acknowledgment that the foundation of the diagnosis deserves re-examination.

⚠️ **Bottom line:** Your diagnosis has a human history — written by a committee, with acknowledged limitations. Understanding this empowers you to ask better questions.

### The Prevalence Reality

When the majority of an aging population qualifies for a diagnosis, is it a disease — or normal biology reclassified?

19.6%

Women 50+ with osteoporosis

By current DEXA-based WHO criteria

51.5%

Women 50+ with osteopenia

Low bone mass below peak but above osteoporosis threshold

~70%

Women 80+ meeting criteria

At age 80+, approximately 70% qualify for an osteoporosis diagnosis

📌 30% of Caucasian postmenopausal women in the US have osteoporosis, and 54% have osteopenia — meaning the vast majority of postmenopausal women carry a clinical label created in 1994.

## The WHO Is Reviewing Its Own Definition

In 2025, the World Health Organization announced a formal global consultation to assess whether the 1994 osteoporosis definition — both its wording and its DEXA-based criteria — continues to meet present-day scientific and public health needs. The fact that the WHO itself is revisiting the framework it established 30 years ago is significant. The science is genuinely evolving.<sup>[15]</sup>

## The Prevalence Reality

Under current DEXA-based diagnostic criteria, 19.6% of women aged 50 and over in the United States have osteoporosis. An additional 51.5% have osteopenia — low bone mass that places them within the diagnostic framework. Combined, **more than 7 in 10 women over 50 have a bone density classification that the current system defines as abnormal**. At age 80 and over, the proportion rises to approximately 70% for osteoporosis alone.<sup>[16][9]</sup>

This raises a question that some of medicine's most serious researchers are asking directly: when the majority of an aging population meets the criteria for a condition, is it meaningful to call that condition a disease — or is it the normal biology of aging, reclassified?

## **The Yoga Difference**

If the osteoporosis diagnosis was created — by a committee, at a specific historical moment, for specific research purposes — then it follows that the most important question after a diagnosis is not "how sick am I?" but "what are the most powerful things I can do to protect my bone health and my overall vitality?"

That reframe changes everything about how you approach your practice.

Yoga, when designed for bone health, doesn't treat a disease. It builds a resilient body. It develops the strength, balance, coordination, and postural awareness that protect against fractures — and that protect against the broader aging trajectory the research describes. It does this regardless of where your DEXA score sits, because the factors it trains are not measured by bone density criteria. They are measured in how confidently you walk, how quickly you catch yourself, how upright you stand, and how capable you feel in your own body.

The 1994 definition assigned a label. A yoga practice designed for bone health addresses the reality beneath the label — building functional resilience that no diagnostic threshold can quantify, and no medication alone can provide.

## **The Empowering Takeaway**

**Your diagnosis is a starting point for informed action, not a life sentence.** The definition of osteoporosis has a human history — it was written by a committee, with acknowledged limitations, for purposes that have since expanded far beyond the original intent. Understanding this history does not dismiss your bone health concerns. It empowers you to ask better questions, seek a fuller picture, and approach your health with knowledge rather than fear.

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## Myth #3 — Osteoporosis Is the #1 Risk Factor for Fractures



*"Not now — now it's terror. When I walk on the street, I'm careful, because I'm terrified."*  
— Participant 12, qualitative study, *Archives of Osteoporosis*, 2025<sup>[1]</sup>

### What Women Are Typically Told

Osteoporosis weakens your bones. Weak bones break. Therefore, the most important thing you can do is protect your bone density — and the biggest risk factor for a fracture is having osteoporosis.

This is the logical chain most women are handed. It is intuitive. And it is significantly incomplete.

### The 54% Finding

In 2005, researchers published a landmark analysis of the Study of Osteoporotic Fractures cohort — 9,704 women aged 65 and over — specifically examining the relationship between bone density and

hip fractures. The findings were striking: **of the 243 women who experienced an incident hip fracture, 54% did not have osteoporosis** at the total hip by DEXA criteria.<sup>[17]</sup>

This finding has been replicated and extended. The International Osteoporosis Foundation confirms that "although low BMD confers increased risk for fracture, most fractures occur in postmenopausal women and elderly men without a densitometric diagnosis of osteoporosis." A broader analysis found that more than 95% of hip fractures are caused by falling — usually by falling sideways — rather than by spontaneous fracture from bone weakness alone.<sup>[2]</sup>

## What Actually Drives Fracture Risk

If it is not primarily bone density, what determines who fractures?

Research consistently points to a cluster of factors, the most important of which is **falls** — their frequency, the direction and energy of impact, and critically, whether a person can catch themselves or absorb the fall before full ground contact occurs. Fall risk, in turn, is shaped by muscle strength, balance, reaction time, neuromuscular coordination, postural stability, medication use, vision, and the home environment — none of which a DEXA scan measures.<sup>[18]</sup>

In a 2019 study published in *Frontiers in Endocrinology*, women with osteoporosis were found to be twice as likely to experience fear of falling compared to women without the diagnosis. And fear of falling itself is a documented fall risk factor: it divides attention during movement, stiffens the natural flow of gait, and suppresses the reactive balance responses that normally protect a person in an unexpected perturbation.<sup>[19][20]</sup>

This creates a painful paradox: the anxiety that follows an osteoporosis diagnosis can itself increase the risk the diagnosis warned about.

## The Frailty Factor

A 2025 meta-analysis examining 15 studies and over 3,400 hip fracture patients found that approximately 4 in 10 patients were frail at the time of fracture. Among those who experienced the most serious complications — prolonged hospitalization, loss of independent living, death within one year — frailty was the strongest predictor. More than the fracture itself. More than age. More than bone density.<sup>[1]</sup>

Frailty — a clinical syndrome characterized by reduced muscle strength, exhaustion, low activity, slowed gait, and unintentional weight loss — is the deeper context in which most serious fractures occur. And frailty, unlike bone density alone, responds directly and powerfully to movement.

## **The Yoga Difference**

This chapter contains one of the most empowering findings in all of fracture prevention research: the primary determinant of whether you fracture is not how dense your bones are — it is whether you fall, and whether your body can catch itself if you do. That is not a fixed biological fact. It is a trainable capacity.

And training it is precisely what a yoga practice designed for bone health does best.

Balance and proprioception — the nervous system's ability to detect and correct body position in real time — improve with consistent, targeted practice. Reaction time and neuromuscular coordination respond to the kind of challenge that single-leg balance work, dynamic transitions, and weight-shifting progressions provide. The "protective reflexes" that research describes — the whole-body response that catches a stumble before it becomes a fall — are trained every time you practice the balance and coordination work that a well-designed yoga program builds progressively over time.

## **The Empowering Takeaway**

**The most important protective factors against fracture are trainable.** Balance can be improved. Reaction time can be improved. Muscle strength and neuromuscular coordination can be improved. The capacity to catch yourself when you stumble — which research suggests is the primary determinant of whether a fall becomes a fracture — can be developed through systematic, consistent, intelligent movement practice. This is empowering news. It means your risk is not fixed by your T-score.

## Osteoporosis Is the #1 Risk Factor for Fractures

### The 54% Finding

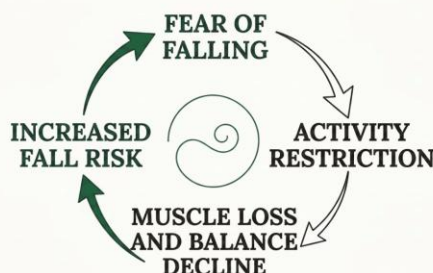
In a landmark analysis of 9,704 women aged 65+, 54% of hip fracture patients did NOT have osteoporosis by DEXA criteria at the time of fracture. The majority of fractures are happening to women the scan would not have flagged.

### What Actually Causes Fractures

More than 95% of hip fractures are caused by falling — usually sideways — not by spontaneous bone failure. The IOF confirms most fractures occur in women *without* a densitometric diagnosis. Falls prevention, not bone density alone, is the primary lever.

### The Fear Paradox

Women with osteoporosis are **twice as likely** to restrict daily activities due to fear of falling — and fear of falling itself is a documented fall risk factor, stiffening gait and suppressing protective reflexes. The behavior meant to prevent injury actually increases the very risk it is trying to manage.



### The Frailty Factor

A 2025 meta-analysis of 15 studies found approximately 4 in 10 hip fracture patients were frail at time of fracture — frailty was the strongest predictor of serious complications, more than age or bone density.

**Bottom line:** The most important protective factors — balance, reaction time, neuromuscular coordination — are all trainable. Your risk is not fixed by your T-score.

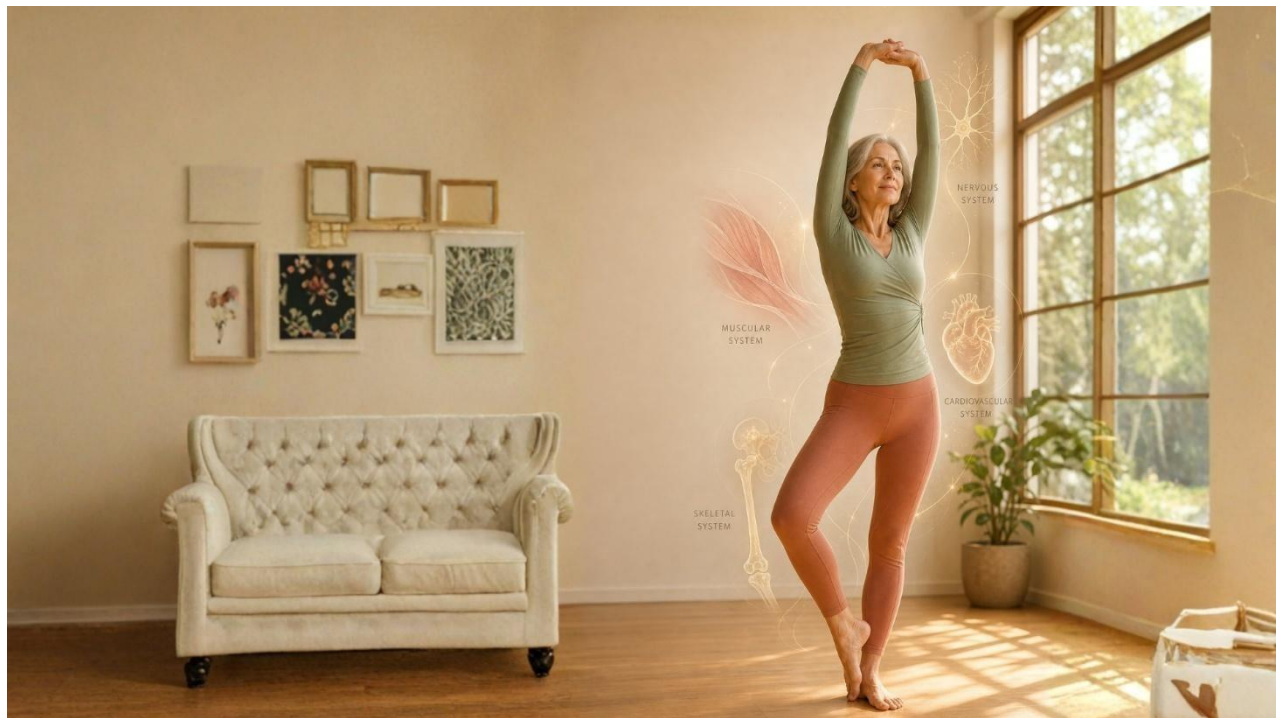
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## Myth #4 — Osteoporosis Is an Isolated Condition



*"This whole situation creates this constant anxiety, so you're never at ease."*

— Participant 11, qualitative study, *Archives of Osteoporosis*, 2025<sup>[^1]</sup>

### What Women Are Typically Told

Osteoporosis is a bone condition. It is managed with bone-focused interventions: calcium, vitamin D, weight-bearing exercise, and if indicated, medication to slow bone loss. The rest of your health is a separate conversation.

### The Iceberg Model

This separation is misleading — and increasingly, researchers are saying so directly.

Osteoporosis exists within a web of interconnected conditions and physiological processes. On the medical side, a wide range of conditions are associated with secondary osteoporosis — meaning they directly drive bone loss beyond what normal aging would produce. These include type 2 diabetes (which affects bone quality even when density appears normal), thyroid disorders (both hypothyroidism and hyperthyroidism affect bone turnover), celiac disease (which impairs calcium absorption), inflammatory bowel disease, rheumatoid arthritis, chronic kidney and liver disease, and several autoimmune conditions. Certain medications — including glucocorticoids (steroids), proton pump inhibitors (common antacids), anticonvulsants, and certain cancer therapies — also significantly accelerate bone loss.<sup>[21][22]</sup>

On the functional side, the relationship between osteoporosis and muscle is particularly critical. Bone and muscle are not separate systems — they are metabolically and mechanically interdependent. Muscle contractions apply mechanical load to bone, which is a primary stimulus for bone formation. When muscle mass and strength decline, that stimulus is reduced. When bone weakens, movement may become more restricted, further reducing the muscle stimulus — a feedback loop that accelerates both processes simultaneously.<sup>[^23]</sup>

MYTH #4

## Osteoporosis Is an Isolated Condition

Bone loss does not happen in a vacuum. A growing body of research confirms that osteoporosis is embedded within a broader web of metabolic, muscular, psychological, and hormonal systems — each acting on the others.



### Secondary Osteoporosis Drivers

Type 2 diabetes, thyroid disorders, celiac disease, IBD, rheumatoid arthritis, and chronic kidney/liver disease all **directly accelerate bone loss** beyond normal aging. Medications including glucocorticoids, PPIs, and anticonvulsants compound this effect — often without patients being informed of the bone impact.



### The Muscle-Bone Feedback Loop

Bone and muscle are metabolically and mechanically interdependent. When muscle mass declines, the mechanical load stimulus for bone formation is reduced — **accelerating both muscle loss and bone loss simultaneously**. Muscle loss begins around age 30 and accelerates at 3–8% per decade.



### Psychological Health and Bone Loss

A 2024 population-based cohort study found a history of psychological problems was associated with **increased odds of osteoporosis** even after controlling for physical risk factors. Depression is linked to lower BMD via elevated cortisol, reduced activity, and medication effects.



### The Frailty Cycle

Muscle loss → fatigue → reduced activity → worse balance → fracture risk. Osteoporosis sits within this cycle as both product and accelerant. **Breaking the cycle requires addressing the whole system** — not just one dimension of it.

✔ **Bottom line:** Every layer you address strengthens your whole aging trajectory — muscle, balance, stress, and movement all act on the same interconnected system.

## **Psychological Health and Bone Loss**

The relationship between psychological health and osteoporosis is bidirectional and under-recognized. A 2024 population-based cohort study published in *The Gerontologist* found that a history of psychological problems was associated with increased odds of osteoporosis diagnosis even after controlling for known physical risk factors. Depression has been linked to lower bone mineral density at multiple skeletal sites in numerous studies, with pathways including elevated cortisol (which inhibits bone formation), reduced physical activity, and potential effects of antidepressant medications on bone metabolism.<sup>[24][25]</sup>

The anxiety and fear that often follow an osteoporosis diagnosis may themselves create a physiological environment — elevated stress hormones, reduced activity — that is unfavorable for bone health. This is not a reason for alarm; it is a reason for addressing the psychological dimensions of a diagnosis with the same seriousness as the physical ones.

## **The Frailty Cycle**

Perhaps the most important integrating concept is what researchers call the frailty cycle: a self-reinforcing downward spiral that begins with muscle loss and reduced activity, progresses to fatigue, weakness, and slowed movement, and eventually arrives at the loss of physical independence. Osteoporosis sits within this cycle — both as a product of it and as a contributor to the fear and restriction that can accelerate it.

Breaking the frailty cycle requires addressing it at the system level — not just treating one bone density number, but rebuilding the whole-body resilience that the cycle erodes. Movement is the most powerful lever available, and it acts on every link in the chain simultaneously.<sup>[^23]</sup>

## **The Yoga Difference**

The frailty cycle — muscle loss → fatigue → reduced activity → worse balance → increased fall risk — is one of the most important concepts in this report. And yoga is one of the few movement modalities that can simultaneously address every single link in that chain.

Where isolated resistance training addresses muscle mass, and where a balance class addresses proprioception, yoga — practiced with the full intention of bone health and fracture prevention — addresses the whole interconnected system at once. Strength and muscle loading. Balance and coordination. Postural integrity and spinal health. Core stability. Breathing capacity. Mind-body awareness and stress reduction. Even the psychological dimension — the fear and anxiety that are themselves documented risk factors — is addressed through yoga's breath-centered, embodied approach in a way that no resistance machine can reach.

The research confirms that bone and muscle are metabolically interdependent — that you cannot effectively address one without addressing the other. Yoga meets this reality with a whole-body practice. It doesn't target one isolated variable. It builds whole-body resilience, interrupting the frailty cycle at multiple points simultaneously, and creating the kind of lasting functional capacity that keeps people moving well, living independently, and aging with vitality far into their later decades.

## The Empowering Takeaway

**Every layer of the picture you address strengthens your whole aging trajectory.** When you build muscle, you protect bone. When you improve balance, you protect muscle and bone. When you manage stress and support psychological well-being, you support the hormonal environment that bone needs to maintain itself. And when you move consistently and intelligently, you interrupt the frailty cycle before it takes hold. This is a whole-person challenge — and it deserves a whole-person response.

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## Myth #5 — The Only Antidote to Osteoporosis Is Medication



*"I hope not to end up in a wheelchair."*

— Participant 3, qualitative study, *Archives of Osteoporosis*, 2025<sup>[^1]</sup>

### What Women Are Typically Told

Your bones are thinning. The most effective intervention is medication — bisphosphonates, denosumab, or other bone-targeted drugs — that will slow bone loss and reduce your fracture risk. Exercise is helpful too, but it is secondary.

### The Muscle-Bone Connection: Sarcopenia

Of all the modifiable risk factors for fractures, muscle loss — sarcopenia — is among the most important and the most underaddressed in clinical practice.

Sarcopenia is the progressive, age-related loss of skeletal muscle mass, strength, and function. It begins around age 30 and accelerates in the decades that follow, proceeding at approximately 3–8% per decade in terms of muscle mass, with steeper declines in muscle strength and power. When both sarcopenia and osteoporosis are present — a combination researchers call osteosarcopenia — fracture risk rises beyond what either condition alone would predict.<sup>[26][23]</sup>

The relationship is bidirectional and tightly coupled. Muscle contractions load bone mechanically, driving bone remodeling and maintenance. When that load diminishes, bone responds by reducing formation relative to resorption. Meanwhile, shared hormonal and metabolic pathways — including estrogen, testosterone, growth hormone, and inflammatory cytokines — affect both tissues simultaneously. You cannot effectively address one without addressing the other.

### **Beyond Muscle Mass: Dynapenia and the Nervous System**

The newest research adds a critical layer. Dynapenia — the age-related loss of muscle *strength and power* — is not simply a function of muscle size. It is driven significantly by deterioration in the nervous system: the speed, precision, and amplitude of the motor signals that travel from brain to muscle and determine how quickly and powerfully muscle fibers contract in response to demand.

Research reveals something startling about this: after just four weeks of immobilization or inactivity, muscle atrophy explains less than 10% of the associated loss of muscle strength.

The predominant mechanism is neuromuscular — the degradation of the brain-muscle connection that happens faster than the muscle itself deteriorates. This finding has profound implications for both rehabilitation and preventive movement practice. It means that exercises which only build muscle mass, without also challenging the neuromuscular system, are addressing only a fraction of the functional problem.<sup>[^27]</sup>

MYTH #5

## The Only Antidote to Osteoporosis Is Medication

### Osteosarcopenia: When Two Conditions Converge

Muscle loss begins around age 30 and accelerates at **3–8% per decade**. When sarcopenia (muscle loss) and osteoporosis are present together — osteosarcopenia — fracture risk rises **beyond what either predicts alone**. Medication addresses bone density but does not address the muscle component driving this compounded risk.

### The Neuromuscular Revelation

After just 4 weeks of inactivity, muscle atrophy explains **less than 10%** of associated strength loss. The predominant mechanism is neuromuscular — the brain-muscle connection degrades faster than the muscle itself. This is why retraining neuromuscular coordination is as important as rebuilding mass — and why movement-based approaches deliver benefits medication cannot.

**Bottom line:** Medication is one tool. Movement addresses what medication cannot — and these capacities can be built at any age with the right practice.

### The 6 Essential Elements of Fracture Prevention

1

#### Progressive Resistance Training

Mechanical load on bone stimulates remodeling

2

#### Balance & Proprioception

Fall prevention reflexes — trainable at any age

3

#### Impact & Dynamic Loading

Cortical bone stimulus that slow loading cannot replicate

4

#### Neuromuscular Coordination

Brain-muscle firing speed — the most rapidly lost, most rapidly regained

5

#### Postural Alignment

Counters hyperkyphosis — a documented vertebral fracture risk factor

6

#### Mind-Body Awareness

Counters fear-driven movement restriction before it starts the frailty cycle

## The Six Essential Elements of Fracture Prevention

Research on fracture prevention consistently points to a multidimensional framework that goes substantially beyond what any single intervention — medication or exercise modality — can provide. The essential elements include:

- 1. Progressive resistance training** — to build and maintain muscle mass, apply mechanical load to bone, and improve resting bone formation signaling.
- 2. Balance and proprioception training** — to train the nervous system responses that prevent falls, including the ability to detect and correct body position in real time.

3. **Impact and dynamic loading** — activities like jumping or quick directional changes that apply compressive forces to cortical bone in ways that slow, sustained resistance training cannot fully replicate.
4. **Neuromuscular coordination training** — to maintain the brain-muscle firing speed and precision that determines whether you can catch yourself when you stumble.
5. **Postural alignment and spinal health** — because hyperkyphosis (forward rounding of the upper spine) is an independent risk factor for vertebral fractures and is highly responsive to targeted exercise.
6. **Mind-body awareness** — including breath work, focused attention, and the cultivation of body confidence, which directly counteracts the fear-driven movement restrictions that worsen fall risk.<sup>[28]</sup>

Most exercise programs address one or two of these elements. Very few address all six simultaneously. A well-designed yoga practice for bone health — built around this research framework — is one of the most complete whole-body interventions available.

## The Yoga Difference

This chapter introduces the six essential elements of fracture prevention: progressive resistance, balance and proprioception, impact and dynamic loading, neuromuscular coordination, postural alignment, and mind-body awareness. Most exercise programs address one or two of these. A yoga practice specifically designed for bone health can address all six — simultaneously, progressively, and safely.

That is not an accident. It is the architecture of a well-designed practice.

Strength work is built into yoga through sustained isometric loading, eccentric muscle engagement, and progressions that use body weight, resistance bands, and intentional muscle activation within poses. Balance work is built through single-leg standing, dynamic transitions, and the neuromuscular demands of moving slowly and with precision. The postural component — so directly linked to vertebral fracture risk — is trained in every pose that asks for spinal alignment and back extensor engagement. And the mind-body awareness that counteracts fear-driven restriction is woven into the breath-focused, present-centered attention that distinguishes yoga from any other modality.

The research also introduces the concept of dynapenia — the age-related loss of the brain-muscle connection that deteriorates faster than muscle itself. Yoga, with its emphasis on precise, coordinated, whole-body movement and breath-synchronized action, trains the neuromuscular firing patterns that pure resistance work misses. When it comes to the most complete, research-aligned fracture prevention strategy available, a yoga practice designed specifically for bone health may be the closest thing that exists.

## The Empowering Takeaway

**Medication is one tool in a larger toolkit — and movement is another, available to everyone.** The research on fracture prevention is unambiguous: the factors that matter most — muscle strength, neuromuscular coordination, balance, posture, and fall-prevention capacity — respond to movement in ways that medication cannot replicate. These are capacities you can build, at any age, with the right practice.

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## Myth #6 — People With Osteoporosis Should Avoid Yoga



*"I need my wheeled walker. I might take a wrong step. I have become even more afraid of falling after I've got osteoporosis."*

— Woman, age 72, Danish phenomenological study, 2014<sup>[^29]</sup>

### What Women Are Typically Told

After an osteoporosis diagnosis, many women are advised to avoid yoga — or any exercise involving twisting, forward bending, or impact. The concern is legitimate in its origin: certain movements do carry real considerations for people with compromised vertebral bones. But the advice often arrives as

a blanket prohibition, and the research suggests that blanket prohibition may cause more harm than it prevents.

## **The Fear-Restriction Paradox**

The International Osteoporosis Foundation identifies fear of falling as one of the most clinically significant and underaddressed consequences of osteoporosis diagnosis. A 2019 study found that women with osteoporosis were twice as likely to restrict their daily activities due to fear of falling compared to women without the diagnosis.<sup>[19][18]</sup>

But the evidence on activity restriction is unambiguous: it accelerates exactly the deterioration it aims to prevent. Reduced activity leads to muscle loss, which leads to worse balance and coordination, which leads to increased fall risk — the very outcome the restriction was meant to avoid. The frailty cycle begins with inactivity. Breaking it requires movement.

Moreover, fear of falling itself — regardless of whether the person actually falls — is associated with measurable changes in movement patterns: increased postural stiffness, reduced stride length, slower walking speed, more divided attention during ambulation, and suppressed protective reflexes. These changes independently increase fall risk. The psychological response to a diagnosis, in other words, can become a physical risk factor.<sup>[20]</sup>

## **What the Research Says About Yoga and Bone Health**

Yoga, practiced with appropriate guidance and modifications, addresses the full spectrum of fracture prevention. It builds muscle strength through sustained isometric and eccentric loading. It trains balance and proprioception through single-leg standing, weight shifting, and dynamic transitions. It develops postural awareness that directly counters the hyperkyphosis associated with vertebral fracture risk. It trains the core stability that protects the spine in daily functional movements. And through its breath-focused, mind-body foundation, it directly addresses the fear and psychological contraction that restrict movement and increase fall risk.<sup>[30]</sup>

Research also points to three specific poses with particular relevance for daily bone health practice:

**Mountain Pose (Tadasana):** Trains optimal spinal alignment, weight distribution through the feet, core integration, and the postural awareness that counteracts the forward rounding associated with vertebral fracture risk. The neuromuscular activity required to maintain alignment in Mountain Pose activates the postural muscles from feet to head.

**Locust Pose (Salabhasana):** Builds the back extensor muscles along the posterior chain. Multiple studies link back extensor strength specifically to reduced rates of vertebral compression fractures —

the most common fractures in people with osteoporosis. Locust Pose is a safe, accessible, highly effective exercise for this purpose.

**Plank Pose (Phalakasana):** Develops integrated core endurance, upper body strength, and wholebody neuromuscular coordination. Upper body and core strength are critical for breaking a fall safely — and the ability to absorb impact through the arms rather than the wrist, hip, or spine is a trainable, protective capacity.

MYTH #6

## People With Osteoporosis Should Avoid Yoga

### The Fear-Restriction Paradox

Women with osteoporosis are **twice as likely** to restrict daily activities due to fear of falling — yet activity restriction accelerates muscle loss, worsens balance, and increases the very fall risk it aims to prevent. Stopping movement is not a protective strategy. It is the beginning of the frailty cycle.

### What Yoga Delivers for Bone Health

Sustained isometric and eccentric loading builds **muscle strength**. Single-leg standing and dynamic transitions develop **balance and proprioception**. Postural awareness directly counters **hyperkyphosis** — a vertebral fracture risk factor. Core stability provides **spinal protection**. Breath-focused mind-body work addresses **fear directly** — the psychological driver that no resistance machine can reach.

📌 **The nuance:** Deep forced twists and aggressive forward bends carry real considerations — the key is *how* you practice, not *whether* you practice. Expert guidance and props make yoga safe and effective.

### Three Poses With Specific Evidence

#### Mountain Pose — Tadasana

Trains spinal alignment, weight distribution, and postural muscle activation from head to foot. Foundation for safe movement in all other poses.

#### Locust Pose — Salabhasana

Builds back extensor strength — directly linked to **reduced vertebral compression fracture rates**. One of the most clinically significant poses for spinal bone health.

#### Plank Pose — Phalakasana

Develops core endurance, upper body strength, and fall-absorption capacity — the ability to protect yourself in the moment a fall begins.

✅ **Bottom line:** Stopping movement is not protective — it is the beginning of the frailty cycle. Intelligent, guided yoga delivers the full spectrum of fracture prevention.

## What "The Right Kind of Yoga" Means

Not all yoga is equally appropriate for people with osteoporosis. Deep, forceful spinal twists, extreme forward bends that place significant compressive or shearing load on the anterior vertebrae, and aggressive inversion work do carry real considerations for vertebral bone health. The key distinction is not *whether* to do yoga, but *how* to practice it — with a teacher who understands the biomechanics of bone health, with props (chairs, blocks, walls, straps) that provide support and modify range of motion, and with attention to spinal alignment in every pose.

Gentle rotation is different from a deep forced twist. A supported forward fold is different from an aggressive forward bend. The nuanced, evidence-informed approach that expert teachers provide is precisely what makes yoga safe and effective for this population.<sup>[31][30]</sup>

## **The Yoga Difference**

This chapter confronts one of the most consequential myths in this entire report — because the advice to avoid yoga after an osteoporosis diagnosis is not just unhelpful. The research suggests it may actively increase the risk it was meant to prevent.

The fear-restriction cycle is real, documented, and interrupting it is one of the most powerful things a person with osteoporosis can do. And yoga — practiced with the right guidance, appropriate modifications, and the specific knowledge of what this population needs — is uniquely equipped to interrupt it.

Three specific poses have research support for daily practice in this population. Mountain Pose trains the postural alignment and core integration that counteract the forward rounding independently linked to vertebral fracture risk. Locust Pose builds the back extensor strength that multiple studies link directly to lower rates of vertebral compression fractures — the most common fractures in people with osteoporosis. Plank Pose develops the core endurance and upper-body strength that support the capacity to break a fall safely.

These three are a foundation. A complete yoga practice for bone health builds from here — into balance progressions, strength sequences, and the full neuromuscular and postural training that keeps the body capable and confident for decades. The key is not whether to practice yoga. It is how: with a teacher who understands this population, with props and modifications that work with the body rather than against it, and with sequences designed from the ground up around the specific needs of people with osteoporosis. That kind of yoga doesn't restart the frailty cycle. It is one of the most effective tools available to interrupt it.

## **The Empowering Takeaway**

**How you practice matters enormously. Whether you practice matters more.** The evidence is clear: movement — intelligent, guided, progressive movement — is one of your most powerful tools for bone health and fracture prevention. Yoga, practiced with appropriate knowledge and guidance, can deliver the full spectrum of what the research identifies as protective. Stopping movement is not protective. It is the beginning of the frailty cycle.

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## Myth #7 — Resistance Training Is All You Need to Protect Your Bones



*"I have always looked forward and I still do. It cannot do any good to put yourself away and sink into a chair because you have something."*

— Woman, age 67, Danish phenomenological study, 2014<sup>[^29]</sup>

### **What Women Are Typically Told**

Exercise for osteoporosis means resistance training. Lift weights. Load your bones. Build muscle. This advice is well-intentioned and contains real truth — but it is incomplete in ways that matter for fracture prevention.

## What Resistance Training Does Well

Progressive resistance training is genuinely valuable for bone health. It applies mechanical load to bone through muscle contractions, stimulating bone remodeling and maintenance. It builds muscle mass that protects bone and supports balance. It improves metabolic health in ways that benefit bone mineral density. For women with osteoporosis or osteopenia, a well-designed resistance program is an important component of a bone health strategy.<sup>[^32]</sup>

## What It Misses

A 2024 systematic review published in the *International Journal of Sports and Exercise Medicine* found that **combined exercise protocols are significantly more effective than resistance training alone** for bone mineral density in people with osteoporosis. A 2025 study comparing different exercise modalities over 24 weeks confirmed that multimodal exercise — combining resistance, balance, and impact training — delivers superior outcomes to any single-modality approach.<sup>[26][23]</sup>

The reason is straightforward: fractures don't happen because bones aren't dense enough. They happen because people fall. And the factors that determine whether a fall results in a fracture — reaction speed, dynamic balance, proprioception, the ability to redirect or break a fall — are not primarily trained by resistance exercise.

The International Osteoporosis Foundation states this clearly: **casual walking may not reduce fracture risk**. Even brisk walking, while beneficial for cardiovascular health and general fitness, does not apply the progressive load to bone that resistance training provides, and does not specifically train the neuromuscular fall-prevention responses that research identifies as most protective.<sup>[^28]</sup>

## The Walking Myth Within the Myth

Many women, after an osteoporosis diagnosis, are advised to "just walk." Walking is presented as safe, achievable, and sufficient. But the IOF's position is clear: the type of exercise matters. Walking may support general health, but it does not substantially challenge balance in the ways shown to reduce fall risk. It does not load the hip and spine with the intensity required to stimulate meaningful bone remodeling in most postmenopausal women. And it does not train the explosive neuromuscular responses that determine whether you catch yourself when you stumble.

This is not an argument against walking — it is an excellent foundation and should be encouraged. It is an argument against *only* walking, and against the myth that any movement is equivalent to targeted, multidimensional movement for bone health.<sup>[^28]</sup>

MYTH #7

## Resistance Training Is All You Need to Protect Your Bones

Resistance training is a genuinely important component — but the science is unambiguous: it is not sufficient on its own.

### What Resistance Training Does Well

Applies mechanical load to bone, builds muscle mass, and improves metabolic health. Research confirms it can improve BMD and reduce bone loss — a genuinely important component of any bone health strategy.

### What the Research Shows It Misses

A 2024 systematic review found **combined exercise protocols are significantly more effective** than resistance training alone for BMD. A 2025 24-week study confirmed multimodal exercise delivers superior outcomes to any single modality.

### The Walking Myth Within the Myth

The IOF states clearly that **casual walking may not reduce fracture risk**. Walking does not challenge balance in fall-risk-reducing ways, nor does it load bone with the intensity needed to stimulate meaningful remodeling in most postmenopausal women. Brisk walking shows some hip fracture benefit — but casual walking is insufficient alone.

### Impact Training — The Missing Element

Jumping, hopping, and rapid direction changes apply **dynamic compressive forces** that cortical bone responds to in ways slow sustained loading cannot replicate. This is an often-overlooked but important component of a complete bone health strategy.

#### RESISTANCE & STRENGTH



**Build muscle, bone load.**

#### BALANCE & PROPRIOCEPTION



**Prevent falls.**

#### IMPACT & DYNAMIC LOADING



**Cortical bone stimulus.**

#### NEUROMUSCULAR COORDINATION



**Brain-muscle speed.**

#### POSTURAL ALIGNMENT



**Spinal protection.**

**Bottom line:** You need the whole picture. A yoga practice designed for bone health integrates resistance, balance, neuromuscular coordination, posture, and impact — the complete approach the science points toward.

## Impact Training and Bone

One modality that is often overlooked in standard resistance programs is impact training — activities that include jumping, hopping, or rapid direction changes that apply dynamic compressive forces to the skeleton. Research shows that cortical bone — the dense outer shell of long bones — responds particularly well to these high-strain, high-strain-rate stimuli in ways that slow, sustained loading cannot replicate. For women with osteoporosis, impact training must be introduced carefully and progressively — but in appropriate form, it is an important component of a complete program.[^23]

## **The Yoga Difference**

The research in this chapter points in one clear direction: the future of fracture prevention is multimodal. The most effective programs are the ones that combine resistance, balance, impact, and coordination work — and the evidence for any single modality, including resistance training alone, consistently falls short of what combined approaches achieve.

This is where yoga — designed specifically for bone health — has a structural advantage that no single-modality program can match.

In a well-designed yoga practice for bone health, the six essential elements of fracture prevention are not separate modules to be scheduled on different days. They are woven together within a single practice. A standing pose sequence can simultaneously train lower-body strength, single-leg balance, postural alignment, core stability, and the neuromuscular firing patterns that determine whether you catch yourself in a stumble. A Plank Pose progression builds upper-body and core strength alongside the whole-body coordination that protects against falls. A balance sequence trains proprioception and reaction speed while also developing the hip and ankle stability that directly reduces fall risk.

This integration is not yoga's compromise. It is yoga's advantage. And for women with osteoporosis who want the most complete, evidence-aligned, whole-body fracture prevention practice available — a practice that addresses not just one pathway to fracture but all of them — it is why a yoga practice designed specifically for bone health may be the single most valuable addition they can make to their program.

## **The Empowering Takeaway**

**You need the whole picture, not just one piece of it.** Resistance training is important. So is balance training. So is neuromuscular coordination work. So is postural alignment. So is impact training, introduced appropriately. A yoga practice designed for bone health integrates all of these elements in a way that most single exercise modalities cannot — not as a replacement for resistance training, but as the more complete approach that the science is pointing toward.

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## Myth #8 — It's Too Late for HRT After 65



*"Of course, I'm worried... I'm worried about the future."*

— Participant 5, qualitative study, *Archives of Osteoporosis*, 2025<sup>[^1]</sup>

### What Women Are Typically Told

Hormone replacement therapy — HRT, also called menopausal hormone therapy (MHT) — is appropriate for managing hot flashes and menopausal symptoms in the years immediately following menopause. For bone health in women over 65, it is generally considered too risky, or simply no longer relevant. The ship has sailed.

This is one of the most consequential myths in this report — because for many women, it may be closing a door that is not actually closed and leaving them without information that could significantly affect their bone health decisions.

## The Black Box Warning That No Longer Exists

For decades, hormone replacement therapy carried a prominent black box warning from the FDA — the agency's highest-level caution — based largely on the 2002 Women's Health Initiative (WHI) study, which reported increased risks of breast cancer, cardiovascular events, and stroke in women taking combined estrogen-progestogen therapy.

In October 2025, the FDA removed that black box warning, describing the previous warnings as "misleading." The agency cited evidence from subsequent analyses showing that the original WHI findings were significantly influenced by the age and health status of the participants — most of whom were well past the window of early menopause — and that women who initiate HRT within 10 years of menopause onset show a very different risk-benefit profile, including **fracture risk reduction of 50–60%** and reductions in all-cause mortality.<sup>[^33]</sup>

MYTH #8

## It's Too Late for HRT After 65

### The Black Box Warning That No Longer Exists

In October 2025, the FDA removed its black box warning on HRT, describing previous warnings as "misleading." Women who initiate HRT within 10 years of menopause show fracture risk reduction of 50–60% and reductions in all-cause mortality. This is among the most significant regulatory reversals in women's health in decades.

### What the IOF Confirms

Menopausal hormone therapy (MHT) reduces fragility fracture risk by 20–35%, increases BMD at all skeletal sites, and is effective **regardless of baseline bone density**. A meta-analysis of 57 RCTs found HRT increases bone density by ~7% over 2 years and reduces spinal fractures by approximately one third.

### The Combination Advantage

A 2025 *Frontiers in Reproductive Health* study found **MHT + structured exercise is more effective for BMD than either alone** — synergistic benefits neither achieves independently. The combination points toward an integrated strategy rather than choosing one intervention over the other.

**⚠ Important nuance:** Fracture risk rises measurably in the first year after stopping HRT. Decisions about discontinuation deserve the same individualized medical conversation as starting it.

### The Evidence Landscape at a Glance

**50–60%**

Fracture risk reduction

For women initiating HRT within 10 years of menopause onset

**20–35%**

IOF-confirmed reduction

In fragility fractures across all skeletal sites

**137K+**

Women in 2026 AAOS study

Early HRT initiation lowered fracture risk by 13% over 5 years

**~7%**

BMD increase over 2 years

Meta-analysis of 57 RCTs; spinal fractures reduced by ~one third

## What Current Research Shows

The International Osteoporosis Foundation states that menopausal hormone therapy:

- Reduces fragility fracture risk by **20–35%**
- Increases bone mineral density at *all* skeletal sites in postmenopausal women
- Is effective for bone protection regardless of baseline bone mineral density
- Has demonstrated efficacy in *both* early and late postmenopausal women<sup>[34]</sup>

A major 2026 real-world study presented at the Annual Meeting of the American Academy of Orthopaedic Surgeons — analyzing data from more than 137,000 postmenopausal women — found that early HRT initiation significantly reduces long-term osteoporosis risk and lowers fracture risk by 13% over a 5-year follow-up. A meta-analysis of 57 randomized controlled studies found that HRT increases bone density by an average of 7% over two years and reduces spinal fractures by approximately one third.<sup>[35][36]</sup>

In 2023, updated Australian guidelines explicitly recommended that clinicians consider prescribing MHT for bone health in women under 65 with low bone density — even in the absence of menopausal symptoms — noting the evidence for fracture prevention across all postmenopausal women.<sup>[37]</sup>

### **The Combination Advantage**

A 2025 study published in *Frontiers in Reproductive Health* found that **menopausal hormone therapy combined with structured exercise is more effective for bone mineral density than either intervention alone** — producing synergistic benefits that neither achieves independently. This finding has important practical implications: whatever decisions a woman makes about hormonal health in consultation with her physician, pairing that decision with an evidencebased movement practice amplifies the benefit.<sup>[38]</sup>

### **An Important Nuance: The Stopping Risk**

A 2025 study published in *The Lancet Healthy Longevity* raised an important and underreported issue: fracture risk rises measurably in the period after discontinuing HRT — particularly in the first year of stopping — before gradually returning to baseline over several years. This means that decisions about *stopping* HRT deserve the same individualized, careful medical conversation as decisions about starting it. Abrupt discontinuation — particularly of denosumab (Prolia), which does not have the same bone-accumulating properties as bisphosphonates — can result in significant rebound bone loss.<sup>[39]</sup>

### **A Note on Individual Decisions**

This section is not a recommendation to start or continue HRT. Hormone therapy decisions are genuinely individualized, influenced by personal and family health history, cancer risk, cardiovascular

profile, and many other factors that only a knowledgeable healthcare provider can assess. What this research does argue is that the conversation deserves to be had — with current information, not assumptions from 2002 — and that the question of whether it is "too late" is not answered by age alone.

## **The Yoga Difference**

This chapter covers medical decisions that belong in individualized conversations with healthcare providers. But it also contains a finding that speaks directly to the value of movement — and specifically of yoga.

The 2025 study confirming that menopausal hormone therapy combined with structured exercise produces greater bone density benefits than either intervention alone is one of the clearest demonstrations in recent research of what an integrated approach can achieve. Not medication or movement — both, working synergistically, producing benefits that neither achieves independently. Whatever decisions a woman makes about hormonal health with her physician, this finding raises a practical question: is her movement practice the kind of structured, evidence-informed, multimodal program that research identifies as the ideal complement? Walking alone does not meet this bar. The IOF has stated clearly that casual walking may not reduce fracture risk. A yoga practice designed for bone health — with progressive strength, balance, impact, postural, and neuromuscular components — does.

And for women who have stopped HRT, or for whom it was never an option, the same principle applies with even greater urgency. The Lancet finding that fracture risk rises measurably after HRT discontinuation makes it more important than ever to ensure that movement is doing its full protective work. A complete yoga practice for bone health — one that addresses all six essential elements of fracture prevention — is not a supplement to other interventions. It is a cornerstone of any long-term bone health strategy, at any age, under any set of medical circumstances.

## **The Empowering Takeaway**

**The door may not be as closed as you were told.** The research on HRT and bone health has evolved substantially. The FDA removed its black box warning in 2025. Major guidelines are being updated. And the finding that MHT combined with movement is more effective than either alone speaks to the power of an integrated approach — where informed medical decisions and an intelligent movement practice work together, reinforcing each other, building the bone health and whole-body resilience that protect you over decades.

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# Closing: Moving Forward with Knowledge — and with Your Body

Eight myths. One thread running through all of them: **you have more agency over your bone health than you have been told.**

Your T-score is a starting point, not a verdict. The definition of osteoporosis has a human history, and it is being reassessed by the very organization that created it. The most important drivers of fracture risk — falls and the functional capacity to prevent them — are trainable. The condition exists within a larger web of interconnected factors that all respond to intelligent intervention. And movement, the right kind of movement, is not an optional supplement to medical care. It is one of the most powerful bone health tools available.

The women we see thriving with an osteoporosis diagnosis are not the ones who have retreated into caution. They are the ones who stayed informed, stayed curious, and found a way to keep moving with knowledge and support. They are the ones who discovered that their body — at 60, at 70, at 80 — was far more capable and responsive than a single number suggested.

That is the foundation of everything we do at YogaUOnline. Not yoga as gentle stretching for fragile people. Yoga as a research-informed, whole-person practice for strong, active adults who want to stay that way — and who understand that the best protection they have is not caution, but capability.

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## About YogaUOnline

YogaUOnline is a research-informed yoga education platform dedicated to the therapeutic applications of yoga, with a particular focus on healthy aging, bone health, and professional teacher education. Our programs are developed in collaboration with leading yoga therapists, physical therapists, and medical researchers, and are designed to be safe, evidence-based, and empowering for adults at every stage of life.

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*This report is for educational purposes only. The information presented here does not constitute medical advice. Please consult your healthcare provider regarding your personal health situation, diagnosis, and treatment options.*

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