

The Bone Quality Protocol

Build stronger bones, slow the loss, and prevent the fractures that actually change lives.

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Bone is not an inert scaffold. It is living tissue that is torn down and rebuilt your entire life. You reach peak bone mass around age 30, then lose a little each year, faster in the first years after menopause. Here is the reframe that matters: the goal is not a number on a scan, it is **bone strength and never breaking a hip or a spine**. Most of what determines that strength is modifiable, and it responds at any age.

IMPORTANT: PLEASE READ FIRST

This is education, not medical advice. It is designed to help you and your physician work together, not to replace a clinician who knows your history. Do not start or stop any medication or supplement on your own.

If you take warfarin (Coumadin), do not add vitamin K or K2 without talking to your doctor first, it can interfere with the drug. Seek prompt care for a fall with sudden, severe back pain or an inability to bear weight, which can signal a fracture.

Know what you are protecting

Bone strength is density plus quality. These facts frame every decision that follows.

The scan	A DEXA T-score of -1 or above is normal; -1 to -2.5 is osteopenia; -2.5 or below is osteoporosis
The real risk	A FRAX score estimates your 10-year fracture risk. Fractures, not the number, are what change lives
The window	Loss accelerates in the first years after menopause, but bone responds to loading and nutrition at any age
Higher risk	Postmenopausal women, low body weight, family history of hip fracture, smoking, chronic steroids, early menopause; men are under-screened

STEP 1 Load your skeleton

This is the single strongest lever. Bone adds material exactly where it is mechanically stressed, so you have to give it a reason to stay strong.

- ☐ **Resistance training** — progressively heavier loading is the most reliable stimulus for bone and the muscle that protects it. Twice a week or more.
- ☐ **Weight-bearing and impact** — walking, stair climbing, and (where safe) hopping or jumping. Swimming and cycling are great for you, but they do not load bone the same way.
- ☐ **Balance and lower-body strength** — this is what keeps you off the floor. See Step on falls below.

Muscle and bone rise and fall together. See my reviews on [brief functional strength training](#) and [strength and longevity in older women](#).

STEP 2 Feed the matrix

Roughly half of bone by volume is protein scaffold that mineral crystallizes onto. Starve it and no supplement rescues it.

NUTRIENT	PRACTICAL TARGET	WHY IT MATTERS
Protein	Eat enough at every meal; older adults often need more. Do not crash diet.	Builds the collagen matrix. Higher intake is associated with better bone and fewer hip fractures, not worse.
Calcium	About 1,000 to 1,200 mg/day, from food (dairy, leafy greens, tinned fish with bones).	The mineral of bone. Get it from food. Calcium pills have not been shown to prevent fractures in most people and carry downsides.
Magnesium	From nuts, seeds, legumes, and greens.	A cofactor for bone metabolism and vitamin D activation.

A note on calcium supplements. In large randomized trials, calcium supplements, alone or with vitamin D, did not meaningfully reduce fractures in community-dwelling older adults, and they can raise the risk of kidney stones. Adequate calcium still matters, but the evidence favors getting it from food. Supplements are reserved for people who cannot meet their needs through diet, or who have malabsorption or diagnosed osteoporosis, guided by a doctor. See [calcium, vitamin D, and fracture risk](#).

STEP 3 Get the vitamin duo right: D and K2, and how they work together

These two decide where your calcium actually goes. Getting them right helps put calcium into bone and keep it out of your arteries.

NUTRIENT	WHAT TO DO	WHY IT HELPS
Vitamin D	Correct a deficiency; dose to your blood level with your doctor.	You need it to absorb calcium and for normal bone metabolism. Correct a true deficiency; supplementing beyond that has not been shown to prevent fractures on its own.
Vitamin K2 (as MK-7)	From natto or an MK-7 supplement . Not if you are on warfarin without your doctor.	Activates osteocalcin, which binds calcium into bone, and matrix Gla protein, which keeps it out of arteries. A 3-year trial found MK-7 slowed bone loss in postmenopausal women.
D and K2 together	Pair them rather than relying on either alone.	They are complementary: D gets calcium in, K2 directs where it goes. See my D3 plus K2 spine study and bone-and-heart review .

STEP 4 Remove the bone thieves

You can undo a lot of good work with a few habits and unreviewed medications.

- ☐ **Smoking and heavy alcohol** — both directly weaken bone. This is one of the highest-yield changes you can make.
- ☐ **Being sedentary or underweight** — bone follows load and needs fuel. Very low body weight is a real risk factor.
- ☐ **Review bone-unfriendly medications with your doctor**, do not stop them on your own: long-term **proton pump inhibitors**, chronic steroids, and **long-term warfarin** can all affect bone.

Do not just build bone, prevent the fall

Most fragility fractures happen because someone falls. Strong bones and a body that does not hit the floor are two halves of the same goal.

- ☐ **Train balance and lower-body strength** — the best fall insurance there is.
- ☐ **Check vision, and review medications that cause dizziness or drops in blood pressure.**
- ☐ **Fix home hazards** — loose rugs, poor lighting, no grab bars where they are needed.
- ☐ **Keep vitamin D adequate** — it modestly lowers fall risk on top of its bone role.

Get the picture, and know when medication helps

Lifestyle is the foundation for everyone. When risk is high, medication prevents fractures, and the two work together.

- ☐ **DEXA scan** — the standard bone-density test. Postmenopausal women, older men, and anyone with risk factors should ask whether it is time.
- ☐ **FRAX** — combines your risk factors into a 10-year fracture probability to guide decisions.

- ☐ **If risk is high:** bisphosphonates and denosumab slow bone breakdown; anabolic agents (such as teriparatide or romosozumab) build new bone for those at very high risk. These are specialist decisions.

Notes for women and men

Women: the estrogen drop at menopause accelerates bone loss, and it speeds up again if hormone therapy is stopped. This is the window to be most proactive. See my article on [hip fracture risk after stopping hormone therapy](#). **Men:** osteoporosis is not just a women's disease. Men fracture later but do worse, and are far less likely to be screened or treated. If you are an older man with risk factors, ask about a DEXA.

On warfarin? Vitamin K and K2 can blunt how well it works. Do not add them without your prescribing doctor. Everything else in this protocol still applies.

Stay curious, stay skeptical, stay healthy.

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