

Why Tai Chi Is One of the Best Things You Can Do for Your Balance

And Why That Matters More Than You Think

A deep dive into the science of age-related balance decline and how Tai Chi's ancient practice offers a modern solution

Falls are not just accidents. For older adults, a single fall can be a life-changing event — a fractured hip, a loss of confidence, the beginning of a retreat from independent living. The statistics are sobering: over 30% of adults aged over 60 fall at least once a year, with that figure rising to 60% among those aged over 80. Yet despite the scale of this problem, the causes of age-related balance decline are poorly understood by the general public — and the solutions even less so.

I know this not just from the research, but from personal experience. I came to Tai Chi thirteen years ago at the age of 54, not as an athlete or a martial artist, but as someone dealing with a range of health challenges — and a balance that I knew was nowhere near where it should be. What followed was a gradual, sometimes surprising transformation. Today, at 67, I teach Tai Chi and Qigong, and the practice that once helped me find my feet — quite literally — is now something I have the privilege of sharing with others. That personal journey is part of why I find the science in this article so compelling: it explains, in precise physiological terms, what I experienced firsthand over more than a decade of practice.

This article sets out to explain that science clearly. We will explore why our balance deteriorates as we age, and then examine in depth why Tai Chi turns out to be one of the most effective interventions science has ever found for rebuilding it.

Part One: Why We Lose Our Balance as We Age

Balance is not a single skill. It is a complex, real-time conversation between your brain, your muscles, your inner ear, your eyes, and the sensory receptors hidden

inside your joints, tendons, and skin. When we are young and healthy, this conversation happens seamlessly and unconsciously. As we age, the signals grow quieter, the pathways slower, and the brain's ability to integrate all of this information begins to deteriorate — often before we are even aware of it.

Understanding why this happens requires looking at several interconnected systems that all decline simultaneously with age.

1. The Deterioration of Proprioception — The Body's "Sixth Sense"

Proprioception is the body's ability to sense the position and movement of its own limbs and joints in space, without relying on vision. It is arguably the most important — and least discussed — contributor to balance. Tiny sensory receptors called mechanoreceptors are embedded throughout our muscles, tendons, and joint capsules, and they continuously stream positional information to the brain. This stream of data is what allows you to walk across an uneven footpath without consciously thinking about where your feet are landing.

Aging causes deterioration of the proprioceptive mechanisms, involving changes in both the peripheral and central nervous systems. This changes joint biomechanics and the neuromuscular control of the limbs, resulting in impaired balance and a higher possibility of falls.

At the peripheral level, the key structures are muscle spindles — stretch-sensitive receptors located within the muscle fibres themselves. Advancing age leads to changes in muscle spindle function and deficits in the processing of sensory input, including myelin abnormalities, axonal atrophy, and declined nerve conduction velocity. In practical terms, this means the signals being sent from the legs and feet to the brain are not only weaker but slower to arrive. By the time the brain receives the message that balance is being disrupted, the window for a corrective response may have already passed.

Muscle spindle receptors provide the primary source of proprioceptive information for postural control, and large afferent nerve fibres are critical for the timing of automatic postural responses — those rapid, coordinated reactions that keep us upright when we stumble. As these fibres degrade with age, the body's capacity for fast, automatic self-correction is directly compromised.

At the central level, aging induces a progressive loss of the dendrite system in the motor cortex, along with losses in the number of neurons and receptors, and neurochemical changes throughout the brain. Research confirms this decline is measurable and consistent: joint-position sense has been shown to deteriorate

significantly and progressively across subjects ranging from their twenties into their eighties, with a rapid acceleration in this decline observed among individuals aged 60 and above.

2. Sarcopenia — The Silent Loss of Muscle

Closely entwined with proprioceptive decline is the progressive loss of muscle mass that comes with aging, known as sarcopenia. Muscle is not simply the engine that moves us — it is also the housing for our proprioceptive sensors and the primary mechanism through which balance corrections are physically executed.

After about age 50, muscle mass decreases at an annual rate of 1–2%, while muscle strength declines by 1.5% between the ages of 50 and 60, and by 3% per year thereafter. This is driven by the progressive denervation of motor units and a shift from fast-twitch Type II muscle fibres toward slower Type I fibres — a loss in explosive muscle power that is particularly consequential for fall prevention, since catching a stumble requires rapid force generation.

Sarcopenia affects an estimated 10–16% of older people worldwide, rising to as many as 50% of those aged over 80. Postural muscles are essential for maintaining stability, and their weakening creates a vicious cycle: reduced exercise accelerates further muscle loss, which further limits the ability to exercise safely. As ankle and hip muscles weaken, the safety margin between a stumble and a fall narrows significantly.

3. Vestibular Decline — When the Inner Ear Loses Its Calibration

The vestibular system, housed in the inner ear, is the body's primary orientation system — the gyroscope that tells the brain which way is up, how fast we are moving, and whether we are tilting. Like every other sensory system, it degrades with age.

The vestibular ganglions, nerves, and vestibular nuclei all undergo age-linked degenerative changes. This means that even when proprioception sends a clear distress signal, the vestibular system may not be able to confirm it with reliable orientation data. Critically, even among healthy, physically active older adults, aging still deteriorates these systems — decline is not exclusively a result of inactivity, it is biological. However, the rate of that decline is very much modifiable.

4. Sensory Reweighting — A Brain That Struggles to Adapt

When one sensory channel is compromised, a healthy nervous system compensates by relying more heavily on the others. A young person who closes their eyes can still balance reasonably well because the proprioceptive and vestibular systems take up the slack. In older adults, this adaptive capacity — called sensory reweighting — also deteriorates. This is exactly what happened in my case. My very first Tai Chi class all those years ago revealed a somewhat shocking revelation; when asked to stand on one leg and balance(which I found challenging) and then to close my eyes, I couldn't do it. I started to fall every time. That situation has definitely changed now.

When proprioception weakens simultaneously with vision and vestibular function, the brain has fewer reliable inputs to draw upon. Its response strategies become slower, more conservative, and ultimately less effective at preventing a fall.

5. The Compounding Spiral

What makes age-related balance decline so insidious is that none of these systems deteriorates in isolation. Reduced proprioception leads to reduced confidence in movement, which leads to reduced activity, which accelerates muscle loss and further dulls the proprioceptive sensors — a self-reinforcing spiral. Declining proprioception also leads to abnormal joint biomechanics during activities such as walking, which over time can contribute to degenerative joint disease, compounding the problem further.

The result is a body that has lost trust in itself, retreating from the movement it needs most.

Part Two: How Tai Chi Rebuilds What Aging Takes Away

If Part One painted a picture of a body slowly losing its grip on the information it needs to stay upright, Part Two is the story of how Tai Chi methodically — and remarkably — rebuilds those very systems. What makes Tai Chi so uniquely suited to fall prevention is not any single mechanism, but the way its practice simultaneously addresses nearly every dimension of balance decline. It is, in the truest sense, a whole-system intervention.

1. Tai Chi as a Proprioceptive Training System — By Design

From a neuroscientific standpoint, Tai Chi is essentially a sustained, structured programme of proprioceptive challenge delivered across the entire body. Every posture demands precise awareness of joint angles, weight distribution, and the position of the limbs in space. Every transition between movements requires the nervous system to continuously recalibrate and update its positional map — exactly the kind of repeated sensory input that drives neurological adaptation.

Research has shown that repeated practice of a motor skill increases muscle spindle output, bringing about plastic changes in the central nervous system, including increased strength of synaptic connections and structural changes in the organisation of neuronal connections. Repetitive input from mechanoreceptors modifies the cortical maps of the body over time, and regular physical activity of this nature increases cortical representation of the joints, leading to enhanced proprioception.

The research on Tai Chi specifically is compelling. Elderly people who practised Tai Chi regularly showed not only better proprioception at the ankle and knee joints than sedentary controls, but also better ankle kinaesthesia than swimmers and runners. This is a striking finding: Tai Chi outperformed conventional cardiovascular exercise in terms of proprioceptive benefit, suggesting it is the nature of the movement, not just its intensity, that matters.

2. Rebuilding the Ankle and Knee — The Foundation of Balance

The ankle and knee are the joints most critical to fall prevention — they are the first structures to detect instability and the primary mechanisms through which corrective forces are applied. Tai Chi directly and intensively trains both.

The slow, semi-squatting posture characteristic of Tai Chi places continuously changing loads on the knee joint and expands its range of motion, increasing the sensitivity of proprioceptors through sustained stimulation of the mechanoreceptors in the joint capsule. Research confirms that Tai Chi increases strength, tactile sensation, kinaesthesia, and static postural control in older adults, with particularly significant improvements in ankle mobility and hip abduction strength — precisely the muscle groups responsible for catching a stumble before it becomes a fall.

Notably, Tai Chi has been found to be more effective among older adults with existing sensory loss — meaning those who need it most benefit the most.

3. Sensory Reweighting — Teaching the Brain to Adapt Again

Long-term Tai Chi practice has been shown to improve sensory reweighting — producing greater reliance on the proprioceptive system and more appropriate use of vestibular inputs, as well as improving the overall complexity of standing balance control. In practical terms, a seasoned Tai Chi practitioner who closes their eyes, walks in dim light, or steps onto an uneven surface is better equipped to draw on the right sensory channel at the right time. Their balance system is not just stronger — it is smarter and more adaptive.

This makes intuitive sense when we consider the structure of Tai Chi practice. Moving from form to form requires practitioners to continuously modulate their balance between one leg and two, through shifting centres of gravity, in multiple planes of movement. The nervous system is repeatedly placed in situations where it must solve balance problems — and over time, it becomes genuinely better at solving them.

4. Neuroplasticity — Tai Chi Literally Reshapes the Brain

Perhaps the most remarkable area of recent research is what brain imaging is revealing about long-term Tai Chi practice. Far from being merely a physical exercise, Tai Chi appears to structurally and functionally remodel the brain — including the regions most responsible for balance and sensorimotor processing.

Long-term Tai Chi practice has been shown to increase brain volume and cortical thickness. Brain imaging research has found that Tai Chi practitioners show greater functional integration in the right post-central gyrus — a region of the primary somatosensory cortex playing key roles in proprioception and spatial body awareness — with this improvement correlating directly with years of Tai Chi experience. Put simply: the longer a person practises Tai Chi, the more efficiently their brain processes positional information from the body.

Exercises with complex movement structures promote the generation of new microvasculature in the cerebral cortex, improving blood supply to support neuronal growth, repair, and functional maintenance. Tai Chi — with its rhythmic torso rotation, precise weight-shift control, and coordination of breath with movement — drives this cerebrovascular benefit in ways that conventional exercise cannot replicate. Studies confirm that Tai Chi induces brain plasticity more robustly than aerobic exercise alone.

5. Dynamic Balance — Navigating the Real World

A critical real-world test of balance is not standing still — it is navigating the environment while walking: stepping over a doorstep, adjusting to a sloped footpath, reacting to an unexpected bump. Tai Chi has been shown to improve this dynamic balance in ways that are directly protective against the most common fall scenarios.

Long-term Tai Chi practitioners demonstrate superior obstacle-crossing technique, including significantly greater toe clearance and more stable centre-of-mass positioning. These benefits are directly attributed to the emphasis on single-leg balance and slow, deliberate weight transfer from limb to limb that is central to all Tai Chi practice.

Beyond reactive balance, Tai Chi also improves proactive balance — the ability to anticipate and prepare for balance challenges before they occur, rather than simply reacting after the fact. The best fall prevention is not catching yourself mid-stumble, but never stumbling in the first place.

6. Muscle Strength — Effective Loading Without the Risk

Because Tai Chi requires sustained semi-squatting postures and slow, deliberate weight transfers, it provides meaningful muscular loading to the lower limbs without the impact stresses of more vigorous exercise. This makes it accessible to older adults who cannot safely undertake higher-intensity resistance training, while still delivering genuine strengthening benefits. The precise joint control, muscle coordination, and sustained lower limb engagement contribute directly to greater postural stability and control of the body's centre of mass.

7. The Mind-Body Factor — Attention as a Safety Mechanism

There is one dimension of Tai Chi's fall-prevention benefit that purely physical interventions cannot replicate: its deliberate integration of focused attention with movement. Falls in older adults are not always purely physical events — cognitive distraction and the divided attention demands of navigating daily environments play a significant role.

With advancing age, the gradual decline of sensory systems reduces the efficiency of automated postural control, increasing the cognitive demand required to simply maintain upright posture. Tai Chi trains the practitioner to be wholly present in their body — attending simultaneously to breath, weight, joint position, and movement quality — effectively building a habit of attentive movement that transfers into everyday life.

Emerging evidence suggests that Tai Chi may be more effective than other exercise interventions for fall prevention precisely because it improves cognitive function and attentional capacity in ways that conventional exercise does not — making it particularly valuable for older adults with mild cognitive impairment.

The Evidence in Summary

A comprehensive analysis of randomised controlled trials published between 2004 and 2024 found that Tai Chi significantly improved balance and reduced fall risk among older adults, with improvements across balance ability, walking speed, and confidence in preventing falls. Crucially, its effectiveness increases with greater exercise time and frequency, and it proves beneficial for both healthy older adults and those at high risk of falling.

What makes this body of evidence so compelling is not simply the scale of the effect, but its depth. Tai Chi does not work on balance through one pathway — it works through all of them simultaneously:

- It rebuilds proprioception from the joint receptors upward
- It strengthens the muscles that execute corrective responses
- It trains the brain to integrate sensory information more efficiently
- It restores the brain's adaptive capacity to reweight sensory inputs
- It physically remodels the brain regions responsible for balance
- It improves the dynamic, real-world navigation skills that prevent trips and stumbles
- It enhances the cognitive attention that keeps the body safe in a complex environment

And it does all of this within a practice that older adults consistently find enjoyable, socially engaging, and culturally meaningful — which is why adherence rates for Tai Chi in clinical trials are among the highest of any exercise intervention studied.

A Note on Getting Started

For those wondering which style or form to begin with, the evidence is encouraging: even simplified Tai Chi forms — including the Yang-style 24-form, the most widely practised form in the world — have demonstrated significant

balance and fall-prevention benefits. What matters most is consistency, gradually increasing session duration and frequency over time, and practising under qualified instruction to ensure correct body mechanics.

For a population facing a convergence of biological systems all declining at once, Tai Chi offers something genuinely rare: a single practice that meets the challenge on every front — ancient in its origins, and thoroughly modern in its scientific validation.

This article draws on peer-reviewed research published in journals including the Journal of Neurophysiology, Frontiers in Physiology, Frontiers in Neuroscience, Scientific Reports, and the European Review of Aging and Physical Activity.

Further Reading & Sources

The following peer-reviewed research informed this article. Readers who wish to explore the science further are encouraged to search for these studies via Google Scholar or PubMed.

On balance, proprioception and ageing

Henry & Baudry (2019) — Age-related changes in leg proprioception: implications for postural control. *Journal of Neurophysiology*

Liu et al. (2022) — Relationship between proprioception and balance control among older adults. *Frontiers in Physiology*

Ribeiro & Oliveira (2007) — Aging effects on joint proprioception: the role of physical activity in proprioception preservation. *European Review of Aging and Physical Activity*

Xie et al. (2025) — Ageing changes the proprioceptive contribution to balance control. *Experimental Physiology*

On muscle loss and sarcopenia

Larsson et al. (2019) — Sarcopenia: aging-related loss of muscle mass and function. *Physiological Reviews*

Cruz-Jentoft et al. (2014) — Prevalence of and interventions for sarcopenia in ageing adults. *European Journal of Clinical Nutrition*

On Tai Chi and balance

Xu et al. (2004) — Effect of Tai Chi exercise on proprioception of ankle and knee joints in older people. *British Journal of Sports Medicine*

Li et al. (2008) — Effects of a 16-week Tai Chi intervention on postural stability and proprioception in older people. *Age and Ageing*

Wang et al. (2012) — Effects of Tai Chi versus proprioception exercise on neuromuscular function of the ankle in elderly people. *Evidence-Based Complementary and Alternative Medicine*

Chen et al. (2023) — Tai Chi for fall prevention and balance improvement in older adults: a systematic review and meta-analysis. *Frontiers in Public Health*

Chen et al. (2025) — Effects of Tai Chi on balance and fall prevention in healthy older adults: a meta-analysis. *Frontiers in Public Health*

Nyman & Victor (2020) — Tai Chi for the prevention of falls among older adults: a critical analysis of the evidence. *Journal of Aging and Physical Activity*

On Tai Chi and the brain

Wei et al. (2014) — Tai Chi Chuan optimises the functional organisation of the intrinsic human brain architecture in older adults. *Frontiers in Aging Neuroscience*

Battilana et al. (2020) — Exercise-linked improvement in age-associated loss of balance and increased vestibular input to motor neurons. *Aging Cell*

Zhang et al. (2025) — Effects of Tai Chi on executive function, dynamic balance, and brain functional connectivity in older adults. *Scientific Reports*

Yours in Tai CHI & Qigong

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