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Plyometric Exercises Help Older Adults Build Strength and Prevent Falls

Analysis by Dr. Joseph Mercola | April 23, 2026

STORY AT-A-GLANCE

- Plyometric training, which includes jumping and hopping exercises, helps older adults improve muscle strength and balance, as well as bone density, reducing their risk of falls and fractures
- Older adults who engage in supervised plyometric exercises experience significant improvements in lower-body power, making everyday movements like standing up and walking safer and easier
- Even short-term plyometric training — lasting as little as four weeks — results in measurable gains in strength, agility, and balance, with the most significant results seen in those who start with lower baseline strength
- Upping the intensity of exercise stimulates bone growth by triggering your body's natural bone-building processes, making plyometric training an effective way to combat osteoporosis and maintain skeletal health
- When combined with resistance training, plyometric exercises provide the best overall benefits for muscle function and fall prevention, helping older adults maintain independence and mobility as they age

Plyometric exercises were originally practiced by athletes to improve their muscle strength and overall fitness.[1] Interestingly, research has shown that these movements benefit older adults as well, who are at risk for mobility issues.

Age-related muscle loss, known as sarcopenia, is a primary reason why older adults struggle with mobility and experience an increased risk of falls. By the time someone reaches 70, they've already lost up to 30% of their muscle mass, which translates to weaker legs, slower reaction times, and difficulty maintaining balance.[2] Muscle loss, though often perceived as inevitable, directly impacts mobility, and is largely preventable.

When mobility decreases, everyday tasks like climbing stairs, getting up from a chair, or walking on uneven ground become dangerous. Falls become more frequent, and once an older adult suffers a fracture — particularly at the hip — their risk of permanent disability or even death skyrockets.[3]

The good news is that plyometric exercises can significantly reduce these risks. They offer older adults a way to maintain muscle strength and prevent falls, in addition to other time-tested solutions such as weightlifting.[4]

Plyometric Training Is Safe and Effective for Older Adults

Writing for The Conversation, Justin Keogh from Bond University and Mandy Hagstrom from The University of South Wales compiled studies regarding plyometric exercises and their benefits to the general population, including fitness enthusiasts and young people.[5]

- **Exploring the benefits of plyometric training for older adults —** One notable systematic review, published in Sports Medicine, focused on older adults.[6] In this study, researchers examined whether plyometric training — impact exercises that require generating large amounts of force in short periods[7] — improve strength, balance, and overall function in the elderly. They also assessed the safety of these exercises for this demographic.[8]

- **The different plyometric exercises involved —** The total population was 289 adults, both men and women between 58 and 79 years old. Some of them were healthy and others were diagnosed with osteopenia. The training programs ranged from four

weeks to 12 months, and exercises varied from basic jumps to more complex movements such as bounding and box jumps.[9]

- **Plyometric training, when done properly, are safe for older adults —** Some interventions focused exclusively on plyometrics, while others combined them with strength or balance exercises. Despite the perceived risk of high-impact movements for older adults, none of the studies included in the review reported a higher incidence of injury, indicating that when done properly, these exercises are, in fact, safe to perform.[10]

The Benefits of Plyometric Training

The Sports Medicine review also found significant improvements in several key areas, most notably lower-body strength, power, and balance.

- **Stronger muscles —** Participants who engaged in plyometric training experienced greater gains in muscle power compared to those performing traditional strength exercises. This means that not only did their muscles become stronger, but they were also able to generate force quicker — an essential ability for preventing falls and reacting to sudden balance changes.[11]

- **Improved balance —** Better balance was another major finding. Several studies within the review demonstrated that plyometric training enhanced postural stability, which refers to the body's ability to maintain an upright position and prevent falls.

  In particular, participants who included jumping exercises in their routine performed better on balance assessments such as the Berg Balance Test (a test used to determine an adult's ability to balance their body[12]) and force plate measurements, compared to those who only did standard strength training or no exercise at all.

- **It takes time for the benefits to appear —** The timeline for improvement varied across studies, but some benefits emerged in as little as four weeks. In one study, older adults who performed plyometric exercises five times per week saw a 49%

increase in hip extension strength within a month.[13] Another study that lasted 12 weeks found that participants improved their jumping performance and agility by over 25%.[14]

- **Guidance is important —** Another notable finding was that supervised exercise programs led to better results than unsupervised ones. When exercises were performed under the guidance of a trainer or physical therapist, participants had higher gains in strength and balance, highlighting the importance of proper instruction, especially if you'll be attempting plyometric movements.[15]

Why Does Plyometric Training Work?

The reason plyometric exercises are so effective lies in how they activate your brain, muscles and bones in different ways.

- **Your muscles stretch and contract —** When you jump, land and immediately jump again, you engage what's known as the "stretch-shortening cycle." This is a process where muscles first lengthen (eccentric phase) and then rapidly contract (concentric phase), creating powerful movements. This rapid force production helps your muscles become more explosive and reactive — key qualities needed to prevent falls.[16]

- **Your brain and body work together —** In terms of balance, plyometrics force your body to stabilize during landing. Each jump challenges your neuromuscular system, requiring quick adjustments to maintain posture.

- **Your spatial awareness improves —** Over time, plyometric training improves proprioception — your body's ability to sense its position in space — which translates to better stability in daily life.

  According to the researchers, "As muscle spindles are stretched during plyometric training, a neuromuscular reflex likely occurs, which may activate higher threshold motor units that would normally not be used. Long-term exposure to such stimuli

may decrease neuromuscular inhibition, which would likely result in greater muscle activity and, in turn, greater strength."[17]

Another Benefit of Plyometric Exercises — Your Skeletal Health

Based on the research published, it's clear that plyometric exercises promote stronger muscles. But they also have a positive impact on bone health. As people age, bone mineral density (BMD) declines due to various factors, leading to osteoporosis and an increased risk of fractures when falling.

- **Exercise boosts BMD —** This benefit was observed in a study published in the journal Bone. Here, researchers noted that postmenopausal women who engaged in moderate- and high-intensity exercise had improved hip and spinal bone density, which reduces their long-term risk of fractures.[18]

- **Impact strengthens your bones —** According to another study, the impact (such as leaping to a box) activates specialized cells in your body that trigger bone growth. As noted by the researchers, "From a mechanically centric point of view, activities that generate higher intensity or quicker loads (such as resistance training and leaping) are excellent for promoting bone health because they stimulate existing bone cells in a significant way."[19]

Going deeper into the mechanisms linking exercise and BMD, impact exercises like jumping stimulate osteogenic processes, resulting in newer, tougher bone cells due to repeated impact. This explains why participants who engaged in consistent plyometric training for a year saw measurable improvements in bone mineral density, reducing their risk of fractures.[20]

The Basics (and Risks) of Plyometric Exercises

Whether you've been exercising regularly or just starting out, plyometric exercises are a good way to keep things interesting. Examples of plyometric exercises include:[21]

- **Box jumps —** Repeatedly leaping on and off a training box.
- **Lateral skater hops —** Moving side to side quickly like an ice skater.
- **Medicine ball throws —** Picking up and throwing a medicine ball against a wall or the ground.
- **Single leg hops —** Hopping on a single spot or through an obstacle course.
- **Squat jumps —** Squatting then jumping into the air repeatedly.

However, remember that these kinds of exercises cause your body to absorb more impact than usual. Done incorrectly, your risk of muscular or skeletal injury increases. For example, missing a landing could cause a sprain or muscle tear. To prevent injuries like these, I recommend working with a fitness trainer who specializes in this area — something the research also noted.

In addition to the tips mentioned above, The Conversation provides some basic guidelines to help you ease into plyometric exercises:[22]

1. Start with one to three plyometric sessions weekly.
2. Do five to 10 repetitions per set of your chosen plyometric exercise.
3. Take a one- to three-minute rest period between sets to ensure complete muscle recovery.

Additional Tips to Maximize Plyometric Exercises and Prevent Injury

To maximize the benefits of plyometric exercises, here are some additional suggestions:

- **Pair plyometrics with resistance training —** Strength training builds muscle, while plyometric training enhances power and reaction time. Merging the two is an effective way to maintain your mobility to prevent falls. Once you're able, try pairing

squats with jump squats, or lunges with jumping lunges. This combination helps maintain both bone density and muscle responsiveness especially as you age.

- **Don't overdo it —** You need to put some effort into plyometric exercises. As noted in another Bone study, "low-intensity exercise was not an effective stimulus to increase bone mass."[23]

  That said, you don't want to overdo it. According to a study published in Aging and Disease, "Excessive high-intensity exercise does not benefit bone health but induces a high level of oxidative stress in the body, which has a negative impact on bone tissue."[24] The key word there is "excessive." To **maximize longevity benefits**, keep high-intensity exercise like plyometrics to a max of 75 minutes per week and strength training to 40 minutes a week.

- **Stay consistent and make exercising a habit —** Your body responds to what you do regularly, not what you do once in a while. Aim for at least two to three sessions per week, including both resistance training and plyometrics. Over time, this will improve your strength, balance, and bone health, keeping you active and independent well into your later years.

Frequently Asked Questions on Plyometric Exercises

Q: Are plyometric exercises safe for older adults?

A: Yes, research shows that when done correctly, plyometric exercises are safe and effective for older adults. Research has found no increased injury risk when exercises are properly supervised and tailored to individual abilities. These exercises help improve muscle strength, balance, and bone density, reducing the risk of falls and fractures.

Q: How do plyometric exercises help prevent falls in older adults?

A: Plyometric exercises improve lower-body strength, power and reaction time, which are essential for maintaining balance and preventing falls. They also enhance postural stability, proprioception (spatial awareness) and neuromuscular coordination, helping older adults react quickly to sudden balance changes.

Q: Can plyometric training improve bone health?

A: Yes, studies show that impact exercises like jumping stimulate bone growth by triggering osteogenic processes, leading to stronger bones. Postmenopausal women who engaged in plyometric training experienced improved bone mineral density in their hips and spine, reducing the risk of osteoporosis and fractures.

Q: What are some plyometric exercises recommended for older adults?

A: Some beginner-friendly plyometric exercises include:

- **Box jumps —** Leaping onto a sturdy box and stepping down.
- **Lateral skater hops —** Jumping side to side like an ice skater.
- **Squat jumps —** Squatting and jumping repeatedly.
- **Medicine ball throws —** Throwing a weighted ball against a wall or the ground.
- **Single leg hops —** Hopping on one foot to improve balance.

Q: How can older adults start plyometric training safely?

A: To begin safely, Start with one to three sessions per week with five to 10 repetitions per set. Remember to take one- to three-minute rest periods between sets for optimal recovery and avoid overtraining — limit high-intensity exercises to a total of 75 minutes per week.

In addition, combine plyometrics with resistance training for better muscle strength and mobility. If you don't have a clue on how to begin, work with a fitness professional to learn proper form and minimize injury risk.

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