

Beyond Digestion — Research Explores Butyrate's Link to Balance and Muscle Strength in Older Men

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STORY AT-A-GLANCE

- › In a 16-week randomized controlled trial, older men who took 300 milligrams (mg) of butyrate daily saw greater improvements in balance, grip strength, and walking speed than men taking a placebo, suggesting that gut health influences physical function as you age
- › Participants with better balance also had stronger muscles, faster gait speed, and healthier intestinal barrier markers, pointing to a close connection between the gut and the musculoskeletal system
- › Researchers found that lower levels of zonulin and lipopolysaccharide-binding protein (LBP) — markers linked to reduced intestinal barrier integrity — were associated with better physical performance
- › Supporting your body's natural butyrate production through fermented foods, resistant starches and a healthier microbiome addresses an underlying factor connected to strength and mobility rather than simply treating symptoms
- › Daily walking, resistance training, adequate protein intake, and eliminating seed oils help create an internal environment that supports beneficial gut bacteria, stronger muscles and better movement as you get older

Balance problems affect millions of older adults, yet most people assume the trouble starts solely in the muscles, joints, or inner ear. A study published in *Gait & Posture* points to a contributor that gets far less attention — the health of the gut barrier.¹

Researchers set out to test whether a compound produced by beneficial gut bacteria could measurably influence how steady, strong, and mobile men remain as they age.

That compound is butyrate, a short-chain fatty acid (SCFA) made when bacteria break down certain carbohydrates. Scientists have studied it for years because of its role in maintaining the intestinal barrier — the lining that keeps the contents of the digestive tract separated from the rest of the body — and in supporting communication between the gut and other systems.

The catch is that aging tends to work against this ecosystem: levels of butyrate-producing bacteria often decline over time, frequently alongside a weakening intestinal barrier and a gradual loss of physical performance.

That overlap raises a question worth taking seriously. If the gut barrier erodes at the same time strength and stability decline, are the two more connected than they appear, and could supporting the intestinal lining translate into better physical function? To find out, researchers gave older men oral butyrate and tracked what happened to their balance, strength, walking speed, and gut barrier markers over the next four months.

The Gut and Muscle Connection Became Harder to Ignore

The study enrolled 130 older men and examined whether taking 300 milligrams (mg) of oral **butyrate** daily for 16 weeks would affect balance, muscle strength, walking speed, and markers of intestinal barrier health.² Participants were randomly assigned to either a butyrate group or a placebo group. The researchers wanted to determine whether strengthening intestinal integrity translated into measurable improvements in everyday physical function.*

- **The men who took butyrate performed better after four months** — Participants in the butyrate group experienced significant improvements in postural balance, **handgrip strength**, and gait speed, while the placebo group did not show the same

changes. These findings suggest that supporting the gut environment was associated with improvements in several physical abilities that become increasingly important with age.

- **Better balance was closely linked to stronger muscles and faster movement –** Researchers found that participants with stronger balance scores also tended to have higher handgrip strength and faster walking speeds. Grip strength is often used as a simple indicator of overall muscle function, while gait speed reflects how efficiently the body coordinates strength, stability, and movement.

The fact that all three improved together suggests they draw on shared underlying systems rather than working in isolation – a hint that what changed wasn't muscle alone, since steady balance depends on coordination across the body, not just leg strength.

- **Improvements in physical function occurred alongside improvements in gut-related markers –** By the end of the study, participants taking butyrate showed lower levels of [zonulin](#) and lipopolysaccharide-binding protein (LBP), two markers researchers used to evaluate intestinal barrier integrity. Zonulin is a protein that controls the tight junctions between the cells lining your gut, essentially how snugly those seams are held together.

When zonulin climbs, the junctions loosen and the barrier grows more permeable; when it falls, the seams tighten. LBP rises when fragments of gut bacteria slip across the barrier into the bloodstream, so a lower reading points to less of that crossing.

Both markers falling, then, points the same direction: a more intact barrier. Men with stronger balance scores generally had lower levels of these markers, while those with poorer balance tended to have higher levels. The relationship between these measurements became one of the strongest findings in the study.

- **Researchers proposed a possible gut-to-body pathway — Aging** is often accompanied by changes in the intestinal barrier. When that barrier becomes less effective, bacterial compounds from the gut gain greater access to circulation.

Butyrate is the primary fuel source for the cells lining the colon — they essentially run on it. Well-fueled lining cells hold the seams between them more tightly, helping maintain separation between the contents of the digestive tract and the rest of the body. Researchers proposed this as one possible explanation for the improvements observed in balance, strength, and mobility.

- **The findings point toward a broader view of healthy aging —** Rather than treating **balance** as a problem caused solely by weaker muscles, the study suggests that physical performance depends on multiple interconnected systems. At the same time, the researchers noted important limitations. The study included older men only, so the findings can't automatically be applied to women.

In addition, C-reactive protein (CRP) and 8-isoprostane — markers commonly associated with inflammation and oxidative stress — didn't change. As a result, the strongest conclusion is that better intestinal barrier integrity was associated with better physical function, not that butyrate acted as an anti-inflammatory treatment.

**These findings are from research conducted in clinical settings. Results may not apply to all individuals.*

Support Your Gut to Support Your Strength

The study highlighted a simple but important idea: your muscles don't operate in isolation. The condition of your intestinal barrier appears closely connected to balance, **walking speed**, and strength. If your goal is to stay steady on your feet and maintain physical independence as you age, focus first on supporting the systems that influence muscle function from the inside out.

The most effective strategy isn't chasing symptoms but addressing the underlying factors that affect gut health, muscle function, and **cellular energy production**.

- **Help your gut make its own butyrate** — Your long-term goal isn't simply to take butyrate — it's to create the conditions that allow your gut bacteria to produce it for you. A healthy microbiome naturally manufactures butyrate, which is why rebuilding your gut ecosystem deserves more attention than any supplement.

If your digestion is relatively healthy, begin with **fermented foods** such as sauerkraut, kimchi, kefir, and full-fat yogurt (choose raw or traditionally fermented dairy where possible). These foods help increase microbial diversity and provide the metabolic building blocks (like acetate and lactate) that support resident bacteria involved in butyrate production. Grass fed butter, ghee, and aged cheeses also contain small amounts of butyric acid itself. Introduce fermented foods gradually and pay attention to how your body responds.

If your gut has been disrupted by years of digestive problems, repeated **antibiotic use**, or chronic inflammation, a butyrate supplement may serve as a temporary bridge while you restore a healthier microbiome. Food and microbial restoration remain the ultimate objective because your body is designed to rely on beneficial bacteria for butyrate production.

If you do use a supplement, note that some butyrate formulations are designed to release in the colon rather than earlier in the digestive tract — though food-based and microbial restoration remain the primary goal.

- **Repair your gut before adding large amounts of fiber** — Counterintuitively, loading up on **fiber** when your gut is already irritated often backfires. Foods such as beans, raw vegetables, and whole grains frequently create excessive fermentation in an imbalanced gut, leading to bloating, gas, and discomfort.

Instead, focus first on easy-to-digest carbohydrate sources such as whole fruit and white rice. These foods provide steady fuel while placing less stress on your digestive system. If your digestion has been compromised for years, this simpler

approach often helps create a better foundation for recovery.

As your symptoms improve, gradually introduce foods that nourish butyrate-producing bacteria. Cooked and cooled potatoes and green bananas provide resistant starch, a type of carbohydrate that reaches the colon intact and serves as fuel for beneficial microbes. From there, add foods such as onions, garlic, and leeks. These foods help feed bacteria that produce SCFAs, including butyrate, helping restore a healthier gut environment over time.

- **Eliminate seed oils that disrupt gut bacteria** — If your meals regularly include soybean, corn, canola, safflower, cottonseed, or sunflower oil, you're making it harder for beneficial bacteria to thrive. These seed oils are rich in [linoleic acid](#) (LA), which may disrupt microbial balance and contribute to conditions that interfere with gut health.

Remove processed foods made with these oils whenever possible. That includes many restaurant foods, packaged snacks, salad dressings, sauces, and convenience meals. Replace them with more stable fats such as grass fed butter, ghee, and tallow. This shift helps create a healthier environment for the bacteria responsible for producing butyrate and maintaining intestinal integrity.

- **Build and maintain muscle every week** — The men who demonstrated better balance also tended to have greater handgrip strength and faster gait speed. That means muscle quality matters. I recommend incorporating resistance training twice a week to preserve and build strength as you age.

If traditional weightlifting feels intimidating, start with bodyweight exercises, resistance bands, carrying groceries, climbing stairs, or chair stands. Another option is blood flow restriction (BFR) training, also known as [KAATSU training](#).

This approach uses specialized bands to partially restrict blood flow during low-intensity exercise, allowing you to stimulate muscle growth and strength gains with much lighter weights. That makes it especially useful if joint pain, balance issues, or

limited mobility make heavy lifting difficult. Every small improvement compounds over time.

Support that training with adequate protein. Aim for approximately 0.6 to 0.8 grams of protein per pound of ideal body weight, with about one-third coming from collagen-rich sources such as homemade bone broth, gelatin, and collagen supplements. Strong muscles provide the foundation for confident movement and long-term independence.

- **Walk every day and combine it with sunlight** — Walking speed improved alongside balance and grip strength in the study. A daily walking habit strengthens the connection between your muscles, nervous system, and balance centers while helping maintain mobility.

Turn walking into a personal challenge. Track your time, distance, or daily step count and work toward gradual improvements, building to a one-hour walk each day. Small goals build momentum and help you stay consistent. Whenever possible, **walk outdoors** in natural sunlight.

Sun exposure supports cellular energy production, helps regulate your circadian rhythm, and promotes healthy **mitochondrial function**. Better cellular energy supports the tissues and systems that keep you moving confidently throughout life.

FAQs About Butyrate, Balance, and Muscle Strength in Older Men

Q: What is butyrate, and why does it matter as I get older?

A: Butyrate is an SCFA produced by beneficial gut bacteria when they break down certain carbohydrates. It helps support the intestinal barrier, which acts as a protective lining between the contents of your digestive tract and the rest of your

body. As you age, levels of butyrate-producing bacteria often decline, which coincides with changes in gut health, strength, mobility, and overall physical function.

Q: Did butyrate improve balance and strength in the study?

A: Yes. In the study, older men who took 300 mg of oral butyrate daily for 16 weeks showed significant improvements in postural balance, handgrip strength, and walking speed compared to men who received a placebo. Researchers also found improvements in markers associated with intestinal barrier integrity.

Q: How are gut health and physical performance connected?

A: The study found that men with better balance tended to have stronger grip strength, faster walking speeds, and healthier intestinal barrier markers. Researchers believe that when the intestinal barrier becomes less effective, bacterial compounds gain greater access to circulation, which affects systems involved in physical performance. Strengthening the gut barrier appears to support healthier function throughout your body.

Q: What foods help support natural butyrate production?

A: Fermented foods such as sauerkraut, kimchi, kefir, and full-fat yogurt help support microbial diversity and create an environment that favors butyrate-producing bacteria. Resistant starch sources such as cooked and cooled potatoes and green bananas also provide fuel for beneficial microbes. Foods such as onions, garlic, and leeks further support bacteria that produce SCFAs, including butyrate.

Q: What else supports balance and muscle strength as I age?

A: The study highlights the importance of looking beyond muscles alone. Daily walking, regular resistance training, adequate protein intake, and maintaining a healthy gut environment all work together to support strength and mobility. BFR, or KAATSU training, offers another option for building strength with lighter weights, which is especially useful if heavy lifting is difficult because of joint discomfort or limited mobility.

This article is for informational purposes only and does not constitute medical advice. Consult a qualified health care provider before making changes to your health regimen.

Sources and References

- ^{1, 2} [Gait & Posture September 2025, Volume 121, 370-376](#)