

Muscle: The Organ that Powers Vitality

In this series, discover how skeletal muscle, the body's largest organ, impacts health and longevity. From regulating hormones and blood sugar to boosting brain health, muscles are far more than just a source of strength.

By [Sheramy Tsai](#) (Epoch Health / The Epoch Times) August 28, 2024 Updated: August 28, 2024

Part 7

Why You Should Avoid Fat Build-Up in Your Muscles

Research shows that intramuscular fat, also known as myosteatorsis, diminishes performance and raises the risk of illness and death.

When we think of top killers, our minds typically jump to smoking, cancer, and obesity. However, there's a hidden danger within our bodies that many people, including doctors, overlook.

Intramuscular fat, or fat stored within muscles, poses a significant health risk. [Studies](#) on body composition reveal that individuals with fatty muscles face a dramatically increased risk of death. This silent threat affects even those who aren't obese, potentially shortening lives unnoticed.

Muscles: Quantity Versus Quality

Muscle discussions typically focus on size and strength, but recent research emphasizes quality over quantity. Odessa Addison, an associate professor at the University of Maryland with a doctorate in rehabilitation science, underscores this shift.

"It's not just the amount of muscle, but the quality and composition that really influence how adults function," she said.

Intramuscular fat, or myosteatorsis, significantly affects muscle quality. Unlike subcutaneous fat (stored under the skin) or visceral fat (around organs), intramuscular fat infiltrates muscle fibers, thus degrading their performance and functionality. It can accumulate between muscle fibers or within muscle cells. Dr. Sean O'Mara, a renowned expert on reversing chronic illness, describes myosteatorsis as "fat replacing your muscle" or "human marbling." In a

conversation with The Epoch Times, he explained that this process is insidious and diminishes muscle mass and performance, resulting in numerous health issues.

“We’ve learned that even if you have the same amount of muscle, more fat within those muscles means they just don’t work as well,” Addison said.

The Dangers of Intramuscular Fat

Muscles with higher fat content are less efficient, leading to decreased strength and mobility, particularly as we age. However, myosteatorosis poses serious health risks beyond impaired muscle functionality.

A 2023 study in the journal Radiology revealed that fat accumulation in skeletal muscles can increase the risk of death as much as Type 2 diabetes and smoking. The research, which tracked nearly 9,000 healthy adults over nine years, found that higher intramuscular fat significantly raises health risks.

Of the 507 participants who died, 55 percent had myosteatorosis, which led to a 16 percent chance of dying within 10 years—higher than obesity, fatty liver disease, and muscle wasting.

“If you have this fat in your muscle, then you have double the risk of mortality of an obese person,” said O’Mara, highlighting the lethal potential of myosteatorosis. Intramuscular fat, like visceral fat, releases harmful inflammatory molecules. “This fat in muscle behaves very similarly to how visceral fat in your abdomen acts, so it’s highly inflammatory,” Addison said.

A 2022 study in Physiology Reports highlights that higher levels of intramuscular fat elevate inflammatory cytokines, contributing to metabolic disorders.

Fitness and nutrition expert JJ Virgin told The Epoch Times that intramuscular fat “releases pro-inflammatory cytokines, creating whole body inflammation.”

Virgin added: “Muscle is where we dispose of our glucose. With fatty muscle, you develop metabolic dysfunction, insulin resistance, and impaired glucose disposal.”

Addison said: “There are metabolic consequences. You’re more likely to have diabetes, insulin resistance, and poor surgical recovery if you have high levels of this fat in your muscle.”

Adding to the evidence, [a study](#) in the Journal of the American Heart Association examined muscle density and heart disease in more than 1,800 people. For men, denser muscles (better quality) were linked to a 74 percent lower risk of heart disease, while larger muscles (which contain more fat) were linked to a sixfold higher risk.

O'Mara explained that people with larger muscles, such as bodybuilders who consume high amounts of carbohydrates, tend to have more intramuscular fat, which contributes to higher heart disease risk. Those with denser muscles, who consume fewer carbs, naturally have less intramuscular fat, lowering their heart disease risk.

“You basically want muscle without fat,” O'Mara said.

Research also links poor muscle health to worse cancer outcomes. [A 2020 study](#) found that cancer patients with myosteatosis, have a 75 percent higher risk of dying than those without fatty muscles. Furthermore, fatty muscles predict worse survival in patients with gynecological, hepatocellular, renal, pancreatic, gastroesophageal, and colorectal carcinoma, and lymphomas.

One immediate danger is the impact of myosteatosis on mobility. “We definitely know that if you have more of this fat, you’re more likely to decline in your ability to move and be independent over time,” Addison said.

This decline can lead to frailty, increased risk of falls, and loss of independence, especially in older adults.

However, not all intramuscular fat is bad. “Endurance athletes tend to have more marbling in their muscles,” as it serves as an energy source, Virgin noted.

How Fatty Muscles Develop

Intramuscular fat often accompanies other harmful fat deposits like visceral fat and deep subcutaneous fat.

“When you have a lot of visceral fat, you likely have a lot of muscle fat as well,” O'Mara said.

Several factors contribute to myosteatosis. Diet is crucial, with high carbohydrate intake, especially processed foods, being a primary contributor.

“Carbohydrates, especially processed foods, all contribute to intramuscular fat. In the absence of carbohydrates, fat and protein have minimal contributions to any type of fat,” O'Mara said.

Alcohol consumption exacerbates the condition by making it harder to eliminate visceral fat and promoting more fat deposition. Poor sleep, common in patients with sleep disorders such as obstructive sleep apnea, also contributes. Stress is equally detrimental.

“People with elevated stress levels, such as political figures under constant pressure, often show elevated amounts of fat,” O'Mara said.

“The biggest factors are inactivity and increase in body weight,” Virgin said. She pointed to [a study](#) showing inactive twins had a 54 percent higher level of fatty muscle than their active counterparts.

Addison explained that age and genetics also play a role, although more research is needed to fully uncover their impact.

Spotting Myosteatorosis: Tools and Techniques

Addison noted that there is currently no standard of care for measuring intramuscular fat.

“I think it’s something that the medical model has not totally caught up to yet,” she said, pointing out gaps in current practice.

Despite advancements in imaging technologies such as MRI (magnetic resonance imaging) and CT (computed tomography) scans, intramuscular fat is not routinely measured outside research settings.

However, some physicians, like O’Mara, do measure various types of fat in the body. According to O’Mara, MRI is the gold standard for detecting myosteatorosis due to its superior imaging capabilities, which provide detailed images distinguishing healthy muscle tissue from fat infiltration.

“Muscle is dark, and fat is white on an MRI. When you see white infiltrating dark muscle, that’s fat replacing muscle, which significantly impacts muscle performance,” said O'Mara said.

Although MRIs are typically more expensive, broader usage could drive down costs and improve health outcomes by enhancing diagnostic accuracy and early detection, he stated.

According to O'Mara, the visual feedback from an MRI is helpful for patient education and engagement. He emphasizes showing patients images of their own muscles compared with healthy and unhealthy tissue.

“When it comes to muscle fat, if you told someone ‘6% of your muscles are fat,’ it’s not useful information,” he explained.

“But if you show them their muscles and the fat, along with photos of what is good and bad, it’s a much more powerful, impactful experience than numeric scores.”

This visual approach motivates patients to make necessary lifestyle changes more effectively than numeric data alone.

CT scans offer a more affordable alternative to MRI while still providing valuable information on muscle fat content. Although less detailed than MRI, CT scans are widely used due to their accessibility. However, O'Mara pointed out the associated radiation risk from CT scans.

Virgin agreed that “MRI is the best way to get higher sensitivity for finding fat in the muscle.” She added that DEXA scans are the “next best option for ease of use and cost” and closely correlate with MRI. DEXA scans (dual-energy X-ray absorptiometry) use low-dose X-rays to measure bone density and body composition, including fat and muscle mass.

Dr. Sandeep Palakodeti, chief medical officer of Rebel Health Alliance, acknowledged that DEXA scans provide insights into overall body fat, including subcutaneous and visceral fat, but cautioned in an interview with The Epoch Times, “I don’t think they can adequately distinguish intramuscular fat from other types of fat as effectively as MRI or CT scans.”

Ultrasound is emerging as a practical and non-invasive method for measuring muscle fat.

Addison highlighted the research of Dr. Michael Harris-Love from the University of Colorado, noting: “Ultrasound is much more clinically accessible. We are

working on methods to capture muscle fat content using ultrasound, allowing patients a quick, noninvasive assessment during routine visits.”

Prevention and Management Tips

Preventing and managing intramuscular fat involves lifestyle changes and targeted strategies to improve overall muscle health.

“My message is always prevention is better than treatment. But when it comes to treatment right now, our best bets are diet and exercise combined,” Addison said. O'Mara also emphasized the importance of diet, exercise, and sleep.

“Carbohydrates, especially processed foods, all contribute to visceral fat,” he said, highlighting the need to minimize these in favor of healthier options like protein and healthy fats. He also advises limiting alcohol and ensuring adequate sleep to reduce fat accumulation.

Exercise plays a critical role in managing intramuscular fat. [A 2021 study](#) found that moderate-intensity aerobic exercise (such as walking or cycling) and combined training (mixing aerobic and resistance exercises) effectively reduced harmful fat within muscles in adults aged 18 to 65 with chronic diseases. “It’s about the quality of the muscle,” Addison stressed, encouraging people to focus on exercises that enhance muscle density rather than just increasing muscle size.

Virgin also underscored the importance of maintaining physical activity to prevent fatty muscle development, emphasizing, “Obesity with poor activity is a recipe for high fatty muscle levels.”

“Caloric restriction on its own is not as effective as combining it with physical activity. You will lose twice the fatty infiltrate if you do both together rather than just trying to lose weight through diet alone,” she added.

Proper hydration and stress management are also crucial. Chronic stress can lead to higher levels of cortisol, which promotes fat storage. Techniques such as mindfulness, yoga, and other relaxation methods can help effectively manage stress levels.

By adopting these strategies, individuals can take proactive steps to reduce intramuscular fat, improve muscle quality, and enhance overall health.

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