

## Why kaatsu, a fitness trend spotted at the Games, isn't just for Olympians

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Updated 1511 GMT (2311 HKT) July 31, 2021



Pictured are current Olympians Galen Rupp (left) and Michael Andrew (right), and past Olympian Mikaela Shiffrin (middle).

**(CNN)** - Restricting your blood flow sounds like a dangerous thing to do, but it's exactly what some Olympians, athletes, and surgery and physical therapy patients have done to strengthen their muscles and speed up recovery.

The origins of this practice go back to 1966, when -- while sitting on his heels during a Japanese temple ceremony -- Yoshiaki Sato noticed his calves felt tingly and pumped up. Sato wondered if his limited blood flow was the key to experiencing that sensation, said Steven Munatones, the CEO of [KAATSU](#), an eponymous blood flow restriction product and education company. Munatones cofounded KAATSU Global -- which translates to "additional pressure" in English --

with Sato in 2014 after being mentored by him about the Kaatsu technique for 13 years in Japan.

Seven years after that initial tingly feeling, Sato "experimented with different kinds of bands placed on different locations on his body -- from his head to his torso to his lower legs," Munatones said via email. "In 1973, he experienced a broken ankle and rehabilitated himself using KAATSU."

This was the first experimentation with KAATSU cycle mode, Munatones added, which is when bands with internal "air bladders" are inflated for 30 seconds as the bands compress around upper limbs, then deflate for five seconds before repeating the cycle. This rhythmic compression slows the blood flow back to the heart and therefore allows the veins and capillaries in the treated areas to engorge with blood -- visible as the skin gradually reddens -- while you're exercising, Munatones said.

This engorgement expedites several naturally occurring biochemical reactions, such as secreting [nitric oxide](#), human [growth hormone](#), [insulin growth factor-1](#) and [beta endorphins](#), all of which have differential roles in increasing blood supply, preventing tissue damage, regulating body composition and muscle growth, growing bone and tissue, and suppressing pain.

"Individuals exercise during the application of BFR to improve muscle mass, muscle strength, reduce pain, improve recovery, increase cardiovascular capacity and augment sports performance," said physical therapist Nicholas Rolnick via email.

Since Sato's discovery and subsequent studies on thousands of people, athletes, fitness enthusiasts and Olympians -- including long-distance runner Galen Rupp, diver [Laura Wilkinson](#), swimmer [Michael Andrew](#) and alpine skier [Mikaela Shiffrin](#) -- have benefited from the technique. But you don't have to be an athlete to use Kaatsu or blood flow restriction training -- here's what experts say you should know before you try it.

## How it works

When someone exercises while practicing Kaatsu or blood flow restriction, blood and metabolic byproducts are "stuck in the muscle, unable to leave," Rolnick said.

"The metabolites increase muscle fatigue, causing the muscle to work much harder than it normally would to produce a contraction at light loads," he added. "We have to work very hard to keep up with the exercise and that extra effort, paired with the fatigue produced through the BFR, accelerates muscle mass and strength gains."

Muscle fibers required to perform high-intensity actions -- such as jumping, throwing, lifting weights or kicking -- are recruited at lower intensities than usually required, said Stephen Patterson, a professor in applied exercise physiology and performance at St Mary's University, London, via email. That means someone could lift 20% to 30% of their maximum weight instead

of the usual 70% or greater, and still experience a response like that of training with heavier loads, he added.

### **Need-to-knows before attempting BFR**

People these experts have sold related products to, treated or studied include athletes of nearly all levels of ability, people who lead sedentary lifestyles, and those recovering from injuries, and range from 18 years old to 104.

The ability to use much lower loads when blood flow restriction training to build muscle and increase strength "is especially beneficial for those who are injured or have other conditions that do not allow them to either lift heavy or perform high intensity aerobic exercise," Patterson said. This includes people who have recently had surgery or are paraplegic or quadriplegic.

"Major problems in the rehabilitation setting are the inability for patients to effectively strength train due to an injury or post-surgical precautions as well as pain," Rolnick said. "The growth of BFR training allows those individuals who would be unable to challenge their bodies under normal circumstances a chance to build more strength and muscle mass during times where it would be near impossible."

If you have just had surgery and have large incisions with stitches and you want to practice Kaatsu immediately, talk to your doctor first, Munatones said. "The reason why is because the incision will dramatically heal much, much faster than normal and their skin can grow very quickly over their stitches - which usually surprises orthopedic surgeons how quickly the body recovers using KAATSU."

Groups for whom blood flow restriction might not be appropriate include people with hypertension, uncontrolled diabetes, obesity, kidney disease, arterial calcification, a history of blood clots and medications or conditions causing higher risk of clotting, venous thromboembolism, vascular diseases, sickle cell anemia, cancer, poor circulatory systems or open fracture, these experts said.

Potential side effects have included lightheadedness, tiny red spots on arms, bruising near the equipment, feelings of pins and needles, and nerve damage, some of which can be avoided by properly practicing blood flow restriction.

Contact your doctor before trying this type of training, or if you experience these or other negative side effects.

## How to practice the technique

Regarding equipment, Patterson recommended using medical grade-type products that will give you a reading to ensure the pressures advertised are true. "Exercise bands and other material etc. may be able to restrict blood flow but from a safety perspective there is no idea what level of restriction you are applying," he wrote via email. That could limit adaptations and responses or cause injury.

"There are many cuffs on the market but my line in the sand is a pneumatic cuff that can be inflated either automatically or manually (like a blood pressure cuff)," Rolnick said. "Each of these types of cuffs can carefully measure the amount of blood is restricted to increase safety profile. This is very important because as BFR continues to grow, more cuffs are going to enter the marketplace that may not be adequate or appropriate."

Rolnick and Patterson advised anyone starting out with blood flow restriction to work and train with trusted practitioners to determine what cuffs would be consistent with your goals -- and to understand how and when to use this type of training. Otherwise, Rolnick added, you could be at higher risk of experiencing a negative outcome -- especially since an ordinary exercise band can't measure how much pressure you're applying.

You can expect burning sensations or soreness during or after the first couple of sessions, but these generally subside by the third session, said Hunter Bennett, a lecturer in exercise science at the University of South Australia, via email.

Once you inflate the cuff, you could practice blood flow restriction by alternating repetitions and rest while training your preferred muscle group, Bennett said.

The consensus among these experts is that using blood flow restriction two to four times a week is required for results to occur.