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How Blood Flow Restriction Exercises Are Helping Aaron Rodgers

Analysis by Dr. Joseph Mercola | December 04, 2023

STORY AT-A-GLANCE

- Jets quarterback Aaron Rodgers is using blood flow restriction to help him recover from a torn Achilles tendon
- BFR involves placing an inflatable band, similar to a blood pressure cuff, around your extremity while engaging in resistance training or exercise
- By partially restricting blood flow, BFR creates an anaerobic environment during exercise, which boosts the anabolic response, helping to stimulate growth and recovery
- What makes BFR unique is its ability to promote muscular development and healing without the need for heavy weights, making it ideal for those recovering from injury or older adults looking to build muscle
- With BFR, you can use zero to 30% of your single-rep max weight and still significantly enhance strength and muscle mass

As Jets quarterback Aaron Rodgers recovers from a torn Achilles tendon, he's shared some details about what his daily rehab entails. It includes blood flow restriction (BFR), which involves placing an inflatable band, similar to a blood pressure cuff, around your extremity while engaging in resistance training or exercise. This modifies arterial inflow and venous outflow.[1]

It typically takes three to four months for an Achilles tendon injury to heal,[2] along with additional rehab before the player can return to the sport. But BFR, which promotes

muscle gain and limits atrophy,[3] allows for a more aggressive rehabilitation plan that could prompt a quicker recovery.

Widely used in the military to help victims of blast-trauma heal, BFR has also gained popularity among elite athletes.[4] However, you can also harness the power of BFR at home, gaining strength and muscle using very light weights.

This makes it ideal for anyone with limited mobility or recovering from an injury as well as older adults looking to build and maintain strength without injury. Researchers explained in Frontiers in Physiology:[5]

> *"Performing exercise with reduced blood flow achieved by restriction of the vasculature proximal to the muscle dates back to Dr. Yoshiaki Sato in Japan, where it was known as "kaatsu training," meaning "training with added pressure." Kaatsu training is now performed all over the world and is more commonly referred to as 'BFR training' and achieved using a pneumatic tourniquet system."*

Why Is Aaron Rodgers Using Blood Flow Restriction?

Rodgers said he's using a "speed bridge" technique to heal his Achilles tendon.[6] It's designed to promote faster healing, with BFR part of that strategy. The first NFL player to use BFR was Houston Texans player Jadeveon Clowney, who had an injured knee. "Now every team utilizes it," ESPN reported.[7]

As explained in the Journal of Foot and Ankle Surgery, "BFR stimulates muscular strength and hypertrophy gains at much lower loads than traditional methods, allowing patients to begin the rehabilitation process much sooner."[8] Research supports the use of blood flow restriction therapy following Achilles tendon rupture and repair,[9] which often leads to loss of calf strength and girth.

By partially restricting blood flow, BFR creates an anaerobic environment during exercise, which boosts the anabolic response, helping to stimulate growth and recovery. According to a study published in Foot & Ankle Orthopaedics,[10] "BFR therapy can be

initiated shortly after surgery since it allows for significant muscle activation with limited load bearing."

The trial involved 43 patients with Achilles tendon rupture, who received either BFR or standard care, consisting of at-home exercises and in-person physical therapy.

After three months, the BFR group had greater absolute strength in the calf compared to the control group. "This indicates that, when used during rehabilitation following Achilles rupture, BFR therapy may increase the strength of the operative leg and may facilitate recovery and outcome," the researchers concluded.[11]

The Journal of Foot and Ankle Surgery[12] also included a report on two patients who successfully used BFR training to recover from Achilles tendon rupture. One, a 29-year-old soldier, was unable to walk without assistive devices even after the injury was repaired and he received rehab. A five-week "return to run" program involving BFR changed that:

> *"He experienced plantarflexion peak torque improvements of 522% and 108.9% and power gains of 4475% and 211% at 60°/s and 120°/s, respectively. He was able to ambulate without assistive devices at the 5-week follow-up examination."*

In the other example, a 38-year-old soldier ruptured his Achilles tendon while exercising and was suffering from strength and functional deficits. He improved dramatically following six weeks of BFR training, demonstrating its effectiveness:[13]

> *"He experienced plantarflexion strength improvements of 55.8% and 47.1% and power gains of 68.8% and 78.7% at 60°/s and 120°/s, respectively. He was able to return to running and sports on completion of 6 weeks of BFR-assisted therapy. Incorporating tourniquet-assisted blood flow restriction with rehabilitation programs can improve strength, endurance, and function after Achilles tendon rupture."*

How BFR Works

What makes BFR unique is its ability to promote muscular development and healing without the need for heavy weights.

While you may achieve similar gains with high-load resistance training to build muscle strength, low-load BFR with resistance training allows you to train more often with less stress to your joints, making it ideal for people who are injured, recovering from surgery or in cardiac rehabilitation, along with older individuals.[14] In fact, if you're an older adult, your muscle growth with BFR is beyond what strength training with heavy weights can do.

With BFR, you can use zero to 30% of your single-rep max weight and still significantly enhance strength and muscle mass, because you're essentially tricking your body into believing you're lifting a heavier weight than you actually are.

During BFR training, the slow twitch Type I muscle fibers become highly fatigued, necessitating the recruitment of fast twitch Type II muscle fibers as the exercise progresses, leading to both short and long-term benefits, including increased strength, muscle thickness and cardiovascular endurance, along with improved physiology of the cardiovascular system.[15] According to researchers with San Antonio Military Medical Center:[16]

> *"BFR represents a way to decrease stress placed on the joints without compromising improvements in strength, whereas for postoperative, injured, or load-compromised individuals BFR represents a way to accelerate recovery and prevent atrophy. There is also growing evidence to suggest that it augments cardiovascular fitness and attenuates pain.*
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> *… While much remains to be learned, it is clear that blood flow restriction therapy stimulates muscle hypertrophy via a synergistic response to metabolic stress and mechanical tension, with supplemental benefits on cardiovascular fitness and pain."*

Use of BFR during regular strength training, postoperative rehabilitation and to prevent atrophy have become increasingly common, but other modes are also being explored,

including the use of BFR with aerobic exercise, use of BFR without exercise and neuromuscular stimulation.[17] The exact mechanisms behind BFR's effectiveness are still being explored, but the researchers explained:[18]

> *"The physiologic adaptations noted during and after BFR also have been found to be mediated by several notable cell signaling pathways.*
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> *Stimulation of protein translation via the mechanistic target of rapamycin pathway, which is important in muscle protein synthesis and hypertrophy, appears to play a fundamental role in the effects of BFR, whereas myostatin, a negative regulator of muscle growth and promoter of muscle fibrosis, has been shown to be downregulated after BFR."*

While some early research suggested BFR might be associated with blood clots, the San Antonio Military Medical Center team noted, "There is no evidence to support an increased risk of thromboembolic events. In fact, the opposite may even be true, with BFR offering a protective effect against such events, given its stimulation of the fibrinolytic system."[19]

Why KAATSU May Lead to Even Greater Benefits

The original version of BFR was developed in Japan 50 years ago, where it's known as KAATSU. I first heard about it at a biohacking conference in 2017. So, I've been doing it for six years, and I believe it's one of the reasons why I, at age 69, recently beat 38-year-old Dr. Marcos de Andrade, an extreme fitness buff, at arm wrestling.

Unfortunately, most BFR taught in the U.S. is less than optimal. Hand grip strength — and by extension arm wrestling — is a barometer of your overall strength and metabolic health, and KAATSU, i.e., BFR done correctly, achieves both. The primary difference between generic BFR and KAATSU is the fact that KAATSU is far safer and causes less spastic muscles than forms of BFR that don't use cyclic compression.

The other is the equipment. The KAATSU device includes a compressor that inflates and deflates the cuffs that you strap onto your extremities, whereas generic BFR bands

provide constant pressure (and hence constant blood flow restriction).

The KAATSU bands inflate for 30 seconds and then deflate for five. They then inflate again at slightly higher pressure for 30 seconds and deflate for five. They do this for a cycle of eight repetitions. The intensity of the pressure can be modified as well.

Part of what makes KAATSU so effective, especially in terms of creating beneficial metabolic byproducts, is the intermittent pressure. The constant BFR pressure does result in muscle growth, but it's not nearly as beneficial as KAATSU, which is why I now recommend investing in a KAATSU machine if you're going to get serious about it. Basically, you simply wear these bands, either on your arms or legs (not both at the same time), while you're doing some type of resistance training.

How to Do KAATSU

The video at the top of this article explains in more detail how KAATSU is performed, and how it helps you maintain muscle mass as you age. With KAATSU (or BFR), you need only about 30% of your one-rep max weight (the amount of weight you can lift one time), so your risk of injury is massively decreased. As a result, you can also work out far more frequently.

Now, the price you pay for that lower weight is an increased number of reps. So instead of doing 10 to 12 reps per set, you're doing 30 for the first set, followed by a 10-second rest period. For the second set, do 20 reps, rest for another 10 seconds, and for the third set, do 10 reps. Ideally you want to get to the point where you're close to failure by the end of the third set.

Basically, the blood flow restriction tricks your body into thinking you're lifting a much heavier weight. I've gained about 20 pounds of muscle mass in the last six years. That typically doesn't happen once you're in your 60s, but it goes to show you that you can optimize your health and build muscle, regardless of your age. Diet, including eating foods that **minimize reductive stress on your mitochondria**, is also important, particularly combined with exercise like BFR.

If you are interested in purchasing KAATSU, use the link below to grab a 10% discount. The new C-4 model came out in the fall and has a bigger battery and some marginal functional improvements over the older C3 model. The regular price of the C-4 is $1199.95, but with your discount it is $1079.95. The C-3 and the C-4 have no significant EMF, which is why I strongly recommend these over any of their Bluetooth models.

Order C4

Sources and References

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