

The Triple Stick Strap

By Tom Michaud, D.C.

This unique strap allows you to build muscle and increase aerobic fitness while performing light-resistance exercises. Perfect for accelerating recovery following muscle strains and ideal for managing kneecap tracking disorders.

Preserving muscle mass as you age is important not just for improving athletic performance, but also for decreasing the chances you'll be disabled when you get older. Several studies have shown that people who are weak in their 30s are much more likely to be disabled in their 70s (1,2). Muscle mass also plays a key role in keeping our joints healthy as people with weak muscles develop osteoarthritis at an accelerated rate (3). Additionally, because muscles store glucose and metabolize fatty acids, the amount of muscle mass you have protects against a range of metabolic disorders, including diabetes and heart disease. All of these factors explain why people who keep their muscle mass as they age tend to live longer and have a better quality of life (4).

Unfortunately, maintaining muscle mass isn't easy. Starting when you're around 35 years old, you start losing about 1% of your body's muscle mass each year. The rate of muscle loss really accelerates when you hit 50, with nearly 2% reductions in muscle volume each year. According to the American College of Sports Medicine, the only way to keep muscle mass on when we age is by doing 3 sets of 10 repetitions using heavy weights (pushing yourself to near full effort with each set). The belief is that lifting heavy weights forces you to recruit a larger percentage of your available muscle fibers, which in turn respond by increasing in size.

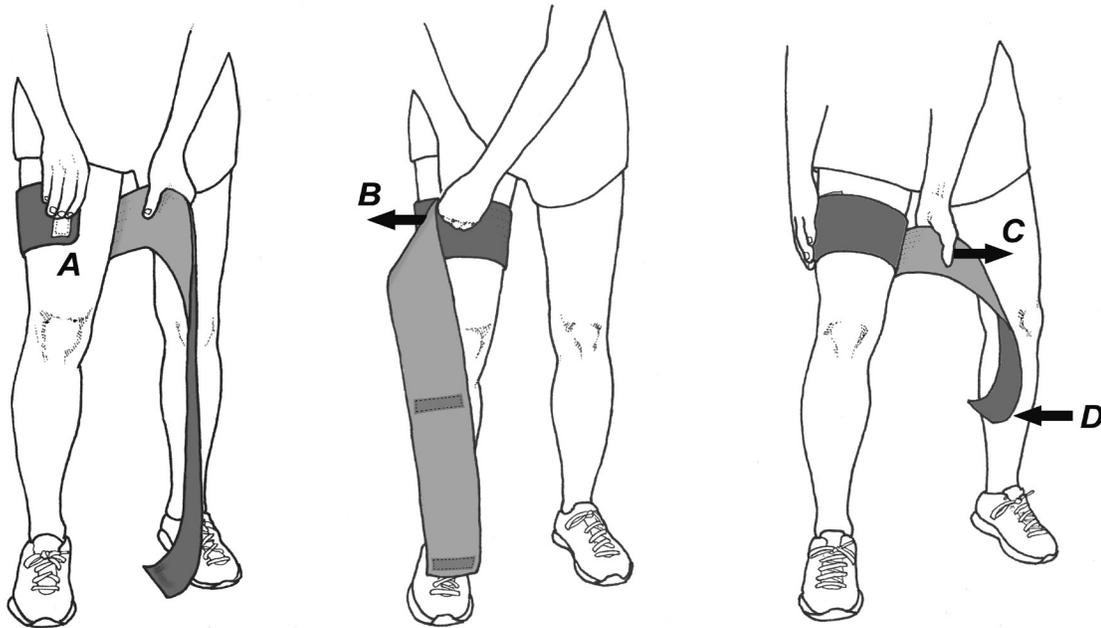


Fig. 1. The Triple Stick Strap. Place the strap along the center of your thigh with the white Velcro pointing out (**A**). Use opposite hand to wrap the strap firmly against your thigh, stretching the band before attaching the other two pieces of black Velcro (**arrows B, C, and D**). At first, place only mild tension on the strap and gradually increase tension as you get accustomed to the feeling of compression. At all times, tension on the strap should be firm but comfortable. Immediately remove the strap if you feel pain, discomfort, and/or swelling.

The problem with using heavy weights is that they're dangerous, especially as you get older. Because tendons weaken with age, heavy weight lifting is notorious for producing tendon injuries that can take months to recover from. Vigorous weight training also produces significant spikes in blood pressure, which most seniors should avoid. People with arthritis are especially prone to injury while lifting heavy weights, as their joints are almost always too weak to tolerate the heavier loads. One review of the literature found that people over 60 were 10 times more likely to be injured while exercising than their younger peers (5). Lastly, once injured, even young athletes are likely to be hurt while lifting heavy weights because strained muscles are more likely to tear with anything but light resistance. This is especially true for adductor and hamstring strains.

Fortunately, new research shows it is possible to build muscle by wearing compressive straps while performing easy exercises. Known as blood flow restriction training (BFR), this technique involves placing a compressive strap around the thigh with enough tension to slightly reduce circulation. It is theorized that because the straps decrease blood flow to the muscle, waste products such as lactic and pyruvic acid build up inside the muscle, creating the acidic environment necessary for the production of growth hormone. While early studies on BFR training suggested it was necessary to completely block blood flow (which besides being uncomfortable was also potentially dangerous), newer research shows that even slight reductions in muscle circulation can increase muscle mass (6). Even more surprising, wearing compressive straps while exercising at light intensities was recently proven to produce similar increases in aerobic capacity as more intense workouts (7). In their 2018 paper published in *Medicine and Science in Sports and Exercise*, researchers from Brazil assigned 30 young males to 1 of 3 exercise protocols. The first group was asked to do 4 sets of 10 repetitions using heavy weights. The second group was asked to perform moderate to high intensity endurance training by cycling at 70% full effort for 30 minutes. The last group was told to ride a bicycle for 30 minutes at about 40% full effort while wearing a blood flow restriction strap. The strap was wrapped around the upper thigh with a comfortable force that was the equivalent of a blood pressure cuff being inflated to 95 mmHg; i.e., the equivalent of a firm handshake. All of the subjects performed their specific exercises 4 times per week. Throughout the study, researchers measured strength and the cross-sectional area of the quadriceps muscle. They also took muscle biopsies at the start and end of the study to evaluate a wide range of cellular markers associated with aerobic fitness, such as VO2 max and vascular endothelial growth factors.

At the end of the 8-week training session, researchers were surprised to see that the subjects who wore compressive straps while riding a bicycle at a comfortable pace had measurable increases in muscle mass, while also showing substantial improvement in aerobic fitness despite the light effort. The blood flow restriction group increased muscle mass nearly 11%, while the subjects in the heavy resistance group increased muscle 12.5% (hardly worth the added effort). Moreover, the subjects in the light exercise group also improved aerobic capacity by 11%, which is a considerable improvement given the reduced total workload associated with exercising at such a low intensity. The authors relate the improved aerobic capacity to the fact that blood flow restriction straps increase the release of vascular endothelial growth factors, which promote the formation of capillaries thereby improving aerobic fitness.

The findings of this paper are important as they shed new insight into the molecular mechanisms associated with blood flow restriction training. This research proves it is possible to increase both muscle mass and aerobic fitness while exercising for brief periods of time at a comfortable pace. A similar study from Japan found that wearing compressive straps around the thighs while walking produced substantial increases in quad muscle volume in just 10 weeks (8).

Since the latest research shows vigorous compression of a muscle is not necessary to get excellent results, and because high pressure may increase the risk of dangerous blood clots (especially in postsurgical patients), it is

important to compress the muscle with the least pressure capable of producing positive results. Although large-scale studies have shown that even forceful muscle compression while exercising is safe for the general population, it makes sense that if you can get the same increases in strength and aerobic capacity with light pressure, then only light pressure should be utilized.

The *Triple Stick Strap* (Fig. 1) was specifically designed to create the lowest level of muscle compression proven to accelerate muscle remodeling: approximately 50 mmHg as measured with a blood pressure cuff (6). This is about one third the pressure used in the original studies on blood flow restriction. As mentioned, this level of compression feels similar to the pressure associated with a firm but comfortable handshake. The Velcro locking points allow you to easily increase or decrease muscle compression while exercising, and the soft edges make the strap comfortable enough to wear while performing your workouts. To get accustomed to the strap, adjust the tension to the point of mild compression and perform an easy workout. Over time, you can gradually increase compression, always staying within a comfortable zone.

Because you can build muscle with even light resistance, the *Triple Stick Strap* is perfect for people with knee arthritis, as they can significantly increase muscle mass while lifting light weights through a smaller range of motion (9). The triple stick strap is also great for managing muscle strains. Laboratory studies show that even badly strained muscles can be exercised with light resistance without worsening the muscle tear (10). In my experience, recovery rates for adductor and hamstring injuries can be cut in half by using the *Triple Stick Strap*. The *Triple Stick Strap* is especially helpful for managing kneecap tracking disorders. By firmly compressing the quad muscle, the strap prevents the kneecap from shifting as the thigh rotates while exercising (Fig. 2). An additional benefit of wearing the strap for kneecap disorders is that by slightly reducing blood flow to the thigh while exercising, you can increase the size and strength of the quad muscle with minimal effort.

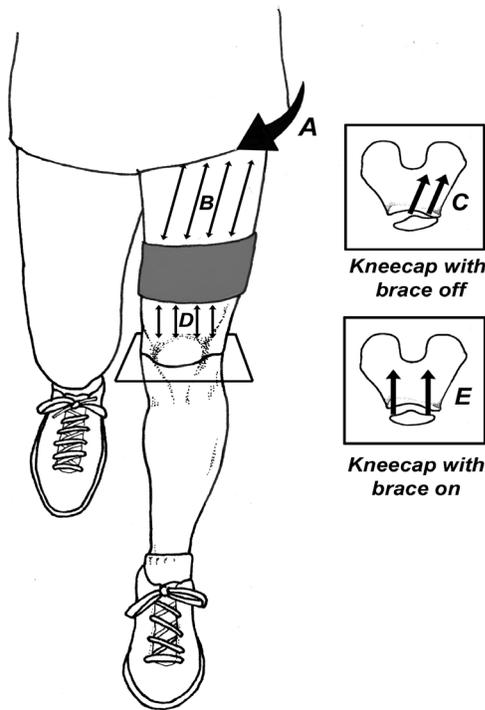


Fig. 2. Managing patellofemoral pain with the *Triple Stick Strap*. Excessive inward rotation of the thigh while running (A) causes the quadriceps muscle to pull the kneecap sideward (B and C). Placing the *Triple Stick Strap* securely above the kneecap compresses the quadriceps muscle, allowing for improved alignment of the kneecap (D and E).

Whether your goal is to accelerate recovery, improve patellar tracking, or increase muscle mass and aerobic capacity, the *Triple Stick Strap* can be a great addition to your exercise routine. As mentioned, even though wearing compressive straps while exercising has been proven to be safe and effective for almost everyone, people who have recently had surgery, especially joint replacements, should consult with their doctor prior to wearing any compressive strap. This is also true for people with a history of clotting disorders and/or people with symptoms such as unexplained swelling, pain, soreness and/or discolored skin. In their 2019 paper evaluating the risk/rewards associated with blood flow restriction training, Bond et al. (11) claim that while the collective literature indicates that blood flow restriction training poses little risk of directly causing injury (even at high strap pressures), the ideal candidate for this type of training is an active person who exercises regularly, but has difficulty with high intensity workouts. This is especially true for people over 60, who would like to avoid the proven risks associated with heavy resistance exercises (5).

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