

What Serious Athletes *Must Know About Step-ups*

By Charles Poliquin

There seems to be an unwritten code among bodybuilding magazine editors to publish at least one article a year that states in the opening paragraph: “The squat is the king of all exercises!” This introduction is usually followed by several sentences mocking anyone who does not squat. Here’s an example:

“The squat is the king of all exercises! Seriously, if you don’t have the squat in your program, you don’t have a program. Leg presses are a fine auxiliary exercise, and they can be used as a temporary substitute for squats if you are having serious back pain or some other medical condition that prevents you from squatting but note the use of the word ‘temporary.’ And don’t get me started on leg extensions – these are just silly, worthless movements that only serve to identify the user as a pencil-neck geek!”

OK, relax. I’m not going to tell you to stop squatting and just do so-called Bulgarian lunges, although that seemed to be the intent of one popular “functional” strength coach. But I would like to go beyond a simplistic approach to training that says that the most effective program for any trainee, regardless of their physical or athletic fitness goals, should always begin with full squats and that trainees must perform squats in every training phase. That’s not realistic.

The KISS principle of “Keep It Simple, Stupid” is often a good one, but such a dogmatic approach to training is, well, rather stupid. And with that warning, let’s look at one lower body exercise that I commonly prescribe to my clients to complement squats, and sometimes act as a substitute for them. It’s a class of exercises called step-ups.

Beyond Aerobics

Gin Miller is credited with creating step training in 1989, a choreographed aerobic training program that incorporates the use of low step platforms. Step training became so popular that the exercise is often associated with aerobic fitness and so-called muscle toning. But the truth is that step ups, and their many variations, are a versatile lower-body exercise that can be used for rehabilitation, structural balance, body composition training and high-performance athletic fitness.

Cross training refers to the concept that because individual sports each focus on certain muscles more than on others, an athlete can achieve balanced muscle development and thereby help avoid injuries, especially overuse injuries, by varying the sports they play. As such, a distance runner could swim in the off-season to develop their upper body, and a golfer might play tennis to balance out the muscles in their back and abdominals. But the issue with most athletes is that regardless of the sports played, the lower body muscles generally do not receive a lot of work throughout a full range of motion and this creates muscle imbalances. Consequently, step-ups have always been a part of my structural balance programs.

To recap, structural balance refers to the major muscles of the body being in balance with each other. This means balance between opposing muscle pairs (such as the biceps and triceps for the arms, and quadriceps and hamstrings for the legs) and also between the limbs (such as the right leg and the left leg). So, it's not enough just to have the proper strength ratio between the hamstrings and quadriceps, for example, but the strength of the quadriceps and hamstrings on the right leg should be equal to the strength of those muscles on the left leg.

One example of the consequences of structural imbalance can be seen in the increasing number of knee injuries among female athletes. The American Orthopedic Society for Sports Medicine reports that each year more than 20,000 high school female athletes suffer serious knee injuries, usually involving the anterior cruciate ligament (ACL). Developing structural balance in all the muscles that affect the knee is one important step to dealing with this problem. However, the concept of structural balance extends beyond injury prevention; it can also help with knee rehabilitation.

In the late 80s, I was hired to train the Canadian National Women's Volleyball team. At the time, all these athletes were suffering, in varying degrees, from patellar tendonitis (jumper's knee), which is a chronic swelling of the tendon that connects the kneecap to the lower-leg bone. This type of injury is often caused by a relative weakness in the vastus medialis oblique (VMO), a quadriceps muscle that crosses the knee joint and thus is an important muscle for maintaining knee stability.

If the VMO is weaker than the muscles on the other side of the leg, particularly the vastus lateralis (which pulls the knee in the opposite direction as the VMO), this imbalance can cause an unnatural tracking of the kneecap. When you see an

athlete's knees collapse inward when running or when landing a jump, this is often a case of weak VMOs. Trying to correct this problem initially with full squats may not be wise, as the altered biomechanics of the knee could worsen the condition.

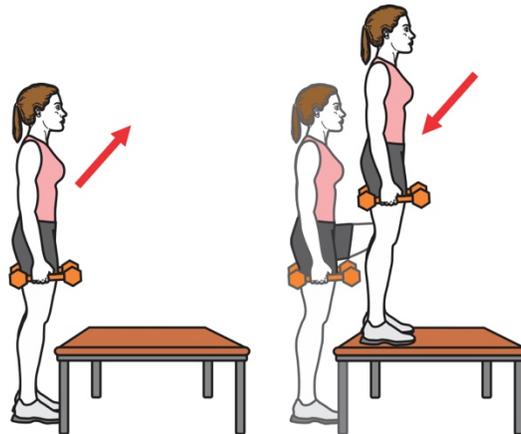


The vastus medialis oblique is a teardrop-shaped quadriceps muscle that crosses the knee. (Miloš Šarčev photo)

The approach I used with these volleyball players was to prescribe a program that included step-ups, especially a specific exercise called the Petersen step-up, which emphasizes the VMO because it begins with the heel elevated (plantar flexion), performed at progressively higher elevations. Eventually the step-ups enabled these athletes to progress into squats. Within two months only one member of the team still had patellar tendonitis, but I believe it was because she was not very faithful to the workout.

The progression of step-ups I use now in my training, consists of the Poliquin step-

up, Petersen step-up, step-up and side step-up. And the progression of implements used to add resistance is dumbbell, barbell on back, barbell on front. From there, I move into split squats, lunges, and then squats. From a periodization perspective, this progression would best be applied at the end of a sports season, when structural imbalances are usually at their worst.



Step-up with Dumbbells (Drawing by Sylvain Lemaire, Hexfit.com)

Step-ups with weights are an exercise that has been heavily promoted by Angel Spassov, who was a strength coach in Bulgaria. However, former Bulgarian national team head coach Ivan Abadjiev says that this exercise was not used by any member of the national teams he coached. That being said, it was reported that Russian weightlifter Leonid Taranenko, who still holds the record for the all-time best clean and jerk with a lift of 266 kilos (586.4 pounds), performed high step-ups when he felt his lower back was excessively fatigued from squats. This makes sense.

Compared to the body position in squats, during step-ups the torso is more perpendicular to the floor, requiring less work from the erector spinae muscles that help extend the spine. Performing step-ups with a barbell on his shoulders, Taranenko reportedly lifted as much as 180 kilos (396 pounds). However, I recommend that anyone who performs this exercise with heavy weights should have at least one rear spotter (but preferably one rear spotter and two side spotters). What spotters must know is that lateral stability is compromised on this exercise, so they must be aware of tilting. And for maximum safety, trainees should perform heavy step-ups inside a power rack, with the safety rods set at an appropriate height so that in case of a miss, the barbell doesn't drop more than a few inches.

Regarding teaching tips, the important point is that the top leg does all the work.

One of my colleagues had a female figure skater of 52 kilos (115 pounds) who could perform 115.7 kilos (255 pounds) in a step-up with the front leg parallel to the ground. But the catch is she was pushing off with the back leg – an impressive lift, but it’s not what we’re looking for. Next, the rear leg must be kept straight (of course, it will be flexed slightly when landing), and the toes of the bottom leg will lift (dorsi flex) to help prevent the trainee from pushing off. The top leg is turned out five degrees, which is anatomically more in line with how the upper thigh bone inserts into the pelvis.

With few exceptions, I’ve found that among the elite athletes I work with, one leg is often significantly stronger than the other. I’ve found that starting these athletes with a cycle of single-leg exercises results in greater long-term progress in the squat than if they performed only squats. One variety of step-ups I often use with athletes is the side step-up.

The start position of the side step-up is with the body sideways to the platform, with the leg closest to the platform resting on the platform. Again, the athlete steps up until the working leg is straight. The side step-up places more emphasis on the vastus lateralis and also on the inner thigh muscle groups called the adductors, which are important for athletes, as they help stabilize the leg during movement.

There are many other useful varieties of step-ups. Additionally, there are adjustable step-up platforms that help the user perform these exercises conventionally and safely. But be aware not all platforms are equal in terms of safety: A lawsuit was filed against a D1 college when a female athlete suffered a serious injury when performing barbell step-ups on a technique platform attached to a power rack. This platform had a V-shape that did not provide optimal support for the foot, and in fact this platform was not designed for this purpose.

In contrast, the Atlantis Leg Platform, which I helped design, is adjustable in one-inch increments, from seven inches to 31 inches. It has a nonslip platform, and a handle is positioned at the front of the unit to enable the upper body to assist with the concentric portion of the exercise, making it invaluable for rehabilitation. Although it weighs a sturdy 100 pounds, it includes wheels for easy mobility. I consider the Atlantis Leg Platform a must for any gym.

Again, the squat is still the king of all exercises, but the versatility of the step-up makes it a key exercise in any physical and athletic fitness training program.

