

Beyond Aerobics: Another Look at Step-ups and Lunges

A new perspective on exercises that can make a difference in athletic performance

Photos by Steve Kinslow



BY **KIM GOSS**

Ever since Gin Miller created step aerobics, step-ups and lunges have been associated with aerobic fitness and general lower-body toning exercises for women. Perhaps this connection reflected negatively on the value of these exercises for athletes, because it's rare to see them used in strength and conditioning programs at any level. And this is a shame.

Although the squat is unparalleled for developing muscle mass and strength, lunges and step-ups can also be valuable in the rehabilitation and prevention of injuries. They can also help build muscle mass, improve flexibility and provide variation that ensures continual progress. They can also improve sports performance.

Single-limb training, also known as unilateral training, is important for sports, as it helps ensure that athletes are physically balanced and as such don't have to compromise their game. For example, tennis players who have muscle imbalances will often develop weaknesses

in their game their that opponents can exploit. Prior to accepting his current position as a tennis coach at the University of Utah, Roeland Brateanu was a BFS clinician. Brateanu says that two of the greatest tennis players of the modern era are Justin Henin-Hardenne and Andre Agassi. “Their games had no major weaknesses, and as a result they could win on any surface. Agassi’s wife, Steffi Graf, was a great champion but had a weak backhand – that may not have been an obstacle when she played because of the level of competition, but to excel in today’s game at the highest levels you need to be strong in all areas.”

If there is a question of balance in your training, it might be prudent to include lunges and step-ups in your training. Let’s look at a few effective variations of each.

Lunges: Facts and Fallacies

When you think of lunges, you may visualize just one type – the forward lunge with a barbell or dumbbell. Although it’s a good exercise, often athletes find

this exercise unnatural. According to Canadian strength coach and Posturologist Paul Gagné, the problem

is that with the forward lunge, your base of support shifts forward as you take a step. “If you do not have good

lower-body stability, especially in the feet and ankles, the knees will not stay aligned with the feet [remember the BFS Absolutes of *knees aligned* and *toes aligned*]. The outcome is stress that can result in injuries, especially overuse injuries such as tendonitis. Further, those individuals with lower-body instability will be forced to use especially light weights, reducing the training effect.”

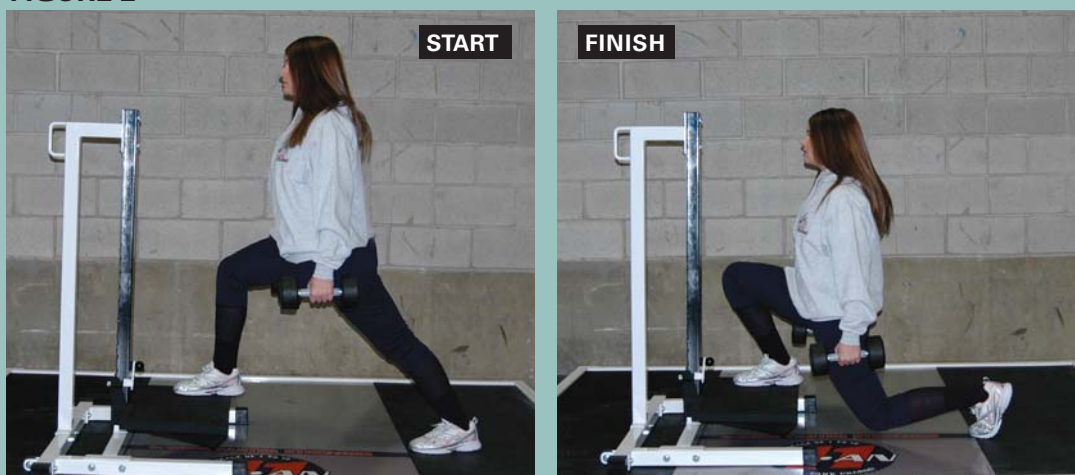
One solution is to lunge onto a low platform (Figure 1), about six inches high for most individuals. Lunging onto a platform requires less ankle stability than a lunge performed on the floor, as there is more weight on the back leg; also, balance is better because this variation entails a shorter range of motion than a lunge performed on the floor. Although stepping forward onto a platform resolves several problems, there is still the issue of balance, as the impact from landing creates instability that forces the athlete to use lighter weights. Gagné says

FIGURE 1



The Forward Lunge to Step is a variation of the Dumbbell Lunge, a BFS standard auxiliary exercise. Because the front leg is elevated, there is less weight on the front leg, making it easier to maintain balance and proper knee alignment.

FIGURE 2



Rather than stepping forward, you can keep the front leg on the step and just straighten the front leg. This variation provides greater stability, thus allowing you to use more weight.

this problem can be resolved by performing a variation of the lunge called the stationary lunge, or split squat.

Rather than stepping forward onto the platform, you keep the foot in contact with the platform for the entire sequence of reps for each set (Figure 2). The base of support isn't shifted forward and there is no impact, and the result is that the athlete can use much heavier weights and most likely impose far less adverse stress on the ankles and knees. When using this type of lunge, Gagné says, you can increase the stress on the upper portion of the quadriceps by using a shorter stride, whereas a longer stride will be felt more in the hamstrings and the lower portion of the quads.

Another variation of the stationary lunge that also affords considerable stability is the stationary lunge performed with the back foot on the platform (Figure 3). This variation was heavily promoted by Bulgarian weightlifting coach Angel Spassov, now a strength coach at the University of Texas, and it is often referred to as a *Bulgarian*

lunge. This position puts greater stress on the quadriceps because there is more weight on the front leg.

FIGURE 3



Performing a stationary lunge with the rear foot resting on a low step increases the stress on the front leg.

Finally, there is one interesting variation of the lunge called the drop lunge that involves a plyometric component (Figure 4). Gagné showed this to me when I trained figure skaters in Dallas, and it was great for improving the ability of skaters to “stick” their landings. Likewise, gymnasts would benefit, and Gagné says it has been a valuable exercise for hockey players. Essentially, you stand on a low platform and then step forward; as you land, you try to stabilize the knee over the long toe. An advanced variation is to land, and then vigorously straighten the leg to return to the start.

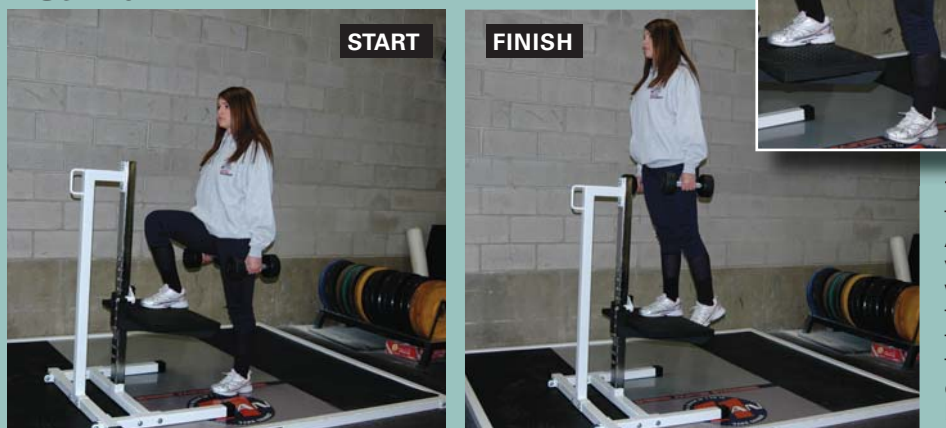
The Next Level in Step-ups

Step-ups with weights are an exercise also heavily promoted by Angel Spassov, and it was reported that Russian weightlifter Leonid Taranenko did high step-ups when he felt his lower back was overworked from the Olympic lifts and squats. This is because during step-ups the torso is perpendicular to the floor, requiring less work from

FIGURE 4



The Drop Lunge is a type of plyometric exercise in which you perform a forward lunge off a low step. At first you just work on landing with your leg in perfect alignment with your knee; then you would lunge forward and then immediately return

FIGURE 5

The Front Step-up works the leg throughout a full range of motion. As your knee stability improves, you want to perform the exercise with the front thigh parallel to the floor. To increase the work on the front leg, simply lift the toes of the trailing leg (as in small photo). BFS does not recommend performing barbell step-ups on our equipment.

the strong extensor muscles of the lower back such as the erector spinae. Incidentally, in 1988 Taranenko clean and jerked 586.4 pounds (266 kilos), a world record that has yet to be exceeded.

It should be noted that Taranenko would use a barbell and up to 396 pounds for three reps on step-ups, so it's obvious that heavy weights can be used in this exercise. However, to do this safely an athlete should perform it inside a power rack, with the safety pins set at appropriate height, and with three spotters. The rear spotter is especially important, as often the lateral stability is compromised on this exercise. Because of the risk involved, BFS does not recommend barbell step-ups – in fact a lawsuit was filed recently in Georgia when a female athlete suffered a serious injury when performing barbell step-ups without a spotter.

A better use for step-ups is in the area of knee rehabilitation, especially to achieve what accomplished strength coach Charles Poliquin calls *structural balance*, which refers to

FIGURE 6

This variation of the step-up works the inner thigh muscles (adductors) and the side quadriceps muscle called the vastus lateralis.

muscles 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). This means it's not enough just to have the proper strength ratio between the hamstrings and quadriceps, but that strength of the quadriceps and hamstrings on the right leg should be equal to the strength of those muscles on the left leg.

One great example of how the step-up can help with rehabilitation through structural balance occurred about 20 years ago when Poliquin trained the Canadian National Women's Volleyball team. At the time, all their athletes were suffering from overuse injuries such as jumper's knee, a type of injury that Poliquin believes was primarily caused by weakness in the vastus medialis, a quadriceps muscle that crosses the knee joint and thus is strongly involved in knee stability. Performing a program that included step-ups performed at progressively higher heights

resolved all but one of the athletes' knee problems within about two months.

Beyond rehabilitation, Poliquin found that many of the elite athletes he works with often have one leg significantly stronger than the other. He found that starting these athletes with a cycle of single-leg exercises results in greater long-term progress in the squat than if they only performed squats. Gagné agrees and says that one of his colleagues has conducted research on over 150 athletes that confirms that strength developed from single-leg exercises has a direct transfer to strength development on two legs.

There are two basic types of step-ups: the *front step-up* (Figure 5) and the *side step-up* (Figure 6). The front step-up is performed with one leg resting on the platform at all times; the athlete straightens their leg until the working leg is straight. The side step-up is performed by turning sideways to the platform, with the leg closest to the platform on the platform. Again, the athlete steps up until the working leg is straight. According to Gagné, the front step-up focuses on the front quadriceps muscle called the rectus femoris, and the side step-up focuses both on the side quadriceps muscle called the vastus lateralis and on the inner thigh muscles called the adductors (which act to stabilize the leg during the exercise). Gagné says you can increase the stress on the vastus lateralis by lifting the big toe of the working leg, and you can increase the stress on the vastus medialis by pressing down with the big toe and lifting

the small ones (in effect, creating a flat foot).

How do you determine the appropriate height of the step? A simple guideline is to have your upper thigh at least parallel to the floor. But if you can't keep the front knee aligned with the longest toe throughout the exercise, then you must use a lower height



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until stability improves. Another important performance point, notes Poliquin, is to lift the toes of the trailing leg as you perform the exercise. This will prevent you from pushing off with the rear leg and therefore will increase the stress on the working leg. Also, you will not be able to use as much weight. Further, when performing step-ups it is not necessary to step up on the platform; simply straighten your front leg and then return to the start – this reduces the pause at the top so your muscles work harder.

There are many other varieties of lunges and step-ups that will be discussed in future issues. But at this point it should be mentioned that BFS has introduced a new product to help perform these exercises conventionally and safely. It's called the BFS Adjustable Step.

The BFS Adjustable Step is adjustable in one-inch increments, from six inches to 26 inches, and there is a locking mechanism that runs along a chrome slide to ensure the platform is rigid. The step is lightweight, easy to adjust, and has a large 14.5" by 26.5" diamond-thread step area; its design allows for a large open area in front to exercise. The unit also has wheels so that when it is tilted, it can be easily moved.

Not to bad-mouth aerobics, but step-ups and lunges belong in the exercise toolbox of every serious strength coach and rehabilitation specialist. They will improve athletes' performance and lessen the chance of injury. It's simply a question of balance. **BFS**

"The dumbbell lunge has always been a standard auxiliary exercise in the BFS program, and this article provided some interesting variations. Great job!"

— Bob Rowbotham