BIGGER FASTER STRONGER

POSITION PAPER • Plyometrics

Practical guidelines on how to implement this valuable training method

Plyometrics can have great value in improving speed, jumping ability and overall explosiveness. Athletes who work hard in the weightroom but neglect all other forms of training, especially plyometrics, will not reach their potential. A major problem is that many coaches often underestimate the intensity of plyometrics and prescribe workouts that can lead to injury.

The exercise scientist regarded as the father of modern-day plyometrics is Professor Yuri Verkhoshansky, a brilliant Russian scientist who pioneered this type of training as a means of sports training to improve athletic performance. Verkhoshansky spent several years researching plyometrics as part of his postdoctoral work and published his first research study in 1964.

Verkhoshansky shared a considerable amount of his findings in plyometrics with Dr. Mel Siff, a sports scientist from South Africa with an extensive background in biomechanics and exercise physiology. According to the late Dr. Siff, the most effective type of plyometrics is what Verkhoshansky calls the shock training method (which is also referred to as classical plyometrics). Siff said that shock training "is a method of mechanical shock stimulation that forces the muscles to produce as much tension as rapidly as possible. It is characterized by an intense muscular contraction that is preceded by a relaxed state."

Stepping off a box (not jumping, as the thigh muscles must be relaxed during the fall) and immediately rebounding upward upon landing is considered an example of a shock training exercise for the lower body. Performing Marine Corps push-ups where you clap your hands, land and then immediately perform another repetition is an example of shock training for the upper body.

One of the characteristics of shock training is a brief transition phase, which is the pause that occurs immediately after the eccentric phase ends and before the concentric phase begins. Such dynamic activity is required to take advantage of two processes: 1) the reflex increase in muscle tension caused by the sudden impact stimulus, and 2) the release of elastic energy stored in the tendons and muscles developed during the eccentric phase—energy that can be refocused to help an athlete jump higher and farther and run faster.

As illustrated in Figure 1, a delay as long as .25 seconds would prevent the athlete from being able to use that stored elastic energy, and the activity would have to be regarded as low- or medium-level plyometrics. Says Siff, "A useful visualization of shock training is to imagine that the surface being touched by the hands or feet during the plyometric contact phase is red-hot, so that any prolonged contact would be dangerous." Verkhoshansky's research has revealed that shock training is the most effective type of plyometrics. Just how effective?

In one 12-week study Verkhoshansky divided track and field athletes into two groups. The first group performed 1,472 low-and medium-level plyometric activities, including squats. The other group performed 475 jumps using the shock training method. Although the shock training group performed a third less work, these athletes showed greater improvement in reactive ability than the group using traditional methods. The intensity of plyometric training explains why the BFS box plyometric program is so effective even though it takes only 10 minutes twice a week.

Considerable peer-reviewed research outside Russia is also available to prove that plyometrics work best when combined with strength training. For example, in a paper published in the Journal of Applied Sports Science Research in 1992, researchers conducted a six-week study on the effects of squatting and plyometrics on the vertical jump. The group that performed just the squat increased their vertical jump 1.3 inches, a significant improvement for six

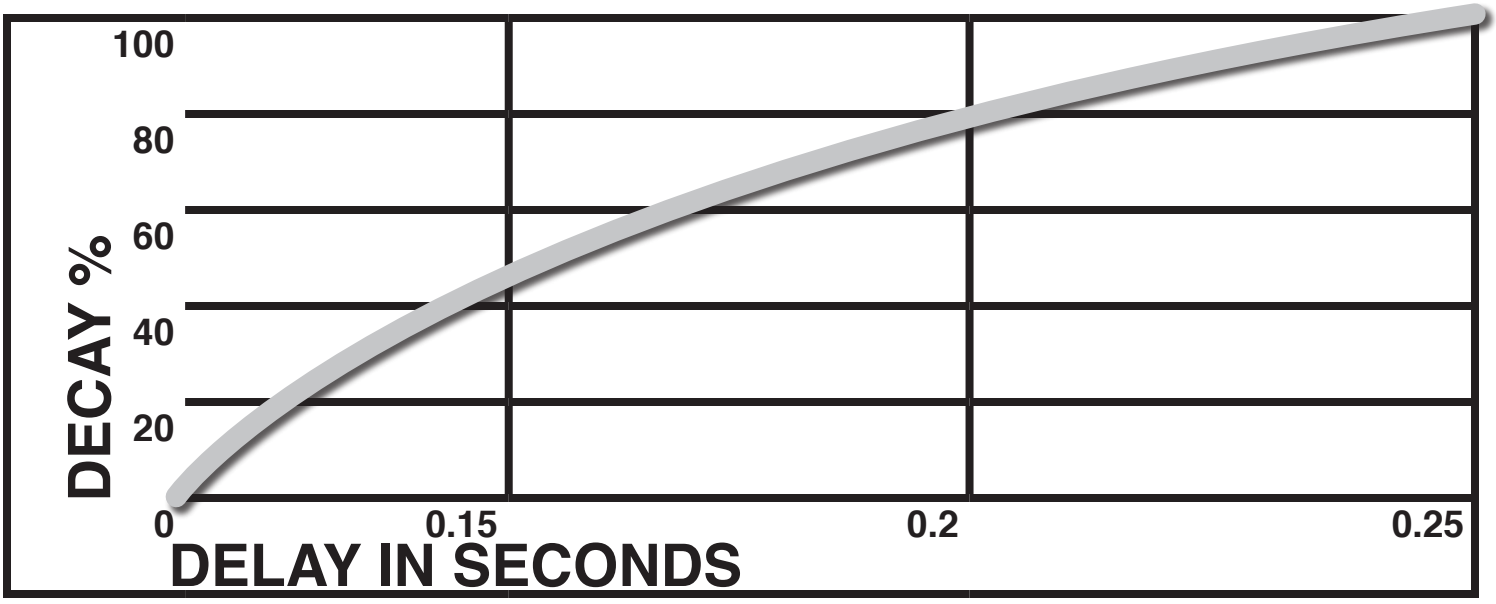

FIGURE 1. A delay as long as just .25 seconds prevents the athlete from being able to use stored elastic energy, and the activity would have to be regarded as preparatory plyometrics.

weeks. When plyometrics was combined with squatting, however, the increase was 4.2 inches! With scientifically documented improvements of that magnitude, you can see why plyometrics is an integral part of the BFS program.

Safe, Practical Applications of Plyometric Training

Plyometrics is a powerful tool for athletic training, but because it places such high levels of stress on the nervous system and on the joints, it must be approached with caution. This entails first developing a strength base with BFS core lifts and at the same time perfecting the technique of box jumping with lower boxes that we call readiness plyo boxes. This type of training may be classified as preparatory plyometrics because it does not produce a high level of muscle tension but helps condition the body and nervous system for more intense forms of plyometrics. Thus, the squat could be considered a form of preparatory plyometrics because, although it involves a stretching and shortening of the quadriceps muscles, the speed component is relatively small, as is the stress on the joints.

Next, it's important not to perform plyometric box jumping on surfaces that are too soft, as this would interfere with the release of stored energy and diminish the intensity of the reflex stimulation of the muscles. Further, to help ensure the safety of the athlete, it is important to use solid boxes with a non-slip surface and a base wider than the top for maximum stability as shown in Figure 2, rather than the example shown in Figure 3 in order to prevent injury. Also, as the athlete progresses, he or she will need to use higher boxes.

Coaches looking to improve the explosive power and jumping ability of their athletes should consider investing in some plyometric boxes and reading all the material available from BFS on the subject. When plyometrics is used correctly and consistently, it is an extremely effective training method. And couldn't your athletes use an edge?

Various heights of plyometric boxes enable athletes of all abilities to perform safe and effective plyometric exercises. With solid boxes, the feet safely slide down the box if the athlete misses, whereas with open boxes the feet can get trapped in an open plyometric box.