



Austin John Ryf is the 2010 BFS Male Athlete of the Year. He is a graduate of Winneconne High School in Winneconne, Wisconsin. In these photos Ryf shows how vertical jumping ability is an essential athletic quality in both basketball and football.

as a method to improve athletic performance. His first book on the subject, published in 1964, includes work so groundbreaking and influential on athletic training that Verkhoshansky is referred to as “The Father of Plyometrics.”

Prior to focusing his career on research, Verkhoshansky was a track coach who specialized in the jumps. In the winter it was too cold for his athletes to train outdoors, so he used weight training in an attempt to duplicate the stress that occurs in the jumping events. Such stress is considerable; for example, during the takeoff for certain jumping events it was found that the force could reach up to 600 pounds. Verkhoshansky tried having his jumpers perform exercises such as quarter squats with maximal weights, but he abandoned that approach because it produced lower back issues in his athletes.

Verkhoshansky found that he could use box jumping to simulate the stress on the legs without overloading the spine. He called this method of training *plyometrics*. According to the late Dr. Mel Siff, who worked with Verkhoshansky, when the feet land during a box jump this creates a “mechanical shock stimulation” that enables the muscles to create maximum muscle tension as rapidly as possible.

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

Box Jumping: *Do It Right!*

How to make the most of this effective training method to improve speed, power and jumping ability

The 40-yard dash and the 100-meter sprint are considered standard indicators of running speed, but even those distances are up for debate. Many coaches believe a distance of 20 yards or even 10 yards might be more sport specific. There is little debate, however, about the standard measurement for jumping ability: the standing vertical jump.

Whether it is performed by hitting plastic tabs on a pole or using a more sophisticated force platform or the laser tracking OptoJump™, the standing vertical jump is a simple test of this basic athletic quality. It also can be used as a measurement of power, especially when

the athlete’s bodyweight is taken into consideration. For example, a fullback who weighs 200 pounds and has a 30-inch vertical jump will be much harder to tackle than a fullback who weighs 150 pounds and has a 32-inch vertical jump.

Because the vertical jump is an important indicator of athletic ability, the basic question coaches want answered is “How does an athlete improve vertical jumping ability?” One answer is box jumping.

The Father of Plyometrics

Yuri Verkhoshansky, a Russian sport scientist, pioneered box jumping

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.

In one 12-week study Verkhoshansky divided track and field athletes into two groups. The basic athletic ability he measured was reactive ability, which is the ability to absorb force in one direction and apply it in the opposite direction. One group performed 1,472 reps of conventional plyometric activities. The other group performed 475 reps of high-level box jumps. This timesaving advantage is important because athletes have so many other claims on their time, especially if they play multiple sports.

Before we discuss the specifics of how to perform box jumps, consider that many of the box jumping protocols

Verkhoshansky used with his elite jumpers are too stressful on the bones and connective tissues of prepubescent individuals. Further, because athletes mature at different times, it's up to a qualified coach to determine when an athlete is physically ready and mentally mature enough to perform the more challenging plyometric exercises.

Coaches who implement box jumping along with a weight training program often see remarkable gains in vertical jumping ability in a short time. For example, in one study published in 1992 in the *Journal of Applied Sports Science Research*, six weeks of combined squat training and plyometrics resulted in an average increase in the vertical jump of 4.2 inches!

Box Jumping Basics

Because box jumping places such high levels of stress on the nervous

system and on the joints, coaches must be cautious when introducing it to their athletes. 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.

Next, it's important not to perform plyometric box jumping on surfaces that are too soft, as this interferes with the release of stored energy and diminishes the intensity of the resulting muscle contraction when the athlete leaves the ground. Further, to help ensure the safety of the athlete, it is important to use solid boxes with a nonslip surface and a base that is wider than the top for maximum stability.

To properly run a plyometric box jumping program, coaches should provide boxes of various heights. The standard plyometric box for high school athletes is 20 inches; however, for middle




Stepping off a platform and immediately rebounding upward upon landing is considered a form of high-level box jumping. Shown performing this form of box jumping is Chloe Van Tussenbroek, a former Level 10 gymnast who had a 26.5 standing vertical jump and is a two-time winner of the National High School Power Clean Championships.

school athletes, heavier athletes and athletes at a lower skill level it's best to start them on 10-inch Readiness boxes. For safety reasons, boxes should be solid rather than open because the athletes' feet can get caught in an open plyometric box. Also, using spotters is necessary when athletes are attempting jumps of greater difficulty.

How to implement a box jumping program, especially in a high school setting, is a bit of a mystery to many coaches. BFS has developed a simple but effective plyometric training program that takes only 10 minutes, twice a week. It is a proven program, having been successfully implemented in athletic programs for over three decades.

The basic BFS Plyometric Box Jumping Program consists of three parts: vertical jumps, standing long jumps, and then box jumps. Start with 1 set of 10 quality vertical jumps followed by 3 sets of 3 reps of the standing long jump. This is the warm-up. Then perform 4 sets of progressively more difficult box jumps: 1) jumping off the boxes, 2) jumping off the boxes and performing a vertical jump, 3) jumping onto the boxes and 4) multiple box jumps. That's it!

The details of the BFS Plyometric Box Jumping Program can be found in the BFS textbook, *Bigger Faster Stronger*, and it's best to view the BFS *Plyometric Training* DVD as well. This DVD shows beginners performing the complete box jumping program for the first time, followed by an amazing demonstration of advanced box jumping skills by veteran BFS clinician P.J. Brown.

Coaches looking to improve the power and jumping ability of their athletes should consider investing in some high-quality plyometric boxes. When box jumping is used correctly and consistently, it is an extremely effective training method to give athletes an edge. 



To run a safe and effective plyometric box jumping program, coaches should provide sturdy boxes of various heights. Shown above, posing with such boxes is Lusía Angilau, a three-year varsity letter winner in volleyball and senior class president at Hunter High School in Salt Lake City, Utah. She now plays for Southern Utah University, where she majors in nutrition.

A force platform, such as the BFS Just Jump and Run, can be used to accurately measure an athlete's standing single- and double-leg vertical jump, approach jump, and multiple jumps.

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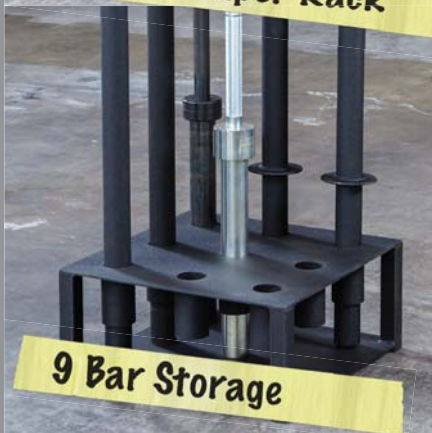
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