

Secrets to Jumping Higher

By Mike Caza, CSCS

Improving an athlete's ability to jump higher is a by-product of generating the greatest amount of force into the ground in the shortest amount of time by improving strength, movement mechanics and power. All three of these components are interrelated and interdependent upon each other in order to develop a better vertical leap. Think about when a bouncy ball is thrown against the ground; it springs back up as a result of the ball's forceful quick reaction off the ground. The elastic makeup, pliability and fixed strength of the ball enables it to react quickly off the ground thereby minimizing energy loss into the ground and promoting a springy vertical motion. Unfortunately, not all athletes are blessed with the qualities the bouncy ball has but with the right training program and correct application of the program, you can improve an athlete's ability to jump higher with a springy, powerful response. In this article, I will share some concepts on building **strength, efficient movement mechanics and power** for the purpose of increasing vertical jumping ability.

When an athlete plants their foot into the ground at takeoff, there is approximately 3-5 times the athlete's body weight working down against them. In light of this, the athlete has to be very strong to offset this gravitational pull and be able to hold the proper mechanical position at takeoff. A good indicator of appropriate strength for vertical jump sport athletes is to be able to squat 1.5 – 2 times their own body weight. Once this is accomplished, the athlete will be better equipped to 1) hold the proper mechanical position at takeoff, 2) have greater potential to apply force through the ground quickly and 3) enable vertical energy to transfer through the body on push off rather than dissipate through the ground due to lack of strength.

Different variations of squats, step ups and deadlifts are the best strength training exercises to develop adequate leg strength to support improvements in vertical jumping. These lifts integrate the large muscle fibers used in jumping when done properly. The goal with strength training is to build strength by having the athletes go through full range of motion exercises with a slow controlled tempo so they can recruit the maximum amount of muscle fibers within each exercise. It is vital for athletes to get strong because in order to apply force through the ground efficiently, high levels of strength are required. A proper balance of core strengthening exercises also must be implemented in conjunction with the strength training to reduce injury risks and maximize power. For example, in squatting, if an athlete lifts too much weight too soon without adequate core strength, excessive stress and compressive forces are placed on the lower back and hip area which can lead to injury and improper strength training technique. I like to use the "150 core rule" with a number of athletes. Basically, we perform 5 different core exercises doing 2 sets of 15 reps on each. We combine a multitude of forward, rotational, and throwing core exercises with medicine balls and stability balls in multiple planes of movement so we are sure to work all the surrounding muscles that are used to assist the

body in vertical jumping. If 150 reps are done with high quality, this is far superior to doing 300 mediocre.

Being able to transfer the acquired strength from the weight room into actual vertical jumping requires sound movement mechanics. We often see athletes who are weight room strong and can bench press and squat a lot of weight but they lack efficient movement mechanics and cannot transfer their strength into athletic movements. In most cases, the culprit is too much muscle mass, body fat and lack of flexibility. In order for me to high jump 7'5, I needed to be as strong as a bull without the mass and keep my body fat under 8%. If I put on a 20 pound weight vest and tried to high jump a bar 7 feet off the ground, it wouldn't happen. If my muscles were tight and restricted, I couldn't freely transfer the explosive energy vertically and that would be equivalent to driving a car with the emergency brake on. You use more fuel and the performance suffers due to the restrictions.

To be efficient when you jump, the arms need to swing free through the shoulders and the legs need to swing freely through the hip joints in order to maximize force production through the ground and enable it to rebound through the body. I often see a number of athletes who are strong and powerful but when they jump and leave the ground, the muscles and joints lock up due to lack of proper movement mechanics and tightness. So the bottom line is strength is of no value without efficient movement and flexibility. Wiring the athletes neuromuscular system with the proper movement training will enable them to utilize their strength because they will be more in tune with their body thus enabling them to be fluid and feel the athletic movements. You can be the strongest athlete in the weight room but without time spent on proper mechanics, true strength cannot be unleashed in an athletic fashion.

Athletes that can jump high possess a lot of explosive power. Their muscles function like an elastic band that is pulled back then let go. When you pull back an elastic band, there is a lot of stored "elastic energy" very similar to how the muscles in the leg are just prior to touchdown before jumping. They are in a lengthened state. As soon as the foot touches down and pushes off, the muscles rapidly contract propelling the athlete into the air. This process of the muscles lengthening and shortening over and over again is called the **strength-shortening cycle**. Improving the stretch-shortening cycle is the reason behind plyometric training to ultimately improve vertical jumping ability. Implementing the correct plyometric training sequences with athletes is essential to improve how quickly the muscles stretch and shorten. This is a process that is trained and improved in athletes progressively. I often see athletes and coaches doing plyometric exercises that are far too advanced for their developmental level. Having a 15 year old athlete jump on and off a 30 inch box usually results in the foot spending too much time on the ground, mechanics breaking down and the athlete isn't strong enough to be able to hold the proper positions upon landing. Plyometric training should progressively increase in difficulty as the athlete adapts and gets stronger and more efficient in their movement. I

had the genetic explosiveness to high jump 6'8" but with the correct training I was able to jump 7'5". In my peak, I was able to jump over 10 hurdles 48 inches in height consecutively without stopping. This is the ultimate test of explosion, body control, and proper mechanics. It took me about 3 years to build up to that height and that many hurdles. Be smart and open minded to learning how to maximize your training and you will see your vertical leap improve.

Many athletes are always seeking different ways to jump higher. If you learn how to strength train properly, develop efficient movement mechanics and do the correct plyometric training that is developmentally appropriate, you will improve your vertical jump. Don't be fooled by gimmicky training gadgets on the market that make false claims to improve your vertical jump. Look into the credibility, education and real world knowledge these individuals have and you will sort through what is good and what is far fetched. I have never seen a world class jumper or Olympic Champion use much of any assisted training devices to reach the top of their game. The one common denominator in great athletes is that their training is very sound and consistent and they understand what they are doing and how to do it properly.

Mike Caza is Owner and Director of Performance at Premier Sport Conditioning in Twinsburg, Ohio. Mike is the creator of Breakthrough Vertical Jump Training, a complete 12 week program designed to help coaches, athletes and trainers enhance vertical jumping ability in volleyball, basketball, football and track and field athletes. Mike was himself a successful world class high jumper and member of the Canadian National track & field team having jumped 7'5" which measures 18 inches over his standing height of 5'11". For more information on the Breakthrough Vertical Jump Training program, visit www.mikecaza.com or call (330) 487-0810.