



Photo courtesy Travis Kwok, Florida Gators

The power clean is considered a vertical jump with weights, so it's a great exercise for improving an athlete's vertical jump. Shown here is University of Florida's Devon Walker, a 6-foot-6-inch sophomore for the Gator Basketball Team. As a high school senior, he was the Winter Haven Basketball Player of the Year, averaging 23.8 points and 10.4 rebounds per game.

11 Practical Ways to Increase Your Athletes' *Vertical Jump*

Sound, research-based advice for coaches

BY **KIM GOSS, MS**

When it comes to vertical jumping ability, the prevailing philosophy among coaches is that great jumpers are born, not made. Although genetics does play a substantial role, the truth is that

any athlete at any level of ability can improve their vertical jump.

Running and jumping are two key components in athletics, and athletes who can jump high usually have talent in overall running ability as well as a

faster "first step" moving in all directions. NFL Combine results bear this out: In the 2013 combine, in the top ten 40-yard dash results among cornerbacks (usually the fastest athletes on the team), eight athletes had vertical jumps

of at least 35 inches and three had 40 inches or more! A case could be made that football coaches who want to know who their fastest athletes are without timing them could simply test their vertical jump.

Just how much an athlete can improve their vertical jump is difficult to predict because there are so many variables. An untrained 16-year-old male might improve his vertical jump by four inches in a single month by following a sound weight training and plyometric program, whereas an elite, highly trained athlete during their off-season might improve it by only one inch. Even so, it's worthwhile for all athletes, elite or otherwise, to work on their vertical.

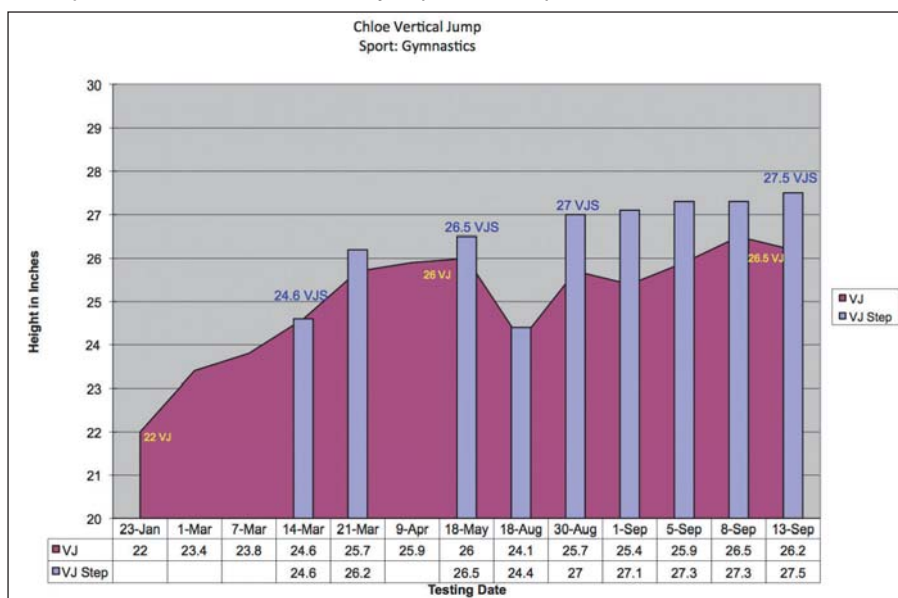
Supporting evidence comes from many studies, including one published in 2012 in the *Journal of Sport and Health Research*. The study reported the effects of a six-week plyometric training program conducted off-season on the vertical jump and other athletic qualities of 16 semipro basketball players. Players increased their vertical jump by an average of 23 percent and their 20-meter sprint speed by 9 percent.

Which training method is best for developing the vertical jump? Opinions vary from coach to coach. Many powerlifters and Olympic lifters have great vertical jumps, and there are outstanding basketball and volleyball players who have never set foot inside a weightroom but whose vertical jumps continue to progress. To sort out these apparent conflicts, here are 11 surefire ways to improve an athlete's vertical jump.

1. Stay lean. Many athletes or coaches underestimate the effect of a few extra pounds of fat on vertical jump performance. If you have an athlete perform a vertical jump and measure it, then attach a five-pound weight vest around their waist and have them



Although Chloe Van Tussenbroek was already a level 10 gymnast when she started weight training, the chart below shows how in eight months she was able to improve her standing vertical jump from 22 inches to 26.5 inches and to add approximately three inches to her vertical jump with a step.



jump again, you'll be surprised at how much just five pounds can make in performance.

The choice of bodybuilding methods can also be a limiting factor. Athletes can hinder their jumping ability by using bodybuilding methods that fail to develop the fast-twitch muscle fibers instead of using the more effective conventional strength training protocols. Regardless of the training method an athlete uses, there will always be some increase in muscle weight, but using higher reps will not develop the more powerful fibers that will contribute most to vertical jumping. This is why the BFS program devotes only

one week out of four in its program to higher-rep training (10 x 3).

2. Squat deep. Although quarter squats might seem more sport specific than full squats for increasing the vertical jump, this is not necessarily the case. In one study comparing full squats to quarter squats among recreational athletes, the full-squat group increased their vertical jump by eight inches after 10 weeks, whereas the quarter-squat group had no increase.

Because the glutes and hamstrings are trained more with full-range movements, this research shows the importance of these muscles in improving the vertical jump. The glute-ham raise

works both muscle groups, so it is an excellent choice as an auxiliary exercise for athletes who want to increase their vertical jump.

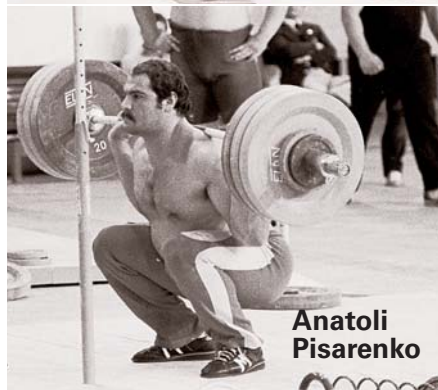
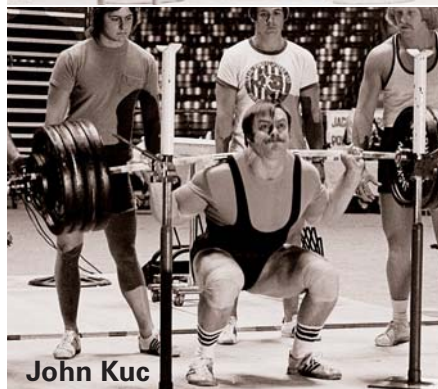
3. Focus on free weights rather than on machines. Although machine exercises can be useful for some purposes, especially for rehabilitation, they tend to be less effective for the vertical jump. In one six-week study using leg presses and calf raises, the average increase in vertical jump was only .39 inches!

4. Perform Olympic lifting movements. Squats and deadlifts certainly work the primary muscles used in vertical jumping and should be considered core exercises for most athletes, but Olympic lifting movements such as the power snatch and power clean are more effective for improving the vertical jump. This idea was examined in a study published in 2004 by the Department of Health and Exercise Science at the College of New Jersey.

This study lasted 15 weeks and involved 20 Division III college athletes divided into two groups: powerlifting (PL) and Olympic lifting (OL). The OL group showed superior results in vertical jump improvement, leading the researchers to conclude, “OL can provide a significant advantage over PL in vertical jump performance changes.” Consequently, for maximal results in vertical jump improvement, workouts should include some form of Olympic lifting exercises.

5. Use multiple training methods. Don't make the mistake of concluding that just one form of training for vertical jump improvement is superior to another. Although plyometrics and weight training can improve power when performed independently, combining them produces even greater results. Check out the evidence from a 1992 study published in the *Journal of*

Photos by Bruce Klemens.



Applied Sports Science Research:

This six-week study focused on determining what type of training protocols produced the greatest improvements in the vertical jump. The group that performed only squats increased their

Powerlifters and Olympic-style weightlifters use different styles of squatting, and both styles will improve the vertical jump. The key is to lower the body until the upper thighs are at least parallel to the floor. Shown in these photos are former world record holders from both Olympic lifting and powerlifting: Blagoy Blagoev, Anatoli Pisarenko, John Kuc and Jo-Jo White. Standing behind Pisarenko is Antonio Krastev, a Bulgarian who snatched 476 pounds!

vertical jump an average of 3.30 centimeters (1.29 inches), and the group that performed only plyometrics increased their vertical jump 3.81 centimeters (1.5 inches). However, when plyometrics were combined with squats, the increase in the vertical jump was 10.67 centimeters (4.2 inches). Who wouldn't be thrilled with a 4.2-inch vertical jump improvement in just six weeks?

6. Stretch. Tight muscles interfere with the ability of muscles to contract. Flexibility in the calves and hip flexors ensures optimal vertical jumping mechanics and the ability to squat deep. The BFS 1-2-3-4 Flexibility program is a good general stretching program that specifically addresses the calves and hip flexors.

7. Keep running. There is a relationship between jumping ability and running speed; an athlete who can run faster will be jumping higher. There are times when athletes have limited access to facilities, such as during vacations or when it's too impractical to juggle gym workouts with sports training. During these times athletes should be able to at least maintain their jumping ability by performing sprints: a few warm-up runs and then several short sprints, such as 20-40 yards.

8. Learn and practice good jumping mechanics. The arms, for example, can contribute significantly to jumping height – you can test this yourself by keeping your hands at your sides and seeing how it reduces the height of your

usual jump. A powerful downswing increases the force put into the ground and increases the involvement of the muscles at the hip joint, especially the glutes and hamstrings. A rapid upswing serves to pull the body upward. Athletes should get with their coach, or perhaps recruit the help of a track or gymnastics coach, to learn the optimal technique for jumping higher.

9. Use pyramid-shaped plyometric boxes. Box jumping is essential for developing vertical jumping ability. Plyometric boxes should have a pyramid shape for maximal stability, and you should never stack bumper plates on top of these boxes to increase their height – they can easily collapse and injure the jumper. The sides of the boxes should be solid, so any athlete who does not jump high enough will simply slide down the side – with open boxes the athlete’s feet can easily hook under the top of the box and increase the risk of injury.

10. Use accurate testing tools. The basic vertical-jump test is the Sargent Jump Test, which dates back to 1921. It involves determining how high a person can reach up with one hand (usually by placing the hand on a wall and keeping both feet flat); then,



The glute-ham raise works both the glutes and hamstrings, muscle groups that must be focused on when trying to increase the vertical jump.

without taking a step, the person jumps as high as possible and measures the difference between the two heights. A difference of 25 inches equates to a 25-inch vertical jump. The cheapest way to administer the Sargent test is to have the athlete stand next to a wall, with chalk applied to their hands to determine their reach and their highest jump. The next major evolution of this test came in the form of a series of plastic tabs set at half-inch increments; the more tabs the jumper hits, the higher their score.

A more accurate way to test the vertical jump is to use a force platform,

such as the Just Jump and Run. This eliminates the chance that an athlete might add several inches to their vertical jump by not elevating their shoulders or extending their spine when they take the standing reach measurement. Testing is very quick; it takes only a few seconds to step on the platform and perform the test.

The ultimate testing tool is the OptoJump™, which not only determines jumping height but also can provide a “Drift Protocol” to determine an athlete’s dynamic stability. Check the December 2011 issue of *BFS* magazine for a detailed discussion of the OptoJump.

11. Take testing seriously. When athletes know ahead of time they will be tested on a 40-yard dash, they often start visualizing how they will run. By test day they have mentally and physically prepared themselves for a maximal effort. Take the same approach with vertical jump testing. Also, practice the test as often as possible to determine the best way to warm up and perform the test.

Vertical jumping is key to athletic performance. You want the best for your athletes, so use these 11 suggestions for the highest results. **BFS**



Stretching is not just for preventing injury; it also helps athletes jump higher.

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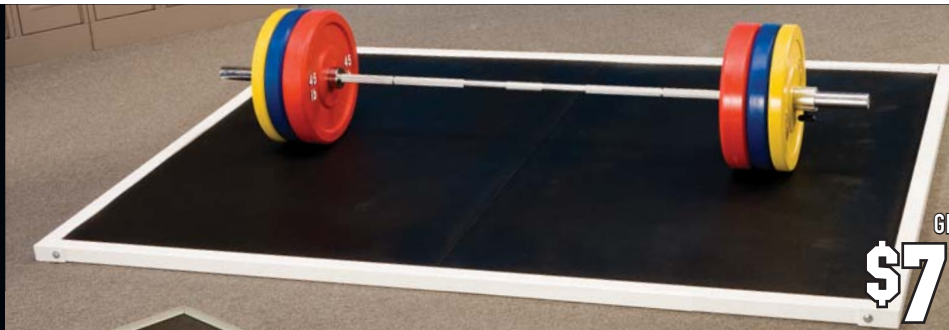
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