Monitoring Athletes for Physical Superiority

Cool tools coaches can use to help athletes reach their goals

BY **KIM GOSS, MS**

In weightlifting and powerlifting it's natural to assume that the athletes who lift the most weight have the best training program. At the last two Olympics in weightlifting, the Chinese lifters dominated both men's and women's lifting, so obviously they know what they are doing. In powerlifting, Louie Simmons' lifters and those who follow his program tend to press, squat and deadlift the heaviest weights –1,000-pound squats are commonplace at his gym. However, in other sports amazing training doesn't always transfer into an amazing career.

Jim Hines was the first sprinter to break 10.0 seconds in the 100 meters. He won the gold medal in the 1968 Mexico City Olympics with a world record of 9.95 that held up for 15 years. After that performance he was drafted by the Miami Dolphins, but in 10 games he caught only two passes for 23 yards and rushed once for 7 yards. His lack of football skills earned him the nickname "Oops." In contrast, Bob Hayes, the 1964 Olympic gold medal winner in the 100- and the 400-meter relay, put in 11 years in the NFL, racking up 7,414 receiving yards and 71 touchdowns.

Hines is an example of an athlete who has exceptional running speed but cannot transfer his skills to the athletic field; in contrast, Hayes' athletic gifts helped him earn a place in the Pro Football Hall of Fame. And as Michael Jordan's short-lived and unremarkable baseball career proved, being the best at one sport may not transfer to other sports. A more recent example is weightlifter Rob Adell (featured in the March 2012 issue of *BFS)*, who had great speed and jumping ability and shattered American weightlifting records in training. However, his trial as a walk-on on the UNLV football team was unremarkable, and he soon quit the sport – although it would have been interesting to see how Adell might have done with a few more years under his belt.

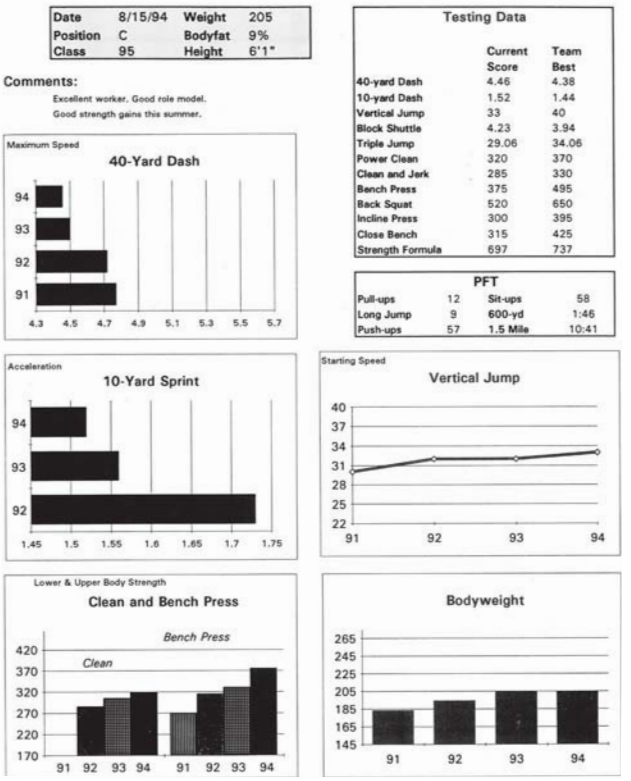
BFS clinician Paula Davis is a successful high school coach who uses BFS set-rep logbooks to carefully monitor performance in the weightroom.

On a more scientific level, let's look at a study of 1,155 college football players who participated in the NFL Combine between 2005 and 2009 (the study was published in the November 2010 issue of the *Journal of Strength and Conditioning Research)*. Specifically, the study investigated the relationship between NFL draft order and the results of eight tests performed in the NFL Combine. Here is what the author of the study said about the results of his analysis: "It would appear that regardless of position, the current battery of physical tests undertaken at the combine holds little value in terms of predicting draft order." That being said, consider that the NFL Combine might not be conducting the right tests.

As a strength coach at the Air Force Academy, I developed a report that graphically and numerically summarized football players' performances in strength, field tests and the military's mandatory physical fitness tests. I then matched this data with the top-three results of our depth charts over three years to determine which of these variables were most important to success in football. For example, I found that the

most important weight training exercise for a lineman was the power clean, whereas field tests such as the triple jump and the 20-yard shuttle run were more relevant for the skill positions.

I used these results to help design position-specific workouts and to adjust individual workouts to resolve weaknesses. For example, accompanying this article is a report on one of our Academy football players who played center. Going into the off-season of his senior year, he could do a 320-pound power clean, a 375 bench press, a 4.46 forty and a 33-inch vertical jump. With such numbers you would think this player had all the physical tools to be a starter. However, the testing results from our math department found that bodyweight was also a significant factor in success for a lineman, and this guy weighed only 205 pounds – at the college level, such an athlete would just bounce off the other players.



College strength coaches often use reports, such as this one used at the Air Force Academy, that graphically and numerically summarize an athlete's performances in strength and field tests.

jump.

Taking into consideration that jumping is intrinsic to figure skating and high jumping, wouldn't you think that the vertical jump would be a great test for athletes in these sports? Guess again. My experience from working with figure skaters for 10 years taught me that generally they have poor standing vertical jumps: I tested one advanced female skater who had performed a triple Axel at a time when only two women in the world had done this in competition, and her vertical jump was only 18 inches. Furthermore, I heard of one study performed at the Olympic Training Center that found that the only athletes the figure skaters could outjump were the table tennis players! Other sports hold similar surprises when it comes to testing the vertical jump; for example, if you compare a group of shot-putters to a group of high jumpers, you'll often find that the shot-putters will have the better results in the vertical jump test.

Jumping to Greatness

Whenever you are faced with selecting the best tests to measure athletic potential, consider that some tests may be available in even better versions today. A vertical jump is a good test for starting speed for sports such as hockey because it shows how quickly an athlete can apply force and start movement. However, because hockey players seldom lift their hands above their heads, a vertical-jump test that requires an athlete to swat plastic tabs above their head is not an ideal test. A vertical-jump test more specific to hockey players could be performed on a force plate, with the hands not required to reach above the head. With the Just Jump and Run platform, which consists of a 28" x 28" jump pad and a handheld computer, athletes simply jump as high as they can, and the computer determines their vertical jump based upon how long they were airborne – and they can place their hands anywhere as they volleyball player, as often they take a step before jumping.

Even so, it's not that the vertical jump is a bad test. Consider that during a traditional vertical-jump test, an athlete's best results come by starting with a relatively slow and deep knee bend, much like the initial movement in the shot put. With the high jump and figure skating jumps, the athlete needs to be able to transfer horizontal movement to the vertical, and the knee bend is relatively shorter and faster. So a better vertical-jump test for these athletes would be to take a step and jump – likewise, this would be a better test for a

Vertical-jump testing is also valuable for rehabilitation. I tested one female athlete who, after knee surgery and physical therapy, could perform a 22-inch vertical jump, which is great; not so great is the fact that she was able to jump 8 inches higher on one leg than on the other. Such a muscle imbalance may place an athlete at a high risk of injury.

Putting all this together, today's strength coaches face two major challenges: First, they are expected to individualize programs to ensure their athletes reach the highest levels of physical performance; BFS set/rep logbooks and the Beat the Computer program are particularly useful tools in this regard. Second, strength coaches have to monitor the training of a large number of athletes. The OptoJump can help with both of these challenges.

"What we have learned at BFS in

our 35 years of striving for athletic excellence is that you must break an exercise down into its critical components and then relate it to the needs of on-field performance," says BFS President Bob Rowbotham. "Getting back to our vertical jump, here we have an exercise that historically has tried to correlate to on-field explosivity. A big vertical jump suggests that the athlete has great explosivity. Sometimes that's true, but not always. Now, with 21st-century technology we can look at all jumps much closer so we can better understand what is really happening."

"The OptoJump Next system allows all coaches and trainers to very quickly and precisely understand the critical components of each jump," says Dr. Peter G. Gorman, president of Microgate USA. "We can instantly measure vertical height, power and flight time. We then can get a true understanding of the athlete's eccentric/concentric ability by looking at ground contact time for each jump – basically, the athlete's ability to load and explode. This is known as the *execution of power*. There is no sense in having a tremendous vertical jump if it takes too long to execute it. By understanding this fundamental weakness, exercises such as plyometrics can be combined with the necessary power lifts to make a more effective and efficient jump."

Dr. Peter G. Gorman, president of Microgate USA, shows the immediate, practical information that can be generated by OptoJump.

Gorman says that the OptoJump also enables the coach to measure an athlete's precision in performing a jump. "This is known as the athlete's *stability*, and we are well aware that without stability, you do not have the ability for true athletic performance. In this simple example, we can now see that a superior vertical jump does not necessarily correlate to on-field performance unless all criteria are met. BFS understands the critical components of performance and the correlation to on-field excellence. By looking at power, execution of power, and stability, we can get a better understanding of overall performance ability." Let's look at OptoJump in action.

Olympic Development

At the Center of Excellence (COE) in Park City, Utah, strength coach Ernie Rimer uses the OptoJump system for three main purposes:

1. Daily field testing
2. Off-season training monitoring
3. Rehabilitation

"The OptoJump is the first tool that allows us to test dozens of athletes within minutes," says Rimer. "It has become an essential component of our work at the COE. It sits in the middle of our floor, and we never turn it off because we use it every day. Over time we can see the progress each athlete has made." Rimer also says that the OptoJump is unsurpassed for assessing body mechanics. "It's a system that goes beyond simplistic graphic programs that analyze body positions, because OptoJump also measures functionality. Now, for the first time, all high school coaches, teachers and trainers have access to the same scientific data that was once restricted to the sports science labs and limited to the elite few that had access to it."

It's been said that talent prevails, and in many cases this is true. But to help refine that talent, coaches need to monitor the training of their athletes with the appropriate tests and tools for the job. BFS stands ready to help. BFS

Malcolm Carmichael/Alpine Canada Photo

USSA photo

USSA photo

At the Center of Excellence (COE) in Park City, Utah, strength coach Ernie Rimer uses the OptoJump system to test and improve athletic performance.

BALANCED TRAINING WITH BFS PROVIDES

- SYMMETRY/FOUNDATION
- ABILITY/STABILITY
- OPTIMAL PERFORMANCE
- INJURY PREVENTION

OPTOJUMP PROVIDES THE MOST ADVANCED ATHLETIC ASSESSMENT TOOL, SO YOU KNOW YOUR PROGRAM IS WORKING

BFS TEAMS WITH TECHNOLOGY LEADER OPTOJUMP

An innovative system of analysis and measurement that brings assessment and optimization of performance to athletic development based on precise, objective data.

By acquiring fundamental parameters of the level of an individual's performance and condition, Optojump allows coaches and teachers to easily monitor their athletes.

This makes it possible to ascertain the abilities or physical fitness of an athlete in a simple and immediate way

Over time, OptoJump creates a database that makes it possible to compare values for that athlete or different athletes.

Call 800-628-9737 for information.

OPTOJUMP 1 METER SYSTEM:

Assess performance and physical condition

Rapidly identify imbalances

Develop program specific training based on the test results

Periodically check the results and the effectiveness of treatment

Create a database of athletes

Motivate subject by providing tangible evidence of progress

BFS SCIENCE LAB

BFS is committed to advancing every coaches and teacher's ability to track the improvement of their students and athletes. On November 1, 2011, BFS opened the "BFS Science Lab" with Dr. Peter Gorman, President of MicroGait USA, at his facility in New York.

"This will be a great addition to the BFS organization," says BFS President Bob Rowbotham. Look for more details about this exciting facility in future issues of BFS and on our website, www.biggerfasterstronger.com

Using top quality BFS equipment and the OptoJump system the BFS Science Lab is developing systems and protocols to continue the advancement of youth training and performance!

BIGGER FASTER STRONGER

BFS

DEDICATED TO HELPING ATHLETES SUCCEED SINCE 1976

MEASUREMENT FOR SUCCESS 1-800-628-9737

online at www.biggerfasterstronger.com • email us at info@bfsmail.com

843 West 2400 South, Salt Lake City, UT 84119 • Fax (801) 975-1159