

## BFS POSITION PAPER

# The Power Clean

Why BFS encourages all athletes to perform this valuable exercise

**A**lthough the power clean has become a mainstay in the conditioning programs of most athletic programs, many coaches are still reluctant to incorporate it into their training programs. Alternatively, they may choose to perform the exercise from only a partial range of motion or they may discourage younger athletes from practicing it. Or, even worse, many coaches will not undergo the training to teach it properly. This paper will address all these issues.

The field of strength and conditioning has evolved, and now weight-rooms have become not only large but also overwhelmed with training fads promoted by sports celebrities and large marketing budgets. Swiss balls, wobble boards, foam rollers, suspension cords, kettle bells, strongman yokes, tires...every year a different new fad is brought forth in the hopes of getting



an edge. The problem is not that these devices are without any value but that they distract from the basics of developing stronger, more powerful athletes.

This is especially true in high schools. Often, two or three training sessions, about 45 minutes each, are all that can be devoted to workouts. During the season, two weight training workouts may be all that athletes can fit into their schedule. What's more, because most high school athletes compete in multiple sports, preseason periods often last only a few weeks. This means that for the majority of the year, an athlete may have only two training

sessions a week, and sometimes fewer. Time is precious, and high school athletes must make every minute count.

## Why Athletes Need the Power Clean

If you peruse the archives section of *BFS* magazine online, you'll see that from our very first issue in 1981 we have been promoting the power clean. In the early years, many individuals believed that the power clean had little value for an athlete or was too dangerous. Why? Perhaps, as with many other aspects of life, you have to follow the money.



Much of the criticism about the power clean came from companies that sold exercise machines, such as that of the late Arthur Jones, inventor of the popular Nautilus machines and one of the most prolific writers in weight training. Although machines have their place in strength and conditioning programs, especially in the area of muscle building and injury rehabilitation, many manufacturers of machines aggressively campaigned against power cleans as a marketing tool to sell more machines. After all, if you're outfitting a gym with platforms and free weights, these companies won't be able to sell you as many machines! But the fact is they

were wrong.

A survey involving 137 Division I coaches found that 85 percent used Olympic lifting movements such as the power clean to train their athletes. In the NFL, that percentage was 88 percent. When *BFS* Editor in Chief Kim Goss was a strength coach for the Air Force Academy (1987-1994), he enlisted the help of the university's math department to conduct an experiment to determine which strength training exercises had the highest correlation to the ability to play football. He compiled the results of the top three athletes on the depth chart for each position, as well as their maxes on numerous core

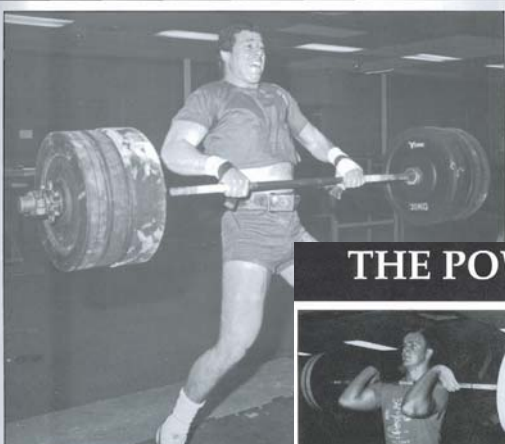
and auxiliary exercises, for a three-year period. For defensive and offensive linemen, and in fact for almost all positions, the exercise that had the highest correlation to playing ability was the power clean. The reason is simple.

Linemen need to be able to express a high level of strength quickly. Because the power clean allows you to accelerate your limbs over a large range of motion, it's one of the best exercises for improving what sport scientists call the *rate of force development*. This is in contrast to conventional power lifts such as squats, which for safety reasons require more time to decelerate the weight – in fact, the only time maximum force can be

Since *BFS* magazine started publishing in 1981, we have featured many articles on the importance of the power clean for athletes.

## THE POWER CLEAN

Part 3  
In a Series



By Bruno Pauletto, M.S., C.S.C.S.  
Strength and Conditioning Coach  
University of Tennessee

In my last article I discussed the different sequences to the power clean and how each sequence should be performed. When teaching the power clean the coach needs to work backward. This means learning the last sequence of the power clean first and the first sequence last. Each sequence should be learned thoroughly in the order presented. The following sequences can be taught

## THE POWER CLEAN:



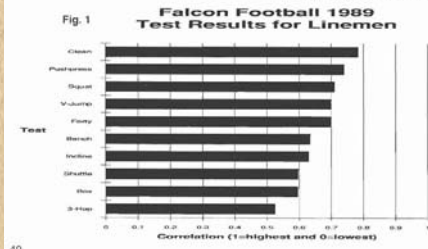
By Kim Goss, B.A., C.S.C.S.  
Assistant Strength Coach  
U.S. Air Force Academy

Many coaches are obsessed with finding new and exotic methods of training. They spend countless hours scanning sports journals from the Eastern Bloc countries for "secrets." They rave over the latest computerized gizmo that will supposedly give their athletes an edge. Although it's wise to try new training methods and exercise equipment for variety, coaches must focus on the basics. Basics like the power clean.

Lieutenant Jim O'Connell is a former Falcon football player, and Captain Robert Watkins is an instructor in our math department. Jim, Robert and I conducted a study on the 1989 Air Force Academy offensive and defensive linemen. Our purpose was to find a mathematical relationship between performance on the field (via our depth chart) and our weight training and field tests. Figure 1 summarizes the results of this study, along with the longest lines representing the strongest correlation. As you can see, the best test for predicting talent for linemen is the power clean.

The power clean is appropriately named because it develops power. Power is the ability to produce strength rapidly. Being a fraction of a second faster can determine if the nose guard sacks the quarterback or if the fullback blasts through a hole. If one of our players complains to Defensive Line Coach Bill Stewart about holding, Coach Stewart will say, "If you were quicker, he wouldn't have been able to hold you!"

A core exercise like the squat is one of the best



## THE POWER CLEAN

Part 6  
In a Series

By Bruno Pauletto, M.S., C.S.C.S.  
Strength and Conditioning Coach  
University of Tennessee

### COMMON ERRORS IN THE PULL

In my last article I discussed common errors at the start of the Power Clean. This article will illustrate errors during the Pull phase of the Power Clean. I recommend that coaches experience these errors with a bar. This will help you more quickly observe these errors in the weight room and thus more readily able to correct them.

#### BFS PROGRAM



Averin Collier power cleaned 310 pounds when he was a senior at Churchville-Chili High School in Rochester, New York. His explosiveness and football skills earned him a scholarship at Syracuse University. Greg Robinson, who has been the head football coach since 2005, said that Collier "is the top recruit that we have landed in my tenure at Syracuse."

## A Closer Look at the POWER CLEAN

Why *BFS* considers this lift a must for serious athletes

BY KIM GOSS

The power clean is a survivor. For many years this *BFS* core exercise has been attacked by those who thought it had little value for an athlete, by those who thought it was dangerous and by those who thought it was too difficult to teach. They were wrong, and the survival of the exercise has benefited

those who want to run faster, jump higher and be overall more powerful. So, why the resistance? Perhaps, as with many other aspects of life, you have to follow the money.

Much of the criticism about the power clean came from companies that sold exercise machines, such as that of the

late Arthur Jones, inventor of the popular Nautilus machines. Although machines have their place in strength and conditioning programs, especially in the area of injury rehabilitation, many manufacturers of machines aggressively campaigned against power cleans as a marketing tool to sell more machines. After all, if you're outfitting a gym with platforms and free weights, these companies won't be able to sell you as many machines!

A recent survey involving 137 Division I coaches found that 85 percent used Olympic lifting movements such as the power clean to train their athletes. In the NFL, that percentage was 88 percent. High school football programs are also catching on, especially the ones

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## BFS PROGRAM

exerted is at the beginning of those exercises. And there is practical evidence in peer-reviewed journals supporting the idea that power cleans are a superior exercise for developing power.

For example, in 2004 researchers at the Department of Health and Exercise Science at the College of New Jersey conducted a 15-week study on weightlifting exercises involving 20 Division III college players. One group focused on powerlifting (“PL”) exercises such as the squat, while the other group focused on Olympic lifting (“OL”) exercises such as the power clean. Although both groups showed improvements in the vertical jump, a standard test for athletic power, the authors noted, “Results suggest that OL can provide a significant advantage over PL in vertical jump performance changes.” There are many physiological reasons for this, such as what type of muscle fibers the power clean works.

There are essentially two types

of fast-twitch muscle fibers that can increase in size: the Type IIa and the more powerful Type IIb. The Type IIb fibers respond better to explosive lifts such as the power clean; and much of the massive development of the traps, lower back and hamstring muscles on Olympic lifters is due to the development of Type IIb fibers. So, if you want as much functional muscle mass as possible for sports, you need to perform the power clean.

But what about the idea that the power clean is dangerous? This subject of weight training safety is covered extensively in the BFS position papers on safety and liability and youth training. For example, the youth training paper reported that a study conducted in the United Kingdom found that the lowest injury rate was in the sport of competitive weightlifting, with a .0017 rate (0.17 percent). The authors noted the following: “Britain’s Schoolboy Championship has been staged annually

for at least 18 years and has involved some 54,600 competition lifts (maximal or nearly so) and at least 54,600 lighter but still heavy warm-up lifts. In this period one boy suffered a concussion when he fell onto a weight after losing control, and another was bruised when he dropped a weight onto his upper back. In neither case has there been any evidence of a long-term consequence.... In short, there seems to be no rational case for continued widespread anxiety about weight training or weightlifting in children.”



Jordon Cedarstrom



Lusia Angilau



Lynn Weikel



Cyrene Ekezie Wittman

Hunter High School in Salt Lake City has a great girls weight training class that stresses the power clean. The class currently has five girls who have cleaned at least 150 pounds and ten who have cleaned 135. The athletic director and coach for the class is Heather Sonne.



Janae Gardner



Lindly Fernandez



Ashley Gibson



It should also be noted that during a power clean the athlete not only must explosively lift the weight but also must catch it. In effect, doing power cleans teaches the athlete to rapidly control the impact, a.k.a. *disrupted forces*, that occur during the lift. When you consider the ever-increasing numbers of athletes suffering ACL injuries, you can see how valuable it is to be able to handle the dynamic, disrupted forces that occur to the ankle and knee during athletic competition. Further, the faster that athletes can handle these disrupted forces, the quicker they will be able to move on the court or on the field.

Finally, the Olympic lifts are “economical” exercises, meaning that they work many muscle groups simultaneously. To achieve a similar training effect with conventional exercises, an athlete would have to perform a leg press, back extension, calf raise, shoulder shrug, upright row and biceps curl – and even then they would be neglecting a few muscles. Time is a major limiting factor in many athletic programs, so it’s important to use exercises such as the power clean that give you the most bang for your buck.

## Is the Power Clean Safe?

One of the current trends among coaches is to have athletes perform the lift just from the mid-thigh position, also known as the “hang.” Addressing this issue is Bud Charniga, one of the best lifters in the US (he was only five pounds away from an American record in the snatch in the ’70s) and an individual who has translated many Russian weightlifting textbooks and has talked to the world’s best coaches at many international weightlifting competitions. He was asked why so many coaches prefer the hang variation of the power clean rather than lifting it from the floor.



Every May Bonanza High School hosts the National High School Power Clean Championships, attracting great athletes such as Dustin Dillard from Churchville Chili High School in Rochester, New York. For more information contact Val Balison at [vjbalison@cox.net](mailto:vjbalison@cox.net).

“Why do many athletes only perform the hang clean? I believe it’s because they don’t develop the flexibility in the knee, hips and ankles, so they shorten the range of motion. They shorten the range of motion – you don’t have to worry about flexibility. The problem with doing it from the hang is that you tend to use your arms too much and you flex your legs less – so basically you’re going to be lifting the weight with your upper body.”

Is the power clean difficult to teach? Certainly not, if you have the proper educational materials and coaches who know how to teach it. BFS currently gives more than 400 clinics a year to young athletes and has been doing so for over 30 years. The power clean is taught in all these clinics, and we often see athletes who have never performed this exercise come away with sound technique that will quickly lead to gains in athletic performance. Further, at our certification clinics, we ensure quality instruction, because coaches must show not only that they can perform the power clean at these clinics but also that they can teach it. But coaches should not stop there.

For further help with teaching and performing this exercise, the US Weightlifting Federation offers clinics on how to perform not just the power clean but also the power snatch and the full variations of these lifts, the snatch and the clean and jerk. And Charniga, through his website [sportivnypress.com](http://sportivnypress.com), offers many free translated articles about Russian weightlifting training methods. Charniga says that the whole point of doing those exercises is that “they are complicated, and it requires coordination, flexibility, agility – all that comes together into a complete motion.” So, just as a football coach would not read one book in their entire career about how to coach their sport, a strength coach should make learning how to perform the power clean and its variations a lifelong learning process.

The power clean is one of the single most important exercises for achieving physical superiority, which is why it has always been a core exercise in the BFS program. Therefore, coaches should take the time to learn how to teach the power clean correctly so their athletes have the best chance to fulfill their potential. **BFS**



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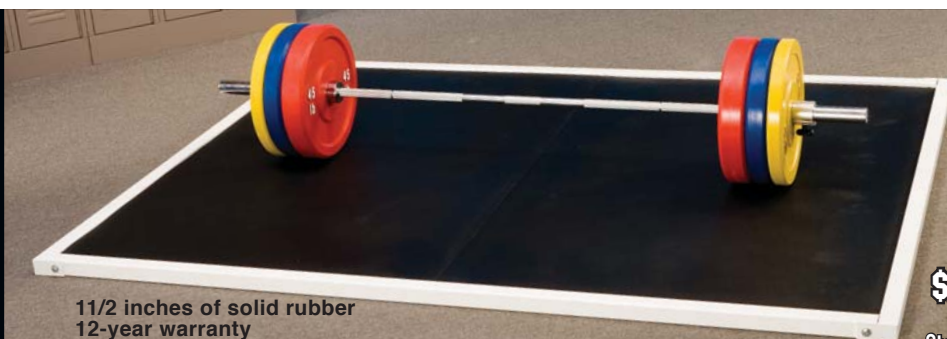
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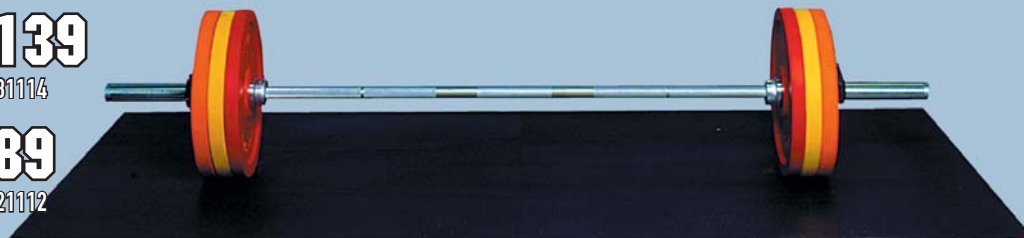
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