Technique Coaching:
Corrective Power Clean Teaching Techniques

This final week draws to a close two weeks of football camp here at Georgia Southern. Aside from teaching the intricacies of triple option play to high school athletes all campers participated in a two-hour weightlifting workshop. The workshop consisted of power clean, squat and bench---pretty basic stuff due to time constraints. My workshop responsibility was teaching the power clean. This is not an easy task considering your sharing a two-hour block of time with two other workshops (squat & bench). Nonetheless, we were able to make some huge improvements in form and technique. Fortunately, many of the kids had done some form of Olympic lifting prior to the lesson. In the mists of teaching these high schoolers I thought it might be a good idea to write on the experiences and obstacles I face when teaching a young population and share them with you in hopes that they spark a candle of thought in teaching your athletes. As coaches and/or athletes, it is important that we recognize poor form and technique with the power clean or any exercise for that matter, in an effort to optimize its sport-specific application while maximizing safety.

Before I start any exercise with an athlete I make certain they understand what it means to set the arch in the back. It doesn’t matter if I’m teaching bench press, lat pulldown or power clean, I want the athlete to understand, as demonstrated in Figure 1, that keeping the back arched through the entire range of motion during an exercise is a
“bullet-proof” position from injury. I begin by having the athlete start with their back rounded, hands on their knees like they would if they were playing basketball and resting on the lane line waiting for a free-throw. Next I have the athlete pull the shoulders back and bring the head and eyes up so they are looking straight ahead. This should naturally pull the back into a flat arched position. From here I have the athlete stand up—tracing the thighs with the hands—maintaining the arched back with head and eyes looking straight ahead. Once at the top, I have the athlete return to the bottom position, stressing that the athlete 1) keep the back arched by bending at the hips 2) reach back with the hips 3) trace the thighs with the hands and 4) head and eyes looking forward. The athlete continues to rehearse this motion until I’m confident they have learned the movement. The athlete then graduates to the use of an empty bar and then added weight. This teaching progression is the same used when teaching the RDL (Romanian Dead-Lift) or sometimes called stiff-legged dead lift.

Figure 1. Setting the Arch

Sound monotonous? It is somewhat but it is imperative the athlete master the movement technique in an effort to safeguard the back from injury, while maximizing
the pertinent application of the power clean. For instance look at the pictures illustrated in Figure 2. Notice the similarities in posture between the two athletes. The athlete on the far left is in the bottom position of an RDL while the picture on the far right shows an athlete performing what is the beginning phase of the second pull in power clean. Both athletes have legs slightly bent, hips are pushed back, shoulders are over the front of the bar with head and eyes looking straight ahead. This body posture allows the athlete to maximize hip flexion prior to full hip extension. What is more, this positioning isolates glute/ham insertion muscles, which are specific to running and jumping.

**Figure 2. Comparison of Movements**

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*Full hip extension* or better referred as “triple extension,” is the “bread-n-butter” of the power clean (Figure 3). The reason for its name is the three (triple) points of flexion; ankle, knee and hip. As I explained to the campers, *triple extension* is the most powerful and sport-specific movement an athlete can do in the weight room. Why? Every sport skill I can think of involves multiple joint actions at the ankle, hip and knee. This sequential activation of muscle and its joint actions must be performed in a timed motor-unit recruitment pattern with maximum force so movements can be done with
coordination, power and balance. Take for instance a player who does a lot of leg extensions and leg curls. They may improve strength in these movements, but little force is developed when performing such single-joint exercises. This results in little transfer of training specific to the motor unit recruitment patterns such as sprinting and jumping performance. Whenever possible, strength exercises should closely match the biomechanical motor patterns of sport if athletic performance is to be improved.

**Figure 3. Triple Extension**

![Triple Extension in the Power Clean](image)

*Triple Extension in the Power Clean*

For instance, Figure 4 shows the acceleration phase of the 40-yard dash. Notice the body is positioned in a straight line with the ankle, knee and hip fully extended. Now compare the sprinter’s body position to that of an athlete performing a power clean. See the similarities? Both athletes are fully extended in a straight line with full extension occurring at the ankle, hip and knee (triple extension). Both of these exercise movements are incredibly powerful because of the amount of force produced via triple extension and its sequential motor-unit recruitment pattern.
I think it's safe to assume that every young athlete dreams of dunking a basketball. So, how many athletes do you see jump and dunk a ball without fully extending the hips? None I'm certain! Likewise, when an athlete performs a vertical jump test, do they just extend the hips halfway and expect the best possible jump score? No! Yet, more times than not, inexperienced athletes have a poor habit of pulling with the arms long before they have even reached triple extension as demonstrated in Figure 5. When this happens maximum velocity is diminished thus, minimizing power development in the hips—the relevant purpose of performing a power clean.

One approach to working with athletes having trouble achieving triple extension is having them perform a clean pull. The clean pull is simply a power clean minus the catch and recovery phase. The exercise movement targets the first and second pull of the power clean while reinforcing the triple extension movement pattern. A descriptive
When periodizing clean pull in a strength program I perform both movements (power clean & clean pull) on the same day. However, I usually have an athlete perform clean pulls at 25+ pounds heavier than their final working set of power clean for a particular day. I do this for several reasons— it stresses the hips greater than the general prescribed power clean working set, which I typically organize at a lower working percentage (50-80% of RM) to allow the athlete to effectively learn the dynamic motor patterns. Secondly, by prescribing heavier weight I am able to tax the athletes neuromuscular system to handle heavier working loads (>85% RM) later in the periodization cycle once skill has improved.

I’m certain of it now as you read this someone is saying, “Heck, I’m not training my athletes to be Olympic lifters—I’m training them to be football players or basketball players or whatever!” My answer to such a comment is this: You strength train to enhance athletic performance and prevent injury. However, if you perform or allow
your athletes to perform an exercise movement with poor form and technique, how can you expect them to achieve optimum results with poor technique, much less remain injury-free? Still not convinced? Let's equate strength training with practice? Take for instance a drill or play a coach is trying to rehearse on the field or court. If an athlete is allowed to practice or perform a drill with poor form and technique, can you honestly expect it to be executed correctly in a game with optimal results? Certainly not and strength training should be regarded no different. When strength training, just as with practice, technique is the means that expresses strength---without it, strength is ineffective and performance diminished.

Time for me to retire from my “soap box” and start reviewing some coaching tips you can observe and use when working with young athletes of novice Olympic-lifting experience. Let's begin by looking at the starting position of the power clean, illustrated in Figure 7. Observe how the athlete’s feet are placed hip width apart. When an athlete performs a vertical jump test, his feet aren’t set outside the shoulders, they’re under the hips where he is able to generate the most force---power clean is no different. Next, notice the athlete’s back---it’s set in a flat position with head and eyes looking straight ahead. This flat back position corresponds to my first mention of setting the back in the beginning. Next, notice the athlete’s shoulders---they are positioned over the front of the bar with the hips set slightly higher than the knees. This is important for several reasons: 1) for one, by having the shoulders positioned over the front of the bar the athlete is able to minimize separation from the body and bar when pulling from the floor. 2) Secondly, having the hips set higher than the knee allows the athlete to position the knees behind the toes and bring the shins in a position that is virtually perpendicular to the floor. This allows a straight vertical pull form the floor preventing the athlete from having to move the bar around the knees then up when pulling from
the ground. These key points (shoulder and hip alignment) allows the greatest mechanical advantage when pulling from the floor, thus translating into optimal triple extension and power clean performance.

**Figure 7.** Power Clean Starting Position

The last point I would like to bring to attention when starting is elbow position. Notice in Figure 7 how the elbows are rotated outward. This positioning serves no immediate advantage in the initial pull from the floor however at the top end of triple extension it allows the elbows to be pulled high and vertical as the athlete quickly drops their center of gravity under the bar to receive the weight. Ultimately this helps to minimize “reverse curling” and/or separation between the bar and the athlete during the catch phase of the power clean.

Now that we’ve reviewed good starting position lets discuss the “first pull of the power clean. The initial pull from the floor is done controlled without jerking. Likewise, hips and shoulders rise together as the athlete pulls the weight from the floor. If the athlete leads with the hips as demonstrated in Figure 8, the hips are taken completely
out of the movement with nearly all the stress being placed on the lower back. This is not a good idea if you’re trying to develop power and explosion in the hips, while preventing injury to the lower back.

**Figure 8. Pulling with the Back**

A simple self-measure or coaching point to ensure correct starting position and pulling form is relatively simple. If the athlete hits the knees when pulling from the floor two things are most likely the culprit: 1) The athlete’s hips are set too low on the start 2) the shoulders are set in-line or too far behind the bar 3) the athlete is resting most their weight on the heels causing the bar to be pulled into the body—preventing a vertical pull 4) and/ or the athlete is pulling with the arms too early.

The next problem I see young Olympic-weightlifters experience when performing the power clean is the catch phase. Ideally, during this phase the athlete has reached triple extension and must dynamically reverse total body extension by rapidly flexing into a quarter-front squat position to receive the bar as demonstrated in Figure 9. At the same time continued shoulder and arm action pulls the athlete under the bar while the arms rapidly rotate under the bar—elbows pushed forward and up—grip and wrist relaxed and bar resting across the shoulders. Inexperience can make
these tasks seem a bit overwhelming yet incorporating a few auxiliary technique exercises the athlete should be able to correct poor form and technique.

**Figure 9. Dropping Center of Gravity (Dynamic Extension into Reverse Flexion)**

Often times an inexperienced athlete will try to rest the weight in the hands rather than racking the bar across the shoulders when performing the catch. Not relaxing the grip at the top of the movement prevents the athlete from pushing the elbows forward and up and allowing the bar to rest across the shoulders. This places an excessive amount of stress on the wrists and often time results in the athlete sacrificing form and technique. As a consequence the athlete is forced to push the hips forward in front of the shoulders to overcompensate as demonstrated in Figure 10. This makes for a poor base (lower body) to support the weight while placing undue mechanical and sheering stress on the knees, hips and lower back.

One way to correct the above is have the athlete perform a front squat with each power clean repetition. Requiring the athlete to immediately execute a front squat
Figure 10. Catching Bar with Hands

reinforces several teaching factors. For one, it puts emphasis on dynamically reversing total body flexion at the knees and hip—re-enforcing for the athlete to “shoot the hips” back and drop their center of gravity as they rapidly pull themselves under the bar to receive the weight. The resulting action allows the athlete’s shoulders to be set in line with the hips making for a strong supportive base while prevent shearing forces off the knees and prevents hyper-flexion (pinching) of the lower back resulting in possible vertebral damage.

If you aren’t already it’s probably a good idea to incorporate front squat solely into your weightlifting program. This exercise offers the athlete a leg variation exercise while placing a greater part of squatting stress on the quads and hip flexors. When periodizing front squat repetition maximums (RM) are usually based on power clean maxes or 70-75% of back squat RM. In terms of incorporating the clean-front squat combo for the first time make certain weight percentages are reduced (50-65% RM---65% being the heaviest you would prescribe). Understand, clean/front squat combo is technique teaching oriented---heavy weight is not necessary.
If you do incorporate front squat into your weekly routine, you are most likely familiar with the traditional racking/resting position of the bar across the shoulders. I suggest you try and get away from performing front squat this way and instead use a “clean grip” as demonstrated in Figure 11. This serves to reinforce good clean-front squat technique in addition to improved wrist strength and flexibility.

**Figure 11.** Front Squatting: Traditional vs. Clean Grip

If poor wrist flexibility is responsible for bad form as opposed to lack of experience, then flexibility should be addressed long before the introduction of clean-front squat combo. As I mentioned earlier, if the athlete is unable to relax the grip while the arms rapidly rotate under the bar, form will be sacrificed. A way to combat poor wrist flexibility is to incorporate flexibility exercises into a pre-existing warm-up routine like those demonstrated in Figure 12. Encourage these exercises not just be done during warm-up, but at home, while watching television, between sets or whenever possible!
The last point I would like to address is foot placement during the catch phase of the power clean. Novice athletes often time have a bad tendency to keep their feet in the same position (hip-width) throughout the entire power clean movement. When the athlete drops the hips and rotates the elbows around the bar they must be concerned with re-establishing the feet on the platform. Re-establishing or “shifting of the feet” is done when the athlete is in the process of dropping the hips and rotating the elbows while rapidly driving the legs and feet back on the platform. The shifting of feet should be from the original hip-width starting position out to shoulder-width catch position as
illustrated in Figure 13. This is done to further lower the hips by dropping the athlete’s center of gravity and provide a wider base of support when receiving the bar. When an athlete shifts the feet correctly a distinctive popping sound is produced. When this is heard it assures the athlete is driving his legs and feet with maximum speed.

**Figure 13. Shifting of the Feet**

More subtle foot shifting patterns are not as easy to notice and often times go unnoticed by the naked eye. However, with the introduction of the Murray Cross both coach and athlete can analyze foot-shifting patterns immediately. The Murray Cross—called after its inventor, former British Olympic and National Coach, Al Murray—is a simple device that can be drawn or painted on a platform and once understood can be used to give immediate feedback on foot and hip position in the clean, snatch and jerk. The basic drawing of the cross is displayed in the Diagram 1. Don’t be overly concerned with its exact dimensions but rather its configuration and interpretation of results are what really matter.
Once set up, have the lifter place the feet within the cross so that the toes are in line with the front, top edge of the cross as illustrated in Example A.

A) As I mentioned earlier, this starting position can be used for all Olympic lifts (clean & jerk, snatch, clean pull, etc.). Make sure the lifter starts with the feet and
barbell in the same plane. Once a prescribed lift is executed a coach and/or athlete can quickly see the foot position in the final executed position.

B) This shows the receiving position of the feet in either a snatch or a clean and shows the lifter has jumped back instead of extending the hips and body in a vertical movement.

C) This shows the foot position in a power clean illustrating the lifter has stepped back instead of shifting the feet to the side. This makes the bar “come around” instead of traveling in a straight vertical line.

Well, I hope all the examples I’ve shared serve to help you as a coach or lifter. In technique coaching we have boundless sophisticated apparatus’ that can be used to analyze technique. Video is now available and even force platforms are not uncommon. These instructional tools can be fed back to the lifter and much can be learned from observing one’s own lifts in training. However, if you’re limited by budget constraints like many of use are, these examples should serve to show how to get the most out yourself and your athletes. In closing I’ve included teaching progressions for power clean and clean pull to help with further coaching and/or training.

I leave you with this final question: What constitutes a sport-specific power clean? Is it the athlete who pulls the weight from the floor to the shoulder by any means necessary without achieving triple extension? Or is it when a lifter successfully achieves triple extension with maximum bar velocity and racks it across the shoulders in a balanced, squat/quarter-squat position. Hopefully after reading this article you can answer the question. Good luck in pursuit toward athletic excellence!
Power Clean

Start
- Dry clean, flat well marked platform area free of obstacles and people
- Olympic bar with revolving sleeves and collard; evenly loaded with bumper plates
- Shoulder-width stance; balls of the feet directly under bar; toes pointed slightly out
- Athlete flexes into squatting position:
  - The feet are placed “hip-width” apart with the toes pointing straight ahead; weight centered between bar and heel of foot
  - Hand placement is at shoulder width or one thumb length from the knurling on bar.
  - Elbows are turned outward; wrist flexed and locked
  - Bar touching the shins
  - The chest and shoulders are positioned in front of the bar approximately two inches.
  - Hips are set slightly above/his the knee joint
  - The back and spine are set tight and rigid (“steel rod”)
  - Head slightly tilted up with eyes looking forward

First Pull
- Athlete executes smooth, controlled pull; do not yank bar off platform
- Lift bar to knee height by extending the hips and knees; “push feet through platform”
- Hips and shoulders rise at same rate
- Bar rises vertically, staying close to the shins
- Feet remain flat, balance briefly shifts to heel
- Torso remains rigid and arched
- Shoulders remain slightly in front of the bar
- Arms remain straight; elbows rotated out
- Head remains in neutral position; eyes looking straight ahead

Scoop
- As bar passes knees, athlete executes “scoop” to achieve optimal pulling leverage
- Trunk actively extends to vertical position; shoulder shift up
- Hips and thighs simultaneously swing forward and down as athlete “thrust hips into the bar,” do not pull bar back into thighs
- Knees flex slightly, moving under the bar
- Middle or top of the thighs brush against bar as athlete accelerates into “second pull”
- Feet remain flat, balance quickly shifts to the ball of the foot
- Arms remain straight; elbows rotated out
- Head remains upright, eyes looking straight ahead
Second Pull (Explosion)
- Trunk is fully upright; athlete has reached “power position”
- Bar is pulled violently as hips, legs and trunk accelerate in explosive “jumping” motion
- Athlete pulls bar as high and close to the body as possible; bar trajectory is vertical
- Jumping action is completed by rising onto the toes
- Upward propulsion is continued by shrugging the shoulders and pulling with the arms
- Elbows are kept high, moving up and out over wrists
- Head remains upright or shifts back slightly, but is not thrown backward

Catch
- Athlete dynamically reverses total-body extension; hip and knees rapidly flex into semi-squat position to catch bar
- Continued shoulder and arm action “pulls athlete under the bar”
- Arms rapidly rotate under bar; elbows pushed forward and up; grip and wrist relaxed
- Athlete meets barbell at upper chest/anterior shoulders
- Feet shift slightly to sides
- Trunk and head remain upright

Recovery
- Athlete front squats barbell to fully erect position; hips, knees and trunk extend completely
- Feet flat on platform, side-by-side, shoulder-width or slightly wider
- Elbows high with hands around bar, supporting barbell across chest/shoulders
- Head upright; eyes looking forward
- Athlete must control the bar
Clean Pull

One of the variations to the power clean is the clean pull, which effectively isolates and works the muscles of the power zone. These exercises also need to be a part of the total leg and hip strength training program, because variation is one of the optimal keys to continued progress and optimal athletic performance.

The clean pull is a functional movement of the power clean minus the catch and recovery phase.

- The start position is exactly the same as power clean.
- Grip is slightly wider than shoulder width.
- Feet are positioned under the bar approximately hip width apart, with the toes pointed straight ahead.
- The lift is initiated with a powerful leg drive into the platform.
- As the athlete pushes with the legs, the bar, hips and shoulders rise together in uniform fashion while the back and spine maintain the flat position.
- With the feet flat on the floor, the arms straight, and the back flat, the legs continue to push powerfully against the floor until the bar passes the athlete’s knee.
- Like the power clean, as the bar passes the top of the kneecap, the athlete “scoops” the bar into the hips while performing the double knee bend.
- When these three movements are performed it results in an explosive acceleration of the bar and athlete off the platform.
- Lastly, upon landing, be sure to catch the bar on the thighs while landing with bent knees. This will prevent compression forces on the spine when done correctly.
- Follow the bar down to the floor and return to your starting position.
**Power Clean:** Common Errors in the Start

Everything is correct except the athlete is up on his toes. The feet should be flat on the ground. This usually indicates a sign of poor ankle flexibility.

The athlete’s form is fine except the head is too far back looking up at the ceiling. The head and eyes should be looking straight ahead.

This form should send up immediate “red flags.” The athlete is pulling the bar off the ground with a round back. The back should be set in an arched position.

The stance is too close and the grip on the bar is too narrow. The feet should be set at hip-width with arms resting on the outside of the thighs.
**Power Clean:** Common Errors in the Start

The stance is too wide pushing the arms too far out. The toes are pointing too fat out.

The athlete is using the “sumo” style grip to pull the bar from the floor. This should never be used when doing power clean or any of its related Olympic lifts.

Everything is correct except the athlete’s arms should be straight not bent. The arms are not used to pull the bar off the ground. The legs and back do all the work.

The athlete’s hips are way too high. In this position the hips are taken out of the pull and undue stress is placed on the lower back.
Power Clean: Common Errors in the Pull

The position is good but the athlete is pulling the weight with the arms. Likewise, the legs are still bent and the feet are flat on the ground indicating that the legs and hips are not being used.

The athlete’s head should not be thrown back when pulling. This causes the athlete to begin pulling with the back. Moreover, hyperflexion (pinching) of the lower back can lead to serious vertebral damage. The head should be straight looking forward.

Many athletes have the tendency of dipping the chest to the bar and cutting the pull short like the one in the picture. Likewise the athletes feet are flat on the platform indicating little or no foot shift. This makes it virtually impossible to drop one’s center of gravity under the bar or get the elbows up and through to receive the bar.

The athlete has not achieved triple extension. At the end of the pull the athlete should be up on his toes at the top of the pull and not flatfooted.
Power Clean: Common Errors in the Pull

From the time the athlete pulls the bar from the floor to the catch phase the bar should stay close to the body. In this picture the athlete has too much separation between his body and the bar.

When pulling the bar the elbows should be high not down like shown in the picture. This makes it virtually impossible for the athlete to rotate the elbows up and under the bar to receive the weight.
Power Clean: Common Errors in the Catch

The athlete has spread his legs too wide to recover the bar safely. The athlete’s feet should be no wider than one-half times shoulder width. The athlete’s feet should be closer together with hips and knees set in quarter-front squat position.

The back is hyperflexed and the shoulders are not set inline with the hips placing excessive sheering stress on the knees and compression on the lower back. When receiving the bar the body should be in a quarter front squat position with elbows up and parallel to the floor with head and eyes looking forward.

Everything in this picture is correct except the athlete has racked the weight with straight legs. After the bar is racked, then the athlete should stand and straighten the legs.

Everything in this picture is correct except the athlete has racked the weight in the hands. This is an immediate sign of poor wrist flexibility. Once the weight gets heavier, they will never be able to support the weight in the hands. Grip should be relaxed with bar resting across the shoulders.