



PERFORMANCE CYCLING CONDITIONING

A NEWSLETTER DEDICATED TO IMPROVING CYCLISTS

www.performancecondition.com/cycling

The New, Right Way of Teaching the “King of Exercises” (Squat) to Athletes

Ken Kontor, Publisher, Performance Conditioning, Inc.

For years strength and conditioning coaches have treated the squat as royalty, making it the cornerstone of their strength and conditioning program for athletes. This was done for good reason—the squat is a multiple joint, ground-based exercise that involves many major muscle groups working the legs and core simultaneously, thus making it a time efficient activity. It is and a key component in improving explosive power from the strength side of the power development equation. Coming out of the squat position is specific to many movements in sports such as firing off the ball in football and jumping in volleyball to name two. The title of king is well deserved.

But not all is well in the kingdom of squat. Athletes are misusing the exercise and are becoming injured by doing squats. Trudie Milner, Practice Administrator for Atlantic Sports Health, a Morristown Memorial Hospital (Morristown, NJ) has seen an alarming increase of squat related injuries.

“Because we are a sports program we see a variety of different sport athletes. In the academic year starting last September I was amazed at the number of kids coming to us for rehab who suffered significant back injuries (from squatting) as a result of unsupervised weight training in high schools and clubs. These injuries are severe enough to jeopardize the playing careers of these young athletes.

It was so alarming that we assembled a team of different doctors to see these athletes including a pediatrician, internal medicine specialist and orthopedic doctor. We find this a terrifying situation and one that parents and coaches need to be aware of. The age of kids getting involved in competitive sports is getting younger and the intensity in which kids are competing is much higher. As professionals, this is something we are now addressing.”

The reason for this problem is two-fold. Certainly, improper loading is a culprit but is easily corrected if there’s proper supervision. If technique breaks down, reduce the load. The other problem, poor technique, is more complex. The root of the problem is not only are the athletes doing the squat wrong but also conditioning professionals are teaching it wrong!

For years the squat has been taught using the classic coaching rules based on the sport of power lifting. In working with these athletes whose only goal was to lift maximum poundage, the technique was acceptable because the squat was the primary focus. However, applying these techniques to the general athletic population has its drawbacks. Athletes generally aren’t built like power lifters who are short levered. Squats are not a primary focus for most athletes whereas gaining functional strength to prevent injury is a primary goal with performance enhancement secondary. It’s not how much but how applied. With all the complexity involved with athletic development, the squat has to be carefully integrated into total athlete development in order to prevent injury, not cause it. A collegiate strength and conditioning coach and former power lifter and world record holder has evolved teaching the squat to make it safe for athletes. The following is his rationale.

“One of the most basic of exercises, the squat, is often the cause of many back problems. This is because proper mechanics are not used when performing the squat. Most coaches tell athletes to keep their backs tight and chest up. The intention is good—to prevent back injuries—but it is the very cause of back problems. When an athlete hears the words “keep your back tight or chest up,” what muscle group do you suppose he contracts? In picture (1) the hip flexors are turned on in an attempt to keep the back straight. Notice how the lower back arches. It is impossible to squat into a deep position with the back arched. The hip and spinal joints lock up and doesn’t allow mobility.”

Notice how the lower back is arched (a gap between the lower back and straight edge) when a straight



edge is placed on the back.

“In picture (2), the lifter is able to keep an upright position and get deep. Notice how the back is in a flat position. This is an example of greater hip and spinal mobility when the pelvis is in the correct position. In the second picture, the athlete was told to keep his abs in a static position (distance between ribs and pelvis maintained), especially as he gets deeper. Now the hamstrings can keep the pelvis level as the squat is performed. The abs stabilize the spine and allow maximum mobility at the hip joints. The back muscles react by lengthening to control the forward lean, keeping the center of gravity over the feet, similar to cables on the shaft of a crane.”

Notice the straight edge is flat against the back leaving no gap.

Compare the two pictures. Note the gap between the bar held against the lifter's back and his back in picture (1). In picture (2) the gap is gone and the back is in a neutral position. Which is more “athletic” and functional to sport movement? What position do you want your athletes' in? Let's look at the wrong and right way of teaching the squat using the correct coaching cues to your athletes. Carefully compare the two methods and adapt the right way that's best for your athletes.



Teaching the Squat to Athletes the Wrong Way

Note: The wrong coaching cues are ~~stricken out~~.

Start

- Use rack, with supports at mid-chest level.
- Be sure spotters are in position.
- Grasp the barbell palms down, slightly wider than shoulder width.
- Step under bar, feet parallel and shoulder-width apart.
- Place the center of the bar on the upper back so it is balanced, resting securely across back of shoulders.
- ~~Elbows pointed back~~, eyes straight ahead, ~~chest up~~, ~~squeeze shoulder blades together~~.
- Straighten legs to lift the barbell off rack and step backward, feet slightly wider than shoulder-width and toes pointed out slightly ~~with slight arch in lower back and tight~~.

Movement

- Under control ~~bend hips backwards~~, ~~bend knees and ankles~~.
- Keep ~~bar over middle of foot to heels~~, feet flat on the floor.
- Inhaling, descend slowly until tops of thighs are parallel to floor; pause.
- Do not let knees come together on descent.
- ~~Keep back straight and chest up~~.
- Exhale as you straighten hips and knees to return upright under control.
- ~~Keep hips under bar~~, eyes focused straight ahead.
- ~~Back as flat as possible~~.
- ~~Knees over ankles~~.

Tips

- Do not bounce at bottom position.
- ~~Do not bring knees together coming up~~.
- Do not speed bar up at the top.
- ~~Stay tight throughout movement~~.

Teaching the Squat to Athletes the Right Way

Note the new, right coaching cues are underlined.

Start

- Use rack, with supports at mid-chest level.
- Be sure spotters are in position.
- Grasp the barbell palms down, slightly wider than shoulder-width.
- Step under bar, feet parallel and shoulder-width apart.
- Place center of the bar on the upper back so it is balanced, resting securely across back of shoulders.
- Elbows pointed down, eyes straight ahead.
- Straighten legs to lift barbell off the rack and step backward, feet slightly wider than shoulder-width and toes pointed out slightly.
- Fill lungs with air (the creation of intra thoracic pressure) and hold.
- Attempt to exhale forcefully but close nose and mouth air passages so that air is not allowed to escape (the creation of intra abdominal pressure, Valsalva maneuver).

Movement

- Under control, squat down as if sitting down on a chair.
- Descend under control until tops of thighs are parallel to floor.
- Keep feet flat on the floor and knees in alignment with feet.
- Important: maintain the intra thoracic/intra abdominal pressure created at the start. Try to keep back relaxed the back will take

care of itself.

- Upon start of the ascent, exhale forcefully using the abdominal muscles to return to the upright position.
- Keep eyes focused straight ahead.

Tips

- Control, do not bounce at bottom position.
- Knees together coming up. The thigh adductors are hip extensors in the low position and help get you through the sticking point.
- Do not speed bar up at the top.
- Keep abs tight Stay tight on the descent and ascent using abdominal pressure and not the tightening of the lower back.

Avoid the shifting of weight predominately to one leg. This indicates a muscle imbalance.

Final Look- The King is Dead Long Live the King

With all the misinformation on teaching the squat which potentially can lead to injury of the athlete the question becomes, is keeping the squat as a viable part of your conditioning program for athletes worth it? Learning the new technique prescribed in this article is a major undertaking and will challenge many conditioning programs. Current thinking and conditioning practices in the collegiate and professional levels is that single leg exercises such as the lunge and step up are more functional to the athlete in many instances. Certainly the loading for these exercises is less than a barbell squat. The king, the squat, may be dead but it's important to find a alternative to work these major muscles groups in a ground based environment- long live the king! 

Acknowledgement: Ron Hruska, Postural Restoration Institute™ www.posturalrestoration.com