

John Kuc was a three-time IPF world powerlifting champion (1974, 79, 80) in the 242-pound bodyweight class. He was the first man to deadlift 850 pounds and had a best of 870 pounds.

Low Back Training for Athletes

For a powerful core, bring the erector spinae to the fore

BY **KIM GOSS, MS**

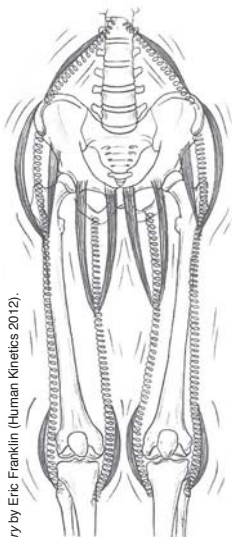
The Russians have been a dominant force in weightlifting for half a century. They have always placed a great deal of emphasis on the erector spinae, the pair of muscles that run alongside the spine like thick cables. In fact, at the 1968 Olympic Games in Mexico City, US weightlifter Tommy Suggs observed the unique way Russian lifters assessed their competitors' lower

back muscles.

As a Russian lifter shook a competitor's hand, he would reach behind the athlete with the other hand and check out the tone and thickness of the athlete's erector spinae muscles. In fact, when you looked at a Russian weightlifter from the side at the start of his lifts, it would appear that his lower back was rounded – the erector spinae muscles

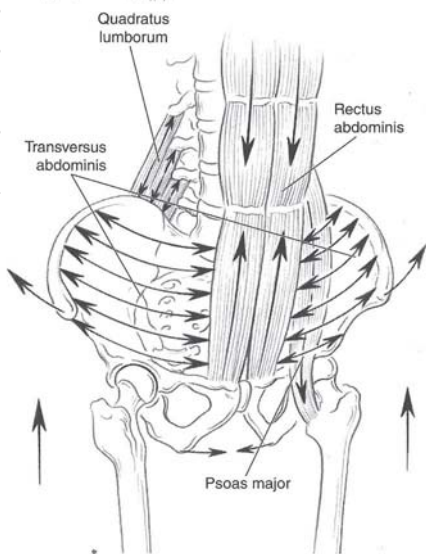
were that thick!

One reason for the emphasis on the erector spinae was that strong back muscles were required to perform the extreme back bending motion that occurred during the Olympic press. Although the US had some excellent pressers, overall the Russians dominated the records in this lift, holding six of the all-time records in the exercise. The



Full range, free-weight exercises such as the front squat and the back squat (shown at right) help prevent muscle imbalances that can cause poor posture. These illustrations show optimal posture and how the muscles surrounding the pelvis can affect posture and movement.

Dynamic Alignment Through Imagery by Eric Franklin (Human Kinetics 2012).



press was discontinued after the 1972 Olympics, but lower back exercises such as glute-ham raises and good mornings remained key assistance exercises in Russian workouts.

Russian weightlifters aside, the lower back is often a weak link in many athletes. This is a serious problem, especially if athletes expect to fulfill their physical potential.

The Anatomy of Power

Lower back muscles not only produce force; they also help transfer force from the legs to the upper body (and in the case of weight training, to the bar). If the lower back is not strong, this weakness will affect athletic performance as

well as how much weight an athlete can use in core lifts such as squats and power cleans.

The key muscle group of the lower back is the erector spinae. It consists of three parallel sets of muscles (iliocostalis, longissimus and spinalis) that run the entire length of the spine. The erector spinae is involved in extending and laterally flexing the vertebral column, and it helps maintain the proper posture of the spine when lifting. As a bonus, according to Canadian strength coach Charles Poliquin, the erector spinae exhibits an exceptional “irradiation effect,” which means that strengthening these muscles helps strengthen many other muscle groups.

Despite the importance of working these muscles to their full capacity, there is an unfortunate trend in many programs for athletes at all levels to avoid exercises that work the lower body through a full range of motion. Power cleans from the mid-thigh have replaced cleans from the floor, quarter squats and leg presses are considered core exercises, and deadlifts have been all but forgotten. The result is decreased flexibility and more muscle imbalances, issues that can contribute to low back pain.

Paul Gagné is a strength coach and Posturologist who has seen the consequences of improperly designed weight training programs. “Many athletes who have focused on exercise machines and

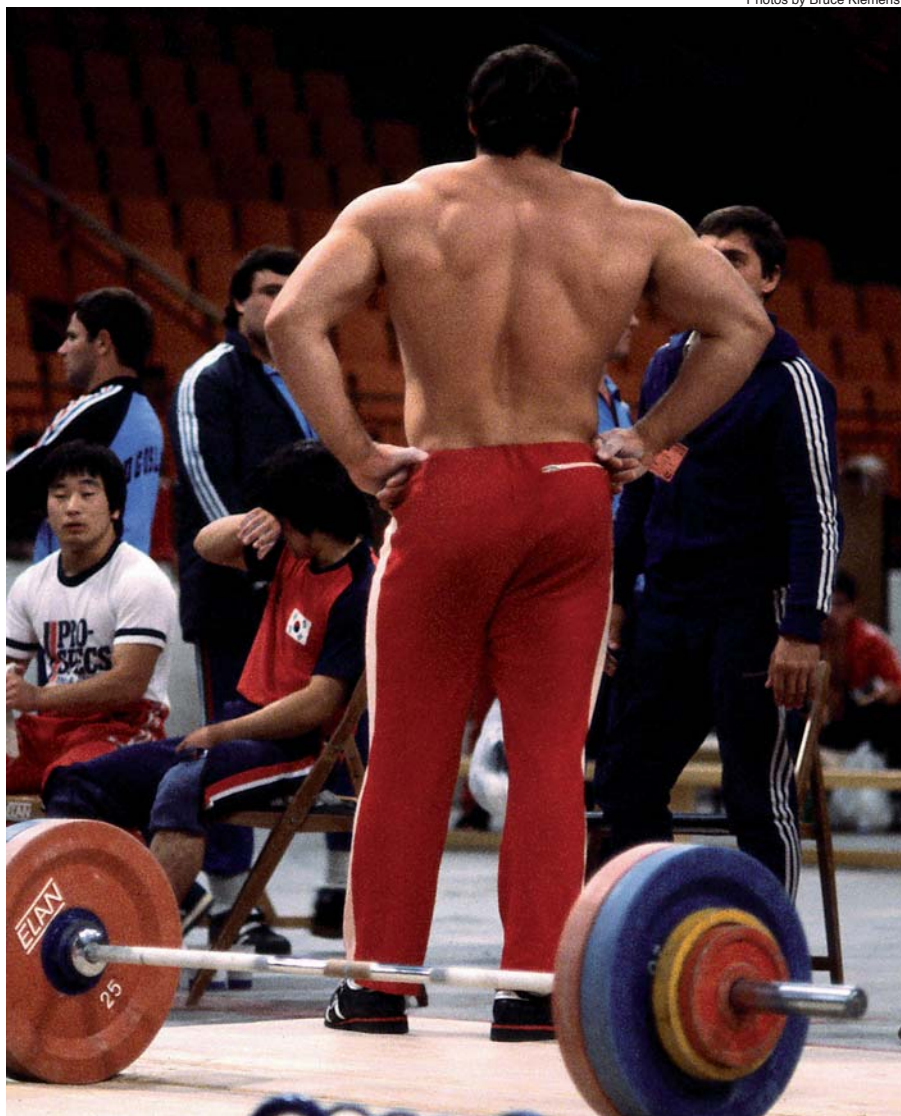
partial-range movements often display postural problems and some have lower back pain,” says Gagné. “For these athletes I have to devote a considerable amount of time retraining the postural system through programs that include flexibility training and specific segmental exercises for the abdominal muscles. Without such training, to have these athletes start with a program of full squats, Olympic lifts and overhead presses and jerks could cause lower back pain or make existing back pain worse.”

Gagné also believes that one reason for these postural problems is the emphasis on sports specialization at an early age. “When athletes focus

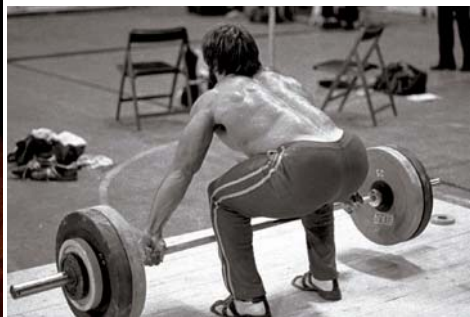
on one sport at an early age, there is an increased risk of muscle imbalances. For example, a swimmer could develop round shoulders and a forward head posture, and a volleyball player could develop tight hip flexors and relatively weak hamstrings. Although the same could be said about gymnasts, whose sport requires early specialized training to reach high levels, gymnastics coaches usually have their athletes perform general conditioning to prevent muscle imbalances. Likewise, figure skating coaches prevent muscle imbalances by having their athletes supplement their training with ballet and other forms of dance.”

Another problem is poor exercise technique. At BFS we recommend compound exercises such as power cleans and squats, but there is considerable technique involved in performing these exercises correctly. Performing a power clean or squat with a rounded back, for example, could easily cause a disk problem because the lower back muscles will not be able to protect the spine. Although machines can have a place in the training of athletes, it’s unwise to place too much emphasis on machine exercises, such as leg presses, at the expense of training the lower back muscles with free weight exercises, such as squats.

Photos by Bruce Klemens



The erector spinae muscles run parallel to the spine. Olympic lifting exercises effectively work these muscles, as shown by the thick lower back development of these elite weightlifters.



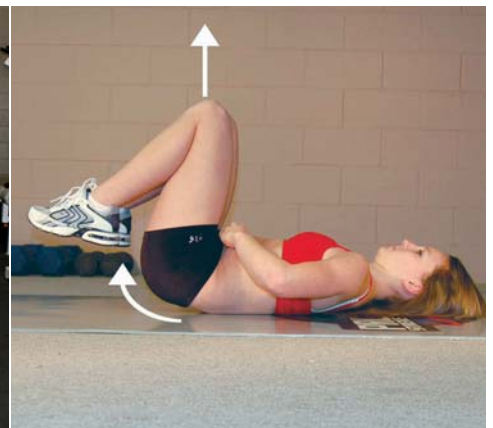
A Closer Look at Back Training

Before we look at specific lower back exercises, it's important to understand that the erector spinae consists of both high-threshold motor units (fast-twitch muscle) and low-threshold motor units (slow-twitch muscle). This means that for complete development an athlete should perform back exercises for low reps with heavy weights and also high reps with relatively lighter weights. In the BFS program such variation is built into the set-rep program.

With that background, let's take a closer look at three basic categories of lower back exercises: deadlifts, reverse back extensions, and back extensions.

Deadlift. The deadlift, as performed with a straight barbell in the sport of powerlifting, is a basic movement that will effectively strengthen the lower back. Keep in mind that with the straight bar, the weight is out in front of the lifter and this can create high levels of shearing forces on the spine. Instead, Gagné advises, "It would be better to perform the deadlift with a hex bar, as it is easier to maintain the proper alignment of the spine."

Reverse back extension. According to Gagné, one of the best exercises for the erector spinae is the reverse back extension, especially for athletes with postural problems. "About 90 percent of the professional hockey players I coach have excessive anterior tilt of the pelvis and chronic tightness in the lower back. They need to focus on working the low back with a neutral spine and only in the external (lengthened) range. So, on a reverse back extension they would lift the weight only three quarters of the way up and work on bringing the legs under the hips at the bottom of the



Exercises that strengthen the lower abdominal and erector spinae muscles may be necessary for those athletes who have developed muscle imbalances from sport-specific training or improper training methods.

movement. Having a machine that has the chest pad tilted downward will facilitate this stretch. Lifting the legs to parallel, as many powerlifters recommend, will place adverse stress on the L3 to L5 vertebrae by causing the spine to hyperextend."

Another advantage of the reverse back extension is that it places minimal compressive forces on the spine, especially when compared to a seated back extension machine. Research conducted by Alf Nachemson of Sweden in 1975 showed that leaning forward about 15 degrees from a seated position can nearly double the compressive forces on the L2 and L3 vertebrae. "Further, the seated back extension machines focus on strengthening the erector spinae in the internal range, which should not be the priority for most athletes, especially those with back pain," says Gagné.

Back extension. Back extensions strengthen the erector spinae muscles in the internal (shortened) range. Back extensions also strongly affect the gluteal muscles. As an example of how much emphasis the Russian weightlifters placed on this exercise, they were often seen using several hundred pounds in this exercise, with the barbell placed on the back of the shoulders.

Another type of back extension, and one that is seldom used, is the type that is performed on an incline back extension bench. Two advantages of the incline bench, says Gagné, are that the muscle tension is less and the angle allows for a greater range of motion of the trunk.

Gagné says that the sequence in which the muscles are activated in both the back extension and the incline back extension is as follows: calves, hamstrings, glutes, and erector spinae. At the start of the movement both these exercises produce traction on the spine and as such help strengthen the muscles; either exercise is an effective warm-up exercise at the start of a workout.

Gagné says that Olympic lifting exercises and their assistance exercises, such as squats, will not only improve lower back strength and athletic performance but also help prevent lower back pain. "Weightlifters tend to have great flexibility, abdominal and lower back strength, and muscle balance. If all athletes would begin their physical training by emphasizing free weight exercises such as these, performed through a full-range of motion, they would be less likely to become injured and would have a significant edge over their competition." BFS

GET FAST NOW!



BY ISOLATING THE POWERFUL GLUTE AND HAMSTRING MUSCLES, THE GLUTE HAM DEVELOPER IS THE

NUMBER 1 SPEED ENHANCING TOOL!

HEAVY-DUTY SUPER GLUTE

Accommodates the largest athletes



GREAT PRICE
\$995

GLUTE HAM DEVELOPER

Our most popular glute ham developer



\$715
SUPERB VALUE

BEGINNER GLUTE/HAM DEVELOPER



Great for beginners: Knee pad ensures perfect form

Rotating thigh pads reduce friction on upper thighs



NOW ONLY
\$925

BIGGER FASTER STRONGER

BFS

DEDICATED TO HELPING ATHLETES SUCCEED SINCE 1976

BFS steel equipment is proudly designed and manufactured in the USA

FOR CUSTOM OPTIONS 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

Solid steel construction with non-slip diamond tread footplate



The Box Squat



Sit and Reach



Straight Leg Dead Lift

3-IN-1 SQUAT BOX

\$235

▪ Custom Paint and Vinyl options available, call for free quote.



Plate Loaded Reverse Back Extension

- ▶ Pivot point properly aligned with hips
- ▶ Decline chest pad reduces low back strain
- ▶ Adjustable safety stop provides maximum range of motion for athletes, to limited range of motion for rehabilitation

\$1195

- ▶ Efficiently sized footprint 1-62" w-41" h-50"

CORE REQUIREMENT

BIGGER FASTER STRONGER

BFS

DEDICATED TO HELPING ATHLETES SUCCEED SINCE 1976

800-628-9737 • WWW.BIGGERFASTERSTRONGER.COM

843 West 2400 South Salt Lake City, UT 84119