

Injuries to the Lumbar Spine:

Lifting, Tumbling, and Vaulting



Low back pain is by no means anything new in the world of athletics. With our athletes squatting, jumping, and tumbling more than it seems like they ever have before, it's not surprising to see overuse related injuries in a variety of

locations, not just the lumbar spine. In fact, the number one cause of injuries in the adolescent athlete is overuse; and the lumbar spine is by no means separated from that statistic.

Although lumbar spine and associated injuries only amounted for approximately 3-5% of all athletic injuries prevalent in high school athletics in the 2010-2011 school year, by in large, the lumbar spine injury will oftentimes require a much longer recovery time than other injuries commonly seen in athletics. In fact, the average starting time for return to play from a lumbar stress fracture begins after 12 weeks.

For our athletes who are repeatedly placing tremendous stress on their low backs, always listen for a few key indicators that could be very effective at helping you recognize the difference between injury and soreness.

- *Pain with repeated motions such as trunk flexion and/or extension.
- *Pain with long periods of standing/sitting
- *Consistent relief of low back pain with trunk or hip flexion
- *Pain with coughing, sneezing, or straining
- *Numbness, tingling, or radiating pain

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The Back Squat:

A Discussion of Proper Form

For the core, hips, and the upper and lower leg musculature, the back squat is probably one of the most effective strengthening exercises there is. However, many have had great discussions on proper squat technique and the ramifications of improper lifting on the ankles, knees, hips, and lumbar spine, especially in the developing adolescent athlete.



Therefore, here are a few common errors usually seen with the back squat:

Knees Cross the Toes:

As the knees move further and further in front of the toes, balance is shifted forward, the heels usually come off the ground, and the athlete has to extend the spine much further to counter balance the weight to keep from falling forward.

Improper Feet Position:

Feet should be evenly spaced, just at or beyond shoulder width apart, and with slight outward foot rotation.

Trunk Flexion when coming up

The athlete's back should remain in the same posture throughout the squat. Usually, when the weight is too much for an athlete as a result of lacking core, glute, and hamstring strength, the athlete will flex forward at the waist and lumbar spine for the first 1-2 seconds after he/she begins to rise from the squatted position.

continued on page 2

Stress Fractures in the Lumbar Spine

In athletics, stress fractures in the lumbar spine can occur for a variety of reasons: improper lifting, lifting too much weight, and/or with the repeated lumbar spine extension that occurs in gymnastics, tumbling, or pole vaulting. When managing athletes in these sports/events, it is always important to review the list of common signs of low back pain mentioned on page 1.



Primarily because your protecting your athletes, but secondarily because stress fractures in the lumbar spine usually follow a progressive increase in their overall status of severity. If not caught in an early stage, continued degeneration of the vertebra can continue, be prolonged, and eventually cause a fracture that can displace.

Spondylitis: Initial inflammation (i.e. pain, limited motion, etc...) of a vertebrae due to overloading.

Spondylosis: As a result of continued inflammation in the vertebral bone, the inflamed portion of the bone begins to be broken down by the chemical mediators present as a result of the inflammatory response which was started in the first stage.

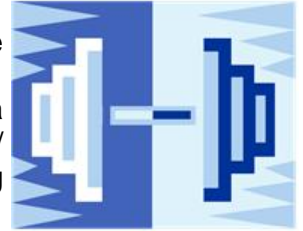
Spondylolysis: As bone degeneration continues without being properly treated or managed, the degeneration continues to a point where the bone is so weakened that it fractures.

Spondylolisthesis: With a section of the vertebra fractured, the two ends of the fracture are obviously now separate from each other. As a result, the two pieces of the bone are now capable of separating as one piece begins to "slip" out of it's proper positioning away from the other.

The Back Squat:
continued from page 1

Looking up:

In general, the athlete who looks up instead of just looking straight ahead has a greater tendency to extend his/her lumbar spine; thus increasing pressure in his/her lumbar spine.



Parallel Squat vs. Olympic Squat:

From an orthopedic standpoint, the greatest pressure on the cartilage in the knee occurs during full flexion under weight bearing. In fact, several orthopedic examinations for meniscus tears in the knee first require the clinician to place the knee in a past parallel or full flexion position as a portion of the test. Performing front squats into an Olympic position therefore, provides tremendous undue pressure on the cartilage in the knee, and is therefore directly correlated to an increased prevalence of meniscus tearing. In addition, the depth of the squat also limits the overall force available in the quadriceps muscle group because it has been placed in a position of maximum length.

Bend Over or Hips Through:

So many perform a squat by simply bending at the waist. Again, the athlete's back should not be moving during the exercise. Instead, think of a squat as taking the hips backward to sit in a chair followed by driving the hips forward to get back to the standing position.

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