

Teaching Neutral Spine Posture for a Strong Back

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Squats, deadlifts, bent-over rows and power cleans are arguably some of the most effective exercises for developing strength, power and strength endurance in the legs, back and lower back and form the basis for excellent functional fitness, as long as they are performed with correct technique. However, incorrect execution of these exercises can also lead to serious injuries of the lumbar spine, which may result in long periods of exercise interruptions, being sidelined in your sports team and possibly never achieving full recovery.

In order to master the above exercises with good technique an initial learning phase is required where the novice receives proper supervision and instruction by a knowledgeable trainer/coach.

McGill (2006) summarises the ultimate approach to building a strong back in a five stage process that ensures a foundation for eventual strength, speed and power training.

These include

Stage 1: Groove motion patterns, motor patterns and develop appropriate corrective exercise

Stage 2: Build whole body and joint stability (including stabilisation of the spine)

Stage 3: Increase endurance

Stage 4: Build strength

Stage 5: Develop speed, power, agility

When it comes to teaching motion patterns in these lifts, an important movement for the subject to learn is the neutral spine position in a forward leaning, hip-flexed position. The correct execution of this posture can be challenging for many novice lifters, whether male or female. Naturally we are conditioned to lean forward by flexing the lumbar spine rather than at the hips, bringing the lower back out of its neutral spine position and putting it in a weak and potentially injury prone position. When load is then applied during a lift, the spine is subjected to large shear forces between the vertebrae and intervertebral discs, which leads to tissue weakening and compromised lower back support. Over time and under increased load this may eventually lead to disc herniation.

On the other hand, maintaining a more neutral lordotic spine will maximise shear support between vertebrae and discs, ensure that the spine can withstand high compressive forces, eliminate the risk of ligamentous damage since the ligaments remain unstrained and eliminate the risk of disc herniation, since this is usually associated with a fully flexed spine.

Olympic lifters have perfected this movement. Rather than flexing the lumbar spine, they lock their spines in neutral posture and emphasize rotation around the hips, and are able to lift enormous weights like this without suffering injury.

Teaching correct motion patterns

Some people are very body aware and are able to adopt a neutral spine or a flexed spine on command. Others may find it extremely difficult to assume these positions.

The initial objective is to have the subject consciously separate hip rotation from lumbar motion when flexing the torso. This can be taught using one or more of the following techniques:

1. Demonstrate correct torso flexion to the subject, then have the subject place one hand on the tummy and the other hand on the lower back. This way the subject can feel whether the lower back is locked and movement is occurring about the hips.
2. Place a stick along the spine and ask the subject to flex the torso forward by flexing the hips, while ensuring that the stick remains in contact over the entire length of the spine, from the sacrum up to the area between the shoulder blades.
3. Have the subject roll the hips forward and backward until the patient gets a feel of what it means to lock the lumbar spine in neutral position on command.

Once this is achieved the next stage will be to build whole body and especially spinal stabilisation. The subject must learn to apply neutral spine position in all daily tasks, whether in or out of the gym, and leaning forward to lift an object of any kind should instinctively result in correct neutral spine position. Repetitive correct movement builds stabilisation of the spine and over time will eliminate faulty motor patterns which are often the cause of long term back problems.

Stage 3: Develop endurance

Rather than aiming at developing strength at an early stage McGill (2007) suggests focusing on developing muscular endurance in order to be able to maintain stabilising patterns of muscle activity. If endurance is limited, technique may often suffer, and the whole process may take a step backwards.

Once the foundation is laid and the above steps have been mastered the subject can progress to a programme aimed at developing strength and power, without the risk of suffering injury due to inadequate technique.

References:

McGill, S. M., (2007) *Low Back Disorders – Evidence Based Prevention and Rehabilitation*, Human Kinetics Publishers, Champaign, Illinois

McGill, S. M., (2006) *Ultimate Back Fitness and Performance*, Backfitpro Inc., Waterloo, Ontario