It seems that many rowers down at the boathouse appear to suffer from back pain. Why is this so common and what can be done to prevent it?

Repetitive stress on the lumbar spine is the primary cause of lumbar spinal injuries in the competitive rower. Whether an athlete is a recreational, collegiate or Olympic-caliber rower, the demands placed on the musculoskeletal system and, in particular, the lumbar spine are extremely high. The low back (lumbar spine) is comprised of five vertebrae with a plump intervertebral disc between each vertebra. Repetitive motions such as lifting, forward bending and rotation can cause low back pain because increased compressive forces are being placed on the intervertebral discs. Physical therapists generally educate patients to avoid these combined motions when performing activities of daily living because of the increased risk of spinal injury. Unfortunately, the very nature of rowing incorporates the high risk motions of repetitive forward flexion and, for sweep rowers, the added component of rotation (when turning toward the rigger). It comes as no surprise that research has shown lumbar disc injuries are high in rowers. The injuries occur because of the excessive load placed on a disc when the rower is in a flexed and rotated position during the catch phase of the stroke. Since the motion of rowing cannot be changed, it is necessary to determine how athletes can continue to participate in the repetitive nature of rowing while avoiding injury to the back.

Biomechanics and Physiology

High-level rowers are well conditioned athletes, spending multiple hours on the water, ergometer and in the weight room training to participate in a high endurance, powerful sport. However, research suggests that rowers develop back pain not because they are weak or under-conditioned, but rather as a result of fatigue and decreased motor control of the spinal and core stabilizing muscles (spinal extensors, multifidus, transverse abdominus and internal and external obliques).

There are four phases of a rowing stroke: catch, drive, finish and recovery. At the catch, a rower is in full flexion. A study conducted by Hosea et al. (1989) determined that a rower is in 30 degrees of trunk flexion at the catch and 28 degrees of trunk extension at the finish. Rowing at 30 strokes per minute over a 2,000-meter course produces greater than 200 repetitions of trunk flexion-rotation. As a rower progresses through the recovery to the catch, the spinal extensor muscles act eccentrically to control the amount of trunk flexion. As a rower fatigues, motor control of the spinal and core stabilization muscles may be lost resulting in increased trunk flexion. Biomechanically, the lumbar spine is vulnerable to injury in the rowing athlete, therefore proper training and rehabilitation of the core stabilizers is essential as a preventative way to avoid low back pain. Below are a few exercises that are important to incorporate into the training and conditioning program.

Spinal Stabilization Program:

A comprehensive spinal exercise program consists of flexibility and core stabilization exercises. Stretching tight musculature increases flexibility, which helps reduce the risk of back pain in rowers. The hamstrings and psoas muscle groups are targeted in this program due to the amount of time a rower spends in lumbar flexion. Core strengthening of the tranverse abdominus, obliques and spinal extensor are also essential in prevention of low back injuries.

Stretching:
Psoas Stretching:
Kneel by wall in half-kneel position. Place hand one hand on wall. Reach with opposite arm overhead towards wall. Push hip forward. Hold position for 30 seconds and repeat three times. Perform exercise on other side.

Hamstring Stretching:
Lay in a doorway, place one leg on door jam and other leg on floor. Keep knee straight. Hold position for 30 seconds and repeat three times. Perform stretch on other side.

Core Stabilization:
Transverse Abdominus training:
Lie on back with knees bent, focus on drawing umbilicus towards the floor.

Bridging:
Lie on back with stability ball under knees. Contract transverse abdominus and gluteals and lift hips towards ceiling. Hold position for three seconds then slowly return to start. Repeat.

Side bridging:
Lie on side opposite oarside (port side rower lies on left side). Place elbow under shoulder. Ensure legs are in line with shoulders. Lift hip toward ceiling, holding position for three seconds. Return to start position. Repeat.

Cross extension:
Begin on hands and knees or with stability ball under hips. Lift opposite arm and opposite leg. Do not hyperextend. Return to start and repeat on opposite side.

Squat and arch:
Sit on stability ball. Walk forward into squat position, with ball hugging curve of back, arms at sides. Extend legs, reaching arms up and overhead following hands with head and extending back. Hold position for three seconds and return to start.

Things to Consider
Signs a rower should seek further treatment from a physician or physical therapist are: pain radiating down one or both legs, inability to find a position that relieves symptoms or pain becomes more intense with coughing, sneezing or going to the bathroom.

For other related exercises for rowers, visit **www.sportsphysicaltherapy.com**.

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