

Submaximal Aerobic Capacity

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Do Patients with Chronic Low Back Pain Have a Lower Level of Aerobic Fitness than Healthy Controls?

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108 chronic low back patients completed questionnaires regarding pain, disability, fear of injury, and activity level and performed a modified submaximal cycling test. Maximum oxygen consumption (VO₂max) was calculated and compared with normative data. Results: both men and women with chronic low back pain had significantly lower VO₂max than healthy controls. Conclusion: chronic low back pain patients have a reduced aerobic fitness level compared with normal subjects. Findings provide evidence for an association between a lower level of aerobic fitness and chronic low back pain.

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Studies demonstrate reduced isometric trunk extensor endurance times in low back pain patients but found no differences in isometric flexion or extension strengths. While isometric strength was not associated with the onset of back troubles, poor static back endurance scores are. Strength appears to have little or a very weak relationship with low back trouble. In contrast, muscle endurance, when separated from strength, appears to be linked with better back health. The back muscles are designed for endurance capacity. A stable spine requires endurable muscles not necessarily strong muscles. A history of low back pain is associated with extensors having less endurance and flexors having more endurance. Graduated, progressive exercise programs of longer duration and lower effort should emphasize endurance first, then progress to strengthening exercises. More repetitions of less demanding exercises will enhance endurance and strength. Low back exercises need not emphasize strength with high load, low repetition tasks. Given that endurance has more protective value than strength, strength gains should not be overemphasized at the expense of endurance. For the injured back, spine flexibility should not be emphasized until the spine has stabilized and has undergone strength and endurance conditioning. The most successful rehabilitation programs emphasize trunk stabilization through exercise with a neutral spine while stressing mobility at the hips and knees.

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Very modest levels of muscle activity can create sufficiently still and stable joints. In usual situations only about 10% of maximal contraction is needed to provide segmental stability. In a segment damaged by ligament laxity or disc disease slightly more may be needed. Therefore, endurance is much more important than absolute strength in most patients, although a strength reserve is needed for unpredictable activities such as a fall, sudden load, or quick movements.