

# Use of Isometric Back Extension Endurance Testing a Case Study

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**Abstract – Endurance has been studied. Most commonly, these are (1) Several types of methods of testing spinal muscle measures of isometric, or static, endurance, (2) active measures of endurance within a nonfixed range of motion (isotonic), and (3) isokinetic testing that places subjects in a fixed range of motion as well as a fixed rate of joint motion acceleration. Of the assessment strategies available, isometric endurance testing seems to be cost-effective and requires little equipment for testing. Because of these features, we chose to focus on isometric endurance assessment; we felt that if there was evidence to support it as a clinically useful and valid procedure, it would be the type of testing that clinicians would choose to use to measure spinal muscle endurance. We also explored the literature for evidence regarding the endurance of the lumbar spine extensors specifically, because many methods are purported to test the lumbar spine extensors.**

**Key Words:** Low Back Pain; Muscle; Physical, Endurance; Isometric Back Endurance; Diagnosis; Sorensen

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## INTRODUCTION

The purpose of this study was to review the literature that investigates the use of isometric back extension endurance testing. Different testing methods and evidence regarding their utilization are presented in this review.

**Objective:** To review the literature that describes and evaluates the use of isometric back extension endurance tests.

## REVIEW OF LITERATURE

Because of these features, we chose to focus on isometric endurance assessment; we felt that if there was evidence to support it as a clinically useful and valid procedure, it would be the type of testing that clinicians would choose to use to measure spinal muscle endurance. We also explored the literature for evidence regarding the endurance of the lumbar spine extensors specifically, because many methods are purported to test the lumbar spine extensors. Relevant articles in English were retrieved through a search of MEDLINE and the *Index to Chiropractic Literature*. Key search terms were *back muscle endurance, isometric back*

*endurance, trunk extensors, back muscle performance, and Sorensen test.*

## MATERIAL AND METHOD

Endurance has been studied. Most commonly, these are (1) Several types of methods of testing spinal muscle measures of isometric, or static, endurance, (2) active measures of endurance within a nonfixed range of motion (isotonic), and (3) isokinetic testing that places subjects in a fixed range of motion as well as a fixed rate of joint motion acceleration. Of the assessment strategies available, isometric endurance testing seems to be cost-effective and requires little equipment for testing.

**Data Synthesis:** The principal criterion for inclusion was as follows: any study that discussed or tested an isometric type of back endurance extension test. Studies that were excluded did not use an isometric testing protocol. Thirty-seven of the initial studies are included in this review. Six different types of isometric back extension endurance testing methods were found. Three of these procedures require special testing devices. Much of the research on this topic has centered on a procedure known as the *Sorensen test*. Normative databases have been established for the Sorensen test and 2 other test types.

Validity and reliability have been assessed for some of the procedures.

## CONCLUSIONS

The influence of motivation and effort exerted by the subject are limiting factors in all of the tests reviewed. These psychologic factors warrant further research. On the basis of the literature reviewed, we determined that the Sorensen is probably the most clinically useful of these tests; it is easy to perform, requires no special equipment, and enjoys the most support from the literature. (J Manipulative Physiol Ther 2001;24:110-22)

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