

Does it Matter Which Exercise?

A Randomized Control Trial of Exercise for Low Back Pain

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Study Design. Multicentered randomized controlled trial.

Objectives. To determine if previously validated low back pain (LBP) subgroups respond differently to contrasting exercise prescriptions.

Summary of Background Data. The role of "patient-specific" exercises in managing LBP is controversial.

Methods. A total of 312 acute, subacute, and chronic patients, including LBP-only and sciatica, underwent a standardized biomechanical assessment classifying them by their pain response, specifically eliciting either a "directional preference" (DP) (i.e., an immediate, lasting improvement in pain from performing either repeated lumbar flexion, extension, or sideglide/rotation tests), or no DP. Only DP subjects were randomized to: 1) directional exercises "matching" their preferred direction (DP), 2) exercises directionally "opposite" their DP, or 3) "nondirectional" exercises. Outcome measures included pain intensity, location, disability, medication use, degree of recovery, depression, and work interference.

Results. A DP was elicited in 74% (230) of subjects. One third of both the opposite and non-directionally treated subjects withdrew within 2 weeks because of no improvement or worsening (no matched subject withdrew). Significantly greater improvements occurred in matched subjects compared with both other treatment groups in every outcome (P values <0.001), including a threefold decrease in medication use.

Conclusions. Consistent with prior evidence, a standardized mechanical assessment identified a large subgroup of LBP patients with a DP. Regardless of subjects' direction of preference, the response to contrasting exercise prescriptions was significantly different: exercises matching subjects' DP significantly and rapidly decreased pain and medication use and improved in all other outcomes. If repeatable, such subgroup validation has important implications for LBP management.

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of low back pain (LBP) with a lack of evidence supporting any specific type of exercise, e.g., back or abdominal strengthening, McKenzie, Williams, flexion, extension, or stretching.¹⁻⁵ LBP clinical guidelines advocate advice to stay active and an early return to normal activity as the means to faster recovery with less disability.⁶⁻⁸ These guidelines challenge the popular clinical practice of prescribing patient-specific exercises^{9,10} determined by an individual's assessment findings and implies that nonspecific exercise can be prescribed without consideration of individual clinical signs, e.g., every LBP patient is given the same exercises.

There is growing opinion that the equivocal or conflicting results among exercise trials can be attributed to the faulty assumption that the "nonspecific" LBP populations studied were homogeneous.^{6,11-14} Alternatively, treatment efficacy has been demonstrated in trials that studied defined LBP subgroups, although methodologic weaknesses require cautious interpretation of results.¹⁵⁻²⁰ Meanwhile, identification of LBP subgroups was listed as the top research priority by the International Forum Primary Care Research in Low Back Pain.²¹ The Cochrane Back Review Group has recently referred to the identification of subgroups and predictors of chronicity as "the Holy Grail" of LBP.²²

One subgroup classification method (McKenzie Method),²³ often referred to as Mechanical Diagnosis and Therapy (MDT), has demonstrated strong inter-rater reliability (kappa values ranging from 0.79 to 1.0)^{17,24-30} and other clinically useful properties: predicting outcome and discogenic pathology, and providing preliminary evidence of patient-specific treatments based on assessment findings.^{15,24,29,31-35}

An important feature of the MDT assessment is the identification of a patient's "directional preference" (DP).^{23,36-39} DP is identified when posture or repeated end-range movements in a single direction (flexion, extension, or side-glide/rotation) decrease or abolish lumbar midline pain, or cause referred pain emanating from the spine to appear to progressively retreat in a proximal direction back toward the lumbar midline ("centralization"). There is often a rapid and concurrent restoration of lumbar range of movement.²³ The inter-rater reliability for identifying DP in the hands of qualified practitioners (McKenzie Institute credentialed) is reported as excellent (agreement 90%, kappa 0.9).²⁶

The objective of this study is to determine if a subject-specific exercise prescription concordant with a study participant's DP will achieve better outcomes than non-concordant exercises.

A number of systematic reviews have raised important questions regarding the role of exercise in the treatment

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