

**Peterson T, Kryger P, Ekdahl C, et al. The Effect of McKenzie Therapy as Compared with that of Intensive Strengthening Training for the Treatment of Patients with Subacute or Chronic Low Back Pain: A Randomized Controlled Trial. Spine 2002; 27(16):1702-1709.**

**Design:** Randomized clinical trial

**Population /sample size/setting/interventions:**

- 160 participants with subacute or chronic low back pain who attended a hospital clinic for rheumatology in Copenhagen, Denmark. All participants were randomized to one of two interventions; 1) McKenzie method (n=132), or 2) intensive dynamic strengthening training (n=128). The treatment period for both groups was 8 weeks at an outpatient clinic, followed by 2 months of self-training at home.
- McKenzie treatment intervention consisted of an initial physical assessment, followed by self-mobilizing repeated movements or sustained positions performed in specific movement directions, the application of manual overpressure, and/or mobilization by the physical therapist.
- The strengthening training intervention included 5-10 minutes on a stationary bike followed by low-intensity warm up exercises for the lumbopelvic muscles for 10 minutes. Next, an intensive dynamic back strengthening training program was performed in flexion and extension under the guidance of the physical therapist. The 60 to 90 minute session twice a week ended with 10 minutes of stretching exercises for the trunk and hip muscles.
- In both groups, patients received a maximum of 15 sessions over 8 weeks. They were instructed to continue self-administered exercises at home for a minimum of 2 months after finishing the 8 weeks of treatment at the clinic.
- Eligibility criteria included 1) low back pain with or without leg pain for more than 8 weeks, 2) all adults aged 18 to 60 years of age, 3) a radiograph, CT scan, or MRI taken within the preceding 2 years.
- Exclusion criteria included receiving treatment by the McKenzie method or strengthening training in the past, clinical evidence of affected nerve root, severe osteoporosis, spondylolisthesis, fracture, referred pain from viscera, in social or psychological crisis, another disease, pregnancy, or inability to understand Danish.

**Main outcome measures:**

- Primary outcome variables were disability and pain measured by self-reports using a questionnaire in Manniche's Low Back Pain Rating Scale. Secondary outcome measures of return to work, and use of pain medication was also measured using this questionnaire, and patients' perception of change in back-related quality of life was measured by the choice they made on a 5-point scale. Health-care utilization was also recorded.
- Outcome measures were recorded at the end of the 8-week treatment period at the clinic, and again at 2 and 8 months after treatment completion using postal questionnaires.
- Intention to treat analysis was used for the primary outcome measures. A supplementary analysis of the 180 patients who completed the full treatment program was also performed.

- 30% or 80 participants did not complete the treatment. Of the 80 who failed to complete the follow-up assessments, 38 (28%) were in the McKenzie group, and 42 (31%) were in the training group.
- The 80 patients who withdrew from the study differed from the 180 participants who completed the treatment in that there were significantly more smokers. 71% in the withdrawal group were smokers at baseline compared to 54% in the completed group (P=0.006).
- The other background characteristics for the McKenzie group and the strengthening training group were the same except that more patients in the strengthening training group had pain distribution below the knee (P=0.01).
- Primary outcomes:
  - o In the intention-to-treat analysis, neither disability nor pain intensity differed between the groups at baseline.
  - o In the intention-to-treat analysis, there was a tendency toward a greater reduction in the disability score favoring the McKenzie group at the 2-month follow-up assessment only (P=0.04). Changes in back and leg pain intensities did not differ between the groups at any follow-up times.
  - o A supplementary analysis on all outcome variables for the 180 patients who completed the full treatment program was also performed. No outcome variable differed between the groups at baseline. The McKenzie group showed a significantly greater reduction in pain intensity than the training group at the 2-month follow-up assessment (P=0.01), and a non-significant difference at the end of the 8-week treatment at the clinic (P=0.02). The authors chose to define statistical significance at a P value of 0.01 or less.
  - o The supplementary analysis showed no differences between the groups with regard to reduction of disability.
  - o In both analyses, small reductions were observed in the pain and disability scores from baseline through all the follow-ups in both groups, but the greatest reductions were observed at the end of the 8-week treatment follow-up for both groups, and pain scores were consistently lower in the McKenzie group.
- Secondary outcomes:
  - o For secondary outcomes, there were no significant differences between the groups from the supplementary analysis at any follow-up assessments.
  - o Between-group differences for all the secondary outcomes were small and not significant.
  - o In the supplementary analysis, a substantial reduction in the number of patients using pain killers was observed at the end of the 8-week treatment follow-up for both groups, but not for any other follow-up assessments.

### **Authors' conclusions:**

- The effectiveness of the McKenzie treatment equaled that of intensive dynamic strengthening training in reducing disability and pain intensity in patients with subacute or chronic low back pain. The McKenzie treatment has some potential, as compared with strengthening training, in the treatment of chronic low back pain.

- The intention-to-treat analysis showed no statistically significant differences between the McKenzie treatment and strengthening training in reduction of disability and pain at any follow-up assessment.
- Supplementary analysis of patients completing the full treatment program and all follow-up assessments showed the McKenzie treatment to be superior to strengthening training only in reduction of pain intensity at the 2-month follow-up assessment.

### **Comments:**

- This is a well-designed and documented study.
- Blinding of the physical therapists performing the interventions was not possible. Therapist preference bias was minimized by choosing therapists who strongly believed in the treatments they performed.
- One drawback of the study was the relatively high withdrawal rate of 30% in both groups. Even though an intention-to-treat analysis was performed to minimize the potential bias this could introduce, a best case, worst case, and intermediate case analysis was not conducted to assess how the 80 people who withdrew from the study before completing all assessments might have affected the outcome results. It would have been prudent for the authors to perform this analysis as well.
- The results suggest that smokers were more likely to withdraw from the study than non-smokers.
- The measured outcomes are acceptable indicators of functional disability.
- Fewer patients using pain killers at the end of the 8-week treatment follow-up for both groups coincides with the lowest pain and disability scores at this same follow-up time.
- Due to looking at multiple outcomes, the authors used a very stringent definition for level of statistical significance ( $P \leq 0.01$ ) which may have prevented them from accepting more positive outcomes.
- This study adds to previous evidence that treatment programs containing active exercises are equally effective in patients with chronic low back pain irrespective of the type of exercises compared.
- No differences were observed 8 months after the end of treatment. These results suggest the possibility of a short term effect for the McKenzie treatment, but equal effectiveness for the McKenzie treatment and intensive strengthening exercise in patients with more than 8 weeks of low back pain.
- In both analyses, all the trends and statistically significant differences in disability or pain exceeded the minimum criteria for clinical importance predefined in this study as a 25% difference between groups. Differences ranged between 33% and 122%.

### **Assessment:**

- This study is adequate for some evidence that the McKenzie method is at least as effective as intensive dynamic strengthening training in reducing back and leg pain intensity in patients with nonspecific low back pain in the short term. It should not be done if there is severe nerve root involvement with motor, sensory, or reflex abnormality.