



McKenzie Method® of Mechanical Diagnosis and Therapy® (MDT): Overview of Supportive Studies

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The McKenzie Method continues to be one of the most researched conservative approaches to musculoskeletal problems. It has been examined in depth in relation to its utility in the spine, and the research is accumulating in the extremities. The following is a selection of some of the most relevant and supportive studies on the approach to date. However, studies on MDT are not universally supportive, to get a comprehensive sense of the literature exploring MDT and for the most up-to-date McKenzie references, please visit: www.mckenzieinstitute.org

Classification Reliability

The following two systematic reviews summarise reliability for MDT. When applied by Credentialed or Diplomaed clinicians, MDT has acceptable reliability for the lumbar spine and conflicting levels for the neck. For the extremities there is strong evidence for acceptable reliability with some study designs, using experienced clinicians:

- [Garcia A, Costa L, de Souza F et al. Reliability of the MDT system in patients with spinal pain: A systematic review. J Orthop Sports Phys Ther. 2018;48:12:923-933.](#)
- [Takasaki H, Okuyama K, Rosedale R. Inter-examiner classification reliability of MDT for extremity problems – Systematic review. Musculoskelet Sci Pract. 2017;27:78-84.](#)

Treatment Efficacy

The following RCTs endorse the treatment value of MDT, showing efficacy in the spine and in the extremities.

- [Long A, Donelson R, Fung T. Does it matter which exercise? A RCT of exercises for LBP. Spine 2004;29:2593-2602.](#)

This high-quality RCT endorsed the value of classifying patients using directional preference (DP) and matching exercises. Pain, function, and medication use were significantly superior in the DP group with matching exercises.

- [Petersen T, Larsen K, Nordsteen J, Olsen S, Fournier G, Jacobsen S. The McKenzie Method compared with manipulation when used adjunctive to information and advice in LBP patients presenting with Centralization or Peripheralization. A RCT. Spine 2011;36:24:1999-2010.](#)

With a one-year follow-up, this study compared two alternative interventions. MDT was found to be more effective than manipulation, and the study gives support to the Method's classification-based approach.

- [Albert H, Manniche C. The efficacy of systematic active conservative treatment for patients with severe sciatica. A single-blind, randomized, clinical, controlled trial. Spine 2012;37:7:531-542.](#)

The patients in this study had symptoms that would normally qualify them for surgery. Those given DP exercises improved significantly for global improvement, sick leave, vocational status, root compression signs, and satisfaction.

- [Rosedale R, Rastogi R, May S et al. Efficacy of exercise intervention as determined by the McKenzie System of MDT for knee OA: A RCT. J. Ortho Sports Phys. 2014;44:173-181.](#)

Patients who were given exercises based on an MDT assessment had superior outcomes compared to those of wait-list controls for both pain and function. 40% of the knees examined were classified as having a DP; they demonstrated large effect sizes at two weeks for all primary outcomes and up to large effect sizes at three months.

- [Fritz JM, Lane E, McFadden M, et al. Physical Therapy Referral From Primary Care for Acute Back Pain With Sciatica : A Randomized Controlled Trial. Ann Intern Med. 2021;174\(1\):8-17.](#)

This RCT with 220 patients, used an exercise-based approach utilising MDT principles, including force progressions, vs 'usual care'. At 1 year, the MDT group showed greater improvements with function, pain and self-reported success.

Association with Psychosocial Factors

Numerous studies and one systematic have explored the association between MDT and psychosocial outcomes. There is a positive association to fear avoidance beliefs, somatisation, depressive symptoms and pain self-efficacy.

- [Werneke M, Edmond S, Young M, Grigsby D, McClenahan B, McGill T. Association between changes in function among patients with lumbar impairments classified according to the STarT Back Screening Tool and managed by McKenzie credentialed physiotherapists. Physiother Theory and Pract. 2020;36\(5\):589-597.](#)

This study followed 705 patients who completed functional scores and the STarT Back Questionnaire at baseline and received MDT care. Over 90% classified at a high-risk level decreased to either low (67%) or medium risk (25%) by discharge indicating that MDT care may reduce some of the STarT physical and psychosocial impairments.

- [Werneke M, Edmond S, Young M, Grigsby D, McClenahan B, McGill T. Directional preference and functional outcomes among subjects classified at high psychosocial risk using STarT. Physiother Res Int. 2018;23:e1711.](#)

This cohort study took 138 patients with LBP and high STarT risk. Those with a DP and given matched intervention showed significant and clinically important differences in function compared to those with no DP.

- [Kuhnow A, Kuhnow J, Ham D, Rosedale R. The McKenzie Method and its association with psychosocial outcomes in low back pain: a systematic review. Physiother Theory and Pract. 2020 Jan 7:1-15 Online first.](#)

This systematic review found there was an association between MDT and improvement in fear-avoidance, pain self-efficacy, depression, and psychological distress.

Predicting Outcomes

MDT also has a proven ability to predict patient outcome. With Centralisation / DP the prognosis for a rapid and lasting improvement is very good.



- [Werneke M, Hart D, Guillermo C et al. Association between directional preference and centralization in patients with LBP. J. Ortho Sports Phys. 2011;41:22-31.](#)
- [May S, Runge N, Aina A. Centralization and directional preference: An updated systematic review with synthesis of previous evidence. Musculoskelet Sci Pract. 2018;38:53-62.](#)
- [Yarzbowicz R. A prospective study of patients with shoulder pain and MDT. J Man Manip Ther. 2020;28:41-48.](#)

Assisting in Spinal / Extremity Differentiation

MDT is used as a means for clinicians to differentiate whether extremity symptoms are from a spinal or extremity source. One cohort study details this MDT process, and a secondary analysis examines the indicators.

- [Rosedale R, Rastogi R, Kidd J, Lynch G, Supp G, Robbins SM. A study exploring the prevalence of Extremity Pain of Spinal Source \(EXPOSS\). J Man Manip Ther. 2020 Sep;28\(4\):222-230.](#)

Using an MDT based 'baseline-test-retest baseline' process, clinicians determined which of the 369 patients with extremity pain had symptoms that were of 'spinal source' and which had 'extremity source' symptoms. Overall, 43.5% of the patients were designated as having a 'spinal source' and were treated with solely spinal intervention.

- [Rastogi R, Rosedale R, Kidd J, Lynch G, Supp G, Robbins S. Exploring indicators of extremity pain of spinal source as identified by Mechanical Diagnosis and Therapy \(MDT\): a secondary analysis of a prospective cohort study J Man Manip Ther. 2022 Jan 25; 1-8. Doi: 10.1080/10669817.2022.2030625](#)

This analysis provides clinicians with indicators that predict the source of symptoms for isolated extremity pain and assist with differentiation clinical decision making. Five indicators were identified, with two being the optimal number.

Avoiding potential Surgery and Cost-Saving Implications

Several studies demonstrate the potential of MDT for pre-surgical screening and intervention to reduce surgery rates and decrease costs for low back pain. In the Rasmussen study, 4 years after implementation of MDT-based spine clinics, lumbar disc surgery rates were reduced by 50%. In the van Helvoirt study, transforaminal epidural injections followed by MDT demonstrated the potential to be an effective strategy in preventing surgical interventions. In the Donelson study the utilisation of MRIs, injections and surgery was substantially lower for those receiving MDT care.

- [Rasmussen C, Nielson G, Hansen V, Jensen O, Schioettz-Christensen B et al. Rates of lumbar disc surgery before and after implementation of multidisciplinary nonsurgical spine clinics. Spine 2005;30:21:2469-73.](#)
- [Van Helvoirt H, Apeldoorn A, Ostelo R et al. Transforaminal epidural steroid injections followed by MDT to prevent surgery for lumbar disc herniation. Pain Med. 2014;15\(7\):1100-8.](#)
- [Donelson R, Spratt K, McClellan W, Gray R, Miller M, Gatmaitan E. The cost impact of a quality-assured mechanical assessment in primary low back pain care. J Man Manip Ther. 2019;27\(5\):277-286.](#)

Systematic Reviews and Guidelines featuring MDT

MDT and the phenomenon of Centralisation and DP have been the subject of, or included in, many systematic reviews and guidelines. Here are a few examples.

- [Delitto A, Georg S, van Dillen L et al. Low Back pain. Clinical Practice Guidelines. J. Ortho Sports Phys. 2012;42:4:A1-A57.](#)

It was recommended that clinicians should use specific repeated movements to promote centralisation in patients with acute, subacute, or chronic LBP, with the recommendation based on Grade A, 'strong evidence'.

- [Brosseau L, Taki J, Desjardins B et al. The Ottawa panel clinical practice guidelines for the management of knee osteoarthritis. Strengthening exercise programs. Clin Rehab. 2017;1-16.](#)

This clinical practice guideline developed by a panel of international experts made recommendations on the management of knee OA in regard to exercise. MDT was 'strongly recommended' as an intervention.

- [Lam O, Strenger D, Chan-Fee M, Pham P, Preuss R, Robbins S. Effectiveness of the McKenzie Method of MDT for treating LBP: Literature review with meta-analysis. J. Ortho Sports Phys. 2018;48:6:476-490.](#)

This review concluded that there was moderate to high quality evidence that MDT is superior to other rehabilitation interventions for pain and disability in patients with chronic LBP.

- [Halliday M, Garcia A, Amorim A et al. Treatment effect sizes for pain and disability are moderated by the delivery approach for MDT in a population with LBP: A systematic review with a meta-regression approach. J. Ortho Sports Phys. 2019;49:219-229.](#)

This review grouped MDT RCTs into those that followed the core principles of MDT and those that did not and compared treatment effect sizes. Those *adherent* studies showed significantly greater reduction in pain and disability, demonstrating that when the approach used is consistent with the core MDT principles, better outcomes are achieved.

- [Georg S, Fritz J, Sillies S et al. Interventions for the Management of Acute and Chronic Low Back Pain: Revision 2021 J Orthop Sports Phys Ther. 2021 Nov;51\(11\):CPG1-CPG60](#)

This guideline designated a 'can use' for the McKenzie Method as a classification system for acute LBP, and a 'may use' for chronic LBP.

- [Hennemann V, Ziegelmann PK, Marcolino MAZ, Duncan BB. The McKenzie Method delivered by credentialed therapists from chronic low back pain with directional preference: systematic review with meta-analysis. J Man Manip Ther. Published online October 9, 2024](#)

This review, including only studies that utilised credentialed clinicians, found low-to-moderate certainty evidence that MDT was superior to all other interventions up to 6 months for pain and 12 months for disability. Short term clinically important differences were found versus exercise, and in the intermediate term, versus minimal interventions.