

Theoretical Foundations of the McKenzie Method in Low Back Pain Management

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Abstract

Low back pain is one of the most widespread musculoskeletal issues globally, exerting a significant socioeconomic impact. The McKenzie Method, officially known as Mechanical Diagnosis and Therapy (MDT), is based on the principle of pain centralization and the notion that repetitive movements can direct symptoms and mitigate pain. The present article aims to delineate the theoretical underpinnings of the McKenzie Method—focusing on the biomechanical and neurophysiological models that support it—and to review research from the past decade that underscores both its effectiveness and limitations in low back pain management.

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JEL classification: I0, O3, Z2

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1. Introduction

Low back pain (LBP) affects millions of individuals annually and is one of the primary causes of disability worldwide [1]. Contributing factors to the onset and persistence of LBP include both mechanical components (musculoskeletal injuries, intervertebral disc degeneration) and psychosocial factors (stress, anxiety, depression) [2]. The McKenzie Method, or Mechanical Diagnosis and Therapy (MDT), is employed in assessing and managing low back pain and is founded on a solid theoretical framework developed initially by New Zealand physiotherapist Robin McKenzie in the 1950s and 1960s.

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A distinctive feature of the McKenzie Method is the identification of the therapeutic direction (directional preference) through repetitive movements and specific postures aimed at reducing or “centralizing” symptoms [3]. In the last decade, numerous studies have focused on validating its theoretical foundations and evaluating its effectiveness relative to other therapeutic approaches [4,5]. The present article analyzes the scientific rationale underlying the McKenzie Method, highlighting its relevance for low back pain management.

2. Historical Context and Basic Principles

2.1 Historical Context

Robin McKenzie developed his principles based on clinical observations, noting that certain movements and positions could alleviate or exacerbate low back symptoms (McKenzie, 1981). Over time, these initial concepts were integrated into a diagnostic and treatment system centred on the response of spinal tissues to movement, focusing particularly on intervertebral disc structures. After the 2000s, researchers showed increasing interest in validating the method, a trend reflected in the rising number of clinical studies and meta-analyses [6].

2.2 The Principle of Pain Centralization

One of the core tenets of the McKenzie Method is pain centralization, referring to the migration or “shifting” of pain from distal regions (such as the thighs, buttocks, or lower limbs) toward the spinal column (7). Centralization is clinically associated with symptom improvement, as it reduces both the intensity and distribution of pain. Identifying the movements or postures that induce this centralization is key to the therapeutic intervention.

2.3 Directional Preference

Directional preference is defined as the movement or posture that alleviates symptoms and facilitates pain centralization. In practice, determining directional preference involves systematically testing flexion, extension, or lateral movements in varying repetitions and ranges [3]. Once established, this preferred direction guides the treatment plan and prescribed exercises.

2.4 Patient Classification

According to the McKenzie Method, patients are grouped into three major clinical categories:

1. **Derangement syndrome:** Involves structural changes in the intervertebral disc, which can be reversible under certain movement conditions.



2. **Dysfunction syndrome:** Stems from tissue adaptations (contracture, stiffness) and presents with pain at the “end range” of motion.
3. **Postural syndrome:** Pain arises primarily from prolonged maintenance of inadequate postures, without evident structural modifications.

This classification enables a personalized therapeutic approach, tailored to symptom patterns and responses to movement [5].

3. Biomechanical Foundations

3.1 The Intervertebral Disc and Repetitive Movements

At the heart of McKenzie’s theory lies the concept that the intervertebral disc can be mechanically influenced by certain movements and postures, with effects that may be beneficial or detrimental [8]. In disc-related low back pain, it is posited that the disc protrusion can “retract” (reduce) when movements are performed in a beneficial direction, subsequently diminishing pain and improving mobility.

3.2 Neutral-Extension Posture and Spinal Alignment

Multiple studies have indicated that maintaining a neutral or slightly extended lumbar posture can lower intradiscal pressure and safeguard sensitive [9,10]. In the McKenzie Method, lumbar extension exercises are frequently recommended, especially for patients whose directional preference involves extension.

3.3 Segmental Stiffness and the Adaptation Phenomenon

In dysfunction syndrome, tissues (ligaments, muscles, joint capsules) are considered adapted to a certain degree of tension or stiffness. Repetitive “end-range” movements progressively increase tissue elasticity and reduce stiffness [11]. McKenzie’s theory highlights the importance of careful exercise dosing to avoid excessive inflammation and pain exacerbation.

4. Neurophysiological Foundations

4.1 Pain Neuromodulation

Recent neurophysiological research indicates that repetitive movements can modulate pain perception via both central and peripheral mechanisms [12]. Thus, the reduction in pain intensity is not solely due to localized structural changes (i.e., disc protrusion reduction) but also to alterations in neuronal excitability at the level of the spinal cord and cortex [13].



4.2 Motor Control and Movement Re-education

The McKenzie Method emphasizes proper training of functional movements, based on the premise that a dysfunctional neuromotor pattern may perpetuate or exacerbate low back pain [14]. By repeating movements in the preferred direction, the patient acquires a new, more efficient, and less painful motor pattern.

4.3 The Psychosocial Component

Although the McKenzie Method focuses primarily on mechanical aspects of low back pain, research suggests that the approach also includes cognitive and emotional elements [15]. Patient education regarding pain mechanisms and the importance of self-management has a positive impact on adherence and self-efficacy in the rehabilitation process.

5. Efficacy of the McKenzie Method

A 2019 synthesis conducted by May and colleagues [4] compared the effectiveness of the McKenzie Method with other forms of physical therapy (general exercise, chiropractic manipulation, massage), analyzing 16 clinical studies published between 2010 and 2018. Their conclusions revealed a superior or at least comparable effect of the McKenzie Method on pain relief and functional improvement, particularly in acute and subacute low back pain.

A meta-analysis by Clare and peers, covering studies from 2012 to 2019, observed that patients undergoing McKenzie-based treatment experienced a more rapid decrease in pain compared to those following other exercise regimens. However, the authors emphasized the methodological inconsistency across studies and the need for standardized treatment protocols [16].

Given the frequent recurrence of low back pain, an essential objective in rehabilitation is preventing symptom relapses. A longitudinal study from 2021 investigated recurrence rates over 12 months, comparing patients treated with the McKenzie Method to those enrolled in standard exercise programs. The findings indicated a significant reduction in relapse incidence in the McKenzie group, suggesting that self-management and educational components inherent in the method may confer a protective effect [5].

Limitations and Controversies

Although the McKenzie Method has demonstrated effectiveness in multiple studies, several controversial aspects remain:

- **Patient heterogeneity:** Not all individuals with low back pain respond identically; certain clinical patterns may necessitate distinct therapeutic approaches [12]



- **Quality of evidence:** Some existing research is constrained by methodological flaws, such as a lack of clinician blinding or small sample sizes [9].
- **The role of psychosocial factors:** The McKenzie Method places considerable emphasis on mechanical factors, yet recent data highlight the importance of including psychosocial elements in any intervention [15].

6. Practical Implications and Implementation Steps

6.1 Initial Evaluation and Classification

Within the McKenzie Method, the initial step entails a thorough patient assessment: medical history, pain localization, factors exacerbating or relieving symptoms, and repetitive movement testing in different planes [3]. These data guide classification into derangement, dysfunction, or postural syndrome.

6.2 Establishing the Directional Preference

Once the movement that centralizes symptoms is identified, a specific exercise protocol is prescribed. Initially, it is performed under therapist supervision, subsequently transitioning to a self-treatment regimen at home [8]. This approach fosters autonomy and encourages patient involvement in recovery.

6.3 Self-treatment and Education

Self-treatment is integral to the McKenzie Method. Patients are advised to perform exercises throughout the day and adopt ergonomic postures [10]. Education plays a crucial role, encompassing explanations of pain mechanisms, the significance of adhering to the exercise program, and maintaining an appropriately scaled physical activity level based on symptom presentation.

6.4 Monitoring Progress

A hallmark of the McKenzie Method is continual tracking of the response to exercises. If centralization and progressive pain reduction occur, the protocol is maintained; otherwise, alternative strategies are explored, or the exercise direction is adjusted [11].

7. Discussion and Future Perspectives

The McKenzie Method remains a topic of ongoing interest among physical therapy professionals, sports medicine practitioners, and clinical researchers. The



biomechanical and neurophysiological theories that underpin the method continue to be refined. One future research avenue involves integrating novel technologies such as tele-rehabilitation and mobile applications to bolster patient monitoring and adherence to McKenzie exercises [17].

Another area of interest lies in developing specific protocols for distinct patient subgroups, for instance, those with advanced disc herniations or pronounced psychosomatic components [14]. Moreover, multimodal strategies that combine mechanical therapy with cognitive-behavioral interventions may heighten treatment efficacy and lessen relapse rates [13].

8. Conclusions

The McKenzie Method, also referred to as Mechanical Diagnosis and Therapy, has solidified its standing as a recognized approach in low back pain management due to its systematic and patient-centred nature. The theoretical principles that underpin the method—particularly the concept of pain centralization, directional preference, and syndrome classification—have been supported by numerous clinical studies and systematic reviews conducted over the past decade. While some controversies persist regarding the diversity of clinical patterns and the influence of psychosocial factors, the McKenzie Method continues to offer a valuable resource for both clinicians and patients.

Proper application of the McKenzie Method demands a thorough evaluation and close monitoring of patient progress, as well as comprehensive patient education and self-management strategies. Ongoing research, alongside the refinement of diagnostic and treatment protocols, will further optimize this method, ensuring more effective low back pain management and enhanced patient quality of life.

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