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Conservative Management of an Adult with Chronic Low Back Pain

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Conservative Management of an Adult with Chronic Low Back Pain

By

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A Scholarly Project Submitted to the Graduate Faculty of the

Department of Physical Therapy
School of Medicine
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In partial fulfillment of the requirements for the degree of

Doctor of Physical Therapy

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This Scholarly Project, submitted by Crystal Braun in partial fulfillment of the requirements for the Degree of Doctor of Physical Therapy from the University of North Dakota, has been read by the Advisor and Chairperson of Physical Therapy under whom the work has been done and is hereby approved.

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Schawnn Decker
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Permission

Title
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Department
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Degree
Doctor of Physical Therapy

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ABSTRACT

Background and Purpose: The purpose of this case study is to describe the conservative management of a male patient with chronic low back pain. This report will provide an insight to the benefits of an individualized treatment program combining therapeutic exercises, the McKenzie Method along with a Lumbar Extension MedX strengthening program.

Case Description: This case study describes the treatment of a 34 year old male computer programmer suffering from low back pain.

Intervention: The patient was treated using directional preference, segmental stabilization, lumbar extension MedX strengthening, and other physiotherapy exercises. He received treatment twice a week for three weeks and three times the final week of his care, for a total of nine visits. He was given a home exercise program from the first day, which was added to throughout his treatment.

Outcomes: The patient showed improvement in self rated pain scale, amount of time he could sit with no pain, exercise capabilities, lumbar strength, lumbar range of motion and function (Oswestry 1/34). These outcomes proved that treatment for this patient was effective.

Discussion: Some form of low back pain is said to affect 60-80% of people in the US. This case report suggests that a comprehensive physical therapy spinal rehabilitation program significantly improve symptoms and function associated with low back pain.
CHAPTER I
BACKGROUND AND PURPOSE

Chronic low back pain is the most expensive benign medical condition in industrialized countries.\(^1\) It is estimated that 60% to 80% of people in the U.S. will be affected by some form of low back pain during their lifetimes. Back pain is the second leading reason for doctor’s office visits in the U.S., the third most common reason for surgical procedures, and the fifth most common reason for hospital admissions. It is the most frequent cause of disability for people younger than 45 years of age, and the most common painful condition reported by patients following headache.\(^2\)

There are numerous predisposing factors associated with low back pain: occupation, age, gender, family history, activity level, obesity, poor posture and alignment, previous back injury, smoking, and psychological and social factors. Patients with chronic low back pain may experience pain that is limited to the midline lumbar region or pain that is referred to any of a large number of sites. These sites include the paraspinal region, posterior pelvis, hips, or buttocks; posterior or lateral thigh, knee or leg; or anywhere in the foot. If the pain is below the knee, it suggests that the origin is not just damage to the spine and surrounding tissues, but also damage to the nerve roots that travel out of the spine and into the leg.\(^2\)

Low back pain is diagnosed based on a combination of patient complaints, diagnostic imaging, and physical examination findings. The American College of Physicians and American Pain Society has seven guidelines for diagnosis and treatment of low back pain. The first recommendation is to take a focused history, along with a physical exam, then place the patient into one of three categories. The categories include nonspecific low back pain, back pain potentially associated with radiculopathy or spinal stenosis, and back pain potentially associated
with another specific cause. They suggest avoidance of routine imaging studies or other diagnostic test in patients with nonspecific low back pain. However, you should perform diagnostic testing for patients with low back pain when severe or progressive neurologic deficits or serious underlying conditions are suspected. Patients with persistent low back pain and symptoms of radiculopathy or spinal stenosis should be evaluated with magnetic resonance imaging (MRI) (preferred) or computed tomography (CT). This should be done only if the patients are potential candidates for surgery or epidural steroid injection.3

The American College of Physicians and American Pain Society recommend providing patients with evidence-based information on low back pain with regard to the expected course, advice to remain active, and effective self-care options. It is also suggested that the first-line medication for most patients is acetaminophen or NSAIDs. Finally, they recommend different options for patients with chronic or subacute low back pain who do not improve with self-care options. These include intensive interdisciplinary rehabilitation, exercise therapy, acupuncture, massage therapy, spinal manipulation, yoga, cognitive-behavioral therapy, and progressive relaxation.3

As one can see, this is a long list of recommendations that are not very specific. The treatment chosen for this patient was very specific. The McKenzie Method, often referred to as Mechanical Diagnosis and Therapy (MDT), was used to diagnosis and treat this patient. MDT demonstrates strong interrater reliability (kappa values ranging from 0.79 to 1.0). 4-9 Once the patient is examined the therapist must then figure out the patient’s directional preference (DP). 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 progressively retreat in a proximal direction toward the lumbar
midline (centralization). The inter-rater reliability for identifying DP in the hands of a qualified practitioner (McKenzie Institute credentialed) is reported as excellent (agreement 90% kappa 0.9).8

In its truest sense, when understood and followed accordingly, the McKenzie Method is a comprehensive approach to the spine, based on sound principles and fundamentals that are very successful. In fact, most remarkable, but least appreciated, is the McKenzie assessment process.11

Unique to the McKenzie Method is a well-defined algorithm that leads to the simple classification of spinal-related disorders. It is based on a consistent "cause and effect" relationship between historical pain behavior as well as the pain response to repeated test movements, positions, and activities during the assessment process. A systematic progression of applied mechanical forces (the cause) utilizes pain response (the effect) to monitor changes in motion/function. The underlying disorder can then be quickly identified through objective findings for each individual patient. The McKenzie classification of spinal pain provides reproducible means of separating patients with apparently similar presentations into definable sub-groups (syndromes) to determine appropriate treatment.11

McKenzie has named these three mechanical syndromes: postural, dysfunction and derangement. Postural is the end-range stress of normal structures; dysfunction is the end-range stress of shortened structures (scarring, fibrosis, nerve root adherence); and derangement is the anatomical disruption or displacement within the motion segment. All three mechanical syndromes — postural, dysfunction, and derangement — occur in the cervical as well as thoracic and lumbar regions of the spine.11
Each distinct syndrome is addressed according to its unique nature with mechanical procedures utilizing movement and positions. The phenomenon of "centralization" occurs most commonly with a derangement syndrome. Its hallmark is sensitivity to certain movements and a preference for particular movement patterns. When certain movements are performed, such as flexion and/or extension (bending or straightening), the symptoms (e.g., low back pain) become either more central (e.g., just in the low back) or less intense. It is not uncommon for a patient to experience rapid reduction of his/her symptoms immediately during the assessment. That is to say, if the patient's symptoms were pain in the right thigh, the pain may be moved more centrally to his/her buttock, or in some cases be completely abolished. 12

McKenzie treatment uniquely emphasizes education and active patient involvement in the management of the patient’s treatment in order to decrease pain quickly and restore function and independence, minimizing the number of visits to the clinic. If a problem is more complex, self-treatment may not be possible right away. However, a certified McKenzie clinician will know when to provide additional advanced hands-on techniques until the patient can successfully manage the prescribed skills on his/her own. Ultimately, most patients can successfully treat themselves when provided the necessary knowledge and tools. An individualized self-treatment program tailored to the lifestyle of the patient puts the patient in control safely and effectively. 11

According to Clare and associates, 13 the data from five lumbar trials were pooled at short-term (less than three months) and from three trials at intermediate (3-12 months) follow-up. At short-term follow-up the McKenzie therapy provided a mean 8.6 point greater pain reduction on a 0 to 100 point scale (95% CI 3.5 to 13.7) and a 5.4 point greater reduction in disability on a 0 to 100 point scale (95% CI 2.4 to 8.4). At intermediate follow-up, relative risk of work absence 0.81 (0.46 to 1.44) favor McKenzie. This review showed patient’s with low back pain using the
McKenzie Method did result in a greater decrease in pain and disability in the short term than other standard therapies.

A Lumbar Extension MedX machine with pelvic stabilization was incorporated into the treatment plan. Pelvic stabilization is necessary to achieve optimal recruitment of the lumbar extensor muscles during dynamic extension exercise on a lumbar extension machine. One method of stabilizing the pelvis is to isolate the lumbar extensors by restricting pelvic rotation. This can be accomplished by applying a restraining force to the lower extremities when the patient is in the seated position. Therefore, if the goal is to strengthen the muscles of the low back, it is necessary to stabilize the pelvis with a clinically proven restraint system. According to Juan et al\textsuperscript{14} a significant effect of restraint condition was observed ($p = 0.006$; partial eta squared = 0.45; observed power = 0.99) on the Lumbar Extension MedX machine.

The efficacy of isolating the lumbar extensor muscles through pelvic stabilization to develop lumbar extension strength is well documented. Pollock and colleagues,\textsuperscript{15} Graves and associates,\textsuperscript{16} and Carpenter and coworkers\textsuperscript{17} have reported more than 100% increase in isometric lumbar extension torque production following resistance training of the isolated lumbar extensor muscles in asymptomatic normal populations. Risch and colleagues\textsuperscript{18} found a significant improvement in lumbar extension strength as well as significant reduction in symptoms of pain and psychosocial dysfunction following resistance training of the isolated lumbar extensor muscles in chronic low back pain patients.

The goal of this case report was to describe the conservative management of an adult male diagnosed with low back pain. This report will provide insight into the benefits that an individualized treatment program combining therapeutic and directional preference exercises
along with a Lumbar Extension MedX strengthening program can have on reducing pain and improving function in an individual with chronic low back pain.
CHAPTER II

CASE DESCRIPTION

PATIENT HISTORY

The patient was a 34 year old male who worked full time as a computer programmer out of his home. He reported a history of back pain for several years, without recalling a specific onset. The patient had a microdisectomy of L5 and S1 5 years previous. He stated that the pain had become increasingly worse in the past 6 months. The patient reported his current symptoms to be pain in the center of his low back with intermittent numbness from his right buttock down the back of his right leg stopping at the knee. He rated his pain 7/10 (0-no pain, 10-worst pain imaginable) when it was at its worst, but he did have pain free moments. He had difficulty sitting or standing for long periods of time and rising from a seated position. He had no treatment for any previous episodes of pain.

The patient referred himself for treatment and reported on a medical history questionnaire that he had seasonal allergies and thyroid dysfunction, but was not on medication for either. He also filled out a Revised Oswestry Pain Questionnaire. This questionnaire is designed to give information as to how the patient’s back or leg pain is affecting his ability to manage everyday life. He received a 5/34, which placed him in the mild disability category. This group can cope with most activities of daily living. Usually, no treatment is indicated, apart from advice on lifting, sitting posture, physical fitness, and diet. This patient had difficulty with sitting, and this was important since his occupation was sedentary.

During the McKenzie lumbar evaluation, this patient demonstrated signs and symptoms that were consistent with a mechanical lumbar derangement. Throughout the initial evaluation he responded with decreased pain to repeated extension in lying. This improvement gave a green
light (move forward with treatment) for the McKenzie intervention to continue and determine his
directional preference.

EXAMINATION

The patient was initially taken through the McKenzie assessment, a series of questions
designed to help make a diagnosis for lumbar pain (Appendix A). According to Razmjou et al., using patterns of pain response to repeated end range spinal test movements was highly reliable when performed by properly trained physical therapists. The agreement between raters for selection of the McKenzie syndromes was $K=.70$, and for derangement syndrome was $K=.96$ (K Cohen's Kappa). Significant findings during this part of the exam revealed that the patient was having intermittent numbness in his right buttock and down the back of his right leg stopping at the knee. He also reported that the pain was worse when he was sitting, standing, or rising.

The patient was then taken through the functional part of the exam which revealed a minimal loss in range of motion during left lateral side glide. Refer to Table 1 for results of the lumbar assessment. He was then asked to perform extension in lying (Fig. 1). This had no effect

Table 1  McKenzie Lumbar Assessment

<table>
<thead>
<tr>
<th>Posture assessment</th>
<th>Amount of Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting</td>
<td>Fair</td>
</tr>
<tr>
<td>Standing</td>
<td>Fair</td>
</tr>
<tr>
<td>Lordosis</td>
<td>Normal</td>
</tr>
<tr>
<td>Lateral shift</td>
<td>None</td>
</tr>
<tr>
<td>Correction of Posture</td>
<td>No effect</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Movement Loss</th>
<th>Amount of Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexion</td>
<td>None</td>
</tr>
<tr>
<td>Extension</td>
<td>None</td>
</tr>
<tr>
<td>Side Glide (R)</td>
<td>None</td>
</tr>
<tr>
<td>Side Glide (L)</td>
<td>Minimum</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pretest symptoms in Lying</th>
<th>Central lower back pain</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Motion tested</th>
<th>During Testing</th>
<th>After testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension in lying</td>
<td>No effect (pain)</td>
<td>No effect (pain)</td>
</tr>
<tr>
<td>Repeated extension in lying</td>
<td>Decreases (pain)</td>
<td>Better (pain)</td>
</tr>
<tr>
<td>Repeated extension in lying with belt overpressure</td>
<td>Decreases (pain)</td>
<td>Better (pain)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post test symptoms in lying</th>
<th>Improved left side glide</th>
</tr>
</thead>
</table>

Figure 1 Prone press-ups

http://www.spineuniverse.com/conditions/back-pain/origin-mckenzie-method
on his symptoms. He then was asked to repeat this motion 10 times. The patient reported that his pain was “a little better” during the exercise and was “better” after the exercise. His motion was checked with estimations and showed some improvement in left side glide. While the patient was lying prone, the physical therapist placed a gait belt across the patient’s low back at L4-L5 and held it there while the patient repeated his press-ups. The patient stated that the pain was gone and the therapist noted an improvement in his range of motion in left side glide using estimation.

EVALUATION, DIAGNOSIS, PROGNOSIS

The findings of this examination revealed that the patient had signs and symptoms consistent with a mechanical lumbar derangement. He showed improvement with left lateral side glide range of motion after repeated extension in lying with overpressure.

This patient was experiencing problems of low back pain, improper posture (rounded shoulders, forward head), and loss of lumbar extension strength. He had extreme difficulty performing his job which involved sitting for 8 hours a day. These issues were implemented into his short-term and long-term goals.

Within 2-3 weeks, the patient was able to demonstrate independence and compliance with the McKenzie protocol low back program and lumbar stabilization program. He demonstrated proper sitting and standing posture to facilitate proper healing and prevent recurrence of low back pain.

In 4-6 weeks, he returned to full work duties and completed all activities of daily living without limitations secondary to low back pain. The patient demonstrated active range of motion within normal limits with static strength test as evidenced by age and body size norms on the Lumbar Extension MedX. He demonstrated proper body mechanics and posture with work and
activities of daily living to facilitate healing and decrease risk of re-injury. He had have an Oswestry score of 2 or less indicating the patients past back problems were having little to no impact on functional activities.

The patient had a diagnosis of Lumbago ICD-9 code of 724.2. The PT guide code was 4F: Impaired Joint Mobility, Motor Function, Muscle Performance, Range of Motion, and Reflex Integrity Associated with Spinal Disorders. He had a great attitude and no co-morbidities that would hinder his prognosis. His rehabilitation potential was excellent for his previously stated goals.

The patient was educated regarding treatment options, appropriate posture, exercise, body mechanics, and behavior modifications to minimize his symptoms at his initial session, as well as throughout his treatment. He was started on a home exercise program to promote independent management of the current diagnosis after his initial evaluation. Joint mobilization and manual therapy techniques were used as indicated to restore normal biomechanical movements. He was initiated into a comprehensive spinal rehabilitation program which included specific lumbar stabilization training, neuromuscular re-education, and directional preference exercise activities. He was re-evaluated after one week to determine his progress. The patient was tested during the next treatment session on the Lumbar Extension MedX to compare his scores to the normative data for his age and body type.
CHAPTER III
INTERVENTION

SESSION 1 (DAY 1)

On the day of the initial evaluation treatment was aimed at identifying his directional preference. He started the treatment with completing one prone press-up. This did not change his symptoms. He then did 10 prone press-ups that reduced his pain and showed a slight improvement in his left lateral side glide estimated by the therapist (eye-ball measurements). The patient was then progressed to 10 prone press-ups with belt overpressure provided by the physical therapist (PT). He was sent home with a home program of prone press-ups with overpressure 10 times every waking hour. He was instructed to check his movement (going through all of the lumbar motions in front of a mirror) and pain level before and after each set. The PT also informed the patient to discontinue if his pain increased down his leg or any new symptoms arose. He was told that it would be normal to be sore up to 20 minutes after the exercises and that the pain may be more intense in the center of his back due to centralization. The patient was informed that centralization was a good indicator that his directional preference was extension.

SESSION 2 (DAY 3)

A positive response to the prone press-ups with over pressure was determined as the patient reported reduced pain in the low back. He also stated that he was able to sit for 2 hours with less pain. During that session, multiple new exercises were administered. Refer to Appendix C and D for a list of the treatments along with frequency, duration, and weight changes. He started out with a six minute warm up on an upright stationary bike. He did 2 sets of prone press-ups with overpressure. He was then progressed to three stretches along with a
nerve glide that stretched the nerve from the dorsum of the foot all the way to the lower back. The first stretch he performed was called knee to chest (KTC). This involved the patient lying on his back with one leg flat on the table and the other pulled up to his chest. This is done with each leg. Knee to opposite shoulder (KOS) was the next stretch. This was performed in the same manner as KTC except the patient pulls his leg across his body toward the opposite shoulder. The final stretch in this series is called the Figure 4 (Fig. 2). This stretch was done in supine, one knee bent with that foot on the table with the other leg crossed over and the ankle resting on top of the opposite knee. The patient was then instructed to press on the knee that was crossed and hold for 30 seconds. This was performed with each leg. The patient was then instructed to stay supine on the table keeping one leg flat and bringing the other leg up so that the hip and knee were at a 90° angle. From there the patient was supposed to raise the lower part of his leg as straight as it would go in the air, and then begin to pump the ankle. This is known as an active hamstring stretch that will glide the nerve in its sheath. The last exercise was done on his back on the table. It was a two minute isometric hold of abdominal muscles known as bracing. The patient was shown the proper technique of contracting his abdominal muscles without lowering his back onto the bed or holding his breath. During this exercise he was instructed to count how many times he had to reset the contraction. He reported that he had to reset 5 times in 2 done so that he would be able to see improvement throughout the treatments.

The patient then was stood and shown how to do push-pulls (Fig. 3) and a straight arm pull down (SAPD) (Fig. 4). These are both
done with a slight bend in the knee while keeping the back straight and eyes forward. He was next taught how to do a Good Morning (Fig. 5). This was used to help the patient bend over with proper body mechanics. The patient held a long pole against his spine. He was then asked to slightly bend his knees and bend forward at the waist so that the pole stayed on his body. If the pole moved, the patient was immediately instructed to stop and start over. The final two exercises the patient was shown were back extension and the reverse hip using a thera-ball. During the reverse hip, the patient starts prone on the floor with a bench in front of him arm length away. A thera-ball is then placed under his abdominal area. He then balanced on the ball and reached out to the bench for upper extremity support. He was instructed to keep his back straight and abdominal muscles tight while lifting both feet off the floor, holding his legs level with his back. When completing back extensions the patient placed his feet against the wall and put the thera-ball at his waist line. The patient placed his arms behind his head and curled down over the ball and extended back up.

The very last treatment of the day was lumbar extension mobilization. Since the patient had a directional preference toward extension with some limited motion, the physical therapist performed 10 extension mobilizations to the spinous processes of the lumbar spine. The patient tolerated treatment well that day and was instructed to keep doing his prone press-ups and add the 5 table activities that were performed that treatment.

SESSION 3 (DAY 6)

The patient reported that he was doing "pretty good," but still a little sore in the center of his lower back. The patient kept with the same routine of his previous treatment except the Good
Mornings were eliminated and dead lifts were added in their place since it is the same motion, but with weight. He was then introduced to the MedX Stretch Machine and the MedX stretch was performed (Fig. 6). This machine stretched the patient from head to toe which helped relieve some of his neck and back pain.

Two other exercises, seated rotation and low rows, were demonstrated then performed by the patient. Seated rotation was done on a machine with 37.5 pound weight. Low rows require the patient to use the same machine as the push pulls and SAPD and the same body mechanics. The cable and weight were from the low floor position. He was required to pull it up so that his elbows bent and his arms came to his sides.

When the patient finished his exercise treatment for the day, he was then tested on the Lumbar Extension MedX machine (Fig. 7). The Lumbar Extension MedX machine can provide resistance over a full range of isolated lumbar motion \((72^\circ)\), or over a selected limited range. In the exercise mode, a compound weight stack provides resistance from 10 to 400 ft. lbs. in increments of one foot pound. Isometric testing may occur every three degrees within a patient’s range of motion. During the test, the software plots a strength curve that allows a comparison of the patient’s strength and range of motion to age and gender matched norms. It also has the ability to detect a lack of reasonable effort by the patient. Various reports can be generated for individual patients and selected patient groups or categories for outcome tracking purposes. Testing accuracy and reliability is assured because the machine factors out the torque of both torso mass and stored energy. Torso mass is eliminated by an adjustable counterweight. Stored energy (tissue
compression and/or joint elasticity) can be assessed and factored out at each angle tested. See Appendix E Normative Analysis Relative Strength data for comparisons.

SESSION 4 & 5

During the next two sessions only minor adjustments were made in his program. See Appendix B for increased weight and repetitions. The patient continued to have some soreness but that was attributed to new exercises. An abdominal dolly exercise (Fig. 8) was added with the patient only going straight forward and backward. He was also introduced to a side crunch on the theraball and quadratus lumborum (QL) side raises. For QL side raises the patient was instructed to lie on one side, ensuring the top hip was stacked above the bottom hip. He then pushed up on his elbow until there was a straight bodyline through feet, hips and head. At the end of each session he was put on the MedX machine for lumbar extension strengthening exercises. Isolated lumbar extension exercise with the pelvis stabilized using specialized equipment elicits the most favorable improvements in low back strength muscle cross-sectional area, and vertebral bone mineral density. Improvements that occurred independent of diagnosis, were long-lasting, and appeared to result in less reutilization of the health care system than other more passive treatments. He reported that he was able to sit for 3-4 hours with no pain and he was having only 1-2 episodes a week of tingling down his right buttock and leg.

SESSION 6-9

The final four sessions stayed the same for exercises however, more weight and repetitions were added (Appendix D). The patient continued to increase his weight on the Lumbar Extension MedX machine and even gained some range of motion (66° to 72°). During
his final treatment he was retested on the Lumbar Extension MedX to check how he had
progressed and how he compared to the normative data. Refer to Appendix F Normative data.
CHAPTER IV
OUTCOMES

At discharge the patient demonstrated improvements from baseline, including increased lumbar range of motion and strength and improved sitting time with no pain. He was able to sit for 8 hours with minimal breaks and no pain. The patient performed all motions of the lumbar spine and had no noticeable limitations viewed by the therapist or himself. The patient had returned to all previous activities and was able to complete his work with no limitations.

The Oswestry index can be used to monitor the response to treatment and rehabilitation. It is based on a patient’s subjective impression of his or her own state of disability. This test is widely used by physical therapists for determining functional disability due to low back pain and is simple, quick, and inexpensive to administer. One limitation of this test is that it is subjective; ultimately, there is no absolute measure of disability due to pain. The reliability of this test has an internal consistency of Cronbach’s alpha: 0.71 to 0.87. The results of this patient’s Revised Oswestry Pain Questionnaire was 1/34 compared to 5/34, indicating self-report of improvements in activities of daily living.

The patient had centralization of his symptoms with the initial treatment of repeated prone press-ups using the McKenzie Method. Within 2 treatment sessions of repeated prone press-ups the patient had no symptoms into his leg or buttock. After the pain was centralized the patient had decreased pain with subsequent treatments. McKenzie emphasizes the maintenance of both the lumbar lordosis and a full range of lumbar spine extension to maintain the nucleus pulposus anteriorly. The patient achieved these goals by discharge. McKenzie also recognizes the importance of lumbar flexion, and as soon as it was determined that performing selected flexion exercises would not increase the subject’s symptoms. They were instituted as part of his
treatment and home program. He was able to gain full, painless range of lumbar spine and return to normal function.

The patient had improvements on the Lumbar Extension MedX machine. He improved his lumbar range of motion from 66° to 72°, which is the limit. He improved strength as shown by the Normative Analysis of Relative Strength (see attached). The patient’s lumbar strength was evenly distributed throughout the region.
CHAPTER V
DISCUSSION

This case report describes the successful management of a 34 year old man with low back pain, using an individualized therapeutic exercise program combined with the McKenzie Method and the MedX Lumbar Extension machine. This patient was able to improve his lumbar strength, lumbar extension and lateral side-glide ROM, as well as level of function and activity while reducing his level of pain. This comprehensive physical therapy spinal rehabilitation program significantly improved symptoms and function associated with low back pain and discomfort. The combination of lumbar stabilization training and directional preference exercises along with a targeted home exercise program improved this patient’s quality of life.

The literature shows that in 80-90% of the cases, back pain is self-limiting, benign and improves spontaneously within approximately six weeks.\(^{24}\) The problem regarding the course of an acute episode is that approximately 90% of the patients consulting about low back pain still report recurrences of back pain 12 months later.\(^{25}\) Therefore, one should especially look at the long term results. According to Rackwitz et al,\(^{26}\) segmental stabilization exercises effectively reduced recurrence of back pain at long term follow up. Therefore by using lumbar stabilization exercises we are decreasing this patient’s chance for recurrence of low back pain.

According to the literature pelvic stabilization is necessary to effectively train the lumbar extensor muscles.\(^{14}\) The goal for this patient was to strengthen the muscles of the low back. Therefore we initiated our patient into a spinal rehabilitation program that incorporated the Lumbar Extension MedX machine which used a clinically proven restraint system to stabilize the pelvis and strengthen the muscles of the low back.
Throughout the course of this patient’s treatment, he continued to show improvements in strength and reduction in pain. His symptoms centralized with the first application of the McKenzie Method treatment of prone press-ups. By matching this patient’s directional preference to the exercises he performed, we were able to elicit positive outcomes that improved his quality of life.

The potential limitations of this case report were the lack in instrumental measurements in the initial evaluation. The patient’s lumbar range of motion was assessed by the physical therapist using eyeball estimates. This is not an accurate way of measuring range of motion. Another limitation is that this is only the outcomes of one patient. To get more accurate data about the use of spinal rehabilitation with lumbar stabilization and directional preference, a larger group with a control would be more beneficial.

Generally speaking, there is a need for high quality studies in acute, subacute, and chronic low back pain conditions in order to evaluate different treatment methods. Especially in the area of segmental stabilization exercises combined with other physiotherapy treatments. Further research in the area of the McKenzie Method along with the use of Lumbar Extension MedX machine are needed to determine the long term effects of treatment for low back pain.

Reflective Practice

Examination- I would make some changes to the initial examination. I feel that a better patient history could have been taken. He was not asked specifically about his past medical or surgical history. He just filled out a sheet that asked him to circle any medical problems he had. I feel that they were not elaborated on and that the physical therapist did not ask for any clarification. I also recommend the use of specific measurements of the lumbar spine which would have helped to give good documentation of improved range of motion.
Evaluation- The patient reported that he was having intermittent numbness into his leg and buttock area. I feel that sensation should have been assessed. I was not able to write up a formal discharge note for this patient. I feel that this would have added to the completeness of his care.

Intervention- I feel that our intervention was very thorough. We had great outcomes with this patient in a much shorter time frame than initially expected. He met all of the goals set forth by the physical therapist and himself. I will definitely incorporate the McKenzie method along with an individualized spinal stabilization exercise program in my future practice.

Further Evidence- I feel that it is important to complete more research in the area of low back pain. I feel that it is important to compare functional outcomes of spinal stabilization exercises with the McKenzie method versus traditional treatment of low back pain. I believe that it would have a big impact on how physical therapists treat patients with chronic low back pain. Since chronic low back pain affects 60%-80% of the US population and is the most expensive benign medical condition in industrialized countries, further research is needed.

Overall Opinion- I feel that the treatment of this patient and this case study really helped to further my education. I initially was very intimidated by patients with spinal issues. I felt that my understanding of the spine was limited. However, I found it very easy to catch on and understand the principle behind the McKenzie method as well as the importance of spinal stabilization. I had an excellent CI that took the time to explain the treatment approach in great detail to me. During this patients treatment I found confidence in myself treating this diagnosis as well as others. This overall experience will make me a better physical therapist.
### Appendix A: McKenzie Lumbar Assessment

**McKENZIE LUMBAR SPINE ASSESSMENT**

<table>
<thead>
<tr>
<th>Date</th>
<th>Name</th>
<th>Sex M / F</th>
<th>Address</th>
<th>Telephone</th>
<th>Date of Birth</th>
<th>Age</th>
<th>Referral: GP / Orth / Self / Other</th>
<th>Work: Mechanical Stresses</th>
<th>Leisure: Mechanical Stresses</th>
<th>Functional Disability from present episode</th>
<th>Functional Disability score</th>
<th>VAS Score (0-10)</th>
</tr>
</thead>
</table>

**HISTORY**

Present Symptoms

Present since

Commenced as a result of

Symptoms at onset: back / thigh / leg

Constant symptoms: back / thigh / leg

Intermittent symptoms: back / thigh / leg

Worse

<table>
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<tr>
<th>bending</th>
<th>Sitting / rising</th>
<th>standing</th>
<th>walking</th>
<th>lying</th>
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</thead>
<tbody>
<tr>
<td>am / as the day progresses / pm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>other</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Better

<table>
<thead>
<tr>
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<th>sitting</th>
<th>standing</th>
<th>walking</th>
<th>lying</th>
</tr>
</thead>
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<tr>
<td>am / as the day progresses / pm</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Disturbed Sleep

Yes / No

Sleeping postures: prone / sup / side R / L

Surface: firm / soft / sag

Previous Episodes

0 1-5 6-10 11+

Previous History


**SPECIFIC QUESTIONS**

Cough / Sneez / Strain / +ve / -ve Bladder: normal / abnormal Gait: normal / abnormal

Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other

General Health: Good / Fair / Poor

Imaging: Yes / No

Recent or major surgery: Yes / No Night Pain: Yes / No

Accidents: Yes / No Unexplained weight loss: Yes / No

Other:
## Appendix B Summary of Treatment (1-5)

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<thead>
<tr>
<th>Date/Visit</th>
<th>11/4/09 #1</th>
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<th>11/9/09 #3</th>
<th>11/11/09 #4</th>
<th>11/16/09 #5</th>
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<td><strong>T W S R</strong></td>
<td><strong>T W S R</strong></td>
<td><strong>T W S R</strong></td>
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<td>30°</td>
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<td>30°</td>
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<tr>
<td><strong>QL side raises</strong></td>
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**KOS=knee to opposite shoulder, KTC=knee to chest, OP=overpressure, ab=abdominal, Ext=extension, SAPD= Straight arm pull down, QL= quadratus lumborum, rom=range of motion in degrees°, *=min, "second, #=pounds, s/a=straight/angle**

**Bold indicated started at that session**

---

23
# Appendix C Summary of Treatments (6-9)

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<td>6' 5 seat</td>
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KOS=knee to opposite shoulder, KTC=knee to chest, OP=overpressure, ab=abdominal, Ext=extension, SAPD=straight arm pull down, QL=quadratus lumborum, rom=range of motion in degrees°, "=min, "second, #=pounds, s/a=straight/angle

Bold indicated started at that session
Appendix D Initial Normative Data

Normative Analysis
Relative Strength

Figure 3
Average Relative Isometric Torque: Male 36-59 Years Lumbar

Table 3

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<th>Degrees:</th>
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<th>36</th>
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<td>1.6</td>
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<td>1.3</td>
<td>1.4</td>
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Appendix E Discharge Normative Data

Normative Analysis
Relative Strength

Figure 3
Average Relative Isometric Torque: Male 36-59 Years Lumbr

Table 3

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<th>36</th>
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<th>60</th>
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<td>1.5</td>
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<td>1.6</td>
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<tr>
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<td>1.3</td>
<td>1.4</td>
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Test Date=11/27/09 Test Time=06:23 AM Lumbr

Test: Retest

Norm: Male 36-59 Years Lumbr

(1) (2) (3)
References