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Outpatient Physical Therapy Management of Lumbar Intervertebral Disc Disorder with Radiculopathy

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OUTPATIENT PHYSICAL THERAPY MANAGEMENT OF LUMBAR INTERVERTEBRAL DISC DISORDER WITH RADICULOPATHY

by

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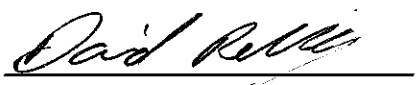
This Scholarly Project, submitted by Kaitlyn McClaflin in partial fulfillment of the requirements for the Degree of Doctor of Physical Therapy from the University of North Dakota, has been read by the Advisor and Chairperson of Physical Therapy under whom the work has been done and is hereby approved.

(Graduate School Advisor)



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Signature Kathy McClellan, SPT

Date 10/5/20

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ABSTRACT

Background and Purpose. This article summarizes the 6-week outpatient physical therapy management of a patient that experienced a lumbar disc derangement with radiculopathy in the right lower extremity. She experienced a decrease in function, range of motion, and strength following onset of symptoms. The purpose of this article is to outline the interventions utilized in this patient's plan of care in an attempt to return her to caring for children, full-time work, and daily exercise at her prior level of function.

Description. Patient was a 31-year-old female with 3 children. She worked as a nurse full-time and reported exercising daily, prior to the onset of symptoms. Symptoms started after she lifted her 18-month-old out of a Pack n' Play. Initial symptoms included back pain, right lateral shift, and shooting pain down her right leg.

Interventions. Interventions during the six-week plan of care included various forms of therapeutic exercise, manual therapy, therapeutic activity, and electrical stimulation. Treatment aimed at improving initial range of motion and strength deficits identified during the initial evaluation.

Outcomes. This patient attended 15 treatment sessions over a span of six weeks. Following discharge, the patient had improved range of motion and strength. She was also able to return to work and child-care full-time and return to exercising daily with no restrictions.

Discussion. Rationale for treatment was based off textbook content on the McKenzie system of Mechanical Diagnosis and Therapy examination model and published resources on lumbar intervertebral disc orders on databases such as PubMed.

CHAPTER I

BACKGROUND AND PURPOSE

Literature reviewed in preparation for this case emphasized that the intervertebral disc is mobile, and therefore, is a source of mechanically generated pain through movement and sustained positions. Internal displacement of the disc material has been determined to be a potential source of pain.[1] Position of the displaced disc material is often influenced by spinal position and prolonged postural positions of flexion and extension. The protocol developed by McKenzie, formally mechanical diagnosis and treatment (MDT) approach, hypothesizes a change in mechanical loads on the intervertebral disc will either increase or decrease pain, causing peripheralization or centralization of symptoms. In a meta-analysis completed by Lam et. al[2], effectiveness of the MDT approach to treatment of acute or chronic back pain was evaluated. Acute back pain was classified as less than 12 weeks since the onset of pain and chronic was classified at greater than 12 weeks since the onset of symptoms. The standardized mean difference and 95% confidence interval were calculated to compare the effects of MDT to other interventions. There were 17 studies that met the inclusion criteria. Results showed that there was high- to moderate-quality evidence that MDT is not superior to other rehabilitation interventions for reducing pain and disability in patients with acute low back pain but was found to be superior in chronic low back patients.[2]

When a patient presents with radicular symptoms secondary to low back pain, it is important to assess their posture, directional preference, and monitor their radicular symptoms. Directional preference is defined as one direction of repeated movement, typically flexion or extension, which decreases or centralizes (symptoms move toward the midline) referred symptoms. The opposite repeated movement produces or increases peripheralization (symptoms move away from the midline) of symptoms.[3] This can be done through a thorough examination and a good appreciation of the patient's subjective history.

Early on, it is important to centralize the patient's pain and restore normal elongation of the patient's muscles in order to correct possible lateral shifts and incorporate strength training into their treatment interventions. Lateral shifts are a clinical sign of disc derangement and can be observed upon examination of a patient where their upper body is clearly shifted to the side. A lateral shift is defined as a deviation from the spinal midline.[4] Lateral shifts can be very obvious to the naked eye, however, are commonly measured through the use of a plumb line. They can vary in severity from 5 mm to 50 mm. The purpose of this case report is to compile objective measures, symptoms, and function directly related to or affected by acute lumbar disc derangement and to describe the patient's response in the presence of physical therapy management.

CHAPTER II

CASE DESCRIPTION

This patient was a 31-year-old female who injured herself while lifting her daughter out of a Pack n' Play (manufactured by Graco™ in Minneapolis, MN) in August 2019. She reported to physical therapy with a referral from her primary care provider after experiencing low back pain and shooting pains down her right leg. She rated the pain a constant 4/10 on a scale of 0 to 10, 0 being no pain present and 10 being the most severe pain experienced. This pain was described as a dull pain. Movement increased her pain to a 7/10. Pain was present in the right low back and shot down the right leg just above the knee. She described this pain during movement as a shooting, sharp pain.

Since the onset of injury, it has been harder for her to sit or lie for short periods of time. The patient reported that bending forward increases pain. She was able to squat without symptoms and stated she could ascend and descend the stairs but did so slowly. The patient said she was able to sleep for about 2 to 3 hours a night before having to switch positions. In an attempt to relieve her symptoms, the patient visited the chiropractor and a massage therapist but did not find relief with either treatment.

The patient struggled to lift her 18-month-old daughter and was unable to work as a nurse (involving lifting and long-standing hours) due to the symptoms present. This patient reported to have no known underlying medical conditions or relevant family medical history that could contribute to the pain she was experiencing. She reported that

she lives in a two-story home with her husband and three children. Her 8-year-old daughter and babysitter had been assisting with care of the 18-month-old daughter. The patient hoped to return to work, her daily exercise routine, and her prior level of childcare following treatment with physical therapy.

A review of body systems was performed on this patient. Her integumentary system was completely intact. There were no visible abrasions or lacerations to the skin. The patient's blood pressure was measured on the right arm in a seated, relaxed position. Her blood pressure was read at 118/70. Heart rate was assessed on the left upper extremity at the site of the radial artery. Pulse was assessed for a full 60 seconds and was 78 beats per minute. Assessment of the neuromuscular and musculoskeletal systems are reviewed in the examination section. The patient reported no signs of saddle paresthesia, bladder or bowel changes, or numbness, all of which are common symptoms of cauda equina syndrome and are appropriate indicators of immediate referral.

Examination

Examination was based on McKenzie's Mechanical Diagnosis and Therapy (MDT) examination.[5] McKenzie's Mechanical Diagnosis and Therapy examination technique assists medical professionals in classifying patients with back pain into one of three categories. These categories include posture, dysfunction, and derangement syndromes. Back pain resulting from mechanical deformation from prolonged positioning is categorized as a posture syndrome and intervention includes correction of the patient's posture. Dysfunction syndromes result from mechanical deformation caused by changes within the soft tissue like scars or adherence. Intervention for dysfunction involves

exercising to remodel the tissue. Finally, derangement syndromes are diagnosed when a patient is experiencing pain in their normal resting positions, but pain is reduced with flexion or extension. Intervention depends on the patient's directional preference.

Directional preference is determined during the examination of the patient. If the patient's pain worsens with extension, the therapist will incorporate interventions involving the opposite direction that worsens symptoms into the plan of care, in other words, flexion. Derangement syndromes are most commonly caused by disc herniation or sequestration.[5]

This patient presented to the clinic with a right lateral shift. Active forward flexion deviated to the right. Left lumbar sidebending and left lumbar rotation increased symptoms in the back and down the right leg. Active hip external rotation on the right increased pain. The patient exhibited limited passive hip internal rotation on the left. The patient experienced increased pain at the end range of passive hip external rotation on the right. With palpation, the patient felt tenderness in the right lumbar paraspinal muscles and along the right iliac crest.

Significant soft tissue restrictions were found in the bilateral piriformis and gluteus medius with palpation (right worse than the left) and mild soft tissue restrictions in the bilateral iliopsoas. She had some discomfort with PA mobilizations around the level of L3-4. Upon further evaluation, the patient's sacroiliac alignment was abnormal with a suspected left anterior innominate rotation. Prone lying abolished symptoms. When prone on elbows, the patient experienced a peripheralization of her symptoms.

Lumbar and hip active range of motion was observed and categorized upon level of impairment and are listed in Table 1.

Table 1: Initial Lumbar and Hip Range of Motion	
Direction of Motion	**Level of Impairment**
Lumbar Left Sidebending	Mild impairment: 20°-25° of sidebending Moderate pain
Lumbar Right Sidebending	Mild impairment: 20°-25° of sidebending No pain
Lumbar Flexion	Severe impairment: 10°-19° of flexion Severe pain
Lumbar Extension	Severe impairment: 0°-9° of extension Severe pain
Hip Internal Rotation	No impairment: >35° of internal rotation No pain
Hip External Rotation	No impairment: >35° of external rotation No pain

Hip strength was tested with resisted isometrics for extension, abduction, external rotation, and internal rotation. Resisted hip external rotation bilaterally increased pain. She also experienced increased pain in the low back with resisted hip abduction on the right. See Table 2 for results of manual muscle testing of the hip.

Table 2: Initial Hip Strength	
Direction of Motion	**Level of Impairment**
Hip Abduction	Right: 4/5, Left: 5/5 No pain
Hip External Rotation	Right: 4/5, Left: 5/5 Mild pain on the right
Hip Internal Rotation	Right: 4/5, Left: 5/5 No pain
Hip Extension	Right: 2/5, Left: 5/5 No pain

Special tests were performed to test neural symptoms versus musculoskeletal symptoms. A passive straight leg raise test was performed with the patient supine and her legs extended each leg was passively flexed at the hip by the therapist.[6] The leg is raised until the patient complains of pain or tightness, or the hip is successfully flexed to 80 degrees without symptoms. According to Summers and colleagues,[7] if the pain is primarily back pain, it is more likely a disc herniation from pressure on the front of the spinal cord or the pathology causing pressure is more central. Shiqing et al. state,[8] if pain is primarily in the leg, it is more likely that the pathology causing the pressure on neurological tissues is more lateral. Results were found positive bilaterally. The straight leg raise was positive with neural discomfort, usually felt as shooting pain in the leg, at 30 degrees on the right, and had a crossover effect at 35 degrees on the left.

A prone knee bend test was performed by having the patient lie in a prone position. Her leg is bent passively by the therapist until either the patient feels discomfort in the low back or full range of motion is achieved. If the patient experiences discomfort before full range of motion is achieved, a L2-3 pathology is suspected. After performing the prone knee bend bilaterally for our patient, we found the results to be negative with no increase in symptoms. Hip tests performed, such as FADIR and FABER were negative bilaterally to rule out possible hip diagnoses. FADIR includes flexing, adducting, and internally rotating the patient's hip passively and asking the patient to vocalize any experience of pain or discomfort. FABER test includes having the patient flex, abduct, and externally rotate their hip into a "4" position and cuing them to move their knee towards the table or floor. If the patient is unable to move their leg in this

direction without experiencing pain in the hip, the hip should be further examined for pathology.

Since special tests indicated this patient was experiencing neurological symptoms, dermatomal testing was performed to determine superficial sensation and identify affected nerve roots. Dermatomes L1-S2 were tested bilaterally with the patient's eyes closed. The patient was asked if the light touch administered was the same or different when comparing the two sides. All dermatomes felt the same bilaterally except for L5 on the dorsal aspect of the foot. The patient reported that the L5 dermatome felt different on the right. This helped my clinical instructor and me in diagnosing this patient's intervertebral disc disorder. With the results of the dermatomal testing, we suspected that the L4-5 disc was causing this patient's pain.

Before her initial evaluation, the patient filled out an electronic Focus on Therapeutic Outcomes (FOTO) assessment specifically for the low back. The FOTO asks the patient questions about their current function in activities such as housework, reaching overhead, stair climbing, caring for children, and working at their job.[9] The ideal FOTO score for the low back is 91 to 100 indicating the patient is not experiencing any activity limitations. Our patient scored a 47 at her initial treatment session.

Evaluation

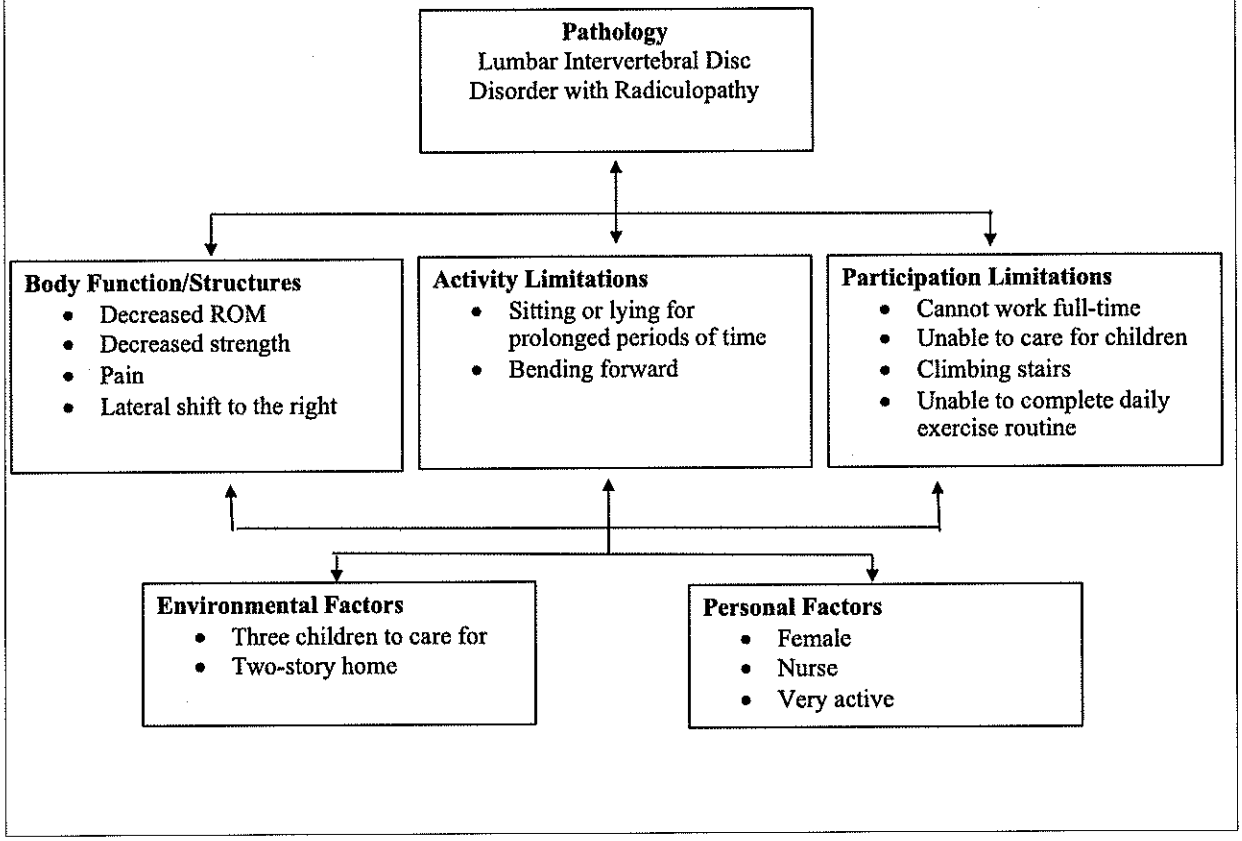
After completing an objective examination on this patient and collecting a subjective history and patient goals, my clinical instructor and I developed a problem list to be addressed throughout the plan of care. The problem list is as follows:

1. Patient is experiencing back pain and radicular pain down her right leg.
2. Unable to work full-time.
3. Unable to care for children at her prior level of function.
4. Patient is unable to perform her daily exercise routine.
5. Lumbar range of motion is decreased and painful.
6. Hip strength is decreased.
7. Patient is unable to sleep longer than two to three hours without onset of symptoms.
8. Unable to ambulate stairs at her prior level of function.

The problems listed were addressed each treatment session. The International Classification of Functioning and Disability and Health (ICF model) was used to display and compile the impairments and factors directing treatment for this patient. The ICF model developed through this patient's evaluation can be seen in Figure 1. Physical therapy intervention modified the aspects of this ICF model. Intervention focused on return to function and daily living, improved strength and range of motion, and patient education.

Goals were developed in collaboration with the patient. All of the patient's goals aimed towards returning the patient to her prior level of function in child-care, work, and exercise. A list of these mutually established goals is below. Every goal listed had a time frame of six-weeks to accomplish.

Figure 1. ICF Model



1. Low back pain will improve to a 0/10 so the patient is able to care for her children, return to work, and perform ADLs at her prior level of function.
2. Patient will improve low back range of motion to within normal limits with forward bending so the patient is able to bend down to the floor more than eight times a day in order to care for her children, return to work, and perform ADLs at her prior level of function.

3. Patient with increase her FOTO score to a 77 in order to stand for one hour, get up and down from the floor, bend or stoop, perform usual housework/work, and go up/down the two flights of stairs with no difficulty.
4. Patient will be independent and compliant with her home exercise program in order to independently manage her own symptoms.
5. Patient will demonstrate erect posture with no lateral shift during ambulation, so she is able to return to ambulating throughout the community at her prior level of function.
6. Low back pain will improve to be able to sleep without disruptions for six hours daily to achieve adequate rest.

Diagnosis

Initial evaluation data indicated that this patient did not appear to have any hip pathologies present. Rather, this patient likely had a disc herniation causing pain and radicular symptoms along with tight musculature in the gluteals, paraspinals, and hip flexors bilaterally which all contributed to symptoms. Since this patient did not get imaging done on her spine, we could not diagnosis this patient with a disc herniation. We instead diagnosed her with a disc disorder. The ICD-10 code for the diagnosis of intervertebral disc disorder with radiculopathy in the lumbar region is listed as M51.16, shown in the patient's record. Goals for this patient include decreasing pain, improving lumbar active range of motion, decreasing lateral shift, improving sleep quality, and decreasing tight musculature (listed above). Achieving these goals will help the patient

return to work, take care of her children at her prior level of function, and resume her daily exercise routine.

Prognosis

Being this patient was very active with three children, had a career in nursing, and reported completion of a daily exercise routine, her outlook for full return to activities/work at her prior level of function was good. She was very motivated and determined to return to her usual activities shown by multiple attempts to return to her prior level of function by seeking treatment from a variety of disciplines, active participation in therapy, and self-reported compliance to her home exercise program.

CHAPTER III

INTERVENTION

This patient was seen three days a week tapering to two days a week for 45-minute sessions for a total of six weeks. Every treatment session involved patient education. Education topics included lateral shift correction, proper lifting techniques for work and childcare, home exercise program, self-monitoring of symptoms and cause of symptoms, and posture mindfulness during ambulation and while sitting.

The first week's interventions involved soft tissue release techniques including manual ischemic compression to the bilateral gluteus medius, piriformis, and iliopsoas and ASTYM protocols for the hip, pelvis, back, hamstrings, and gastric/soleus withcoconut oil. The muscle energy technique (MET) for SI alignment was attempted to correct the patient's left anterior innominate rotation (one pelvic bone is rotated forward in relation to the other) with two sets of three repetitions, six second holds. The patient resisted hip extension on the left and hip flexion on the right to align the SI joint. Following the MET, the patient used isometric hip adduction to reset the pubic symphysis with three repetitions of six second holds. The MET was unsuccessful at correcting the patient's anterior rotation, so pelvic blocks were used. One block was placed at the level of the iliac crest on the left, the other block was placed at the level of the posterior superior iliac spine on the right. The patient was directed to breathe deeply for one

minute. The blocks were then displaced, and the patient performed isometric hip adduction once more three repetitions of six second holds. SI alignment was corrected after pelvic blocking. Prone manual lumbar traction was performed for five minutes. The patient performed prone on elbows lying for two repetitions of one-minute holds. Pain-reducing modalities were executed. Multi-radiance super pulsed laser therapy was performed on the low back at 1,000 Hz to 3,000 Hz for five minutes scanning and focusing for areas of impedance.[10] Treatment concluded with frequency-specific microcurrent with electrodes on the patient's bilateral midback and anterior distal legs with the patient in prone lying. Settings included 10 minutes of 40 Hz, 200 microamps, and 10 minutes of 396 Hz, 200 microamps.[11]

The second week of treatment included continued ischemic compression, ASTYM, pelvic blocking, prone lumbar distraction, multi-radiance super pulsed laser therapy, and frequency-specific microcurrent. We progressed the patient from prone on elbows to prone press-ups, having her perform three sets of ten repetitions. We added passive straight leg with distraction with both the knee flexed and extended in an attempt to relieve neural tension, performing three sets of ten repetitions. By the end of the second week, the patient rated her pain a 2/10 and stated she was noticing herself walking with more erect posture than she was at her initial session. Table 3 below shows a compact version of interventions performed within the first two weeks of this patient's plan of care. These interventions are listed in no specific order, nor were all used collectively in each treatment session.

Table 3: Interventions Used in the Clinic During Weeks One and Two of Treatment		
Intervention	**Time/Repetitions**	**Intensity**
Asytm: hip, pelvis, back	12 minutes	N/A
Ischemic compression	10 minutes	N/A
Muscle energy technique	5 minutes	N/A
Pelvic blocking	2 minutes	N/A
Manual lumbar distraction	5 minutes	N/A
Straight leg raises with distraction (bilaterally)	8 minutes	N/A
Lateral shift correction	2 minutes	N/A
Prone on elbows	5 minutes	N/A
Prone lying	5 minutes	N/A
Press ups	5 minutes	N/A
Laser stim	5 minutes	1-3k Hertz
Frequency Specific Microcurrent	10 minutes	200 microamps

The third week of treatment included the continuation of ischemic compression of the bilateral piriformis and gluteus medius, ASTYM, pelvic blocking, prone lumbar distraction, bilateral straight leg raises with distraction, multi-radiance super pulsed laser therapy, and frequency-specific microcurrent. During the third week, the patient was feeling low to no pain. She reported feeling 80% back to her baseline. We began therapeutic exercises during the third week, including supine bridging three sets of ten repetitions, hip abduction in side-lying (bilaterally) three sets of ten repetitions, and a modified plank for 30 seconds.

The fourth week of treatment included continued ischemic compression, ASTYM, and multi-radiance super pulsed laser therapy. We also continued exercises, such as supine bridging and modified planking. We added single-leg bridging (bilaterally) three

sets of ten repetitions and side planks (bilaterally) three sets of 20 seconds to the exercise plan. By the end of week four, the patient was experiencing minor symptoms, usually after a long walk or working around her house for prolonged periods of time. Table 4 compiles a list of interventions performed in this patient's treatment session for week three and four. These interventions are listed in no specific order, nor were they all used in every treatment session.

Table 4: Interventions Used in the Clinic During Weeks Three and Four of Treatment

Intervention	**Time/Repetitions**	**Intensity**
ASTYM: hip, pelvis, back	12 minutes	N/A
Ischemic compression	10 minutes	N/A
Pelvic blocking	2 minutes	N/A
Muscle energy technique	5 minutes	N/A
Manual lumbar distraction	5 minutes	N/A
Straight leg raises with distraction	2 sets, 10 repetitions	N/A
Bridging	3 sets, 10 repetitions	Low
Hip abduction	3 sets, 10 repetitions	Low
Plank	1 set, 30 seconds	Modified
Bird/dog	2 sets, 10 repetitions	Low
Laser stim	5 minutes	1-3k Hertz
Frequency Specific Microcurrent	10 minutes	200 microamps

The fifth week of treatment included the continuation of ischemic compression, multi-radiance super pulsed laser therapy, bridging, single-leg bridging, and side planks. Exercises were added to the session. Exercises included bird/dogs two sets of ten repetitions, regular planking two sets for 45 seconds, dead bugs two sets of 10 repetitions, and recumbent biking at a resistance of 7.0 for five minutes. During the fifth week, the patient returned to work and was not experiencing any pain in the low back or down her legs.

The final week of treatment focused on monitoring maintenance of the patient's progress. Even after not being seen by physical therapy for seven days, the patient was still not experiencing any symptoms in the low back or down the bilateral legs. Table 5 is a list compiling interventions used in the final two weeks of treatment. These are listed in no specific order, nor were all used in every treatment session.

Table 5: Interventions Used in the Clinic During Weeks Five and Six of Treatment

Interventions	**Time/Repetitions**	**Intensity**
ASTYM: hip, pelvis, back	12 minutes	N/A
Ischemic compression	10 minutes	N/A
Bridging	3 sets, 10 repetitions	Low
Plank	2 sets, 30 seconds	Modified
Plank	2 sets, 45 seconds	Medium
Side planks	3 sets, 20 seconds	Low
Single-leg bridging	3 sets, 10 repetitions	Medium?
Bird/dog	2 sets, 10 repetitions	Low
Dead bug	2 sets, 10 repetitions	Medium
Recumbent bike	5 minutes	7.0, Medium-High
Laser stim	5 minutes	1-3k Hertz

CHAPTER IV

OUTCOMES

This patient responded very well to treatment and was very compliant with her home exercise program. She was able to return to work, take care of her children, perform housework, and exercise at her prior level of function with no repercussions or onset of symptoms. She could climb the stairs and drive at her prior level of function. At the completion of treatment, she reported no pain in the low back or down the legs. The patient completed another FOTO assessment to compare her function at the time of discharge to her self-reported function at her initial appointment. Her FOTO score at discharge was a 94 compared to her initial score of 47. See Table 6 for ROM at discharge.

Table 6: Lumbar and Hip Range of Motion at Discharge

Direction of Motion	**Level of Impairment**
Lumbar Left Sidebending	No impairment: > 25° of sidebending No pain
Lumbar Right Sidebending	No impairment: > 25° of sidebending No pain
Lumbar Flexion	No impairment: > 50° of flexion No pain
Lumbar Extension	No impairment: > 25° of extension No pain
Hip Internal Rotation	No impairment: >35° of internal rotation No pain
Hip External Rotation	No impairment: >35° of external rotation No pain

At discharge, strength with hip extension, abduction, external rotation, and internal rotation were all 5/5 bilaterally and non-painful. This patient was very satisfied with her results following her physical therapy plan of care. No ethical or safety issues arose during this plan of care.

CHAPTER V

DISCUSSION

This patient made significant progress during her 6-week treatment with physical therapy. This patient was highly motivated and very compliant with treatment in an attempt to return to full-time work and be able to take care of her children. It was important to initially focus on releasing tight musculature and reduce radicular symptoms in order to progress to exercising and functional activities. Throughout the 6 weeks, the patient was diligent in performing her home exercise program. The subjective FOTO assessment provided evidence for this patient's improvements made in functional activities. This patient's success correlates with the motivation and compliance shown throughout the plan of care.

In a study conducted by Sluijs and colleagues,[12] they found that there are 3 main factors related to noncompliance in the physical therapy setting. These 3 factors include barriers to patient's perception and encounter, lack of positive feedback, and degree of helplessness. Results showed that barriers that patients perceive strongly related to noncompliance along with patients facing a worse prognosis and highly educated patients. Although our patient was a highly educated woman, she had no known barriers or feelings of helplessness. Throughout the entire plan of care, she received positive feedback and no regression.

In regard to the use of modalities in the treatment of disc derangement, Unlu et. al,[13] performed a study comparing the use of 3 different modalities. These modalities included traction, ultrasound, and low-power laser therapy. A total of 60 patients experiencing acute low back pain and acute radiculopathy enrolled in the study and were randomly assigned to one of the three groups. Results showed that traction, ultrasound, and low-power laser therapy were equally effective in the reduction of pain and disability scores. This provides evidence that the low-laser therapy we used may have contributed to the reduction of pain throughout this patient's plan of care.

Finally, in an article outlining conservative versus surgical treatment of lumbar disc herniations by Awad and Moskovich,[14] they express the benefits of physical therapy in conservative treatment. No specific exercises are listed but they state that physical therapy helps to reduce symptoms while limiting lost days at work for the patient. If the patient were to have surgery in an attempt to relieve symptoms, they would be placed on bed rest and miss possibly weeks of work. Thankfully, our patient responded well to conservative treatment and missed minimal time at work.

Reflective Practice

When reviewing this specific case, I cannot pick out anything I would change in her plan of care. This patient was able to meet all of her short- and long-term goals within the 6 weeks of treatment. Her treatment sessions progressed well with no known regression in symptoms. If the patient did show any signs of regression or no progression in this plan of care, it would have been a good idea to refer the patient to radiology for imaging of her lumbar spine. No referrals or additional consultations were necessary in

during this patient's plan of care. We chose to use the MDT approach to develop a plan of care for this patient. It would be beneficial to research other methods of treatment to rehabilitate patients experiencing low back pain in the future to expand my knowledge and skills on treatment of the low back.

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