

## A Case Study: Functional Rehabilitation Approach in Low Back Pain Management

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### Abstract

This case report outlines the use of functional rehabilitation in treating and managing low back pain. The functional rehabilitation approach includes the use of manual therapy, neuromuscular re-education and therapeutic exercises in the management of Chronic Low back pain. The patient is a 38-year-old male with chronic low back pain. The patient received treatment at the clinic after evaluation. The therapy sections were 1hr per section. The patient was treated 3 times a week for the first 2 weeks and then 2 times per week for the 4 weeks. The Treatment sections were then reduced to one time per week for the next 6 weeks. Re-evaluation was performed after the initial 6 weeks of treatment and at the end of the 12th week. The patient felt improvement after 6 weeks of treatment in a range of motion and pain level. The goal of the treatment which includes decreasing pain and spasm, reduce trigger points, Range of motion, and Functional improvement was achieved. The result obtained from this patient though is a small sample does suggest that Functional rehabilitation programs such as Manual Therapy, Neuromuscular re-education, and functional Exercises will benefit patients with low back pain [1].

**Keywords:** *Functional Rehabilitation Low Back Pain; Functional Exercise; Neuromuscular Re-Education; Manual Therapy; Pain Management*

### Introduction

The International Association for the Study of Pain describes the pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” [2]. There is no physiological, imaging, or laboratory test that can identify or measure pain. Pain is what the patient says it is. The clinician must accept the patient’s report of pain. Epidemiology of LBP includes 80% of lifetime prevalence, the second leading cause of physician visits in the united states, and the most common cause of disability in patients over 45 years old [3].

Low back pain includes pain in the lumbar spinal, sacral spinal and lumbosacral pain. Lower back strain is caused by damage to the muscles and ligaments of the back. A herniated disc in the lumbar spine can put pressure on spinal nerve roots, causing pain in the lower back or legs [4]. Acute pain may be a caution signal for genuine or potential tissue harm and is related to injury, or illness while Chronic pain is for the most part characterized as pain enduring past the normal tissue healing time [3].

### Case Presentation

A 38-year-old male presents with chronic low back pain that is getting worse. The patient reports the gradual onset of LBP following injury 3 years ago. He reports that the low back pain is getting worse. The patient complains of difficulty going from sitting to standing and lying down to getting up. He also complains of difficulty getting out of his vehicle due to pain. The provocation of the pain includes bending forward, prolonged sitting, prolonged standing, and squatting while rest brings temporary relief of pain. The patient described the quality of pain as sharp, soreness/achy pain, stiffness, and tightness. He stated that the pain is constant but varies in intensity. Burning pain radiates down the right leg with complaints of occasional numbness, weakness, and tingling sensation. The patient rated the pain VAS severity as 8/10 using a pain scale with 10 being the worst pain. He reports that the pain is worse at the end of the day. The patient also complained of pain at night, especially when he slept on his stomach. Patients report no change or impairment in bowel and bladder function.

The patient had a history of back pain related to an occupation involving heavy lifting. His past medical and surgical history appears to be unremarkable. He seems to be in good health and his review of the system is unremarkable except for the low back pain. The patient is married, a non-smoker, occasional alcohol consumption and does not exercise.

### Patient evaluation

The physical examination revealed that the patient was alert, oriented, in acute distress, but cooperative during the examination.

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The patient's gait was abnormal with antalgic lean to the left due to pain. The patient had difficulty changing positions during the examination due to pain. Thoracolumbar range of motion testing was with difficulty due to severe muscle spasm prevented an accurate assessment of segmental spine movement.

Straight leg raise was positive on the right with reproduction of pain and radicular symptoms. Bowstring Test on the right reproduced LBP and radicular symptoms; Milgram's, Yeoman's, and Goldthwaite's sign tests resulted in exacerbated LBP. Faber test indicated exacerbation of LBP and Bilateral Hip pain. Heel walking and toe walking were with difficulty with radicular pain to the right leg. Sensory Testing was normal for both upper and lower extremities. Deep Tendon Reflexes were normal in both upper and lower extremities dermatome tested.

### Palpation

- Lumbar paraspinal muscle revealed local severe tenderness with spasm +++.
- The patient exhibited a jump sign upon palpation.
- Lumps of muscle contraction were noted at the bilateral lumbar region more on the right.
- Tenderness at the bilateral piriformis.
- Trigger points at the lumbar paraspinal muscles, gluteal muscles.
- Spinal palpation indicates tenderness and restrictions at the L2-S1 region.
- Deerfield leg length check showed functional short right leg.

### Radiology report

The patient brought his radiology report which indicates. DJD at L5-S1 Region, Mild Spinal Stenosis at L5-S1 region, and 3 mm Central Disc Protrusion at L5-S1 region.

### Clinical impression

- Lumbago with radiculopathy right side.
- Lumbar stenosis at L5-S1 region.
- DJD of the lumbar spine.
- Chronic back pain.
- Myalgia.

### Treatment

The functional rehabilitation approach of managing low back pain was used in the management of the patient's chronic LBP by incorporating both physical and psychological functions. Functional rehabilitation therapy did include neuromuscular re-education, manual therapy, exercise therapy and patient education. The overall goal of the treatment was to decrease pain, spasm, and inflammation; reduce neurological symptoms; improve Rom; improve function; improve quality of life and reduce trigger points.

The therapy sections lasted 1hr per section. The patient was treated 3 times a week for the first 2 weeks and then 2 times per week for the 4 weeks then 1 time per week for the next 6 weeks. Re-evaluation was performed after the initial 6 weeks of treatment and at the end of the 12<sup>th</sup> week with the observation of a decrease in VAS and improvement on the functionality of the patient.

### Neuromuscular re-education (NMR)

The goal of the treatment is to "retrain the brain" to use correct posture and correct biomechanics; and to correct posture and biomechanics, thereby greatly reducing the chance of pain returning in the future. NMR helps to improve ROM and functional mobility. The focus on NMR was Proprioceptive Neuromuscular Facilitation (PNF) which involves stretching the involved muscles, the patient resists(contract) against the stretch, relaxes and then the muscles are stretched even further. This technique is more effective if it is done correctly by both the patient and the practitioner. It is important for a practitioner to understand how PNF works [1].

### Manual therapy

Manual therapy is an old method of practice used worldwide for centuries. The goal of the treatment is to relaxing tense back muscles and restricted joints to decrease back pain and increase flexibility. Manual Therapy techniques used to manage the patient's condition includes soft tissue work and mobilization or manipulation of the spine. Soft tissue work, including massage therapy which helps to, relax muscles, increase circulation, break up scar tissue, and ease pain in the soft tissues. The mobilization/manipulation helps to loosen tight tissues around a joint, reduce pain in a joint and improve flexibility and alignment [6].

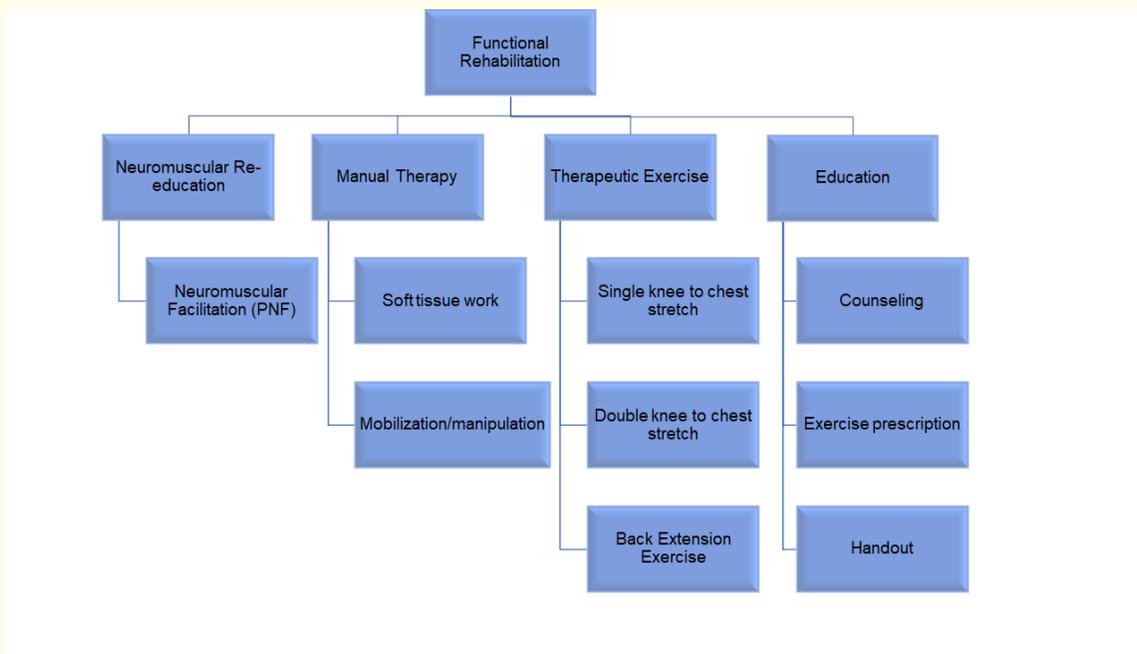
### Therapeutic exercise

The goal of therapeutic exercise therapy is to relieve back pain, heal soft-tissue injury, reduce repetitive injury during motions, sudden movements, and stresses. The therapeutic exercise used for the patient's LBP management includes single knee to chest stretches, double

knee to chest stretches, back extension exercise, knee rotation exercise, bridge exercise, lower abdominal strengthening exercise, and hip abduction strengthening exercise [7]. We noted that monitoring the exercise was more effective than having the patient do the exercises at home by himself.

**Education**

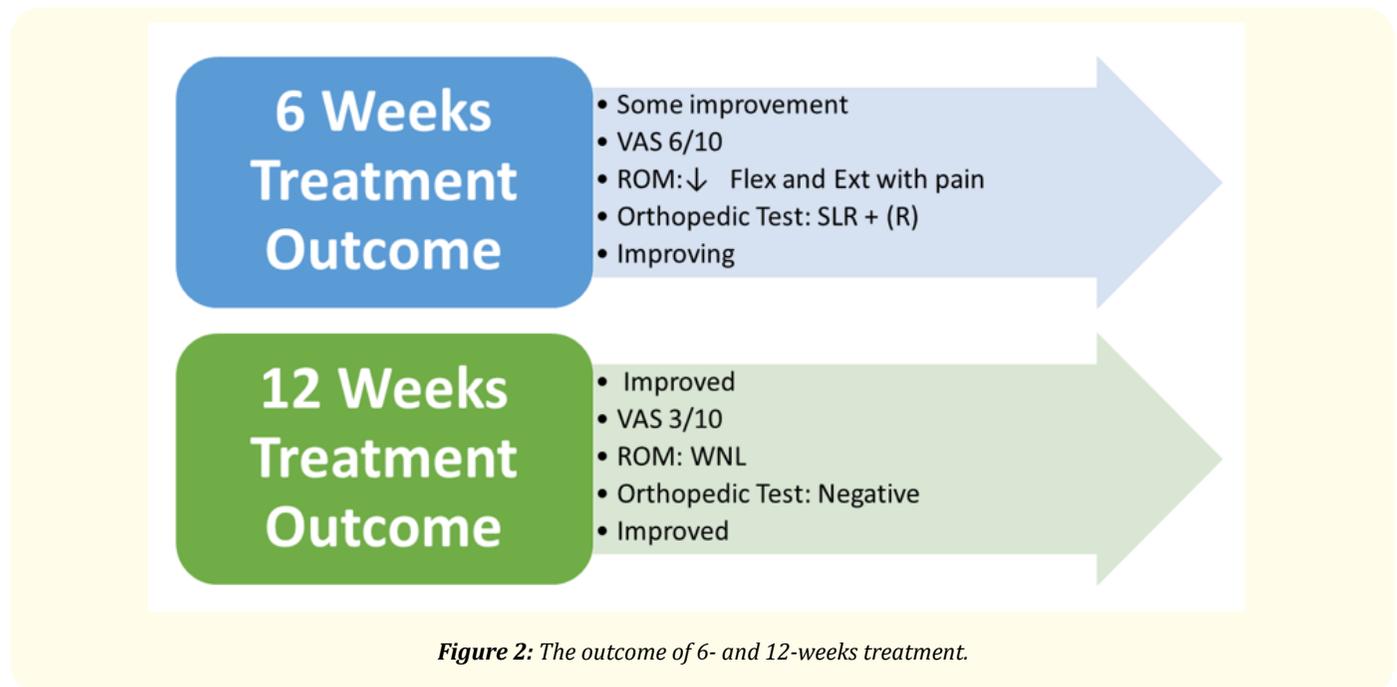
The purpose of the education was to reassure and validate the patient’s pain experience. Through the education section the impact of the pain on the patient. The patient was educated on the Implication of getting treatment or neglecting treatment. He understood that neglecting his treatment is not an option in other for total rehabilitation to take place. The educational intervention includes counseling, Pamphlets on pain, and an Exercise prescription handout. Patient educated to understand that he needs to commit to the treatment and understand that he has a vested interest and power toward his own recovery [7].



**Figure 1:** Functional rehabilitation.

**Outcome**

The patient felt some improvement after 6weeks of treatment. Pain intensity (VAS) decreased from 8/10 to 6/10 The Thoracolumbar Range of motion was decreased upon flexion and extension with the patient complaining of pain, but bilateral Lateral Flexion and extension was within normal limit with pain at end range only. Straight leg raise was positive on the right with some radicular symptoms. The assessment showed that the patient is progressing with improvement. After 12 weeks of treatment, the Patient felt improvement after 12 weeks of treatment. The Pain intensity (VAS) decreased from 8/10 to 3/10. The Thoracolumbar Range of motion was improved with no restrictions or pain at the end range. All Orthopedic Test was negative. The goal of the treatment was achieved.



## Conclusion

The result obtained from this patient though is a small sample does suggest that Functional rehabilitation program such as Manual Therapy, Neuromuscular re-education, and therapeutic exercises was helpful in managing the patient low back pain and will benefit other patients with low back pain. Research suggests that the functional method of therapy produces a good result in chronic low back pain management.

## Financial Disclosures

None.

## Conflicts of Interest

None.

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