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**Effect of neural mobilization on patient with 4 lumbar disc prolapse with femoral nerve injury**

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**Definition**

**Neural Mobilization** (or nerve mobilization) refers to a therapeutic technique

used in physical therapy and rehabilitation to improve the movement and

function of nerves. The goal of neural mobilization is to address nerve pain,

tension, and restrictions by gently moving or stretching the nerve within its

anatomical range. This process can help alleviate symptoms like numbness,

tingling, weakness, or pain that arise due to nerve entrapment, irritation, or

injury.

The technique involves using specific movements, often combined with other

therapeutic exercises, to reduce the pressure or tension on the affected nerve,

promote better neural gliding, and restore normal nerve function. Neural

mobilization can be particularly effective in treating conditions such as

herniated discs, sciatica, carpal tunnel syndrome, and other forms of

radiculopathy.

**Effects of Neural Mobilization on a Patient with:**

**1\_ Lumbar Disc Prolapse (Herniated Disc)**

**A\_Nerve Root Compression**: A lumbar disc prolapse can cause compression or

irritation of the nerve roots, potentially affecting the femoral nerve. Neural

mobilization can help improve the movement of the nerve, reduce tension,

and decrease pain associated with compression.

**B\_ Pain Reduction**: The technique may reduce symptoms of radiculopathy

(radiating pain) by promoting better neural gliding and reducing adhesions or

scar tissue around the nerve.

**C\_ Improved Nerve Mobility**: By gently moving the affected nerve through its

normal range, neural mobilization can reduce stiffness and allow the nerve to

glide more freely, improving overall function.

**2\_ Femoral Nerve Injury**

**A\_ Reduced Nerve Compression**: If the femoral nerve injury is caused by

compression, neural mobilization may help alleviate the pressure on the

nerve, promoting better function and reducing associated pain.

**B\_ Restoring Motor Function**: The femoral nerve controls muscles in the thigh,

so injury can lead to weakness or loss of muscle function. Neural mobilization

may aid in restoring motor function by improving the nerve’s ability to send

signals to the muscles.

**C\_Alleviating Sensory Symptoms**: Femoral nerve injury often results in sensory

deficits, such as numbness or tingling. Mobilizing the nerve can help improve

sensory function by reducing irritation and facilitating better signal

transmission.

**Symptoms**

The symptoms that may indicate a need for neural mobilization, especially in

conditions like lumbar disc prolapse or femoral nerve injury, can vary

depending on the specific nerve involved and the extent of the injury.

**1. Pain:**

**Radiating pain**: Pain that shoots or radiates along the path of the nerve, such

as from the lower back down the leg in sciatica or thigh pain in femoral nerve

injury.

**Sharp or burning pain**: Often described as a burning or electric shock-like

sensation, especially when the nerve is compressed or irritated.

**2. Numbness:**

A loss of sensation or "dead" feeling in parts of the body, commonly in the

legs, feet, or thighs, if the femoral nerve or sciatic nerve is affected.

**3. Tingling or "Pins and Needles" Sensation:**

A feeling of tingling, often referred to as "pins and needles," typically felt in

areas like the foot, thigh, or leg due to nerve compression or irritation.

**4. Weakness:**

**Muscle weakness**: If the nerve injury is severe, it can result in weakness in the

muscles controlled by the affected nerve. For example, a femoral nerve injury

can cause difficulty in lifting the leg or weakness in the quadriceps.

**Difficulty with movements**: Struggling to perform everyday activities such as

walking, standing up from a seated position, or climbing stairs.

**5. Decreased Reflexes:**

A reduction in reflexes (such as knee or ankle reflexes) can be a sign of nerve

dysfunction or compression, especially when related to a herniated disc or

nerve root involvement.

**6. Altered Sensory Perception:**

**Hypersensitivity**: Over-sensitivity to touch, heat, or cold in the areas served by

the affected nerve.

**Loss of coordination or balance**: Difficulty with coordination or maintaining

balance due to nerve dysfunction.

**7. Increased Sensitivity to Movement:**

A person might experience increased pain or discomfort with certain

movements, such as bending or extending the back, or stretching the leg,

especially when these movements put pressure on the affected nerve.

These symptoms typically arise from nerve impingement, compression, or

injury, and neural mobilization techniques aim to alleviate these by improving

nerve function and reducing any restrictions. However, it's important that the

symptoms and the severity of the condition be assessed by a healthcare

provider before performing neural mobilization.

**Reasons**

The causes that may lead to nerve problems requiring neural mobilization

treatment include:

**1. Lumbar Disc Prolapse (Herniated Disc):**

This occurs when the protruding or bulging spinal disc presses on nearby

nerves, leading to symptoms such as pain, numbness, and tingling, especially if

the disc compresses nerve roots.

It can cause pressure on the sciatic nerve or other nerves branching from the

spine, resulting in nerve problems such as femoral nerve injury.

**2. Nerve Inflammation (Neuropathy):**

Nerve inflammation due to injury or chronic strain can lead to nerve irritation,

causing pain, numbness, or weakness in the muscles controlled by the

affected nerve.

Causes of nerve inflammation can include conditions such as diabetes,

infections, or physical injuries.

**3. Nerve Injury (Trauma or Injury):**

Physical injuries such as accidents or falls can lead to nerve damage, causing

pressure or tearing of tissues around the nerve.

Nerve injury can lead to problems in movement or sensation, such as muscle

weakness or numbness in the limbs.

4. Pressure from Tumors or Spinal Stenosis:

Tumors or stenosis (narrowing of the spinal canal) can compress the nerves,

leading to symptoms similar to those caused by a herniated disc.

This can result in nerve pain or numbness in certain parts of the body.

**5. Overuse or Repetitive Strain:**

Overusing a muscle or nerve by repeating the same motion or maintaining a

static position for long periods can lead to nerve damage from constant

friction or pressure.

This often occurs in jobs or activities that involve repetitive movements or

improper posture.

**6. Postural Dysfunction or Muscular Imbalance:**

Poor posture or muscular imbalances can place pressure on the nerves. For

example, prolonged periods of incorrect posture can strain the nerves, leading

to pain and tension.

Bad habits while sitting or standing can cause nerve compression.

**7. Arthritis or Structural Problems:**

Spinal arthritis can lead to nerve compression due to swelling or structural

changes in the joints.

Conditions like spondylolisthesis can also irritate the nerves.

**8. Diabetes:**

Diabetes can cause nerve damage due to persistently high blood sugar levels,

leading to a condition known as diabetic neuropathy.

This damage affects peripheral nerves and results in symptoms such as

numbness or tingling in the limbs.

**9. Infection or Inflammation of Surrounding Tissues:**

Infections or inflammation of the tissues surrounding the nerves (such as soft

tissue inflammation) can put pressure or irritate the nerves.

In some cases, viral or bacterial infections can lead to symptoms like nerve

pain or muscle weakness.

**10. Hormonal Changes or Aging:**

As people age, their nerves become more susceptible to damage due to

changes in the tissues and membranes surrounding the nerve.

Hormonal changes, such as those during pregnancy or thyroid disorders, can

also affect the nerves and cause functional problems.

**11. Poor Lifestyle Habits (such as Sedentary Lifestyle):**

A sedentary lifestyle or sitting for long periods can cause accumulated pressure

on the nerves due to lack of movement or improper body posture.

**Treatment by physical therapy**

**Treatment of Nerve Problems through Physical Therapy**

Physical therapy plays a crucial role in the management and treatment of

nerve-related issues, such as lumbar disc prolapse, femoral nerve injury, and

other neuropathies. The main goal is to reduce pain, improve nerve mobility,

strengthen muscles, and restore normal function. Below are common physical

therapy treatments for nerve problems:

**1. Neural Mobilization (Nerve Gliding)**

**Purpose**: To improve the mobility of the affected nerves by gently moving

them through their normal range of motion.

**Mechanism**: This technique reduces nerve tension, alleviates pressure on the

nerve, and helps prevent adhesions or scarring that can restrict nerve

movement.

**Benefit**: Neural mobilization is especially effective for nerve compression, such

as in cases of disc herniation or nerve root irritation. It helps to reduce pain,

numbness, tingling, and weakness.

**2. Stretching and Strengthening Exercises**

**Purpose**: To improve flexibility, reduce stiffness, and strengthen muscles

around the affected nerve.

**Mechanism**: Stretching helps to release tight muscles that might be

compressing or irritating the nerve, while strengthening exercises help

support the injured area and prevent further damage.

**Benefit**: Stretching exercises can relieve pressure on the nerves, and

strengthening exercises help improve muscle function and prevent future

injuries.

**3. Postural Training**

**Purpose**: To correct poor posture that might be contributing to nerve

compression or irritation.

**Mechanism**: Postural training focuses on teaching the patient how to maintain

proper alignment while sitting, standing, and moving to reduce strain on the

nerves and spine.

**Benefit**: Proper posture minimizes pressure on the spine and nerves, reducing pain

and improving overall spinal health.

**4. Heat and Cold Therapy**

**Purpose**: To reduce inflammation, ease muscle spasms, and provide pain relief.

**Mechanism**: Heat therapy can increase blood flow to the affected area, promoting

healing, while cold therapy reduces inflammation and numbs the area, providing

temporary pain relief.

**Benefit**: These therapies are often used in conjunction with other treatments to

alleviate acute pain and inflammation associated with nerve injury or compression.

**5. Electrical Stimulation (TENS or NMES)**

**Purpose**: To reduce pain and stimulate nerve function.

**Mechanism**: Transcutaneous electrical nerve stimulation (TENS) uses low-frequency

electrical pulses to block pain signals, while neuromuscular electrical stimulation

(NMES) helps stimulate muscle contractions to improve strength and reduce muscle

atrophy.

**Benefit**: Electrical stimulation can help control pain and improve muscle strength,

which is particularly useful in cases of nerve injury leading to weakness.

**6. Manual Therapy**

**Purpose**: To mobilize joints, improve movement, and reduce muscle tightness.

**Mechanism**: Techniques such as joint mobilizations, myofascial release, and soft

tissue massage are used to release tension in muscles and fascia, helping to reduce

pressure on nerves.

**Benefit**: Manual therapy can improve range of motion, reduce pain, and address

any restrictions in the muscles or joints that may be contributing to nerve

problems.

**7. Traction Therapy**

**Purpose**: To relieve pressure on spinal discs and nerves.

**Mechanism**: Spinal traction involves stretching or gently pulling the spine to create

space between the vertebrae, which helps reduce nerve compression.

**Benefit**: Traction therapy can be particularly effective for conditions like herniated

discs, where the disc material is pressing on nearby nerves.

**8. Education and Lifestyle Modifications**

**Purpose**: To teach the patient strategies to prevent further injury and manage their

condition at home.

**Mechanism**: The therapist may provide advice on proper lifting techniques,

ergonomic workstation setup, and exercises to improve mobility and strength.

**Benefit**: Educating the patient helps to prevent re-injury and empowers them to

manage their condition effectively.

**9. Aquatic Therapy**

**Purpose**: To allow the patient to perform exercises in a low-impact environment,

reducing stress on joints and nerves.

**Mechanism**: Water buoyancy supports the body, making it easier for the patient to

move and perform exercises with less pain or discomfort.

**Benefit**: Aquatic therapy is beneficial for those with severe pain or mobility

limitations, as it reduces the strain on the affected nerves and allows for a more

comfortable rehabilitation process.

**10. Functional Training**

**Purpose**: To help the patient return to daily activities and work tasks without

exacerbating nerve problems.

**Mechanism**: Functional training focuses on improving the patient’s ability to

perform everyday activities such as walking, lifting, bending, or climbing stairs while

avoiding positions that put pressure on the affected nerve.

**Benefit**: This training helps restore independence and functionality, making it easier

for patients to carry out routine tasks without pain or limitations.

**Conclusion:**

Physical therapy provides a comprehensive approach to treating nerve problems.

Through neural mobilization, strengthening exercises, postural training, and various

therapeutic techniques, physical therapy can alleviate pain, improve mobility, and

restore normal nerve function. By addressing the root cause of nerve compression

or irritation, physical therapy can greatly enhance the patient’s quality of life and

reduce the need for invasive treatments.

**Resources:**

**1\_** "Orthotic Intervention for the Hand and Upper Extremity: A Clinical Resource Guide" by MaryLynn A. A. I. Schmidt and Jane O. G. Block: A resource for understanding musculoskeletal disorders, including nerve injuries and their rehabilitation.

**2\_** "Physical Rehabilitation" by Susan B. O'Sullivan and Thomas J. Schmitz: A comprehensive guide to physical therapy techniques, including those for treating nerve injuries and neuropathies.

**3\_** "Neurological Rehabilitation" by Darcy Ann Umphred: Focuses on neurological conditions, including nerve injuries, and provides therapeutic approaches for recovery.