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A multidisciplinary perspective on **LOW BACK PAIN** MANAGEMENT

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## MESSAGES FROM THE PRESIDENTS



*Prof. Dr. Adnan Khan  
MBBS, FRCP (Edin.), MRCP (UK), DIM (London)  
President, Pakistan Society of Neurology (PSN)*

As the President of the Pakistan Society of Neurology (PSN), I am pleased to share the guidelines with the title “A Multidisciplinary Perspective on Low Back Pain (LBP) Management” for the doctor’s fraternity involved in the provision of LBP care. In fact, we all know that the prevalence of low back pain is too high in our society (although we do not have any national data). These guidelines will not only make our practice easy and simple but will also put us at par with evidence-based standards. Every effort has been made to make these guidelines user-friendly and easy to understand in a stepwise approach to the management of LBP.

PSN gives prime importance to the dissemination of knowledge and updating our physicians to modify their practice according to the current international standards. I hope these guidelines will prove a major step in enhancing knowledge about one of the most common prevailing problems in our society.

In the end, I would like to pay my special thanks to all the authors and reviewers whose efforts have given a practical shape to these guidelines.





*Prof. Dr. Samina Ghaznavi  
MBBS, MCPS, FCPS, FACR  
President, Pakistan Society for Rheumatology*

Low back pain, as we all know is a very common occurrence all over the world, in almost all populations, and has a wide array of etiologies. Getz Pharma has taken a very valuable initiative in formulating the “Multidisciplinary perspectives on Low Back Pain Management,” keeping in mind all the etiologies, and taking on board all the relevant specialties, by inviting the “Task Force” from each specialty to work in their own domain.

The Taskforce of Pakistan Society for Rheumatology comprised of renowned Rheumatologists from all over Pakistan, who formulated the guidelines in record time.

I applaud all the different specialties for their valuable contribution pertaining to their own fields.

We know that, due to a lack of awareness and neglect in our part of the globe, back pain remains untreated, falls in the wrong domains, or is treated by quacks. This leads to disease worsening, with eventual disability, further leading to financial overburden in an already impoverished population.

These guidelines have been formulated to educate our general practitioners, who are the front line of our healthcare system. The multidisciplinary perspectives will prove to be very helpful, not only to provide, immediate relief, but also to recognize the etiology and refer the patients to the relevant specialties, and get the proper treatment. Hence, it can be rightly said that this was the need of the hour.



*Prof. Tahseen Riaz  
MBBS, FCPS (Ortho)  
President, Pakistan Orthopaedic Association (POA)*

Being a member of the healthcare team, we are daily presented with patients having Low back pain (LBP) ranging in all age groups, genders, and socioeconomic status.

LBP is not a single entity rather it includes different pain originators from biomechanical aspects to the body's inflammatory responses. Prolonged sitting, osteoporotic low-impact trauma, high energy trauma, infection, different types of tumors, and metastases can lead to LBP, but the serious nature of underlying diseases, treatment and outcomes are entirely different for each subgroup of pathologies.

To have a methodological way to deal with such a perplexing nature of LBP, it is necessary to develop simple, easily comprehensible and logical guidelines for all medical professionals to reach the correct diagnosis for proper treatment and management of the patient. I am happy that Getz Pharma has provided a platform for five major professional societies to collaborate and develop a "Multidisciplinary perspective on Low back pain management."

I am hopeful that this effort will lead to a better understanding of the disease, timely referral to the concerned specialty, and future advancement in managing low back pain due to various etiologies.



*Professor Azizunnisa Abbasi  
FRCOG, MRCOG, FCPS, DGO, MCPS  
President, Society of Obstetricians & Gynecologists of Pakistan (SOGP)*

It is a great privilege to write a message for the launching of the “Multidisciplinary Perspective on Low Back Pain Management.” It was an honor for SOGP to develop this guideline in collaboration with Getz Pharma and other medical professional organizations.

I am grateful to my colleagues from SOGP for their untiring effort to develop this important document. Low back pain is the most common clinical presentation among gynecological/obstetrical patients.

We take immense pride in our mission to advance healthcare, promote research, provide support, and keep liaison with other organizations for better healthcare for the women of our country. As we look forward, we are excited about the future possibilities and challenges in the field of medicine. SOGP remains committed to staying at the forefront of these developments, providing cutting-edge resources, and facilitating collaboration among our partners.



*Dr. Shahzad Anwar*  
*MBBS, Diplomate Pain Medicine (Harvard University, USA), MSc. Pain Medicine (Pak),*  
*MSc. Pain Management (Cardiff, UK), Fellow WIP (Hungary)*  
*President, Society for Interventional Pain Medicine*

I am honored to share a heartfelt testimonial highlighting the paramount importance of a Multidisciplinary Perspective on Low Back Pain Management. As the President of our esteemed society, I have witnessed firsthand the transformative impact that a collaborative approach can have on the lives of countless patients suffering from this debilitating condition.

Low back pain is a pervasive and complex health issue that affects millions of individuals worldwide, often leading to reduced quality of life and increased healthcare costs. It is imperative that we, as healthcare professionals dedicated to the field of interventional pain medicine, recognize the value of a multidisciplinary approach in tackling this formidable challenge.

Through our collective efforts, we have tried to integrate the expertise of pain physicians, neurologists, orthopedic surgeons, rheumatologists, and gynecologists. This collaboration not only empowers us to address the diverse aspects of low back pain but also allows us to tailor treatments to the unique needs of each patient.

As we move forward, let us reaffirm our commitment to the Multidisciplinary Perspective on Low Back Pain Management.

**A Multidisciplinary  
Perspective on  
LOW BACK PAIN  
Management**

# CHAPTER-I

# INTRODUCTION

## A. BACKGROUND & EPIDEMIOLOGY OF LOW BACK PAIN

Soreness or discomfort in the lower back, more precisely in the region between the ribcage and the buttocks, is referred to as low back pain. It is a chronic condition with a variable course characterized by often recurrent but transient episodes of pain in lower back region. Its severity might range from little, sporadic pain to persistent, incapacitating symptoms. Muscle strains, ligament sprains, spinal degeneration, herniated discs, spinal stenosis, and underlying systemic diseases are just a few of the causes of low back pain.

On an international level, low back discomfort is very common. Up to 80% of people are predicted to experience low back discomfort at some point in their lives. Although it affects people of all ages, this ailment gets more prevalent as people get older. Low back discomfort has a significant negative influence on quality of life, productivity at work, and healthcare costs. Various places and people may have variable rates of low back pain prevalence. The diversity in prevalence rates is caused by elements like lifestyle, occupation, cultural practices, and access to healthcare. For instance, persons who work in physically demanding jobs or in unfavorable working conditions may be more susceptible to low back discomfort.

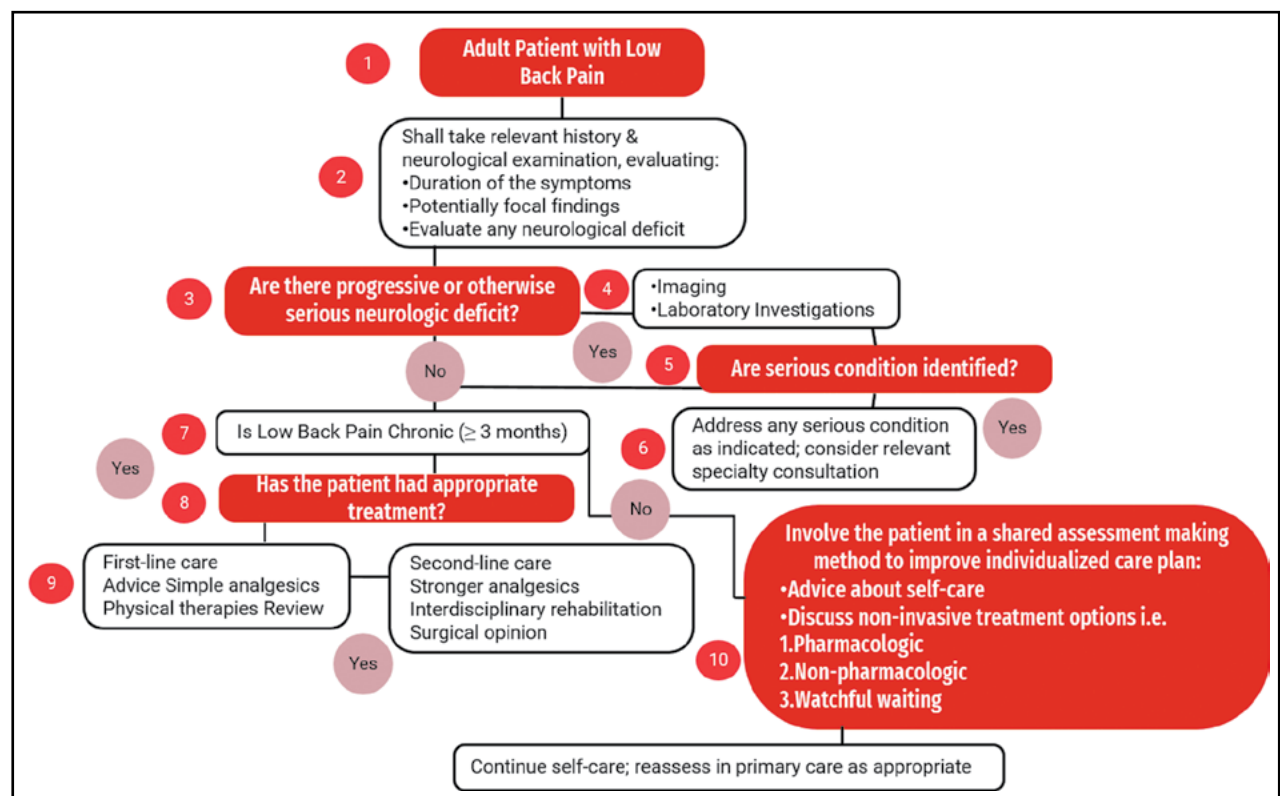
Globally, 619 million people experienced low back pain in 2020, and it is predicted that 843 million people will by 2050, primarily due to population growth and aging. Low back pain is one of the main contributors to disability-adjusted life years (DALYs), a measure of the burden of disease on a global scale. It represents a sizeable amount of the total healthcare expenditure, which includes doctor visits, diagnostic tests, drugs, and treatments<sup>4</sup>. It also results in indirect expenses from lost productivity, disability compensation, and work absence. The prevalence of low back pain may differ at the local and regional levels based on particular elements within those populations. The incidence rates in particular areas or communities can be affected by socioeconomic circumstances, cultural customs, healthcare systems, and public awareness of back pain therapy.

Healthcare systems, policymakers, and practitioners must have a good grasp of the epidemiology and history of low back pain in order to develop successful policies for prevention, management, and resource allocation. By managing the burden of low back pain, people can have an improved quality of life, less impairment, and optimal use of healthcare.

## B. SCOPE OF THE GUIDELINES:

The goal of the low back pain guidelines is to give general practitioners (GPs) multidisciplinary advice on how to recognize and treat the various etiologies of low back pain. These recommendations are meant to make sure that people with low back pain are referred to and treated by the proper healthcare providers. Numerous conditions, including musculoskeletal, neurological, or systemic ones, can result in low back discomfort. The presentation of low back pain as a symptom, however, can be misleading, making it difficult for GPs to precisely diagnose the underlying illness. Finding the precise source of low back pain might be challenging for a number of reasons:

- i. **Overlapping Symptoms:** Different etiologies of low back pain can present with overlapping symptoms, such as pain, stiffness, or reduced mobility. For example, both a muscle strain and a herniated disc can result in similar symptoms, making it difficult to differentiate between them based solely on clinical presentation.
- ii. **Non-Specific Symptoms:** Low back pain itself can be a non-specific symptom, meaning that it does not always indicate a specific underlying cause. It is often a result of complex interactions between various factors, including mechanical, structural, and psychosocial elements. This complexity adds to the challenge of identifying the primary pathology.
- iii. **Lack of Diagnostic Tests:** In many cases, there is no single definitive test that can confirm the precise cause of low back pain. Diagnostic imaging, such as X-rays or MRIs, may not always provide a clear picture of the underlying pathology. Therefore, GPs must rely on their clinical judgment and consider multiple factors to make accurate diagnoses.
- iv. **Diagnostic Red Flags:** While low back pain is usually a benign condition, there are instances where it may indicate a more serious underlying pathology, such as infection, tumor, or cauda equina syndrome. However, these “red flag” symptoms are relatively rare, making it challenging for GPs to determine when further investigation or referral is necessary.





Given these difficulties, the guidelines are intended to give GPs a systematic method for diagnosing and treating patients with low back pain. In order to assist general practitioners in identifying patients who need additional testing or referral to the appropriate specialists, they will explain critical evaluation criteria, clinical decision rules, and red flag indicators. GPs can take advantage of the skills and knowledge of many healthcare specialists involved in treating low back pain by adopting multi-disciplinary guidelines. These advices may come from experts in the fields of orthopedics, neurology, physiotherapy, pain management, and other pertinent fields. This collaborative approach guarantees that patients with low back pain receive complete care and appropriate referrals to experts who can address the underlying cause of their pain.

The ultimate goal of the guidelines is to enhance patient outcomes by increasing the precision with which low back pain is diagnosed, minimizing the need for pointless tests, maximizing specialist referrals, and customizing treatment regimens based on the distinct etiology of low back pain. The guidelines enable GPs to make educated decisions and improve the overall management of patients with low back pain by giving them specific and scientifically supported suggestions.

### C. TYPES OF LOW BACK PAIN:

Healthcare providers can more effectively adapt their treatment modalities and make the proper referrals when required by recognizing the various types of low back pain and their differentiating characteristics<sup>1&5</sup>.

i. ***Mechanical Low Back Pain:***

The most typical form of low back pain, known as mechanical low back pain, is brought on by musculoskeletal conditions like intervertebral disc degeneration, muscle strains, and ligament sprains. Heavy lifting, bending, and twisting are frequently involved in these activities. Typically, the lower back is the only area of pain, and certain activities may make it worse.

ii. ***Low Back Pain with Radiculopathy:***

Sciatica, or radicular low back pain, develops when a spinal nerve root is pinched or aggravated. Spinal stenosis or a herniated disc may be to blame for this. Sharp, shooting pain that travels down the leg following the route of the damaged nerve is a common symptom of radicular pain. Additionally, they might feel tingling, numbness, or have weak muscles.

iii. ***Non-Specific Low Back Pain:***

Low back pain with no known etiology is referred to as non-specific low back pain. When other underlying illnesses have been ruled out, it is an exclusion diagnosis. An aching or tight lower back is a typical symptom of non-specific low back pain. It might be caused by things like bad posture, muscle imbalances, or psychological issues.

iv. ***Inflammatory Low Back Pain:***

Ankylosing spondylitis and other inflammatory spondyloarthritis types are linked to inflammatory low back pain. These ailments result in inflammation in the spine's joints and tissues, which causes discomfort, stiffness, and decreased movement. Young individuals are more likely to experience inflammatory low back pain, which may also be accompanied by other systemic symptoms.

v. ***Referred Low Back Pain:***

Referred low back pain is when the lower back is felt to be affected by organs or tissues in the pelvis or abdomen. The gastrointestinal tract, uterus, bladder, and kidneys are common places where pain is transferred from. The source of the pain might not be immediately obvious and it could be dull, achy, or cramp-like.

## SELECTED READINGS

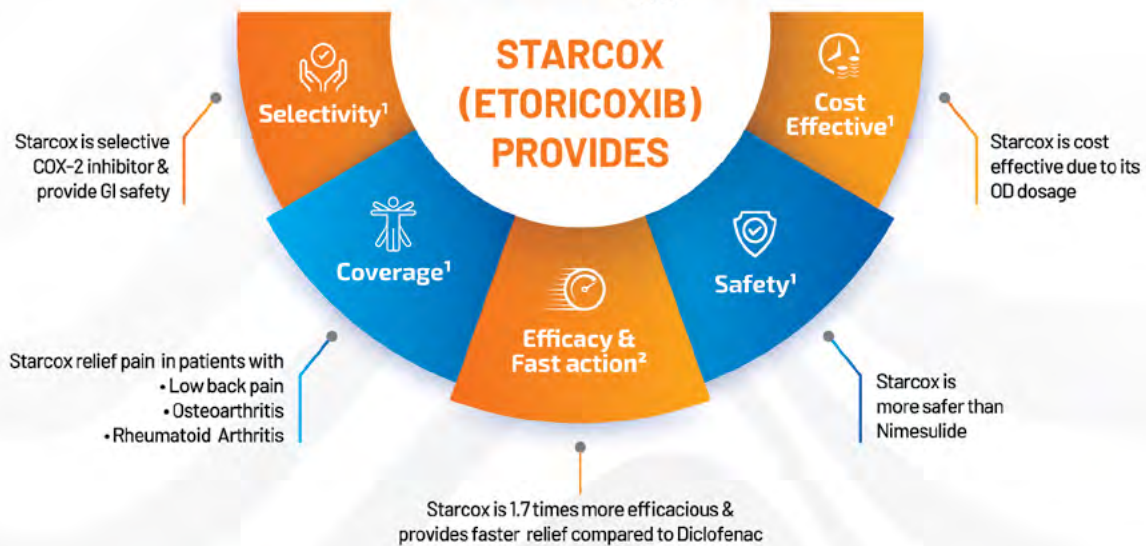
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## **CHAPTER-II**

# **NEUROLOGICAL LOW-BACK PAIN**

## A. EPIDEMIOLOGY: PREVALENCE OF EACH ETIOLOGY

Clinical practice guidelines normally state that neuropathic pain in LBP occurs at a rate of about 5%; however, some studies state that 16–55% of patients with chronic LBP may be affected by neuropathic pain. According to extensive epidemiological studies, neuropathic pain affects 20% to 35% of back pain patients. Currently, the most prevalent neuropathic pain syndrome is persistent lumbar radicular pain. The phrase “mixed pain syndrome” was created because of the complicated and nociceptive pathophysiology of back pain, which is assumed to involve neuropathic pain-generating pathways. Neuropathic pain can result from mechanical compression of the nerve root (mechanical neuropathic root pain), lesions of nociceptive sprouts within the degenerated disc (local neuropathic), or inflammatory mediator action (inflammatory neuropathic root pain) originating from the degenerative disc even without any mechanical compression. Neurological low-back pain encompasses various etiologies, including spinal compressions and disc herniation. The prevalence of each etiology can vary, but they collectively contribute to a significant proportion of low back pain cases. According to epidemiological studies the following conditions are mentioned:

- i. **Spinal Nerve Compression Disorders:** These conditions involve the compression or irritation of spinal nerves, resulting from various factors. They can cause a range of symptoms such as pain, numbness, tingling, and weakness. The specific disorders include: (a) Herniated Disc, that occurs when the soft inner material of a spinal disc protrudes or leaks through the outer layer and compresses nearby nerves. This can lead to radiating pain, numbness, and weakness in the lower back and legs. (b) Spinal stenosis is a narrowing of the spinal canal or nerve root canals, causing compression of the spinal cord or nerve roots. It typically results in pain, numbness, and weakness in the lower back and legs, often exacerbated by walking or standing. (c) Degenerative disc disease refers to the natural wear and tear of the spinal discs over time. It can cause chronic low back pain, instability, and nerve compression if the discs degenerate and lead to spinal osteoarthritis or disc bulging.
- ii. **Cauda Equina Syndrome:** Cauda equina syndrome is a rare but serious condition where the nerve roots of the cauda equina at the base of the spinal cord become compressed, leading to severe low back pain, urinary and bowel dysfunction, saddle anesthesia, and leg weakness. It requires immediate medical attention.
- iii. **Nerve Entrapment:** Nerves in the lower back, such as the sciatic nerve, can become entrapped or compressed, leading to sciatica and radiating leg pain. This can be caused by factors like muscle imbalances, spinal abnormalities, or piriformis syndrome.

## B. SIGNS & SYMPTOMS OF EACH PATHOLOGY

### i. **Spinal Nerve Compression Disorders:**

#### (a) **Herniated Disc:**

- Back pain or neck pain, depending on the location of the herniation.
- Radiating pain, numbness, or tingling sensation along the nerve pathway, which may extend to the arms or legs.
- Muscle weakness in the affected area.
- Loss of reflexes in the affected area.
- Pain that worsens with movement, coughing, or sneezing.
- Chronic low back pain.
- Stiffness or decreased flexibility in the spine.
- Weakness or muscle atrophy in severe cases.

#### (b) **Spinal Stenosis:**

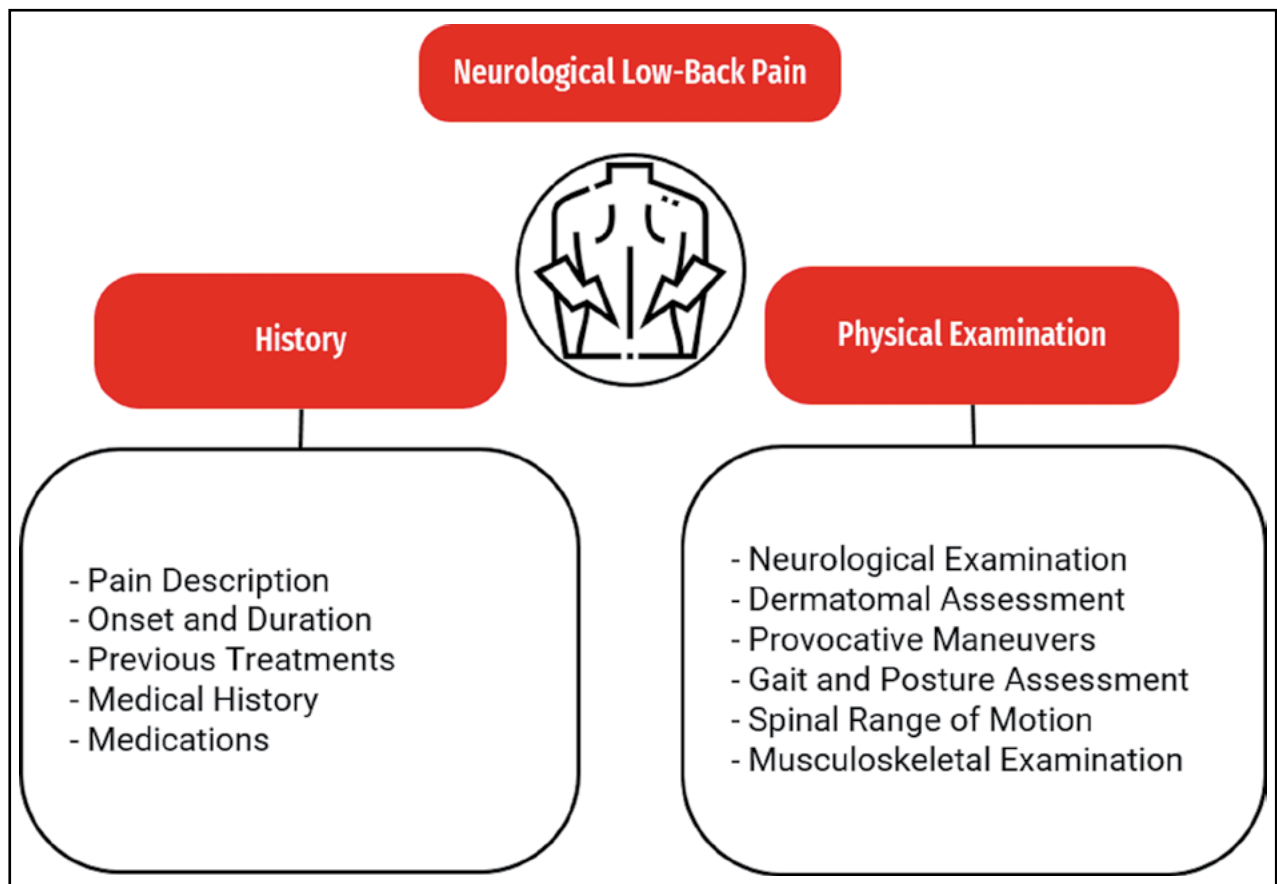
- Back pain or neck pain, often radiating to the arms or legs.
- Numbness, tingling, or weakness in the extremities.
- Cramping or pain in the legs after standing or walking for a prolonged period (neurogenic claudication).
- Difficulty with balance and coordination.
- Bowel or bladder dysfunction in severe cases.
- Low back pain.
- Weakness or paralysis in the limbs.
- Sensory changes, such as numbness or tingling.
- Loss of bladder or bowel control.
- Difficulty walking or maintaining balance.
- Pain that worsens with certain movements or positions.

*ii. Cauda Equina Syndrome*

- Severe low back pain.
- Urinary and bowel dysfunction.
- Saddle anesthesia (numbness in the groin area).
- Leg weakness or paralysis.
- Loss of reflexes in the lower extremities.
- Sexual dysfunction.

*iii. Nerve Entrapment:*

- Aches or pain in the region the compressed nerve supplies.
- A “pins and needles” or tingling sensation.
- Weakness or atrophy of the localized muscles.
- Slower reflexes.
- Modifications in sensory perception, such as altered sensation or temperature sensitivity.



## C. RELEVANT HISTORY & PHYSICAL EXAMINATION

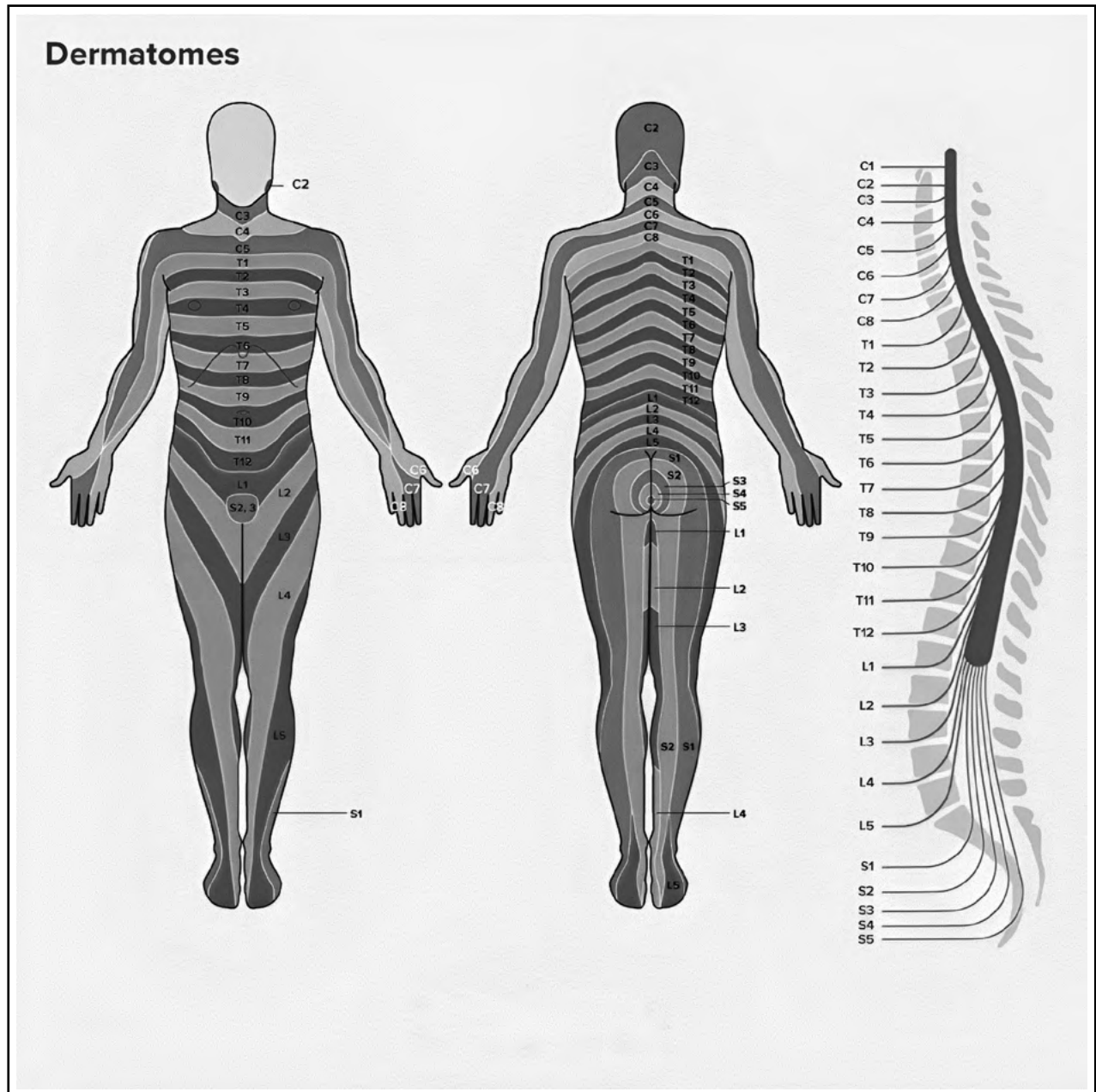
### i. *Relevant History:*

A pertinent history and a comprehensive physical examination are essential when examining a patient with suspected neuropathic low back pain. Consider the following important factors:

- a. **Pain Description:** Identify the pain's features, such as its type (such as burning or shooting), severity, location, radiation pattern, and aggravating or mitigating circumstances.
- b. **Onset and Duration:** Ask about the onset of the pain, how it has changed over time, and whether there have been any injuries or triggering events.
- c. **Previous Treatments:** Ask about any prior pain-relieving methods that have been used, such as medicine, physical therapy, or other interventions.
- d. **Medical History:** Check for any underlying medical illnesses, such as diabetes, autoimmune diseases, or a history of peripheral nerve injury that may contribute to neuropathic pain.
- e. **Medications:** Record all of the patient's current prescriptions, including any analgesics or anything that can impair nerve function.

### ii. *Physical Examination:*

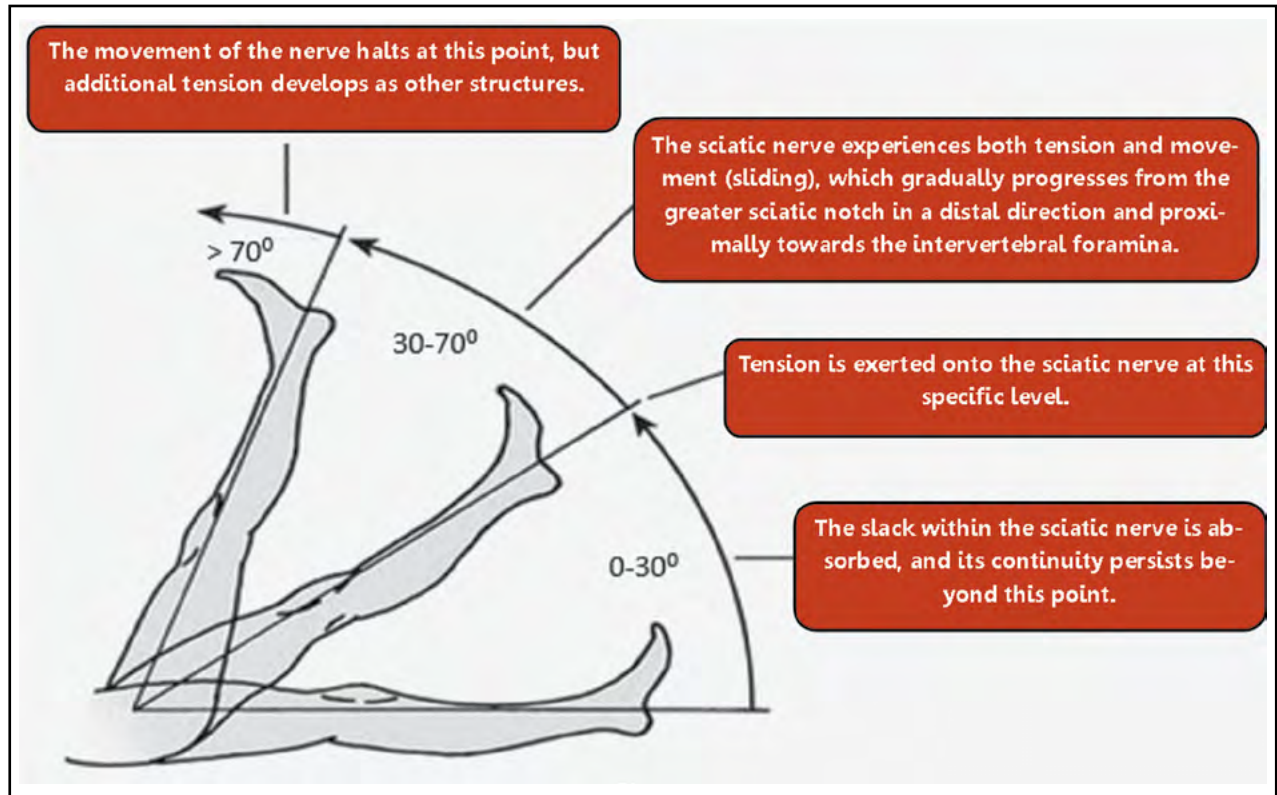
- a. **Neurologic Involvement:** Patients exhibiting neurologic involvement in cases of low back pain may present with distinctive symptoms. These can encompass weakness in one or both legs, often making activities like ascending or descending stairs challenging. Additionally, instances of legs giving way while standing or experiencing a slapping sensation in the foot during walking might signify a foot drop and potential involvement of the L5 nerve root. Sensory changes could manifest as sensations of numbness, tingling, coldness, electric shocks, or intense burning pains. Patients might even describe unique sensations, such as feeling water running down the leg or experiencing a sudden "pop" in the lower back, followed by the gradual onset of radicular symptoms. A common occurrence associated with lumbar spinal stenosis is neurogenic claudication, or pseudo-claudication, characterized by radiating pain, cramps, or weakness down one or both lower extremities. Notably, these symptoms tend to worsen with walking or standing and are promptly relieved by rest or spinal flexion. This flexion enlarges the spinal canal and foramina, creating more space for compressed nerve roots.
- b. **Dermatomal Assessment:** Dermatomal assessment is an examination technique used to evaluate the sensory distribution along specific dermatomes. Dermatomes are specific regions of the skin that are innervated by individual spinal nerves. Assessing dermatomal sensation is important in diagnosing and localizing the involvement of nerve roots or peripheral nerves in patients with neuropathic low back pain. The dermatomal assessments include Mapping Dermatomes, Light Touch, Pinprick Assessment and Temperature Discrimination. Any sensory abnormalities, including hypoesthesia, hyperesthesia, or anesthesia, along specific dermatomes should be documented and compared with patient's reported pain distribution that can aid in localizing the source of neuropathic low back pain and determining the affected nerve roots or peripheral nerves.



Dermatomal Assessment

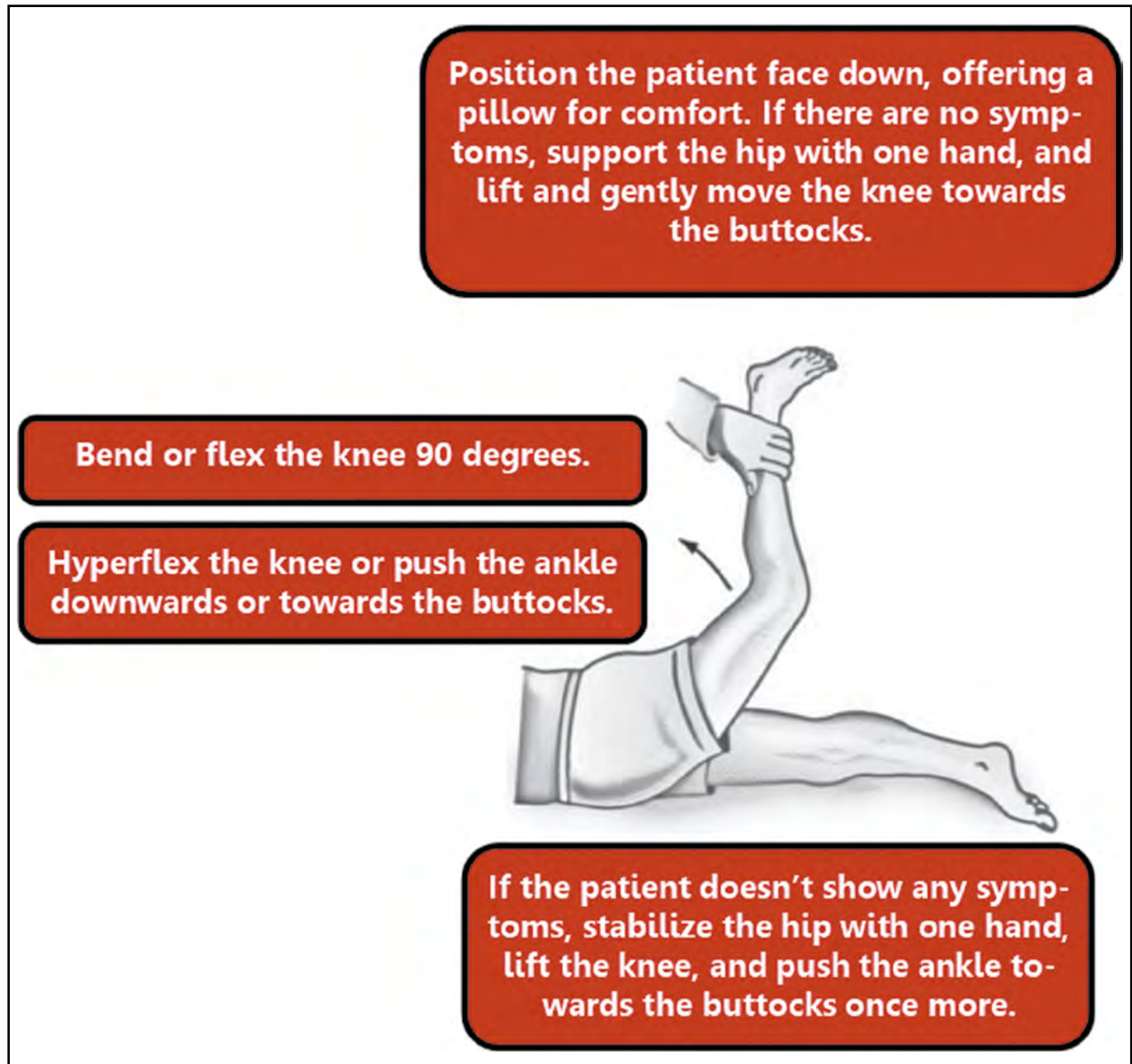
- c. **Provocative Maneuvers:** Provocative maneuvers are particular physical examination techniques performed on individuals with suspected neuropathic low back pain to replicate or amplify pain. These techniques aid medical practitioners in determining the origin or cause of the pain and evaluating the involvement of the nerve roots. Here are a few provocative actions that are frequently used:
  - **Straight Leg Raise (SLR) Test:** The SLR test is performed to determine whether there is lumbar nerve root irritation or compression, possibly as a result of a herniated disc. The examiner elevates one leg while maintaining the knee extended as the patient rests flat on their back. Below the knee, pain or a recurrence of radiating leg pain (sciatica) is regarded as a positive test and denotes nerve root involvement.





Straight Leg Raise (SLR) Test

- **Crossed Straight Leg Raise (CSLR) Test:** An alternative to the SLR test that looks at the opposing leg is the CSLR test. While maintaining the knee extended, the examiner elevates the unaffected leg. If performing this motion again creates discomfort on the affected side or radiating leg pain, it may be causing irritation or compression on the nerve roots.
- **Femoral Nerve Stretch Test:** The femoral nerve stretch test evaluates the femoral nerve's involvement, which may be impacted by lumbar spine nerve root compression. The examiner lifts the lower leg off the bed while the patient is resting on their stomach, passively extending the hip. Reproducing discomfort in the groin or anterior thigh area suggests femoral nerve involvement.



Femoral Nerve Stretch Test

- **Slump Test:** The slump test measures spinal cord or nerve root involvement in the cervical and lumbar areas. The patient voluntarily flexes their neck while sitting on the edge of the examination table with their legs outstretched. The patient is next instructed to slump forward while simultaneously extending one knee and dorsiflexing one foot, according to the examiner. An inflammation of the spinal cord or nerve roots is indicated by the repetition of pain, tingling, or worsening of symptoms.
- **Prone Knee Bend Test (Nachlas Test):** The prone knee bend test is performed to determine whether the lumbar spine's nerve roots are irritated or compressed. The examiner bends the knee, moving the heel toward the buttocks as the patient rests flat on their stomach. If the low back discomfort is repeated or spreads down the leg, it may be a sign that a nerve root is involved.

- d. **Gait and Posture Assessment:** When assessing individuals with neuropathic low back pain, a crucial part of the physical exam is assessing their gait and posture. It entails watching and analyzing the patient's gait and posture to provide important insights into their musculoskeletal function and potential pain-causing variables. Observing the patient's gait while they walk normally, as well as their speed, step length and width, arm swing, and foot clearance, are all part of the gait exam. While standing Posture, Pelvic Alignment, Spinal Alignment, and Upper Extremity Posture are all observed during Posture Assessment.
- e. **Spinal Range of Motion:** For individuals with neuropathic low back pain, measuring spinal range of motion is an important component of the physical examination. The patient's capacity to flex, extend, lateral flex, and rotate their spine is assessed throughout the examination. Any restrictions, discomfort, or asymmetries are noted throughout the assessment. The examination also involves feeling for discomfort or anomalies and checking the spine's alignment. The results of the spinal range of motion examination, in combination with the results of other tests and the patient's medical history, aid in the diagnosis and treatment of neuropathic low back pain.
- f. **Musculoskeletal Examination:** For individuals with neuropathic low back pain, a musculoskeletal examination is a crucial part of the physical examination. It aids in musculoskeletal assessment, which includes locating any abnormalities, muscular imbalances, or pain-causing factors in the lower back, hips, and lower limbs. In order to detect hip joint pathology or sacroiliac joint dysfunction, it includes evaluating the patient's posture, muscle strength, palpation, range of motion, and functional movements tests like squatting, bending, and lifting in order to determine how well they can go about their daily lives without their pain getting worse.

Clinical presentation in patients with lumbar radiculopathy

Root Level	Pain Distribution	Dermatomal Sensory Distribution	Weakness	Reflex Abnormality
L1	Inguinal region	Inguinal region	Hip flexion	Cremasteric reflex
L2	Inguinal region, Anterior Thigh	Anterior thigh	Hip flexion, hip adduction	Cremasteric reflex, thigh adductor reflex
L3	Anterior thigh, knee	Distal anteromedial thigh including knee	Knee extension, hip flexion, hip adduction	Patellar reflex, thigh adductor reflex
L4	Anterior thigh, medial aspect leg	Medial leg	Knee extension, hip flexion, hip adduction	Patellar reflex
L5	Posterolateral thigh, lateral leg, medial foot	Lateral leg, dorsal foot, and great toe	Foot dorsiflexion, knee flexion, hip abduction	Not applicable
S1	Posterior thigh and leg, lateral foot	Posterolateral leg, lateral aspect of foot, sole of foot	Foot plantar flexion, knee flexion, hip extension	Achilles reflex

Modified with permission from Levin KH, Continuum (Minneapolis).

## D. GRADING AND SEVERITY

Grading and severity of neurological low-back pain can be determined using various classification systems, such as:

- i. **Oswestry Disability Index (ODI) or the Visual Analog Scale (VAS):** These tools assess the functional disability and pain intensity, respectively, providing a quantitative measure to determine the severity of symptoms and their impact on daily activities.
- ii. **Quantitative sensory testing**

In order to screen for and evaluate neuropathic low back pain, quantitative sensory testing (QST) provides a more objective and correct procedure. To assess the health and integrity of the sensory pathways, QST analyzes a variety of sensory parameters. Here are a few QST techniques for neuropathic pain screening that are frequently used:

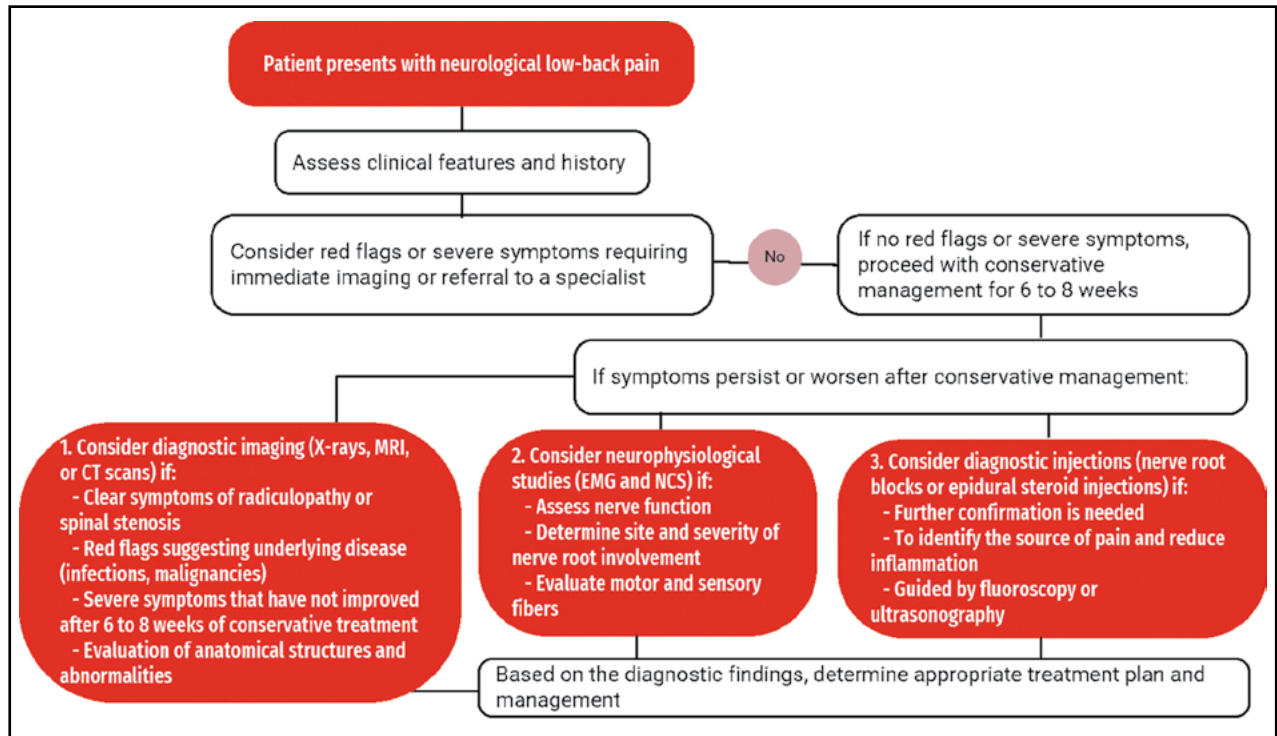
  - a. **Thermal Threshold Testing:** Using a device that stimulates the skin with regulated heat or cold, QST examines thermal perception thresholds. The participant indicates when the temperature change becomes unpleasant (heat or cold pain threshold) or when they first feel it (warmth or cold detection threshold). Changes in temperature thresholds may be a sign of neuropathic pain.
  - b. **Mechanical Sensory Testing:** When doing QST, devices that apply regulated pressure or vibration to the skin are used to measure mechanical feeling. For instance, pressure pain threshold testing quantifies how much pressure is necessary to cause discomfort. Reduced pain thresholds to pressure can be a sign of neuropathic pain.
  - c. **Dynamic Mechanical Allodynia Testing:** When a person experiences pain in reaction to non-painful stimuli such as mild contact or brushing, this is referred to as dynamic mechanical allodynia. Using defined methods, QST evaluates the existence and severity of dynamic mechanical allodynia. Neuropathic pain sufferers may have increased sensitivity to stimuli that are typically painless.
  - d. **Vibration Threshold Testing:** A vibrating device applied to the skin by QST is used to measure the vibration perception threshold. When they first feel the vibration, the participant says. Reduced vibration perception thresholds may indicate neuropathic pain-related sensory impairment.
  - e. **Pressure Algometry:** Using a pressure algometer, pressure algometry applies controlled pressure to particular places on the body to evaluate pain sensitivity. It aids in determining whether allodynia and hyperalgesia are present in neuropathic pain disorders.
- iii. **Bedside sensory tests:** Sensory tests performed at the patient's bedside can be useful in search for neuropathic low back pain. These examinations evaluate sensory irregularities that are indicative of neuropathic pain. Here are a few typical bedside sensory examinations
  - a. **Pinprick Test:** To assess the perception of sharp pain, a pinprick test includes lightly pricking the skin with a sterile pin or a blunt tip. Individuals with neuropathic pain may display atypical reactions, such as heightened or reduced pain feelings compared to normal.
  - b. **Light Touch Test:** Using a cotton swab or a soft brush, the light touch test assesses the sense of touch. The sensitivity to light touch in the affected area may be increased (hyperesthesia) or decreased (hypoesthesia) in those with neuropathic pain.
  - c. **Temperature Sensation Test:** This test evaluates how hot and cold stimuli are perceived. People are questioned about their perception of temperature after being exposed to a thermal stimulus, such as a test tube containing warm or cold water. Neuropathic pain may be indicated by altered temperature perception, such as hypersensitivity (hyperalgesia) or diminished sensitivity (hypalgesia).
  - d. **Vibration Sensation Test:** Vibration is administered to bony prominences or particular parts of the body using a tuning fork or a handheld vibration instrument. Vibration hypoesthesia is a reduced capacity to feel or detect vibrations in people with neuropathic pain.

- e. **Dermatomal Mapping:** Assessing sensory alterations along certain dermatomes (areas of skin innervated by a single spinal nerve) is known as dermatome mapping. A medical professional can check for any anomalies or differences in sensory perception between various dermatomes using a variety of sensory stimuli, including as touch, pinprick, or temperature.
- iv. **Neuropathic pain screening tools:** The identification of neuropathic low back pain and its differentiation from other types of pain can be aided by screening methods. Several frequently used neuropathic pain screening techniques are listed below:
  - a. **Douleur Neuropathique 4 (DN4):** The DN4 is a ten-item validated questionnaire that includes 10 sensory symptoms and indicators of neuropathic pain. It evaluates whether tingling, numbness, scorching pain, and other sensory anomalies are present and what their characteristics are. A clinical examination component of the DN4 is also included for identifying neuropathic pain symptoms. The chance of neuropathic pain is computed based on the replies and a score.
  - b. **Leeds Assessment of Neuropathic Symptoms and Signs (LANSS):** The LANSS is a device made to assess several types of neuropathic pain, including lower back pain. It entails filling out a questionnaire to rate sensory abnormalities, allodynia (pain brought on by non-painful stimuli), and hyperalgesia (exaggerated pain response) symptoms. Calculating a total score yields the likelihood of experiencing neuropathic pain.
  - c. **PainDetect:** A screening tool designed to distinguish between neuropathic and non-neuropathic pain is the PainDetect questionnaire. It has seven questions that evaluate the intensity, pattern, and particular sensory symptoms of the pain. To obtain a probability rating for neuropathic pain, the responses are assessed.
  - d. **Neuropathic Pain Questionnaire (NPQ):** The NPQ is a self-administered questionnaire that assesses the sensory symptoms and pain quality and intensity related to neuropathic pain. It also asks questions on pain-related functional limitations. The answers are used to assess the probability of neuropathic pain.

## E. RELEVANT INVESTIGATIONS

Diagnostic investigations play a crucial role in confirming the suspected etiology of neurological low-back pain. The following investigations may be considered:

- i. **Imaging:** X-rays, MRI, or CT scans can provide detailed images of the spine, allowing visualization of anatomical structures, disc herniation, spinal stenosis, or other abnormalities. However, to identify a nerve lesion or nerve compression and to document the radicular component, radiographic methods may be inconclusive, and there is no strong proof that routine imaging influences treatment choices or enhances outcomes. Early diagnostic imaging doesn't appear to be helpful unless there are clear symptoms suggesting radiculopathy or spinal stenosis, there are red flags that suggest an underlying disease (infections, malignancies), or the patient has severe symptoms that haven't improved after 6 to 8 weeks of conservative treatment. The outcomes can have an impact on future management.
- ii. **Neurophysiological Studies:** Electromyography (EMG) and Nerve Conduction Studies (NCS), evaluate nerve function and help determine the site and severity of nerve root involvement. The distal motor delay and the F-wave latency of nerves that receive their nerve fibers from the damaged root are two examples of neurophysiological tests that can be used to support a proximal nerve root lesion. If motor fibers are involved in the injury, then only abnormal values will be revealed by this examination. In cases when the lesion is close to the dorsal root ganglion, sensory conduction investigations are typically normal; as a result, they are ineffective in making the diagnosis. Somatosensory-evoked potentials are utilized to identify sensory fiber injury that has occurred close to the site of origin, such as in the nerve root, by analyzing the whole afferent conduction from the periphery to the brain.
- iii. **Diagnostic Injections:** Neurological low back pain is examined via diagnostic injections such nerve root blocks and epidural steroid injections. For nerve root blocks, a local anesthetic and occasionally a corticosteroid are injected close to the suspected nerve root to ascertain whether it is the cause of pain. In order to alleviate inflammation, epidural steroid injections include injecting a corticosteroid into the region around the spinal cord and nerve roots known as the epidural space. By locating the cause of the discomfort and reducing symptoms, these injections can be both diagnostic and therapeutic. For precise placement, they are guided by fluoroscopy or ultrasonography. Interventional pain treatment specialists with the necessary training should administer epidural steroid injections and nerve root blocks.



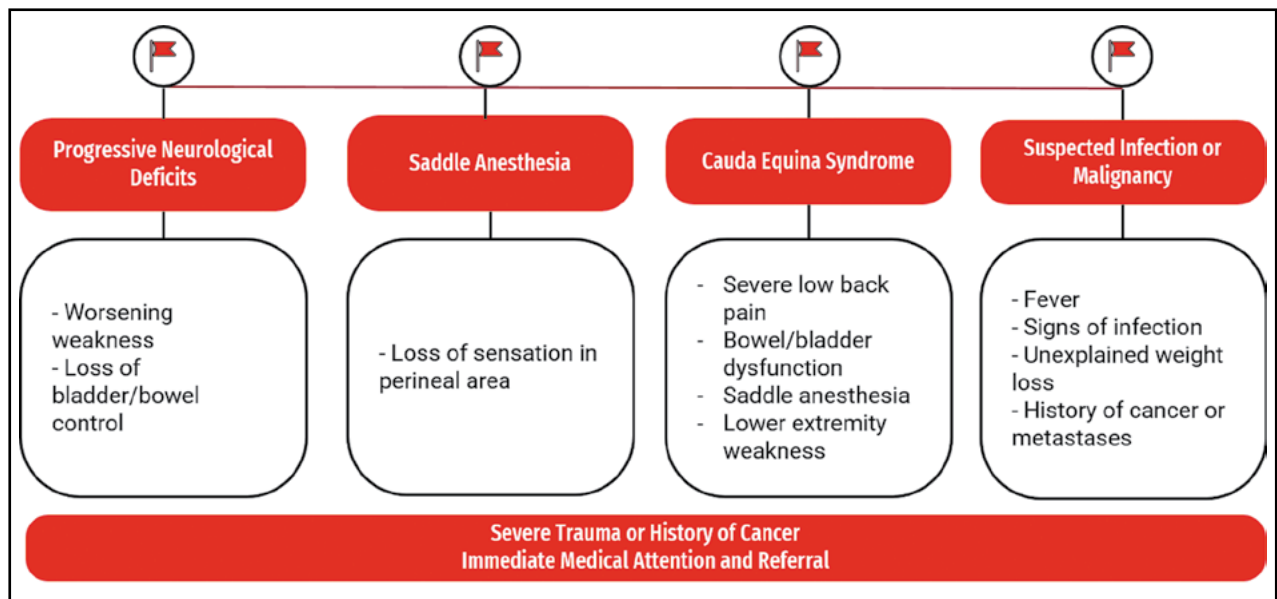
## F. RED FLAGS OF NEUROLOGICAL LOW BACK PAIN (COMPLICATIONS OR PROGNOSIS)

It is important to recognize “red flags” linked with neurological low back pain because they may point to serious underlying diseases or complications that demand urgent care. Here are more specifics on the warning signs:

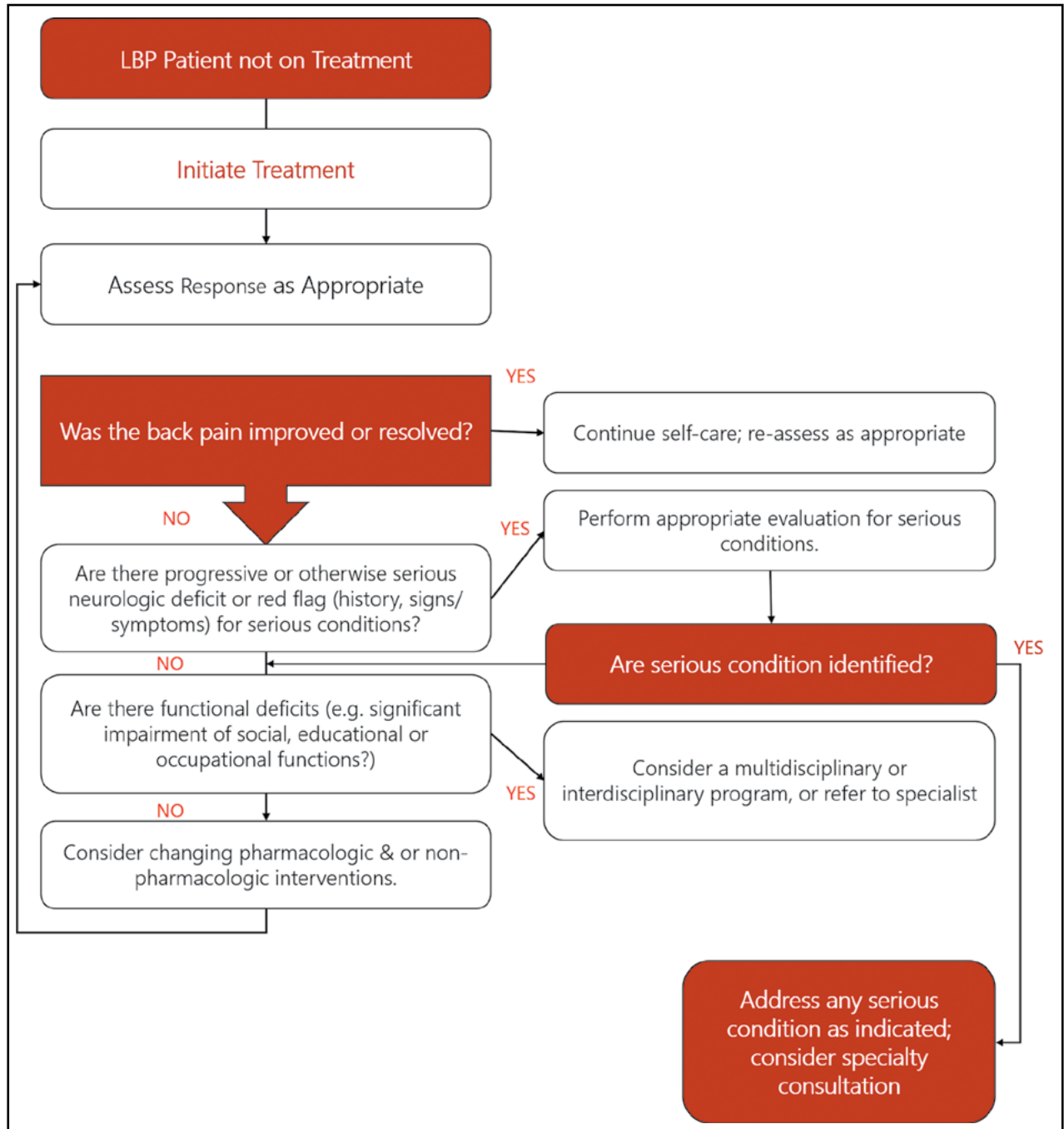
- i. **Progressive Neurological Deficits:** Progressive deterioration of neurological function, such as growing lower limb weakness or loss of bladder or bowel control, raises the possibility of nerve compression or injury. This necessitates immediate diagnosis and treatment because it could be caused by disorders like a herniated disc or spinal cord compression.
- ii. **Saddle Anesthesia:** The term “saddle anesthesia” describes the loss of feeling in the perineal region, which includes the areas that would contact a saddle while seated. It may be a sign of the cauda equina or the sacral nerve roots being affected, possibly as a result of spinal stenosis or a herniated disc. To identify and treat the underlying problem, prompt medical care is required.
- iii. **Cauda Equina Syndrome:** When the nerve roots of the cauda equina, which are found at the base of the spinal cord, are compressed, a medical emergency known as cauda equina syndrome results. Severe low back discomfort, saddle anesthesia, bowel or bladder malfunction, and sexual dysfunction are possible symptoms. In many cases, immediate surgical intervention is necessary to relieve the compression and avoid long-term neurological damage.
- iv. **Suspected Infection or Malignancy:** Red flags are raised if there is a possibility of an underlying infection or cancer, such as spinal osteomyelitis or a spinal tumor. Unexpected weight loss, night sweats, fever, or a history of a recent infection or malignancy are all possible symptoms. To address the underlying condition, prompt investigation and suitable management are required.
- v. **Severe Trauma or History of Cancer:** It is crucial to take these into account as warning signs if the low back pain is related to significant trauma, such as a fall or car accident, or if the person has a history of cancer. They raise the possibility of metastatic illness, spinal cord compression, or fractures of the spine. In order to detect any acute injuries or probable consequences, an immediate evaluation is required.

- vi. **Fever and Inflammatory Signs:** Fever may be a marker of an infectious cause of back pain, such as a spinal abscess or discitis, accompanied with inflammation symptoms like redness, warmth, or swelling over the back. Diagnosis and treatment require immediate medical intervention.
- vii. **History of Intravenous Drug Use:** People who have used intravenous drugs previously are more likely to get infections, especially spinal infections. When someone complains of low back pain, it's crucial to take the likelihood of infectious causes into account and act quickly to examine and treat the problem.
- viii. **Age at Onset:** In people older than 50 or younger than 20, neurological low back pain may be the earliest sign of underlying systemic illnesses such as ankylosing spondylitis, spinal compression fractures, or inflammatory disorders. In these situations, additional analysis is necessary.
- ix. **Unexplained Weight Loss:** Unintentional weight loss may be a sign of a systemic illness, including malignancies, especially if it is coupled with other troubling symptoms like persistent low back pain, exhaustion, or night sweats. To ascertain the cause, a detailed analysis is required.
- x. **Chronic Steroid Use:** Corticosteroid use over an extended period of time can weaken bones and increase the risk of spinal compression fractures. Individuals with a history of persistent steroid usage should have their neurological low back pain thoroughly examined for any possible fractures or other consequences.
- xi. **Non-Mechanical Pain:** When pain is constant, unrelated to movement or position, and occurs while the person is at rest or asleep, it may point to non-mechanical reasons like an infection, tumor, or inflammatory condition. To identify the root reason, more research is required. Recognizing warning signs is essential for fast referral to qualified specialists and prompt treatment to avoid long-term consequences.

By understanding the epidemiology, different etiologies, signs and symptoms, relevant assessments, grading, investigations, and red flags associated with neurological low-back pain, healthcare professionals can effectively diagnose and manage these conditions, ultimately improving patient outcomes and quality of life.



**G. MANAGEMENT OF LOW BACK PAIN:**





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# CHAPTER-III

# RHEUMATOLOGICAL LOW-BACK PAIN

## A. EPIDEMIOLOGY: PREVALENCE OF EACH ETIOLOGY

Rheumatological (inflammatory) low-back pain encompasses various etiologies, including Ankylosing Spondylitis, Psoriatic Arthritis, Enthesitis Related Arthritis (ERA)/Juvenile SpA, and Infective Spondylitis. The prevalence of each etiology varies, and they collectively contribute to a significant proportion of inflammatory low back pain cases. According to epidemiological studies:

- i. **Ankylosing Spondylitis:** Ankylosing Spondylitis affects approximately 0.1% to 1.4% of the population worldwide. It typically manifests in young adults, predominantly males. The prevalence can vary among different ethnic groups and regions.
- ii. **Psoriatic Arthritis:** Psoriatic Arthritis is estimated to affect around 0.1% to 1% of the general population. It is commonly associated with psoriasis, a chronic skin condition. The prevalence of Psoriatic Arthritis is influenced by genetic factors and may vary among different populations.
- iii. **Enthesitis Related Arthritis (ERA)/Juvenile SpA:** ERA or Juvenile SpA refers to the onset of symptoms before the age of 16 years. The prevalence of ERA/Juvenile SpA is estimated to be around 1 in 1,000 children, with a higher incidence in boys. It represents a subgroup of spondyloarthritis that primarily affects the entheses (sites where tendons or ligaments attach to the bone).
- iv. **Infective Spondylitis:** The prevalence of Infective Spondylitis can vary depending on the geographic region and population studied. It is generally considered a rare condition, but its incidence may be higher in individuals with risk factors such as intravenous drug use, immunosuppression, or previous spinal surgery.

By understanding the epidemiology, different rheumatological etiologies, signs and symptoms, relevant assessments, grading, investigations, and red flags associated with rheumatological low back pain, healthcare professionals can effectively diagnose and manage these conditions, leading to improved patient outcomes and quality of life.

## B. RHEUMATOLOGICAL ETIOLOGIES (INFLAMMATORY LOW BACK PAIN):

Types and definitions of each pathology and their differences with each other

- i. **Ankylosing Spondylitis:** Ankylosing Spondylitis is a chronic inflammatory disease primarily affecting the axial skeleton, including the sacroiliac joints and the spine. It is characterized by inflammation, progressive stiffness, and fusion of the spine, leading to reduced spinal mobility. Ankylosing Spondylitis is strongly associated with the HLA-B27 genetic marker.
- ii. **Psoriatic Arthritis:** Psoriatic Arthritis is a chronic inflammatory arthritis that occurs in individuals with psoriasis. It can involve various joints, including the axial skeleton. Psoriatic Arthritis exhibits diverse clinical manifestations, such as asymmetric oligoarthritis, symmetric polyarthritis, or predominant involvement of the distal interphalangeal joints (DIP).
- iii. **Enthesitis Related Arthritis (ERA)/Juvenile SpA:** ERA or Juvenile SpA represents a subset of spondyloarthritis that primarily affects the entheses, joints, and spine in children and adolescents. It is characterized by inflammation at the sites of entheses, leading to pain, stiffness, and swelling. ERA/Juvenile SpA shares similarities with Ankylosing Spondylitis but has distinct features related to its onset in younger individuals.
- iv. **Infective Spondylitis:** Infective Spondylitis, also known as septic or bacterial spondylitis, is caused by a bacterial infection of the spine. It can result from hematogenous spread of bacteria, direct inoculation due to spinal surgery or trauma, or contiguous spread from adjacent structures. The infection leads to inflammation, destruction of spinal tissues, and potential neurological complications.

## C. SIGNS & SYMPTOMS OF EACH PATHOLOGY

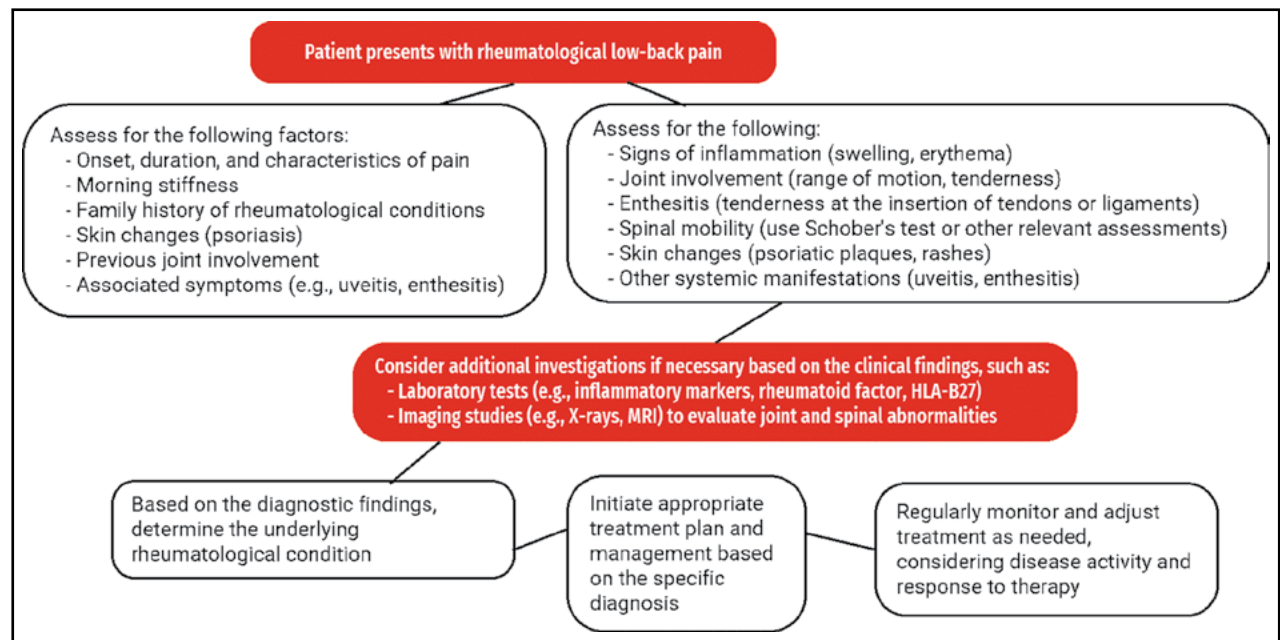
- i. **Ankylosing Spondylitis:** Common signs and symptoms of Ankylosing Spondylitis include chronic low back pain, morning stiffness, reduced spinal mobility, and fatigue. In severe cases, fusion of the spine may cause a fixed forward flexed posture (known as “bamboo spine”).
- ii. **Psoriatic Arthritis:** Psoriatic Arthritis can present with various manifestations, including joint pain, swelling, and stiffness. In addition to joint involvement, individuals may exhibit skin changes (psoriasis), nail abnormalities, dactylitis (sausage-like swelling of the fingers or toes), or enthesitis (inflammation at tendon or ligament attachment sites).

- iii. **Enthesitis Related Arthritis (ERA)/Juvenile SpA:** ERA/Juvenile SpA typically presents with symptoms such as enthesitis (pain and swelling at the sites of tendon or ligament attachment), arthritis (joint inflammation), back pain, and stiffness. Children with ERA may also experience growth abnormalities or uveitis (inflammation of the eye).
- iv. **Infective Spondylitis:** Infective Spondylitis is characterized by severe back pain, localized tenderness, fever, and systemic symptoms (e.g., malaise, weight loss). Neurological symptoms, such as radiculopathy or spinal cord compression, may also be present in advanced cases.

#### D. RELEVANT HISTORY & PHYSICAL EXAMINATION

Obtaining a comprehensive history and conducting a thorough physical examination are crucial in evaluating patients with rheumatological low-back pain. The following elements may be relevant:

- i. **History:** Inquire about the onset, duration, and characteristics of pain, morning stiffness, family history of rheumatological conditions, skin changes (psoriasis), previous joint involvement, and any associated symptoms (e.g., uveitis, enthesitis).
- ii. **Physical Examination:** Assess for signs of inflammation, joint involvement, enthesitis, spinal mobility, skin changes, and other systemic manifestations, such as the Schober's test for spinal mobility or the examination of entheses.

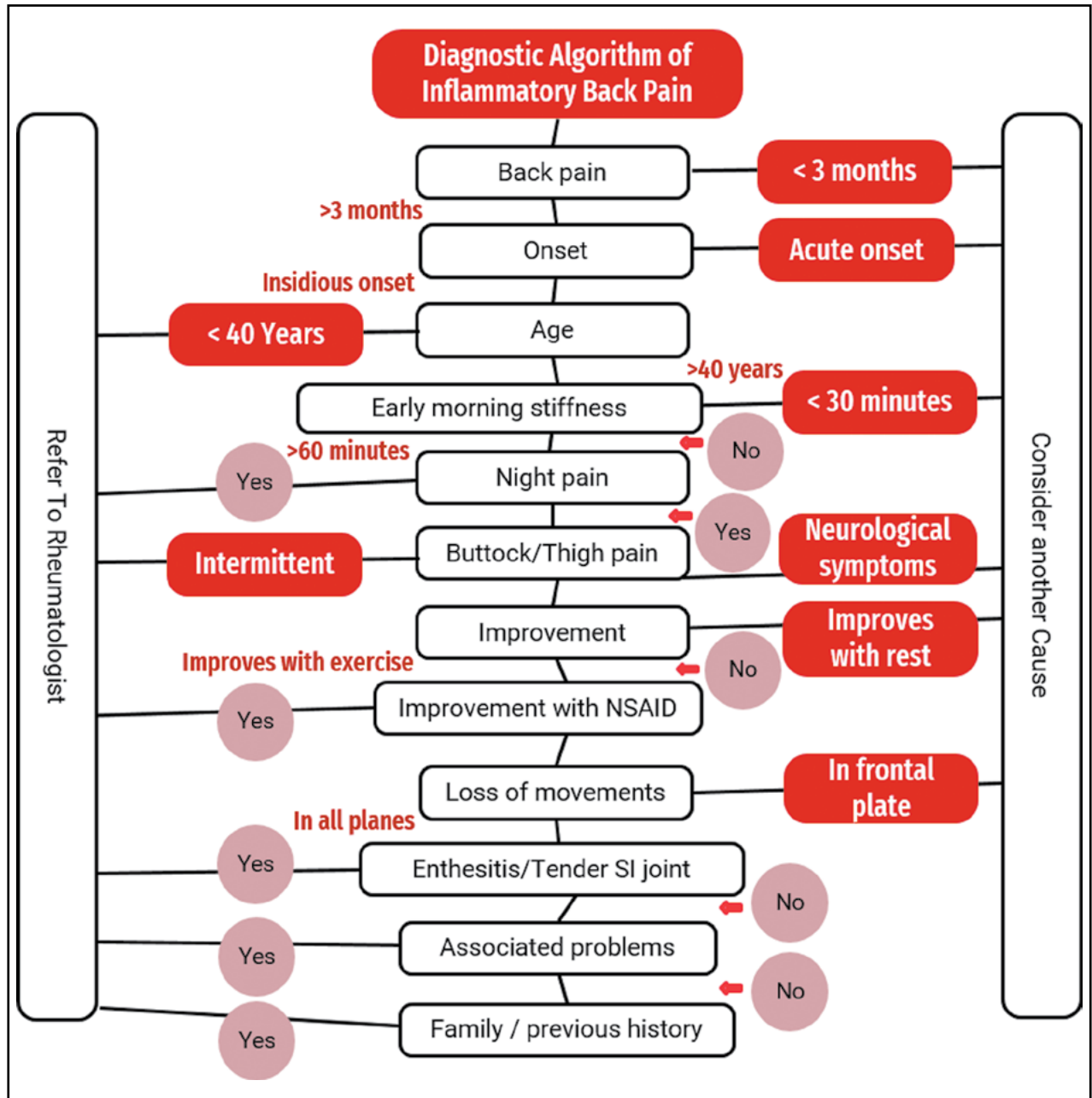


#### E. GRADING AND SEVERITY

Grading and severity of rheumatological low-back pain can be assessed using various tools, such as the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI), Psoriasis Area and Severity Index (PASI), or juvenile-specific scoring systems. These tools evaluate the extent of disease activity, functional impairment, and impact on the patient's quality of life.

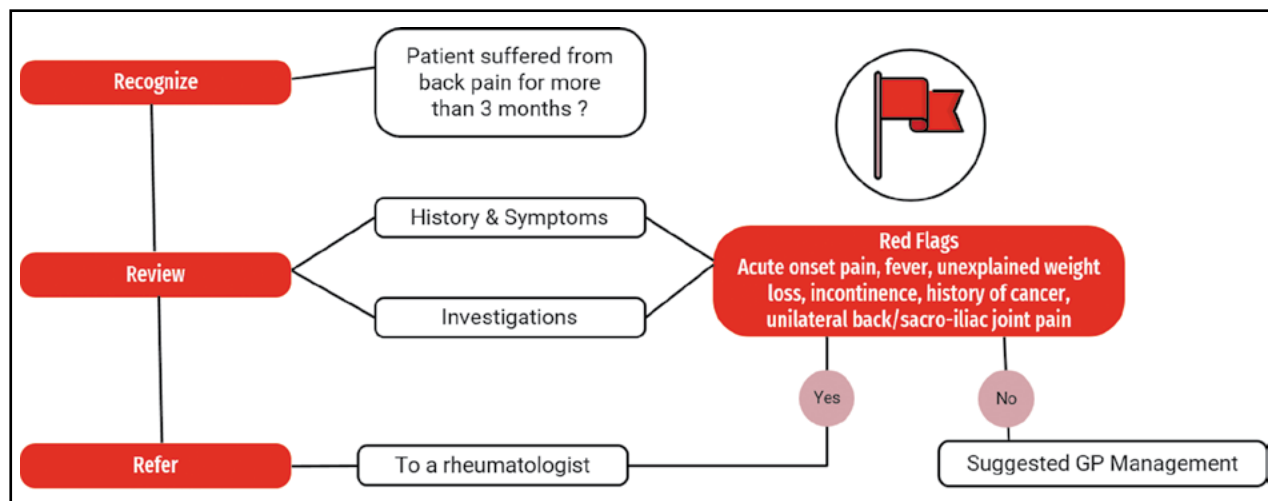
#### F. RELEVANT INVESTIGATIONS

- i. Diagnostic investigations play a crucial role in confirming the suspected rheumatological etiology and assessing disease activity. The following investigations may be considered:
- ii. **Laboratory Tests:** These may include inflammatory markers (e.g., C-reactive protein, erythrocyte sedimentation rate), rheumatoid factor, anti-cyclic citrullinated peptide antibodies, HLA-B27 testing, and specific biomarkers for psoriatic arthritis.
- iii. **Imaging:** X-rays, magnetic resonance imaging (MRI), or ultrasound may be used to assess joint and spinal involvement, enthesitis, and signs of inflammation or structural damage.
- iv. **Synovial Fluid Analysis:** In cases of suspected infectious spondylitis, synovial fluid analysis can help identify the causative organism and guide appropriate antibiotic treatment.



### G. RED FLAGS OF RHEUMATOLOGICAL LOW BACK PAIN (COMPLICATIONS OR PROGNOSIS)

When it comes to rheumatological low back pain, certain “red flags” or warning signs may indicate the presence of a potentially serious underlying condition. If you experience any of the following red flags, it is important to seek immediate medical attention:



- i. **Severe or Progressive Pain:** Intense, worsening, or debilitating low back pain that is not relieved by rest or changes in position.
- ii. **Systemic Symptoms:** Symptoms that suggest a systemic inflammatory condition, such as fever, unexplained weight loss, or fatigue.
- iii. **Night Pain:** Low back pain that worsens at night or interrupts sleep.
- iv. **Age of Onset:** Onset of low back pain before the age of 40 or after the age of 50.
- v. **Insidious Onset:** Gradual and progressive development of low back pain over a prolonged period.
- vi. **Thoracic Pain:** Presence of pain in the mid-back region (thoracic spine).
- vii. **Morning Stiffness:** Stiffness in the low back and other joints lasting for more than 30 minutes in the morning or after periods of inactivity.
- viii. **Symptoms Beyond the Spine:** Symptoms extending beyond the low back, such as joint pain or swelling in other areas of the body, skin rashes, eye inflammation, or gastrointestinal symptoms.

- ix. **Neurological Symptoms:** Numbness, tingling, or weakness in the legs, or loss of bowel or bladder control. These symptoms may indicate nerve compression or spinal cord involvement.
- x. **History of Rheumatological Conditions:** A personal or family history of rheumatological conditions such as ankylosing spondylitis, psoriatic arthritis, or inflammatory arthritis.
- xi. **Trauma or Injury:** Low back pain following trauma or injury, especially in individuals with a history of osteoporosis or fragility fractures.

It's important to note that these red flags are not exhaustive, and any sudden or severe symptoms should be evaluated by a healthcare professional to determine the cause and appropriate management.

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# **CHAPTER-IV**

# **MECHANICAL LOW-BACK PAIN (ORTHOPEDIC PERSPECTIVE)**



## A. EPIDEMIOLOGY

A sizable section of the population suffers from mechanical (orthopedic) low back pain, which is a common ailment. While the precise prevalence figures may change based on the population under study and the particular cause. Low back pain from osteoporosis is widespread, especially in elderly people. Global estimates indicate that osteoporosis affects almost 200 million women and causes more than 8.9 million fractures annually. A significant part of mechanical low-back pain cases is caused by vertebral fractures, which are frequently linked to osteoporosis. While Mechanical low back pain is frequently caused by vertebral fractures, especially in people who have osteoporosis or have undergone trauma. According to studies, about 25% of postmenopausal women and 40% of elderly men experience vertebral fractures.

These fractures may result in persistent pain and functional limitations. Even though it is less frequent than other causes of low back pain, malignancy-related low back pain is nevertheless a major concern. According to variables including the population under study and the prevalence of underlying cancer, there are different levels of malignancy-related low back pain. Metastatic spinal tumors are thought to be the cause of 5–10% of all cases of low back pain. There are many disorders that contribute to the prevalence of low back pain, including osteo-degenerative etiologies and mechanical low back pain. The prevalence and incidence of various mechanical low back pain causes and osteo-degenerative etiologies vary between people and geographical areas, underscoring the significance of understanding the epidemiology to inform diagnosis and treatment options.

In addition, elements like age, gender, career, and lifestyle choices may have an impact on the occurrence of mechanical low-back pain. Healthcare professionals can better understand the relevance of mechanical low-back pain and create effective diagnostic and treatment plans when they are aware of the incidence of each etiology. Healthcare practitioners can effectively manage and lessen the burden of mechanical low-back pain for patients by addressing the individual etiologies and their related prevalence.

## B. OSTEO-DEGENERATIVE ETIOLOGIES & MECHANICAL BACK PAIN

Mechanical low back pain is discomfort that comes from the bones, muscles, ligaments, and intervertebral discs in the spine. Poor posture, muscular imbalances, repetitive motions, or an unexpected strain on the back can all contribute to it. Rest usually helps mechanical low back pain, which is frequently made worse by particular positions or activities.

- i. **Osteoporosis:** Loss of bone density and strength, which increases the risk of fractures, are the hallmarks of osteoporosis. Vertebral compression fractures can happen in the spine, resulting in short stature, acute or chronic low back pain, and a stooped posture.
- ii. **Spondylosis:** The term “spondylosis” refers to degenerative changes in the spine, such as the development of bone spurs, loss of disc height, and facet joint degeneration. Mechanical low back discomfort, stiffness, and restricted movement may result from these alterations.
- iii. **Facet Joint Syndrome:** Facet joints are tiny joints that provide support and movement between neighbouring vertebrae. Facet joint syndrome develops when these joints swell up or degenerate, resulting in localized low back pain, stiffness, and trouble moving in some ways.
- iv. **Spondylolisthesis:** One vertebra slipping forward or backward in relation to an adjacent vertebra is known as spondylolisthesis. If the displaced vertebra compresses the spinal nerves, it may result in low back pain, rigidity in the muscles, and nerve impingement.
- v. **Vertebral Fractures:** Severe low back pain may be the result of vertebral fractures, which are frequently brought on by trauma or weak bones. Osteoporosis, trauma, or underlying cancers can all cause fractures.
- vi. **Spinal Metastases:** Spinal metastases, or malignant tumors that have metastasized to the spine, can hurt the lower back. The discomfort could get worse at night, when you move, or when you bear weight. Neurological impairments, such as weakness or alterations in sensory perception in the lower extremities, may also be present. The common causes are breast, prostate, thyroid, renal cell carcinomas, multiple myelomas and leukemias.

vii. **Primary Bone Tumors:**

- a. **Benign:** Examples of spinal tumors that are usually benign include neurofibromas, schwannomas, meningiomas, ependymomas, astrocytomas, hemangioblastomas, osteosarcomas, and osteoid osteomas.
- b. **Malignant:** Spinal tumors categorized as malignant include chondrosarcomas, chordomas, malignant fibrous histiocytomas, and Ewing sarcomas. These malignancies necessitate thorough medical evaluation and appropriate intervention for optimal management.

### C. SIGNS & SYMPTOMS

The specific signs and symptoms associated with each orthopedic etiology of low-back pain includes:

i. **Osteoporosis:**

- Acute or chronic LBP.
- Height loss and a stooped posture.
- Increased susceptibility to vertebral compression fractures.

ii. **Spondylosis:**

- Mechanical LBP, often worsened by certain movements or positions.
- Stiffness and limited mobility in the spine.
- Radiating pain or neurological symptoms if nerve compression occurs.

iii. **Facet Joint Syndrome:**

- Localized LBP, often worsened by specific movements or positions.
- Difficulty with twisting or bending motions.
- Possible radiation of pain to other areas of the spine.

iv. **Mechanical Low Back Pain:**

- Pain that is worsened by certain activities or positions.
- Pain that improves with rest.
- Muscle stiffness or spasms in the low back region.

v. **Spondylolisthesis:**

- LBP, which may be chronic or intermittent.
- Muscle stiffness or tightness in the lower back.
- Nerve impingement symptoms, such as radiating pain or numbness, if the displaced vertebra compresses spinal nerves.

vi. **Vertebral Fractures:**

- Acute or chronic LBP, which may be severe.
- Height loss and a stooped posture.
- Restricted mobility and difficulty with certain movements.

vii. **Spinal Metastases:**

- Worsening LBP, particularly with movement or weight-bearing.
- Night pain that disrupts sleep.
- Neurological deficits, such as weakness or sensory changes in the lower extremities.

viii. **Primary Bone Tumors:**

- Persistent, localized low back pain that does not respond to conservative treatments.
- Possible neurological symptoms if the tumor compresses spinal nerves.
- Other associated symptoms, such as unexplained weight loss or fatigue.

#### D. History & Physical Examination

When evaluating a patient with mechanical (orthopedic) low-back pain, a thorough history and physical examination are crucial in identifying the underlying causes and formulating an appropriate management plan. Here are key elements of the history and specific examination maneuvers that aid in understanding the patient's condition:

##### **History:**

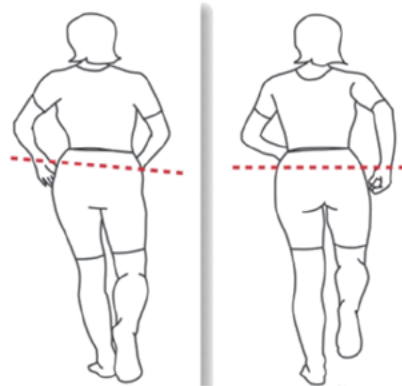
- **Onset and Duration:** Determine when the pain started and how long it has been present. Assess for any recent injuries or trauma.
- **Location and Radiation:** Identify the exact location of the pain and whether it radiates to other areas, such as the buttocks, hips, or legs.
- **Nature of Pain:** Inquire about the characteristics of the pain, such as its intensity (sharp, dull, or throbbing), quality (aching or stabbing), and whether it worsens with certain activities or movements.
- **Aggravating and Alleviating Factors:** Determine factors that worsen or improve the pain, such as specific movements, positions, rest, or medications.
- **Functional Impact:** Assess how the pain affects the patient's daily activities, including work, sleep, and mobility.
- **Past Medical History:** Consider any previous episodes of low-back pain, previous treatments, or relevant medical conditions, such as osteoporosis or malignancies.

##### **Physical Examination:**

- **Inspection:** Observe the patient's posture, gait, and spinal alignment. Look for any visible deformities, asymmetry, or signs of inflammation.
- **Palpation:** Gently palpate the back to identify areas of tenderness, muscle spasm, or bony abnormalities. Pay attention to the spinous processes, paraspinal muscles, and sacroiliac joints.
- **Range of Motion (ROM) Testing:** Evaluate the patient's ability to flex, extend, rotate, and laterally bend the spine. Assess for any restrictions, pain, or abnormalities during these movements.
- **Neurological Examination:** Test for neurological deficits, including sensory changes, muscle strength, and reflexes in the lower extremities. Look for signs of nerve compression or involvement, such as sciatica or radiculopathy.
- **Provocative Tests:** Provocative tests are commonly used in clinical practice to help assess orthopedic and mechanical low back pain. These tests aim to reproduce or exacerbate the patient's pain by stressing specific structures or movements in the spine. Here are some examples of commonly used provocative tests:
  - i. **Straight Leg Raise (SLR) Test:** This test is performed with the patient lying flat on their back. The examiner lifts the patient's leg straight up while keeping the knee extended. A positive test is indicated by the reproduction of low back or leg pain, suggesting nerve root irritation or compression, such as in sciatica.

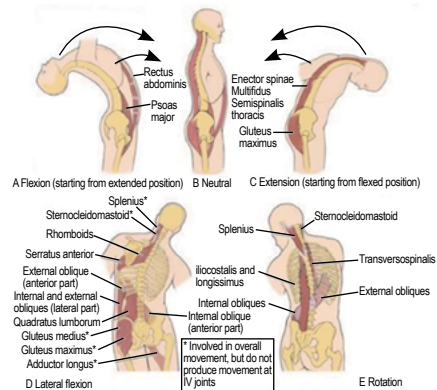
## GAIT AND POSTURE

Observation of the patient's walk and overall posture is suggested for all patients with low back pain. Scoliosis may be functional and may indicate underlying muscle spasm or neurogenic involvement.



## RANGE OF MOTION

The examiner should record the patient's forward flexion, extension, lateral flexion and lateral rotation of the upper torso. Pain with forward flexion is the most common response and usually reflects mechanical causes. If pain is induced by back extension, spinal stenosis should be considered.

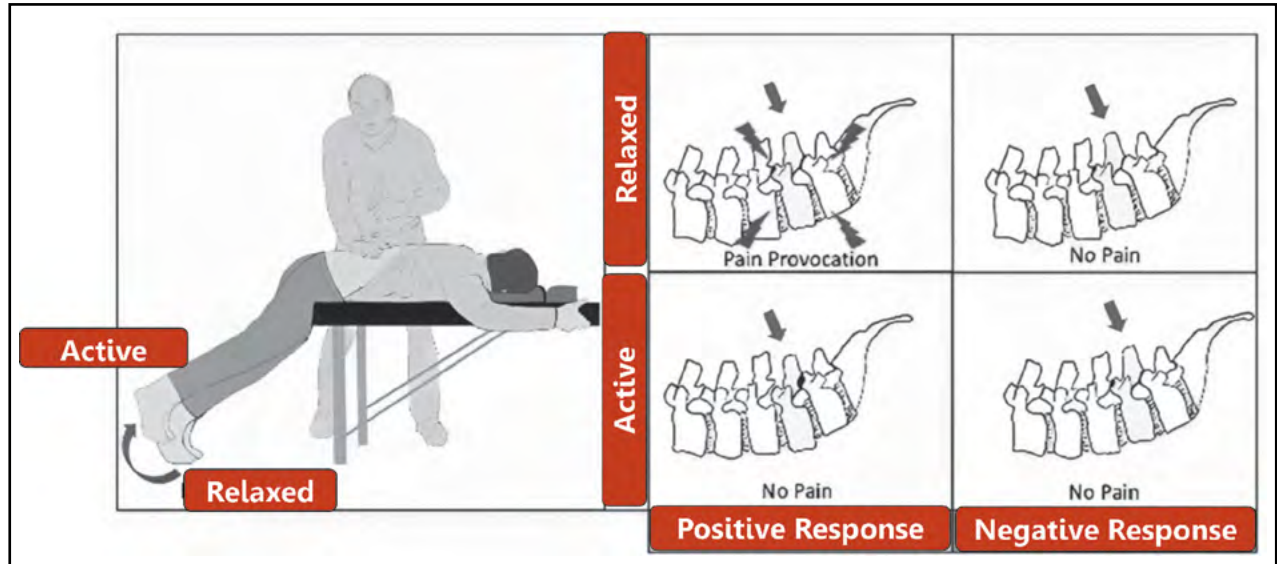


## PALPATION

Point tenderness over the spine with palpation or percussion may indicate fracture or an infection involving the spine. Palpating the paraspinous region may help delineate tender areas or muscle spasm.

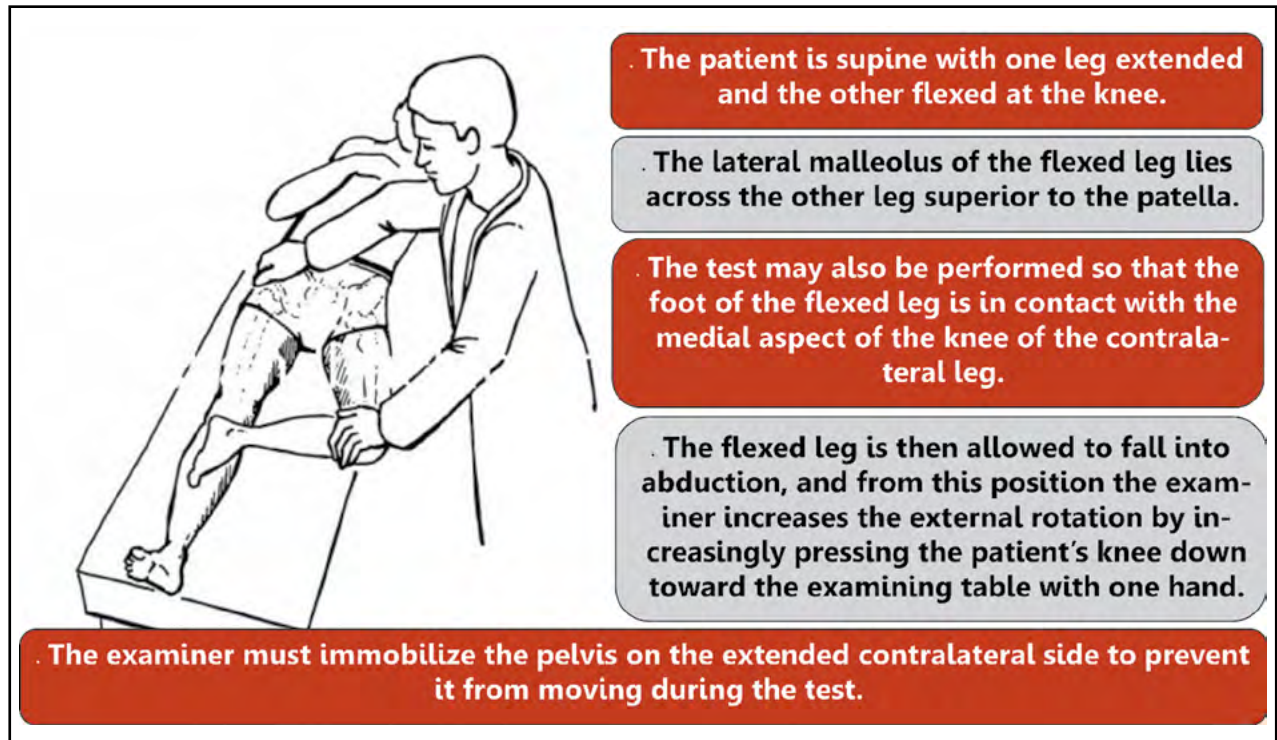


- ii. **Prone Instability Test (PIT):** The PIT assesses for segmental instability in the lumbar spine. The patient lies face down, and the examiner applies gentle downward pressure on the patient's pelvis. If the patient experiences a reduction in pain or an increase in lumbar stability with the pressure, it suggests segmental instability as a potential cause of their low back pain.



Prone Instability Test

- iii. **Lumbar Extension Test:** This test involves the patient leaning back into lumbar extension, either standing or prone on a table. A positive test is indicated by the reproduction of low back pain during extension, suggesting facet joint dysfunction or irritation.
- iv. **Patrick's Test (FABER Test):** This test is used to assess hip joint and sacroiliac joint dysfunction. The patient lies supine, with one ankle resting on the opposite knee, forming a "4" shape. The examiner gently presses down on the elevated knee, causing external rotation and abduction of the hip. Pain in the low back or hip during this maneuver may indicate sacroiliac joint pathology or hip joint problems.
- v. **Kemp's/Extension Quadrant Test:** This test is performed with the patient standing or seated. The examiner stands behind the patient and rotates their trunk to one side while applying slight pressure on the shoulder and opposite hip. Reproduction of low back pain during this rotation may suggest facet joint pathology or irritation.
- vi. **Patrick's Faber Test (FABERE-Patrick's Test):** This test combines the FABER test (Patrick's test) with additional pressure applied over the patient's knee. It helps differentiate between hip joint and sacroiliac joint pathology.



FABER test (Flexion, ABduction, External Rotation)

## E. GRADING AND SEVERITY

To grade and assess the severity of mechanical low-back pain (orthopedic), healthcare providers can utilize various methods and tools. Here are some commonly used approaches:

- i. **Pain Intensity Scales:** Pain intensity scales, such as the visual analog scale (VAS) and numerical rating scale (NRS), are commonly used to assess the severity of pain. Patients rate their pain on a scale from 0 to 10, with 0 indicating no pain and 10 representing the worst imaginable pain. These scales provide a quantitative measure of pain intensity.
- ii. **Functional Impairment Scales:** Assessing functional impairment caused by low-back pain is also essential in determining severity. Scales like the Oswestry Disability Index (ODI) and Roland-Morris Disability Questionnaire (RMDQ) evaluate the impact of pain on various daily activities and functional limitations. These scales help gauge the extent to which pain affects a person's ability to perform everyday tasks.
- iii. **Pain Duration and Persistence:** The duration and persistence of low-back pain are important indicators of severity. Acute pain that lasts for a short duration is generally considered less severe than chronic or recurrent pain that persists for several months or longer.
- iv. **Pain-related Disability:** Evaluating the degree of disability caused by low-back pain is crucial for assessing severity. It involves assessing the impact of pain on activities such as walking, sitting, standing, lifting, and performing work-related tasks. Assessments can include self-reported questionnaires or physical examinations.
- v. **Radiological Findings:** Radiological investigations, such as X-rays, magnetic resonance imaging (MRI), or computed tomography (CT) scans, may be utilized to evaluate structural abnormalities, such as fractures, herniated discs, or degenerative changes. The presence and extent of these abnormalities can provide insights into the severity of the underlying condition.
- vi. **Clinical Assessment:** A comprehensive history and physical examination by a healthcare provider are essential for grading and assessing severity. The healthcare provider will evaluate factors such as the nature of the pain, location, radiation, aggravating or relieving factors, and associated symptoms. They will also assess range of motion, muscle strength, and perform specific maneuvers to identify any neurological deficits or signs of instability.

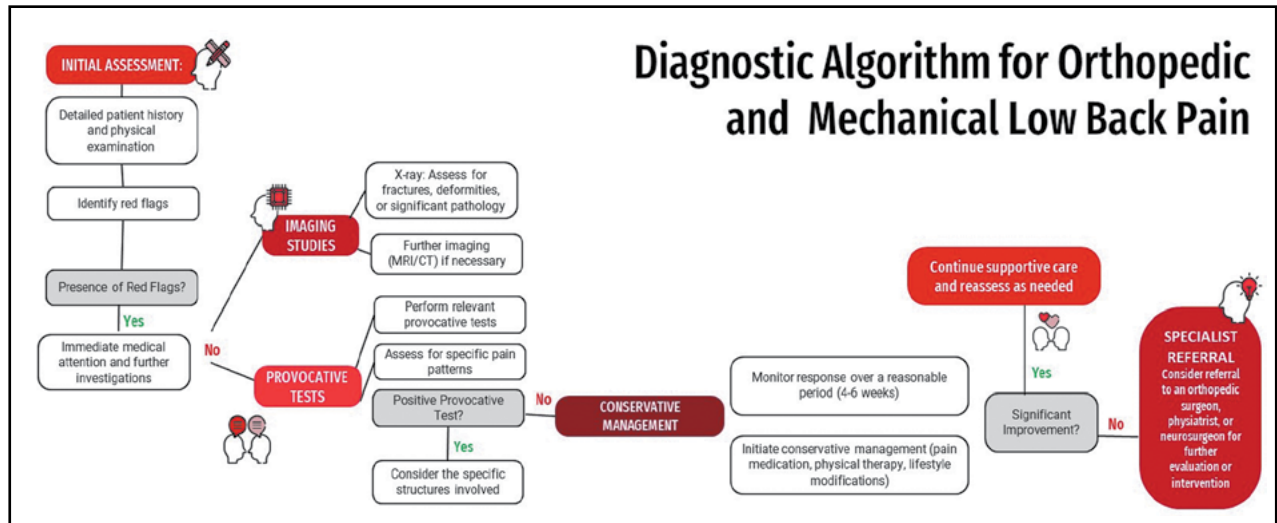
The experience and functional limits of each patient should be considered when determining the severity of the condition. A multidimensional method that considers functional impairment, pain intensity, and clinical evaluation offers a more thorough knowledge of the severity of mechanical low-back pain. Healthcare professionals can create individualized treatment plans, track progress, effectively communicate with patients, and make well-informed decisions about additional investigations or interventions by grading the severity of mechanical low-back pain. Healthcare professionals can better manage and attend to the unique needs of individuals with mechanical low-back pain by using these assessment techniques.

## F. RELEVANT INVESTIGATIONS

Relevant investigations are essential for making the correct diagnosis of mechanical low-back pain because they offer verifiable proof and support the presumed etiology. Medical professionals can choose the right investigations depending on the clinical presentation and the suspected underlying cause with the use of diagnostic algorithms. Here is a description of the goal of typical investigations and how they contribute to the diagnosis:

- i. **X-rays:** As the initial imaging tool for evaluating mechanical low-back pain, X-rays are routinely used. They provide crucial information about the spine's bone structures, including the presence of fractures, wear and tear, and abnormalities in spinal alignment. X-rays are very useful for spotting spondylolisthesis, vertebral fractures, and arthritis symptoms. However, they might not provide thorough details on intervertebral discs and soft tissues.
- ii. **Bone Mineral Density Tests:** Bone density measurements and the diagnosis of disorders like osteoporosis are accomplished through the use of bone mineral density assays, such as dual-energy X-ray absorptiometry (DEXA) scans. Particularly in elderly people, osteoporosis may be the root cause of low back discomfort and can contribute to vertebral fractures. Tests for bone mineral density are useful for detecting osteoporosis and its severity, assisting in therapy selection, and estimating the likelihood of future fractures.
- iii. **Magnetic Resonance Imaging (MRI):** MRI scans in particular are very helpful in examining soft tissues, intervertebral discs, nerves, and the spinal cord in mechanical low-back pain cases. A detailed image from an MRI can be used to detect malignancies, spinal infections, herniated discs, spinal stenosis, and other disorders that impact the spinal structures. In situations of spondyloarthropathies, it can also detect inflammation in adjacent tissues, such as the sacroiliac joints. When a suspected nerve compression is present or when results from other studies are ambiguous, MRI is especially helpful.
- iv. **Computed Tomography (CT) Scan:** In certain circumstances, CT scans may be utilized to acquire fine-grained cross-sectional pictures of the spine. They are particularly useful in assessing spinal fractures, spinal abnormalities, and complex anatomical variations because they can offer extra information regarding bony structures. CT scans are frequently combined with X-rays or MRI to obtain a thorough picture of the anatomy and disease of the spine.
- v. **Laboratory Tests:** Laboratory tests may be prescribed in some circumstances to look into underlying systemic diseases linked to low-back pain. Ankylosing spondylitis and infection-related spinal diseases, for instance, can be diagnosed with blood tests for inflammatory markers including C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR). To further rule out disorders like rheumatoid arthritis or to screen for systemic diseases that can present as low-back pain, specialized blood tests may also be carried out.

The objective of these investigations' are to confirm or rule out particular etiologies, pinpoint the underlying pathology, and provide treatment recommendations. Based on the patient's clinical presentation, medical history, physical examination results, and suspected etiology, the appropriate investigations should be chosen. To provide a thorough and precise diagnosis of mechanical low-back pain, healthcare professionals should take into account the diagnostic algorithm and the importance of each investigation.



### G. RED FLAGS OF OSTEO-DEGENERATIVE LOW BACK PAIN (COMPLICATIONS OR PROGNOSIS)

While conservative treatment can manage the majority of cases with osteo-degenerative low back pain, there are some warning signs that might point to problems or a worse prognosis. These warning signs include:

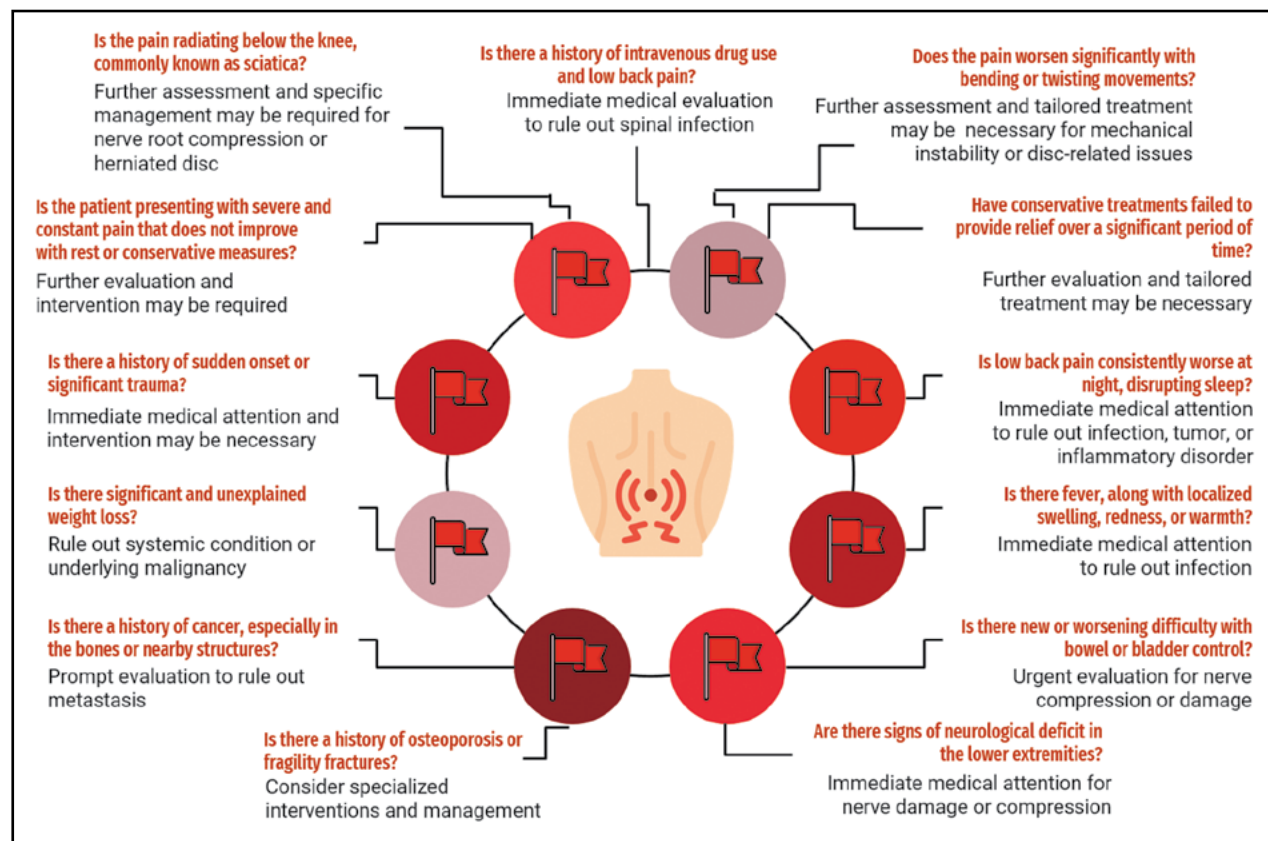
- i. **Severe and constant pain:** Intermittent pain that may come and go is the typical symptom of osteo-degenerative low back pain. A patient may have more serious structural damage or inflammation if they experience intense, ongoing pain that does not go away with rest or conservative treatment.
- ii. **Sudden onset or trauma:** LBP may indicate a more serious issue, such as a fracture or ruptured disc, if it develops suddenly or is brought on by a significant injury or trauma. These situations can need quick medical care and assistance.
- iii. **Unexplained weight loss:** A significant and unexplained weight loss coupled with LBP may be a sign of a systemic disorder or underlying cancer. If patient have weight loss along with your symptoms, it's crucial to screen out any major underlying causes.
- iv. **History of cancer:** If a patient has a history of cancer, particularly cancer of the bones or other adjacent tissues, and they experience new or increasing low back pain, this may indicate metastasis or cancer spread. This needs to be assessed right now.
- v. **Failure of conservative treatments:** A more complex or severe condition that necessitates further evaluation may be indicated if numerous conservative treatments, such as rest, physical therapy, medication, and other non-surgical options, have been tried for a significant amount of time (e.g., several months).
- vi. **Night pain:** It may be a sign of a more serious underlying illness, such as an infection, tumor, or inflammatory disorder, if low back discomfort routinely gets worse at night and keeps you from sleeping.
- vii. **Fever and inflammation:** Fever and localized edema, redness, or warmth in the low back region may be signs of an infection or inflammatory illness that needs to be treated right away.
- viii. **Bowel or bladder dysfunction:** Urinary incontinence or the inability to completely empty the bladder are examples of new or worsening bowel or bladder control issues that may indicate nerve compression or injury and necessitate immediate evaluation.
- ix. **History of intravenous drug abuse:** A spinal infection or discitis, which can have serious repercussions, is a concern if a patient has a history of using intravenous drugs and is experiencing low back pain. In these situations, prompt medical examination is essential.
- x. **Radiating pain below the knee:** Although low back discomfort is typical, if it travels down the leg, or "sciatica," it may be a sign of a herniated disc or nerve root compression. This can call for more specialized management techniques.
- xi. **Worsening symptoms with bending or twisting:** A more thorough evaluation and individualized treatment may be necessary if the LBP dramatically worsens when the patient performs certain actions, such as bending forward or twisting. This could indicate mechanical instability or disc-related problems.



xii. **History of osteoporosis:** Concerns about the risk of spinal compression fractures arise in patients who have a history of osteoporosis or fragility fractures and low back discomfort. Specialized care and interventions may be needed for certain fractures.

xiii. **Neurological deficit:** Lower extremity muscle weakness, a loss of feeling, or slowed reflexes could be signs of nerve injury or compression. This demands emergency medical care.

It's crucial to remember that the existence of these warning signs does not automatically imply that the patient has a significant complication or a poor prognosis, but they do call for additional examination and evaluation by a healthcare professional. It is advised to seek medical assistance if the patient exhibits any of these warning signs in order to decide the best course of action.



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## **CHAPTER-V**

# **LOW-BACK PAIN IN GYNECOLOGY & OBSTETRICS**

## A. EPIDEMIOLOGY

Women worldwide frequently have low back discomfort. Menstruation, Infections or prolapse are a few reasons but prevalence of low back pain rises during pregnancy, with 20% of women reporting it prior to conception, 40% in the first trimester, and 44-70% in the third. Pregnancy-related low back pain is a frequent complaint that affects 20-90% of pregnancies. It is characterized as pain that develops during pregnancy between the pubic symphysis and the gluteal folds, with or without potential radiating pain to the posterolateral thigh, the knee, and the calf. This discomfort can start at any time throughout pregnancy and is not brought on by a recognized disease like a herniated disc. Even though the majority of cases are minor, about one-third of women report having significant discomfort. Several studies looked into the frequency of low-back discomfort during pregnancy in various populations. The percentage of pregnant women who report experiencing low back discomfort varies, from 8% to over 89%. The third trimester is when pregnancy-related low-back pain is most common. Most of the time, the discomfort begins between the fifth and seventh months of pregnancy. At this time, the impact of the body weight gain and altered posture is greater.

## B. OBSTETRICAL / GYNECOLOGICAL ETIOLOGIES

- i. **Pregnancy-related Low Back Pain:** During pregnancy, hormonal changes and the growing uterus can contribute to low back pain. The increased weight and shift in the center of gravity can strain the lower back muscles and ligaments, leading to discomfort or pain.
- ii. **Pelvic Girdle Pain (PGP):** PGP is a condition characterized by pain in the pelvic joints, including the sacroiliac joints and symphysis pubis. It can cause low back pain, difficulty walking, and discomfort during activities such as standing up, walking, or climbing stairs. PGP can occur during pregnancy or postpartum.
- iii. **Preterm Labor:** Preterm labor refers to the onset of labor before the 37th week of pregnancy. It can be associated with low back pain or pelvic pressure as the uterus contracts and prepares for delivery.
- iv. **Ovarian Disorders:** Conditions such as ovarian cysts or ovarian torsion (twisting of the ovary) can cause low back pain, usually on one side. Ovarian disorders may be accompanied by other symptoms such as pelvic pain, abdominal discomfort, or irregular menstrual cycles.
- v. **Uterine Disorders:** Certain uterine conditions, such as uterine fibroids or adenomyosis, can cause low back pain. Uterine fibroids are non-cancerous growths that develop in or on the uterus, while adenomyosis is the presence of endometrial tissue within the uterine wall.
- vi. **Pelvic Inflammatory Disease (PID):** PID is an infection of the female reproductive organs, often caused by sexually transmitted bacteria. It can lead to inflammation and pain in the pelvic region, including the lower back.
- vii. **Endometriosis:** Endometriosis is a condition where the tissue similar to the lining of the uterus (endometrium) grows outside the uterus. It can cause chronic pelvic pain, which may radiate to the lower back.
- viii. **Adenomyosis:** Adenomyosis is a condition where the endometrial tissue grows into the muscular wall of the uterus. It can cause heavy or prolonged menstrual bleeding, pelvic pain, and low back pain.
- ix. **Low Back Pain due to Epidural Anesthesia:** Epidural anesthesia is commonly used for pain relief during labor and delivery. However, in some cases, it may cause temporary low back pain due to factors such as needle trauma, inflammation, or nerve irritation.
- x. **Pelvic Organ Prolapse:** Pelvic organ prolapse occurs when the pelvic organs, such as the uterus, bladder, or rectum, descend and press against the vaginal wall. This can cause low back pain, pelvic pressure, and a sensation of heaviness or bulging in the pelvic area.
- xi. **Nutritional Deficiency/Pre or Post-Menopausal back pain:** Around menopause due to loss of bone mineral density or Calcium / Vitamin D deficiency can cause low back discomfort or pain.

## C. SIGNS & SYMPTOMS

### i. *Pregnancy-related Low Back Pain:*

- Dull or achy pain in the lower back.
- Pain that may radiate to the buttocks or thighs.
- Discomfort or pain exacerbated by prolonged standing, walking, or certain movements.
- Pain that improves with rest or changes in position.
- Associated pelvic or hip pain.

### ii. *Pelvic Girdle Pain (PGP):*

- Pain in the pelvic region, including the lower back, hips, and groin.
- Pain that may be sharp, stabbing, or aching.
- Difficulty with weight-bearing activities such as walking, climbing stairs, or turning in bed.
- Popping or clicking sensations in the pelvis.
- Pain that may worsen with prolonged sitting or standing.

### iii. *Preterm Labor:*

- Regular or frequent contractions before the 37th week of pregnancy.
- Menstrual-like cramping in the lower abdomen or back.
- Pelvic pressure or a sensation of heaviness.
- Changes in vaginal discharge or fluid leakage.
- Persistent low back pain.

### iv. *Uterine Disorders:*

- Low back pain that may be constant or intermittent.
- Pelvic pain or pressure.
- Heavy or prolonged menstrual bleeding.
- Painful menstrual periods (dysmenorrhea).
- Abdominal or pelvic fullness.

### v. *Pelvic Inflammatory Disease (PID):*

- Lower abdominal pain that may radiate to the lower back.
- Pain during sexual intercourse.
- Abnormal vaginal discharge.
- Fever or chills.
- Painful or frequent urination.

### vi. *Endometriosis:*

- Pelvic pain that may radiate to the lower back.
- Painful menstrual periods (dysmenorrhea).
- Pain during or after sexual intercourse.
- Infertility or difficulty getting pregnant.
- Fatigue or gastrointestinal symptoms (e.g., bloating, constipation, diarrhea).

### vii. *Adenomyosis:*

- Pelvic pain that can extend to the lower back.
- Heavy or prolonged menstrual bleeding.
- Menstrual cramps (dysmenorrhea).
- Enlarged or tender uterus.
- Pain during sexual intercourse.

### viii. *Postpartum Back Pain:*

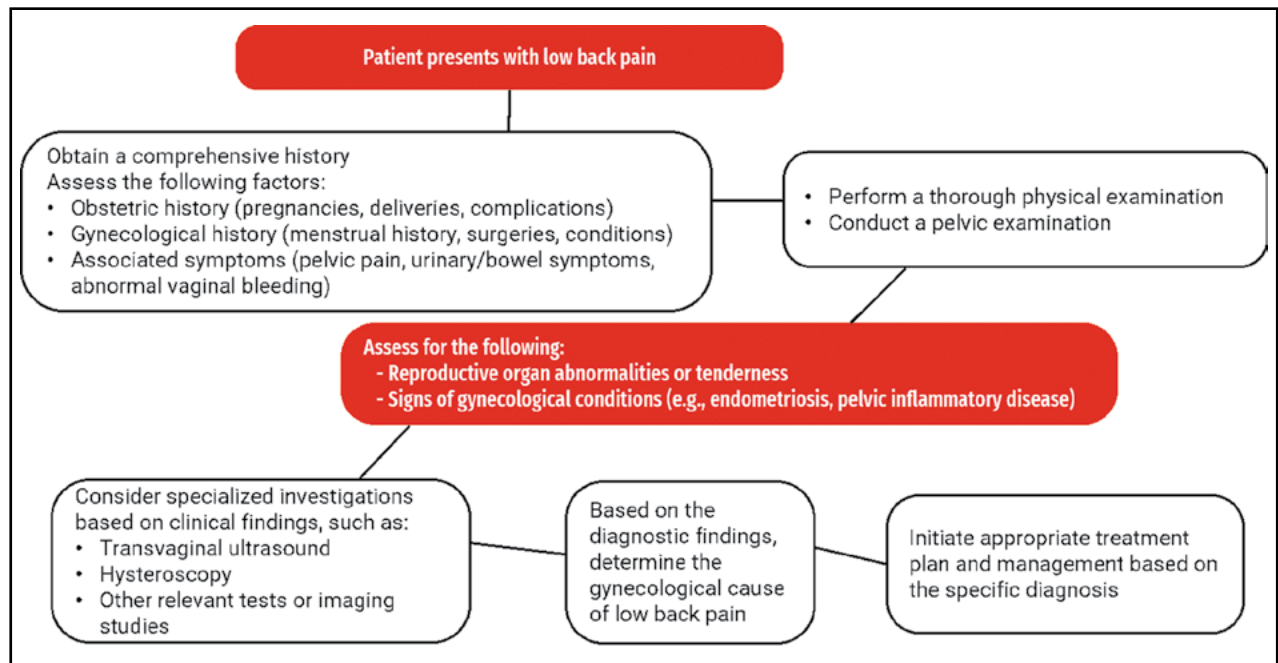
- Low back pain that may be localized or generalized.
- Pain worsened by activities such as bending, lifting, or prolonged standing.
- Muscle spasms in the back.
- Fatigue or exhaustion.
- Discomfort or pain during breastfeeding or carrying the baby.

- ix. **Pelvic Organ Prolapse:**
  - A sensation of pressure or heaviness in the pelvic area.
  - Low back pain that worsens with prolonged standing or activity.
  - A bulging sensation in the vagina.
  - Difficulty emptying the bladder or bowels.
  - Pain or discomfort during sexual intercourse.
- x. **Low Back Pain due to Epidural Anesthesia:**
  - Localized pain at the site of the epidural injection.
  - Soreness or tenderness in the lower back.
  - Dull ache or discomfort in the low back region.
  - Possible radiation of pain to the buttocks, hips, or thighs.
  - Temporary nature of the pain, typically resolving within a few days to weeks.
- xi. **Nutritional Deficiency / Pre or Post-Menopausal back pain**
  - Decreased bone density and susceptibility to fractures.
  - Fatigue and overall weakness.
  - Muscle aches and cramps.
  - Changes in posture and gait.
  - Increased risk of osteoporosis.
  - Joint pain and stiffness.
  - Heightened vulnerability to spinal issues.
  - Reduced flexibility and mobility.
  - Potential impact on overall quality of life.

#### D. HISTORY & EXAMINATION

Taking a thorough history and performing a comprehensive physical examination are vital for diagnosing gynecological causes of low back pain. In addition to the usual history and examination features, here are some other factors to consider when looking at low-back pain in gynecology and obstetrics:

- i. **History:**
  - **Obstetric history:** It's crucial to find out how many times the patient has given birth, how many times she's delivered, and whether or not there have ever been any problems. This knowledge can shed light on potential reasons of low back discomfort, such as changes brought on by pregnancy or prior birth-related traumas.
  - **Gynecological history:** It's important to evaluate the patient's menstrual history, any past operations or treatments done for gynecological issues, and any history of diseases such endometriosis or pelvic inflammatory disease. These gynaecological issues may contribute to low back discomfort.
  - **Associated symptoms:** Inquire about any pelvic pain, bowel or urine problems, or unusual vaginal bleeding that may be present in conjunction with low-back pain. These signs and symptoms can be used to rule out possible gynaecological causes or associated diseases.
- ii. **Examination:**
  - **Pelvic examination:** To check for any abnormalities or soreness in the reproductive organs, such as the cervix, uterus, and ovaries, a comprehensive pelvic examination may be carried out. This examination aids in identifying gynaecological issues that can be responsible for your low back pain.
  - **Specialized investigations:** Additional tests or imaging scans may be required, depending on the probable gynaecological reason. These can consist of hysteroscopy, transvaginal ultrasonography, or other specialised examinations to assess the pelvic organs and related structures.



## E. GRADING AND SEVERITY

Grading and assessing the severity of gynecological low back pain can help determine the appropriate management approach. Severity may be categorized based on pain intensity scales (e.g., numerical rating scale) or functional impairment scales. This allows healthcare providers to track changes in pain and evaluate the effectiveness of treatment interventions. However, there are a number of validated back pain assessment tools available for the general public that can be utilized in the diagnosis to better accurately determine the complaints:

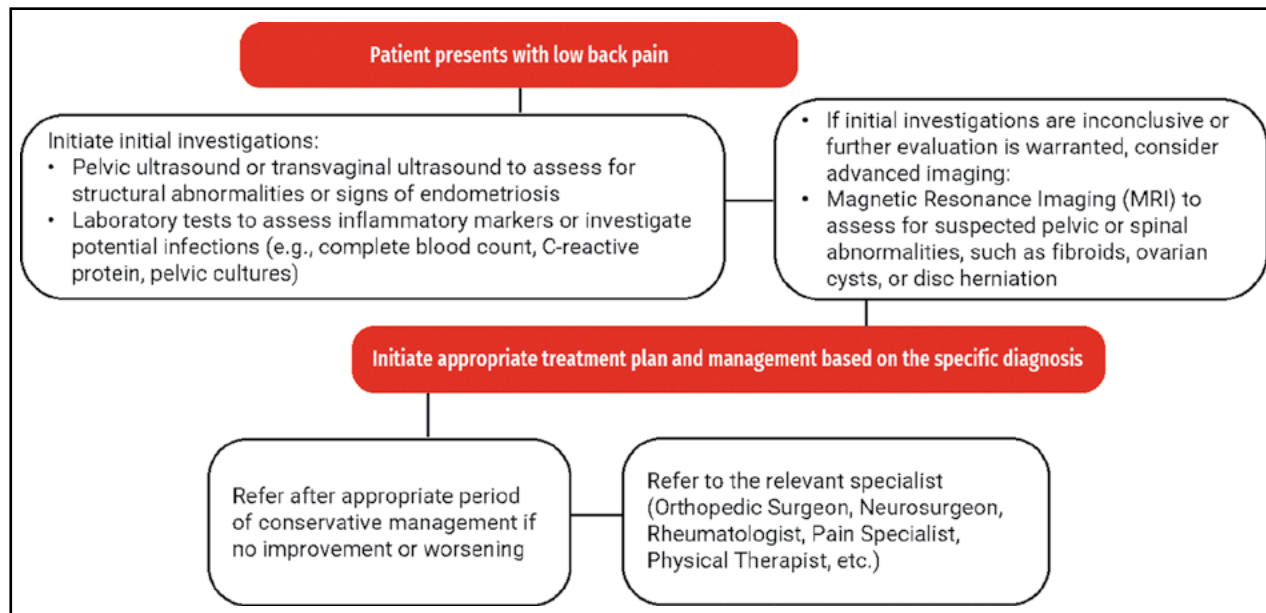
- i. **Visual Analogue Scale (VAS):** The Visual Analogue Scale (VAS) is used in assessing gynecology or obstetric-related low back pain to measure pain intensity. Patients are asked to rate their pain on a horizontal or vertical line ranging from “no pain” to “worst pain imaginable.” They indicate the point on the line that corresponds to their perceived pain intensity. The distance from the “no pain” end of the scale provides a quantitative measure of pain intensity, typically ranging from 0 to 10. The VAS is a simple and effective tool for patients to subjectively communicate their pain levels, helping healthcare providers monitor pain severity and evaluate the effectiveness of interventions over time.
- ii. **Roland Disability Questionnaire (RDQ):** The Roland Disability Questionnaire (RDQ) is a self-administered questionnaire used to assess the impact of low back pain on daily activities and functioning. It consists of multiple items related to pain intensity, mobility, and the ability to perform specific tasks. Patients rate their ability to perform each task on a scale from 0 to 23.
- iii. **Québec Pain disability index (QPDI):** The Québec Pain Disability Index (QPDI) is a questionnaire specifically designed to assess the impact of pain on various aspects of daily activities and functioning. It consists of items covering domains such as physical activities, work, social and recreational activities, and emotional well-being. Patients rate the level of disability for each item on a scale from 0 to 6. The total score reflects the overall pain-related disability experienced by the patient.
- iv. **Photograph series Of Daily Activities (PHODA):** The Photograph series Of Daily Activities (PHODA) is a tool used to assess pain-related fear and avoidance behaviors in relation to specific activities. Patients are presented with a series of photographs depicting various activities or movements that may trigger pain or anxiety.
- v. **Impact on Participation and Autonomy (IPA):** The Impact on Participation and Autonomy (IPA) is a self-reported questionnaire that assesses the impact of a health condition, such as gynecology or obstetric-related low back pain, on a person’s participation in daily activities and their sense of autonomy.

- vi. **Pain Behavior Scale (PBS):** The Pain Behavior Scale (PBS) is used to assess observable pain-related behaviors exhibited by individuals with gynecology or obstetric-related low back pain. It involves the observation and rating of specific behaviors associated with pain, such as facial expressions, body movements, and vocalizations.
- vii. **Oswestry Disability Index:** The Oswestry Disability Index (ODI) is a widely used questionnaire for assessing functional disability in patients with low back pain, including gynecology or obstetric-related cases. It consists of multiple items related to activities of daily living, pain intensity, and the impact of pain on functional abilities.
- viii. **The Pregnancy Mobility Index (PMI):** A pregnancy-specific self-report questionnaire assessing mobility in connection to both back and pelvic discomfort was used because there aren't any pregnancy-specific outcome measures.
- ix. The Active Straight Leg Raise test can demonstrate that LBP sufferers employ much more muscle activity than the healthy groups, yet create less force. At both 0 and 20 cm, healthy controls generate more hip flexion force than PLBP. [21][22]
- x. During a physical examination, it's critical to differentiate between low back discomfort and posterior pelvic pain. The Posterior Pelvic Pain Provocation (PPPP), FABER, long dorsal sacroiliac ligament, and standing on one leg are suggested provocation tests.
- xi. The Trendelenberg sign evaluates the lower back, pelvis, and hip's capacity to transfer load unilaterally while supporting weight. When the patient lowers their pelvis to the side that is not instance, the test is affirmative. The patient in this instance has weakened abductor muscles.
- xii. Some tests cannot be performed as per usual given the patient's growing abdomen during pregnancy like Thomas Test to check Hip Flexor Length and SI Joint Examination

#### F. RELEVANT INVESTIGATIONS

Relevant investigations play a crucial role in diagnosing gynecological causes of low back pain. Diagnostic algorithms can guide healthcare providers in choosing appropriate investigations based on the suspected etiology. These may include:

- i. Pelvic ultrasound or transvaginal ultrasound to evaluate for structural abnormalities or signs of endometriosis.
- ii. Laboratory tests to assess inflammatory markers or investigate potential infections or nutritional deficiencies like calcium or vitamin D.
- iii. Magnetic Resonance Imaging (MRI) for further evaluation of suspected pelvic or spinal abnormalities.



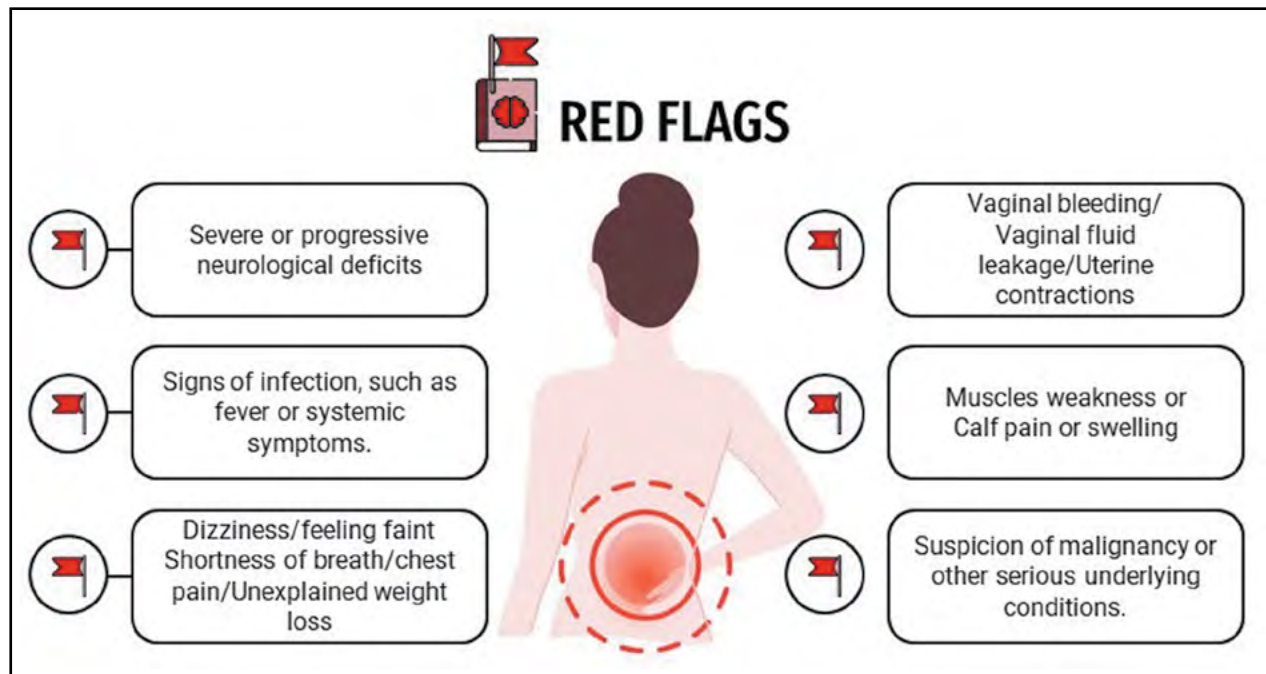
## G. RED FLAGS

To categorize probable issues or prognostic variables related to gynecological low back pain, it is crucial to recognize warning signs. Recognizing these warning signs enables medical professionals to promptly refer patients to specialists for additional assessment and management. Red flags crucial to identify during treatments may include:

- i. **Severe or Progressive Pain:** Intense, worsening, or debilitating low back pain that is not relieved by rest or changes in position.
- ii. **Sudden Onset of Symptoms:** A sudden and severe onset of low back pain without any apparent cause or trigger.
- iii. **Neurological Symptoms:** Numbness, tingling, or weakness in the legs or loss of bowel or bladder control. These symptoms may indicate nerve compression or cauda equina syndrome, which requires immediate medical attention.
- iv. **Abnormal Vaginal Bleeding:** Unusual or excessive vaginal bleeding, especially if it occurs outside of the normal menstrual cycle or after menopause.
- v. **Pelvic or Abdominal Mass:** The presence of a palpable mass in the pelvic or abdominal region, which may be associated with low back pain.
- vi. **High Fever or Signs of Infection:** Fever, chills, or signs of infection such as pelvic pain, increased vaginal discharge with an unusual odor, or pain with urination.
- vii. **History of Cancer:** A personal or family history of gynecological or reproductive organ cancers, especially if the low back pain is persistent or worsening.
- viii. **Trauma or Injury:** Low back pain following a recent trauma, fall, or injury to the pelvic or lower back area.

By understanding the epidemiology, etiologies, signs and symptoms, relevant assessments, grading, investigations, and red flags associated with gynecological low back pain, healthcare providers can provide targeted and effective management strategies for their patients.





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# CHAPTER-VI

# TREATMENT GUIDELINES

## SECTION 1: PAIN ASSESSMENT & MONITORING

### A. PAIN INTENSITY TOOLS

Accurate assessment and monitoring of pain intensity are crucial for effective management of low back pain. Several tools and scales are available to assess and monitor pain intensity. The following are commonly used tools/scales:

- i. **Numerical Rating Scale (NRS):** A 0-10 scale where patients rate their pain intensity on a numerical scale, with 0 representing no pain and 10 representing the worst pain imaginable.
- ii. **Visual Analog Scale (VAS):** A 10 cm line with anchors of “no pain” and “worst pain imaginable.” Patients mark a point on the line corresponding to their pain intensity.
- iii. **Verbal Rating Scale (VRS):** Patients describe their pain intensity using words such as “none,” “mild,” “moderate,” or “severe.”
- iv. **Faces Pain Scale:** Especially useful for children, this scale presents a series of faces ranging from smiling to crying, allowing patients to indicate their pain level.
- v. **The Back Pain Functional Scale (BPFS):** A subjective scale used to measure the patient’s physical function after low back pain. This scale is based upon the International Classification of Function (ICF) model proposed by the World Health Organization. It is used to evaluate the patient’s level of physical independence during the initial two weeks of low back pain. However, it is not used for backpain after two weeks.
- vi. Roland-Morris disability questionnaire (RMDQ),
- vii. Back Pain Functional Score
- viii. Oswestry Disability Index (ODI)
- ix. Pain Self-Efficacy Questionnaire (PSEQ)
- x. **Patient-Specific Functional Scale (PSFS):** The Patient Specific Functional Scale (PSFS) is a patient-specific outcome measure which investigates functional status. Patients are asked to nominate up to five activities with which they have difficulty due to their condition and then rate the functional limitation associated with these activities. The PSFS is intended to complement the findings of generic or condition-specific measures.

These pain intensity tools help healthcare providers objectively assess pain intensity, track changes over time, and evaluate the effectiveness of treatment interventions.

### B. FOLLOW-UP CRITERIA

Establishing follow-up criteria is essential to monitor patients’ progress, adjust treatment plans, and evaluate the effectiveness of pain management strategies. The frequency of follow-up appointments may vary depending on the severity and chronicity of low back pain. Follow-up criteria may include:

- i. **Pain Intensity:** Assessing whether pain intensity has decreased or reached a manageable level based on the chosen pain intensity tool/scale.
- ii. **Functional Improvement:** Evaluating improvements in physical functioning, such as the ability to perform daily activities, range of motion, and quality of life.
- iii. **Adverse Effects:** Monitoring for any adverse effects related to pharmacological interventions or procedures.
- iv. **Patient Satisfaction:** Assessing patient satisfaction with the treatment approach and addressing any concerns or issues they may have.

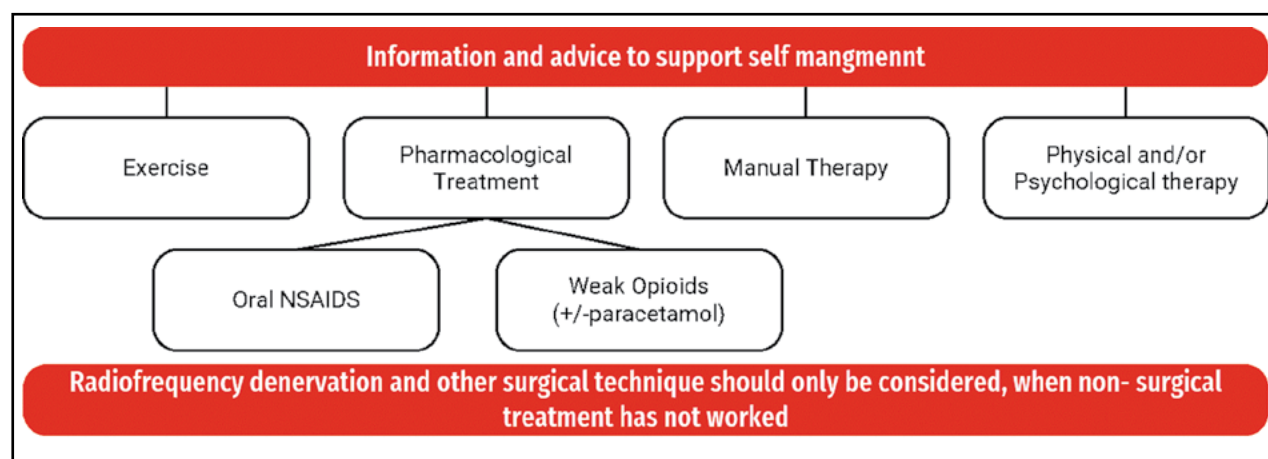
Regular follow-up appointments provide an opportunity to make necessary adjustments to the treatment plan, provide additional support or referrals if needed, and ensure ongoing pain management success.

## SECTION 2: NON-PHARMACOLOGICAL PAIN MANAGEMENT FOR LOW BACK PAIN

### A. PATIENT COUNSELING & PHYSICAL REHABILITATION

Non-pharmacological approaches play a crucial role in the management of low back pain. Patient counseling and education are essential components of treatment. Healthcare providers should educate patients about the nature of their condition, the importance of self-care, and lifestyle modifications that can help manage low back pain.

- i. **Lifestyle Modifications:** Encouraging patients to adopt healthy lifestyle habits can have a positive impact on low back pain. This may include maintaining a healthy weight, engaging in regular physical activity, improving posture, and avoiding prolonged sitting or sedentary behaviors.
- ii. **Physical Rehabilitation:** Physical therapy and rehabilitation programs tailored to the individual's needs can help improve flexibility, strengthen the core muscles, and enhance overall physical function. Techniques such as therapeutic exercises, manual therapy, and posture correction are commonly employed in physical rehabilitation.



### B. INTERVENTIONAL PROCEDURES FOR PAIN MANAGEMENT

In cases where conservative treatments have not provided sufficient pain relief, interventional procedures may be considered. These procedures are typically performed by pain specialists or interventional pain physicians and aim to provide targeted pain relief.

- i. **Epidural Steroid Injections:** These injections deliver corticosteroids directly into the epidural space to reduce inflammation and alleviate pain.
- ii. **Facet Joint Injections:** Medications, such as local anesthetics or corticosteroids, are injected into the facet joints to relieve pain caused by arthritis or joint inflammation.
- iii. **Radiofrequency Ablation:** This procedure uses heat generated by radiofrequency waves to disable nerves responsible for transmitting pain signals from the affected area.
- iv. **Pulsed Radiofrequency Neuromodulation of Dorsal Root Ganglia:** Central and peripheral sensitization is a major factor in patients suffering from chronic and acute on chronic radicular pain. Pulsed Radiofrequency Neuromodulation helps by addressing and decreasing the sensitization of the dorsal root ganglia.
- v. **Plasma Coblation Nucleoplasty:** This procedure reduces 10-15% volume of the inflamed herniated disc so gives a long-term pain relief in patients suffering from discogenic low back pain.
- vi. **Vertebro & Kyphoplasty:** This procedure is performed to treat traumatic and osteoporotic fractures also helps in improving pain.

- vii. **Endoscopic Disc Decompression:** This minimally invasive procedure is performed in patients with serious symptoms like developing cauda equina and motor weakness.

### C. ANTENATAL CARE FOR LOW BACK PAIN

Low back pain during pregnancy is a common concern. To manage and prevent low back pain in pregnant women, the following general precautions can be recommended:

- i. **Maintaining Proper Posture:** Encouraging pregnant women to practice good posture, such as sitting and standing with a straight back and avoiding slouching or hunching.
- ii. **Exercise and Physical Activity:** Engaging in safe exercises and activities recommended by healthcare providers can help strengthen the back muscles and promote flexibility.
- iii. **Proper Lifting Techniques:** Advising pregnant women to use proper body mechanics when lifting objects, avoiding heavy lifting whenever possible.
- iv. **Use of Supportive Devices:** Recommending the use of supportive devices, such as maternity belts or belly bands, to provide additional support to the lower back during pregnancy.
- v. **Sleep Position:** Encouraging pregnant women to sleep on their side with a pillow between the knees to alleviate strain on the lower back.

By incorporating these non-pharmacological approaches and providing appropriate antenatal care, healthcare providers can offer comprehensive pain management strategies for low back pain, focusing on patient education, functional improvement, and individualized care.

## SECTION 3: PHARMACOLOGICAL INTERVENTIONS IN LOW BACK PAIN: A DETAILED OVERVIEW

Low back pain is a common condition that can cause significant discomfort and functional impairment. Pharmacological interventions play a crucial role in the management of low back pain, aiming to alleviate pain, reduce inflammation, and improve functional outcomes. This section provides a comprehensive overview of various pharmacological interventions used in the treatment of low back pain, including their mechanisms of action, dosages, side effects, and pharmacokinetic/pharmacodynamic profiles.

### A. Types of Analgesics:

- i. **Non-selective NSAIDs:** Non-steroidal anti-inflammatory drugs (NSAIDs) are commonly used for their analgesic and anti-inflammatory properties. They work by inhibiting the cyclooxygenase (COX) enzymes involved in prostaglandin synthesis, thereby reducing pain and inflammation. Diclofenac and Ketorolac are examples of non-selective NSAIDs. Dosages vary depending on the specific drug and formulation, and side effects may include gastrointestinal disturbances, renal impairment, and cardiovascular risks.
- ii. **COX inhibitors:** COX inhibitors selectively inhibit the COX-2 enzyme, which is involved in inflammation, while sparing COX-1, which is important for maintaining gastric mucosa. Etoricoxib and Celecoxib are examples of COX inhibitors. They provide analgesic and anti-inflammatory effects with potentially fewer gastrointestinal side effects compared to non-selective NSAIDs. Dosages and side effects should be monitored as per prescribing guidelines.
- iii. **Muscle relaxants:** Muscle relaxants are used to alleviate muscle spasms and improve pain associated with muscle-related low back pain. Tizanidine and Orphenadrine are examples of muscle relaxants. These medications work by acting on the central nervous system to reduce muscle tone and spasticity. Dosages and side effects may vary, including sedation, dizziness, and dry mouth.
- iv. **Narcotics:** Narcotics, also known as opioids, are potent analgesics used for moderate to severe pain that is unresponsive to other treatments. Nalbuphine and Tramadol are examples of narcotics used in low back pain management. They bind to opioid receptors in the central nervous system, resulting in pain relief. Dosages should be carefully titrated to balance pain control and minimize side effects such as sedation, constipation, respiratory depression, and the risk of dependence.

- v. **Gabapentinoids:** Gabapentinoids, including Pregabalin and Gabapentin, are anticonvulsant medications that have shown efficacy in managing neuropathic pain associated with low back pain. They work by modulating calcium channels in the central nervous system, reducing the release of neurotransmitters involved in pain signaling. Dosages and side effects may vary, including dizziness, sedation, and peripheral edema.
- vi. **Anti-depressants:** Certain classes of antidepressant medications, such as serotonin-norepinephrine reuptake inhibitors (SNRIs) and selective serotonin reuptake inhibitors (SSRIs), can be effective in managing chronic low back pain. Duloxetine and Escitalopram are examples of anti-depressants used in this context. These medications modulate neurotransmitter levels in the brain, which can help alleviate pain and improve mood. Dosages and side effects should be carefully monitored, including gastrointestinal disturbances, sexual dysfunction
- vii. **Combination Therapies:** Combination therapies involving two or more analgesic medications are sometimes used to enhance pain relief and address multiple aspects of low back pain. Examples include Tramadol + Paracetamol and Diclofenac + Misoprostol. The specific dosages, indications, and side effects of these combinations depend on the individual components used.

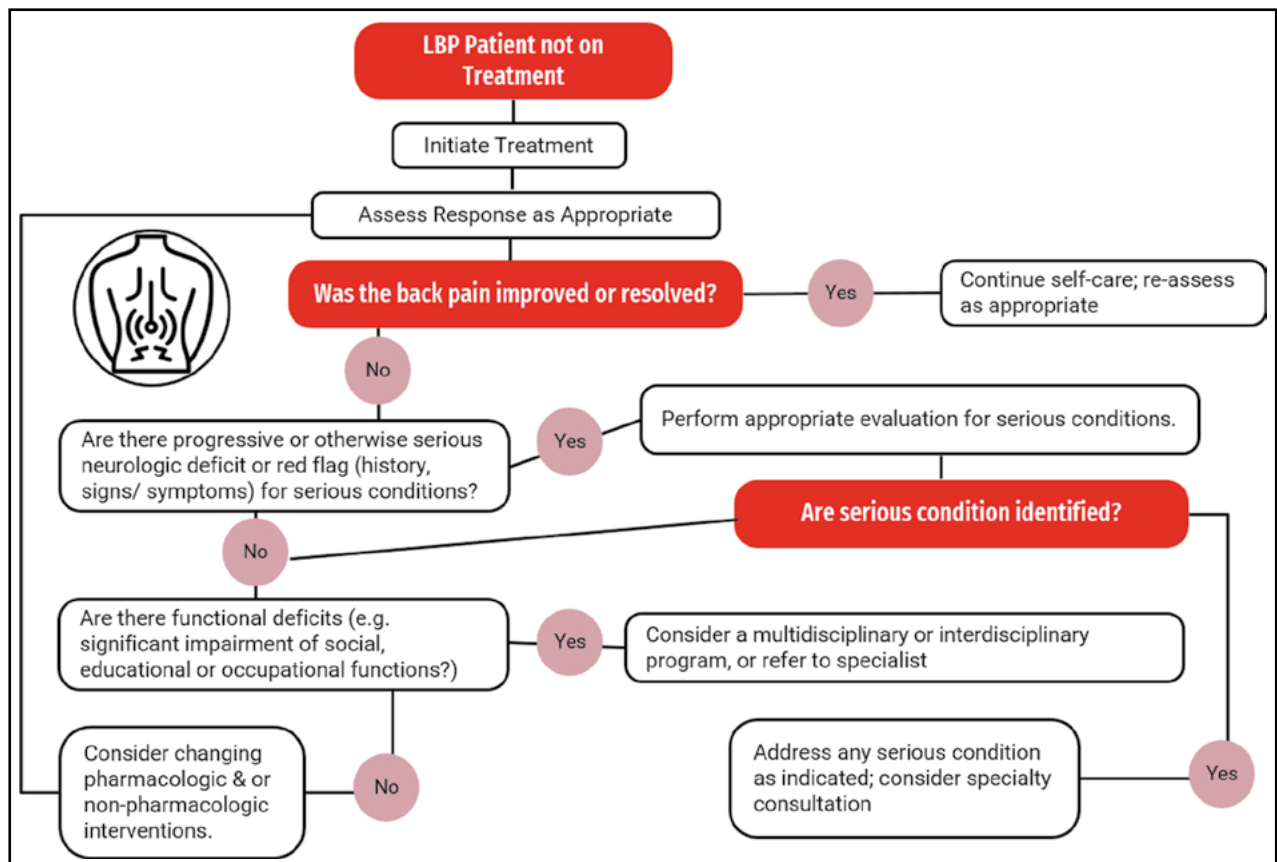
Category	Generic	Starting Dose	Max./Day	Mechanism of Action	Side Effects
Muscles Relaxants	Baclofen	5 mg TID	80 mg	Act on the central nervous system to reduce muscle spasms	Drowsiness Dizziness Dry mouth
	Cyclobenzaprine	5 mg TID	30 mg		
	Orphenadrine <sup>e</sup>	100 mg BID	200 mg		
	Metaxalone <sup>e</sup>	800 mg TID	3,200 mg		
	Methocarbamol <sup>e</sup>	1.5 gm TID – QID	8 gm <3 days		
	Tizanidine	2 – 4 mg TID	36 mg		
Anti-depressants	Amitriptyline <sup>c</sup>	10 – 25 mg QHS	150 mg	Modulation of neurotransmitters in the central nervous system	Dry mouth Constipation Sedation
	Duloxetine <sup>c</sup>	20 – 30 mg QD	60 mg		
	Venlafaxine ER	37.5 – 75 mg QD	225 mg		
	Nortriptyline <sup>c</sup>	10 – 25 mg QHS	150 mg		
	Desipramine <sup>c</sup>	10 – 25 mg QHS	150 mg		
NSAIDS <sup>d</sup>	Naproxen	250 mg BID	1,500 mg	Inhibition of COX enzymes, reducing prostaglandin synthesis	Stomach ulcers Gastric bleeding Renal toxicity Cardiovascular events
	Ibuprofen	400 mg q 4 – 6H	3200 mg		
	Indomethacin	25 mg TID	200 mg		
	Ketoprofen	50 mg QID	300 mg		
	Ketorolac <sup>e</sup>	10 mg q 4 – 6H	40 mg		
	Diclofenac NA	50 – 75 mg BID	150 – 200 mg		
	Salsalate	1,000 mg TID	3,000 mg		
	Piroxicam	20 mg PO qD or div BID	no more than 30-40 mg/d		
	Meloxicam	5 – 7.5 mg QD	15 mg		
COX-2 Inhibitors	Celecoxib	100 mg BID	400 mg	Selective inhibition of COX-2 enzymes	Increased risk of cardiovascular events
	Etoricoxib	Varies based on specific drug			
	Rofecoxib	Varies based on specific drug			

Opioids	Tramadol	50-100 mg orally every 4 to 6 hours as needed for pain	400 mg per day,	Bind to opioid receptors in the central nervous system	Constipation Sedation Respiratory depression
	Codeine	15-60 mg orally every 4 to 6 hours	vary depending on the formulation and combination		
	Oxycodone	5-15 mg orally every 4 to 6 hours	80 mg per day		
	Morphine	10-30 mg orally every 4 to 6 hours	120 mg per day		
Gabapentinoids	Gabapentin	300 mg orally once daily on day 1, 300 mg orally twice daily on day 2, and 300 mg orally three times a day on day 3.	Typically, 3600 mg per day, but can vary based on individual factors and the healthcare provider's assessment.	Modulation of calcium channels in the central nervous system	Dizziness Sedation Peripheral edema
Topical Analgesics	Lidocaine patches	Apply one patch to the affected area for up to 12 hours within a 24-hour period. The specific strength of the patch may vary (e.g., 5%, 4%, etc.),	not recommended	Localized pain relief through various mechanisms	Local skin irritation Allergic reactions
	Capsaicin cream	Thin layer of cream to the affected area up to 3 to 4 times daily	may vary depending on the concentration of capsaicin in the cream and individual response.		
	Methyl salicylate cream	thin layer of cream to the affected area 3 to 4 times daily, as needed	epend on the concentration of methyl salicylate in the cream and individual factors		
Corticosteroids	Prednisone	5 to 60 mg per day, taken orally	not recommended to exceed 80 mg per day	Anti-inflammatory effects through various mechanisms	Increased risk of infection Adrenal suppression
	Methylprednisolone	4 to 48 mg per day	not recommended to exceed 32 mg per		
	Dexamethasone	0.75 to 9 mg per day	not recommended to exceed 12 mg per day		

Combination Therapies	Tramadol + Paracetamol	one tablet 37.5 mg tramadol and 325 mg paracetamol 4 to 6 hours	total daily dose of tramadol should not exceed 400 mg, and the total daily dose of paracetamol should not exceed 4,000 mg	Combined effects of multiple drugs for enhanced pain relief	Varies based on specific combination
	Diclofenac + Misoprostol	one tablet containing diclofenac 50 mg and misoprostol 200 mcg. This can be taken orally two to four times a day	Typically, the total daily dose of diclofenac should not exceed 150 mg, and the total daily dose of misoprostol should not exceed 800 mcg.		

### B. OUT-PATIENT/CHRONIC PAIN MANAGEMENT CRITERIA:

In the management of chronic low back pain, treatment strategies focus on long-term pain control, functional improvement, and maintaining the patient's quality of life. Out-patient management involves a multimodal approach that includes pharmacological interventions, physical therapy, exercise, and lifestyle modifications. The choice of pharmacological interventions depends on the severity of pain, underlying etiology, patient preferences, and comorbidities. Regular follow-up and monitoring are essential to assess treatment efficacy, adjust medications, and manage any potential side effects.





### C. IN-PATIENT/ACUTE PAIN MANAGEMENT CRITERIA:

In-patient management of acute low back pain typically occurs in a hospital setting or specialized pain clinic. It involves a comprehensive assessment to determine the underlying cause of the pain and initiate appropriate treatment. Pharmacological interventions may be used in combination with non-pharmacological modalities such as physical therapy, heat/cold therapy, and spinal manipulation. The selection of medications is based on the severity of pain, patient's medical history, and response to initial treatments. Close monitoring of pain intensity, functional status, and any adverse effects is crucial during the in-patient management phase.

### D. ANALGESIA IN PREGNANCY:

The management of low back pain in pregnant women requires special consideration due to potential risks to the fetus. Pharmacological interventions should be used cautiously, with an emphasis on non-pharmacological approaches whenever possible. Non-selective NSAIDs and narcotics are generally contraindicated during pregnancy due to potential adverse effects. However, certain medications, such as acetaminophen, may be considered under the guidance of a healthcare provider. The use of any pharmacological interventions during pregnancy should be carefully weighed against the potential benefits and risks to both the mother and the developing fetus.

In summary, pharmacological interventions play a vital role in the management of mechanical low back pain. Understanding the various types of analgesics, their mechanisms of action, dosages, side effects, and pharmacokinetic/pharmacodynamic profiles allows healthcare providers to make informed decisions when choosing appropriate treatment options. It is essential to consider individual patient factors, severity of pain, and underlying etiology in order to develop a tailored treatment plan that optimizes pain relief and improves functional outcomes while minimizing potential risks and side effects. Regular monitoring and follow-up are crucial to assess treatment efficacy, adjust medications, and ensure optimal pain management.

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# CHAPTER-VII

# ROAD MAP FOR REFERRALS

Referring patients with low back pain to the relevant faculty is essential for accurate diagnosis, appropriate management, and optimal patient outcomes. The following aspects provide a roadmap for referrals, including a flow chart or tabular algorithm:

#### A. WHO TO REFER?

Patients with specific clinical characteristics or red flags should be considered for referral to specialized healthcare providers. These red flags may include severe neurological deficits, suspected serious underlying pathology (such as infection or malignancy), progressive symptoms, or the presence of systemic symptoms. Additionally, patients with complex cases or those who have not responded to initial conservative management may also warrant referral.

#### B. WHEN TO REFER?

Referral timing depends on the severity and nature of the patient's symptoms. Immediate referral is necessary for cases involving acute neurological deficits, suspected cauda equina syndrome, or other emergencies. For patients with less severe symptoms, referral may be considered after an appropriate period of conservative management (e.g., 4-6 weeks) if there is no improvement or if the condition worsens.

#### C. WHOM TO REFER?

The choice of the relevant faculty depends on the suspected underlying etiology of low back pain. Referrals may be made to the following specialists:

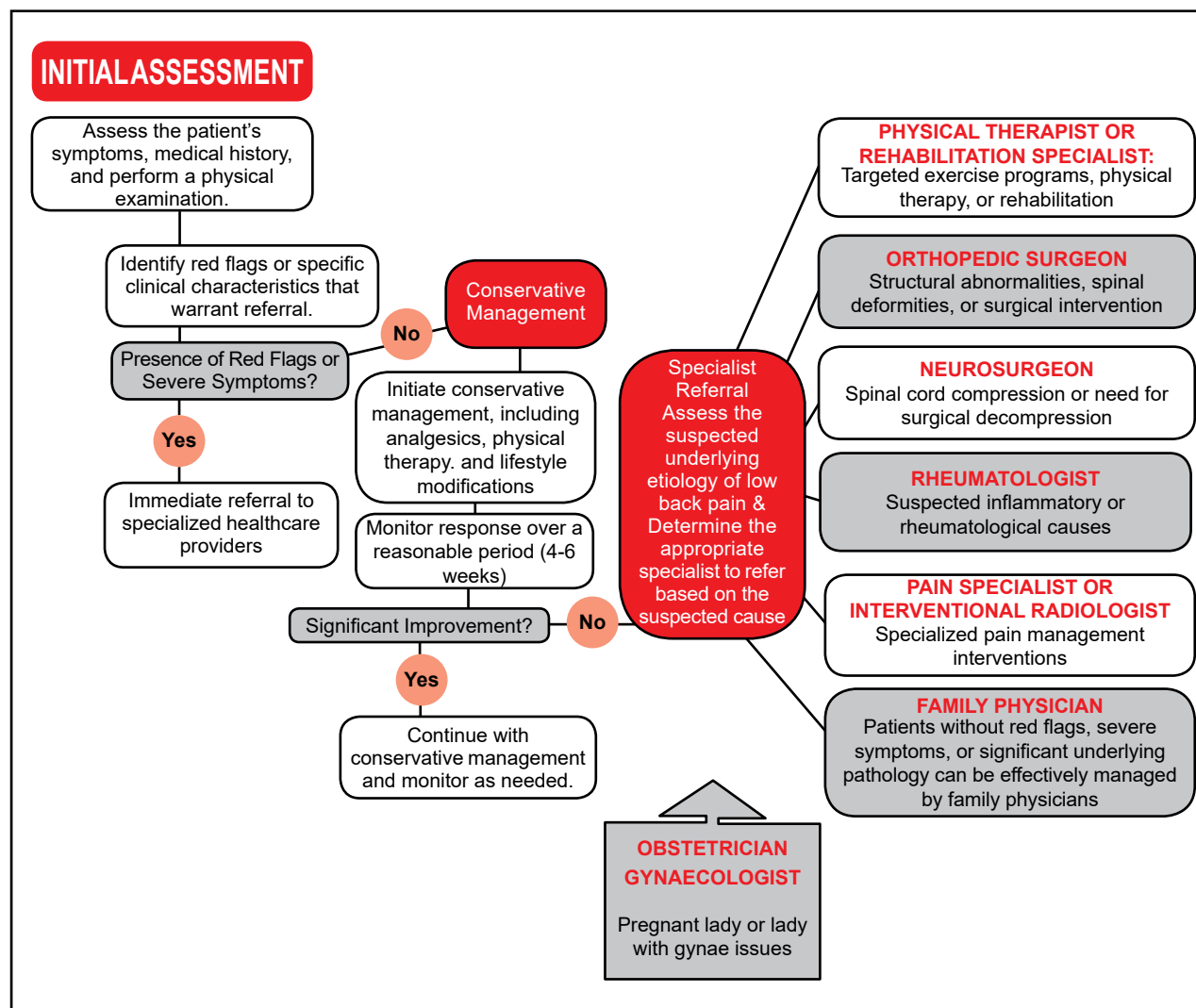
- i. **Orthopedic Surgeons:** For cases involving structural abnormalities, spinal deformities, or suspected surgical interventions.
- ii. **Neurosurgeons:** When there is evidence of spinal cord compression or the need for surgical decompression.
- iii. **Rheumatologists:** For patients with suspected inflammatory or rheumatological causes of low back pain.
- iv. **Obstetricians & Gynaecologists:** In case of pregnant lady or women with gynecological complaints with low back pain.
- v. **Pain Specialists or Interventional Radiologists:** In cases requiring specialized pain management interventions, such as nerve blocks or epidural injections.
- vi. **Physical Therapists or Rehabilitation Specialists:** For patients requiring targeted exercise programs, physical therapy, or rehabilitation.

#### D. WHICH PATIENTS SHOULD BE TREATED BY FAMILY PHYSICIANS?

Family physicians can effectively manage and treat the majority of low back pain cases, particularly those without red flags or significant underlying pathology. Patients with nonspecific low back pain, mild to moderate symptoms, or those responding well to conservative management (e.g., analgesics, physical therapy, lifestyle modifications) can be appropriately managed by family physicians. They play a crucial role in initial assessment, education, conservative treatment, and monitoring of the patient's progress.

This road map for referrals provides a systematic approach to identifying patients who require specialized care for low back pain. It ensures that patients with red flags, severe symptoms, or complex cases are appropriately referred, while patients with milder symptoms or nonspecific low back pain can be effectively managed by family physicians. By following this roadmap, healthcare providers can optimize patient care, improve diagnostic accuracy, and facilitate timely access to appropriate treatments and interventions.

The following flow chart illustrates a suggested algorithm for referrals for low back pain:



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