Sciatica

Indexing Metadata/Description

› **Title/condition:** Sciatica

› **Synonyms:** Sciatic neuralgia; sciatic neuritis; neuralgia, sciatic; lumbosacral radiculopathy; lumbar radiculopathy, radicular pain, lumbar

› **Anatomical location/body part affected:** Low back/lumbosacral spine, sciatic nerve, and involved lower extremity

› **Area(s) of specialty:** Orthopedic rehabilitation, neurological rehabilitation, sport rehabilitation

› **Description**

- The term “sciatica” describes the symptoms of sciatic nerve pain radiating down the posterior leg. It has also been used to describe paresthesia from the low back to below the knee or referred to the posterior thigh, calf, and foot. Sciatica is commonly attributed only to lumbosacral radicular pain. However, sciatica implies either radicular or referred lower extremity pain/paresthesia that involves a lesion of sciatic nerve root(s) or anywhere along the sciatic nerve itself
- Sciatica is strongly associated with low back pain (LBP), which has multiple causes including spinalpathogenesis. Most commonly affected are the L4-5, L5-S1 and L3-4 nerve levels

- There is consensus that treatment of sciatica should be conservative in the first 6 to 8 weeks after onset because most new cases resolve in the short term

› **ICD-9 codes**

- 355.0 lesion of sciatic nerve
- 722.10 displacement of lumbar intervertebral disc without myelopathy
- 724.3 sciatica
- 724.4 thoracic or lumbosacral neuritis or radiculitis, unspecified
- 724.2 low back pain (lumbago)
- 724.5 backache, unspecified
- 724.8 other symptoms referable to back
- 724.9 other unspecified back disorders

› **ICD-10 codes**

- G55.1 nerve root and plexus compressions in intervertebral disc disorders
- G57.0 lesion of sciatic nerve
- M51.1 lumbar and other intervertebral disc disorders with radiculopathy
- M54.3 sciatica
- M54.4 sciatica with lumbago
- M54.16 Lumbar radiculopathy

- (ICD codes are provided for the readers’ reference, not for billing purposes)

› **G-Codes**

- Mobility G-code set
  - G8978, Mobility: walking & moving around functional limitation, current status, at therapy episode outset and at reporting intervals
- G8979, Mobility: walking & moving around functional limitation; projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
- G8980, Mobility: walking & moving around functional limitation, discharge status, at discharge from therapy or to end reporting

• **Changing & Maintaining Body Position G-code set**
  - G8981, Changing & maintaining body position functional limitation, current status, at therapy episode outset and at reporting intervals
  - G8982, Changing & maintaining body position functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
  - G8983, Changing & maintaining body position functional limitation, discharge status, at discharge from therapy or to end reporting

- **Carrying, Moving & Handling Objects G-code set**
  - G8984, Carrying, moving & handling objects functional limitation, current status, at therapy episode outset and at reporting intervals
  - G8985, Carrying, moving & handling objects functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
  - G8986, Carrying, moving & handling objects functional limitation, discharge status, at discharge from therapy or to end reporting

• **Self Care G-code set**
  - G8987, Self care functional limitation, current status, at therapy episode outset and at reporting intervals
  - G8988, Self care functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
  - G8989, Self care functional limitation, discharge status, at discharge from therapy or to end reporting

• **Other PT/OT Primary G-code set**
  - G8990, Other physical or occupational primary functional limitation, current status, at therapy episode outset and at reporting intervals
  - G8991, Other physical or occupational primary functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
  - G8992, Other physical or occupational primary functional limitation, discharge status, at discharge from therapy or to end reporting

• **Other PT/OT Subsequent G-code set**
  - G8993, Other physical or occupational subsequent functional limitation, current status, at therapy episode outset and at reporting intervals
  - G8994, Other physical or occupational subsequent functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
  - G8995, Other physical or occupational subsequent functional limitation, discharge status, at discharge from therapy or to end reporting

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<th>G-code Modifier</th>
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<td>At least 1 percent but less than 20 percent impaired, limited or restricted</td>
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<td>CJ</td>
<td>At least 20 percent but less than 40 percent impaired, limited or restricted</td>
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<td>At least 40 percent but less than 60 percent impaired, limited or restricted</td>
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<td>CN</td>
<td>100 percent impaired, limited or restricted</td>
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- **Reimbursement**: Depends on insurance contract coverage; no specific issues regarding physical therapy exist for sciatica. Inquire about ongoing litigation or a worker’s compensation claim
Presentation/signs and symptoms

• The primary symptoms are pain/paresthesia in the affected leg and/or foot and disability that impairs activities of daily living (ADLs)\(^{(2,3)}\)

• Pain/paresthesia is typically described as dull or sharp, burning or tingling that involves the buttock, posterior thigh, calf, or foot/ toes\(^{(2,3)}\)

• There might be tenderness over the involved spinal or pelvic area, paravertebral muscles, or muscles of the buttock(s)

• Common signs are reduced trunk mobility and flexibility, and range of motion (ROM) in the affected leg\(^{(2,3)}\)

• Positions that place tension on the sciatic nerve trunk (e.g., hip flexion in sitting with involved leg straight) or the straight-leg raise (SLR) test often reproduce the patient’s sciatica

• Coughing, sneezing, and other sudden movements in trunk flexion can aggravate symptoms

Causes, Pathogenesis, & Risk Factors

Causes\(^{(2,3,4,5)}\)

• Intervertebral disc herniation; might involve L3-4, L4-5, L5-S1, S1-2, or multilevels

• Degenerative lumbar spinal (central or foraminal) stenosis

• Low-grade spinal infection affecting the sciatic nerve roots

• Single trauma or cumulative/repetitive microtrauma to lower back

• Pelvic instability or sacral base unleveling

• Lumbar arterial stenosis

• Nonsynaptic conditions that involve the sciatic nerve
  – Spasm, edema, and/or inflammation of the piriformis muscle (see Clinical Review... Piriformis Syndrome; Accession Number: 5000007742)
  – Uterine pressure on pelvis during pregnancy that compresses sciatic nerve
  – Trauma to buttock overlying sciatic nerve

Pathogenesis

• Intervertebral disc herniation (i.e., bulging, protrusion, extrusion, or sequestration) is the most common finding on magnetic resonance imaging (MRI)\(^{(2,3,4,5,6)}\)

• The dermatomal pattern of sciatica indicates radiculopathy specific for the nerve root(s) irritated\(^{(2,4)}\). However, sciatica below the knee that accompanies L4-5 and/or L5-S1 disc herniation might not follow a dermatomal pattern\(^{(2,5)}\)

• For pain below the knee, correlate pain with the sensory distribution of affected spinal nerve root. Based on a 2014 systematic review, strong evidence indicates that sciatica in chronic LBP represents a radicular pattern of neuropathic pain\(^{(22)}\)

• Disc herniation might initiate a proinflammatory cytokine (e.g., tumor necrosis factor [TNF]-alpha) pain response in the nerve root and local epidural fat\(^{(6)}\). Cytokine inhibitors such as etanercept have yet to show effectiveness for treating sciatica\(^{(7)}\)

• A nondiscogenic cause of sciatica is irritation, spasm, or contracture of the piriformis muscle; however, piriformis sciatica is usually limited to the buttock or upper posterior thigh

• Lumbar pain generators that distribute to the low back might trigger LBP in patients with concurrent sciatica\(^{(8)}\)

Risk factors

• A 2014 meta-analysis (N=19,165) found that overweight and obesity were associated with increased risk for lumbar radicular pain and hospitalization for sciatica\(^{(33)}\)

• A 2014 systematic review found that modifiable risk factors for first-time sciatica included smoking, obesity, occupational factors such as manual work, and health status\(^{(34)}\)

• History of low back trauma\(^{(9,10)}\); Smoking\(^{(9,10,34)}\); Pregnancy\(^{(9,10)}\); Tall skeletal frame\(^{(9,10)}\); Occupational loading of the low back\(^{(9,10)}\); Male sex\(^{(34)}\)

• Middle and older age\(^{(34)}\)

• Back strain from sudden, unaccustomed physical exertion\(^{(9,10)}\)

• Factors in 14-year-old adolescents that predicted sciatica in adulthood\(^{(10)}\)
  – Smoking
Overall Contraindications/Precautions

› Red flags include cauda equina symptoms (e.g., loss of bowel and bladder control, saddle anesthesia of the perineum, bilateral lower extremity pain/numbness/weakness). Patients with these symptoms should be referred immediately to emergency medicine to rule out cauda equina

› Other red flags that indicate prompt referral to emergency medicine are worsening symptoms, hyperalgesic sciatica, and sciatica with severe motor deficits that might represent more severe neurological disease

› Signs that indicate referral back to physician include fever and increased night pain, which are associated with a spinal tumor or infection such as osteomyelitis, and severe abnormal behavior that might indicate underlying psychopathology

› Spinal tumor, infection, unhealed fracture, and deep vein thrombosis (DVT) are contraindications for therapeutic exercise

› Patients with functional limitations (e.g., poor balance, restricted weight-bearing status) or comorbidities (e.g., degenerative disc disease, severe cardiopulmonary disease, renal failure, diabetic peripheral neuropathy, dementia) who are referred for therapeutic exercise usually require special considerations for adapting/modifying their exercise

› Stop therapeutic exercise and consult physician in the event of signs or symptoms of spinal cord/nerve root compression, bowel/bladder changes such as unexplained incontinence, cardiopulmonary distress, dizziness, or lightheadedness

› See specific Contraindications/precautions to examination and Contraindications/precautions under Assessment/Plan of Care

Examination

› Contraindications/precautions

• Lack of specific consent from patient or prescription from referring physician to perform a back examination

• Unresolved inflammation, infection, fracture, or severe hematoma

• Stop the exam and notify referring physician in the event of red flags indicating spinal cord compression or worsening of radicular signs and symptoms

• Exclude patients unable to follow instructions because of cognitive impairment and notify physician

• Use caution with SLR test or exercises that might overstretch the sciatic nerve to avoid exacerbation of symptoms

› History

• History of present illness/injury

  – Mechanism of injury or etiology of illness: The presumptive mechanism of lumbosacral radicular sciatica is spinal nerve root compromise, unless MRI rules out disc pathology. What was the patient doing at onset of symptoms, or were symptoms insidious in nature? How have the symptoms progressed since onset? Have there been any neurological complications such as bowel or bladder changes?

  – Course of treatment

    - Medical management: Ask about patient’s past and current medical management for back pain/sciatica. What medications have been tried? How did the pain respond to treatments? Was bed rest ordered and followed and, if so, for how long?

    - Surgical management: Have any surgical interventions been tried? What was the date of surgery? How long was hospital stay? Any postoperative complications? Any restrictions ordered by surgeon?

    - Medications for current illness: Analgesic medications commonly prescribed for this condition include oral nonsteroidal anti-inflammatory drugs (NSAIDs) such as aspirin, ibuprofen, naproxen), mild opiates (e.g., meperidine [Demerol], hydrocodone), and topical NSAIDs (e.g., salicylate, diclofenac). If symptoms are severe, patient might have also been prescribed a course of oral prednisone. A randomized controlled trial (RCT, N=84) in the U.S. found that epidural injection of either steroid or etanercept did not provide significantly greater pain relief or improvement in functional capacity than placebo (saline) at 1-, 3-, or 6-month follow-up in adults with subacute sciatica. A 2013 meta-analysis found insufficient evidence that biological agents targeting TNF are effective for treating sciatica. A 2015 meta-analysis of RCT also found NSAIDS and systemic steroids to be ineffective in treating sciatica. Additionally, Topimax and Lyrica were also not recommended for treatment of patients with sciatica.

    - Diagnostic tests completed: Ask about findings on back x-rays or other imaging studies. MRI is the preferred modality for diagnosing involvement of nerve roots in the lumbar spine. A small RCT (N=38) in the U.S. found that lumbar
radiculopathy identified using electromyographic (EMG) tests was associated with a favorable response to physical therapy in patients with sciatica.

**Home remedies/alternative therapies:** Has patient received acupuncture or chiropractic treatments or spinal traction?

**Previous therapy:** Document whether patient has had occupational or physical therapy for back pain or lower extremity musculoskeletal conditions and what specific treatments were helpful or not helpful.

**Aggravating/easing factors:** What positions does the patient attempt to avoid (e.g., forward flexion to put on socks, lifting a heavy weight, prolonged sitting, or climbing stairs). Focus on degree of sciatica related to each factor that patient reports and time before the symptoms appear or are eased.

**Body chart:** Use body chart to document location and nature of symptoms. What areas of the back and lower extremity are affected? Are the neck and upper back involved?

**Nature of symptoms:** Patients commonly present with LBP and paresthesias/numbness. Classic description of pain is unilateral dull or sharp, burning or tingling in the involved lower extremity, and is often associated with leg muscle spasms/cramping and weakness. Depending on the level of the spine affected, symptoms begin in the buttocks and radiate posteriorly (S1), dorsolaterally (L5) or anterolateral thigh (L4).

**Rating of symptoms:** Use a visual analog scale (VAS) or 0-10 scale to assess symptoms at their best, at their worst, and at the moment. The Roland Morris Disability (RMD) Questionnaire and the Oswestry Low Back Disability (ODI) Questionnaire are commonly used as outcome measures for pain and function. Specifically address if pain is the primary symptom and whether it is present now and how much.

**Pattern of symptoms:** Document whether there are changes in symptoms throughout the day and night (i.e., A.M., mid-day, P.M., night).

**Sleep disturbance:** Document number of wakings/night related to sciatica. In what position does the patient sleep? Are pillows used for positioning (e.g., between legs)?

**Other symptoms:** Document other symptoms that patient might be experiencing, such as upper back or neck pain. Do these symptoms exacerbate the condition? Are these related to compensatory posture or movements? Document symptoms that might require referral to physician/emergency room (e.g., symptoms of cauda equina or spinal cord compression).

**Barriers to learning**
- Is patient communication/education limited by language, hearing, vision, or cognitive impairment?

**Medical history**

**Past medical history**
- **General inquiry:** Is there a prior history of low back problems or injury?
- **Comorbid diagnoses:** Are there coexisting problems, such as degenerative disc disease, osteoporosis, diabetes, cancer, heart disease, dementia, psychiatric disorders, movement dysfunction, complications of pregnancy, etc.?
- **Medications prescribed:** Obtain a comprehensive list of medications prescribed and/or being taken (including over-the-counter drugs).

**Social/occupational history**
- **Patient’s goals:** Document the specific and general goals the patient hopes to accomplish with therapy (these usually involve improved general mobility and function in ADLs).
- **Vocation/avocation and associated repetitive behaviors, if any:** What factors restrict the patient’s ability to participate in desired occupational, recreational, or social activities? What repetitive behaviors does patient perform throughout his or her day that might contribute to symptoms?
- **Functional limitations:** Determine whether symptoms interfere with ADLs or use of adaptive equipment.
- **Living environment:** Are there barriers in the home that impede access, such as stairs; what modifications are needed?

**Relevant tests and measures:** (While tests and measures are listed in alphabetical order, sequencing should be appropriate to patient medical condition, functional status, and setting)

- **Anthropometric measures:** Determine height, weight, and body mass index (BMI). Is weight loss indicated to reduce risk of sciatica associated with back strain?
- **Balance:** Assess static and dynamic balance in standing.
- **Ergonomics/Body mechanics:** Assess patient’s body mechanics with ADLs, functional mobility, and/or work activities. For ergonomic assessment, see *Clinical Review... Ergonomics Assessment and Intervention*.
• **Gait/locomotion:** Assess walking ability and evaluate for atypical gait patterns (e.g., antalgic, Trendelenburg, coxalgic, stooped). Does sciatica increase with walking or using stairs?

• **Joint integrity and mobility:** Assess mobility of the trunk and lower extremities during functional activities such as dressing, transfers, lifting, and carrying. Activities that involve hip flexion or rotation often aggravate symptoms. Do the patient’s posture and flexibility during movements appear limited by pain or restricted joint mobility? Assess mobility of lumbar spine, sacroiliac joint, and hip, knee, and ankle joints within patient’s pain tolerance. Assess passive accessory intervertebral motions (PAIVMS) with A-P, P-A and transverse mobilizations as well as spring testing. Limited lumbar joint mobility can contribute to complaints of sciatica.

• **Observation/inspection/palpation:** Inspect for signs of lumbar deformity such as spondylolisthesis, excessive lordosis or scoliosis, lateral shift; if present, document whether severe, moderate, or mild. Do the iliac crest appear even? Are the lower extremities in normal alignment? Is there a leg length discrepancy? Palpate for proper transverse abdominus and multifidi muscle contractions/firing pattern. Palpate lumbosacral area and paraspinal muscles for tenderness. Patients with piriformis syndrome might have trigger points and muscle spasms in the involved buttock.

• **Pain:** Use VAS to assess sciatica during exam, and compare to its best and worst.

• **Posture:** Assess spinal alignment (both posteriorly and laterally) as well as posture of head, neck, shoulders, trunk, pelvis, and lower extremities, in sitting and standing. Is the posture stooped (head forward and shoulders rounded)? Is the lumbar curve flattened or excessively lordotic? Is the patient listed to the side, possibly away from the painful side?

• **Range of motion (ROM):** Assess active and passive thoracolumbar ROM (forward flexion, lateral flexion, rotation, and extension). Pain in patients with lumbar disc herniation typically limits trunk forward flexion and rotation. Assess for restricted hip rotation, tensor fascia lata, medial hamstrings, quadratus lumborum, or posterior adductors (suggestions involvement of the piriformis). Also assess flexibility throughout lower extremities.

• **Reflexes:** Assess bilateral patellar and Achilles tendon reflexes and compare sides for symmetry. Patient might have diminished deep tendon reflexes (DTRs) in affected leg.

• **Sensation:** Document whether symptoms (pain, paresthesia) are in the dermatomal distribution of sciatic nerve. Assess pressure, temperature, sharp/dull, and sensation to light touch in distribution of sciatic nerve.

• **Strength:** Assess for weakness in the involved leg using manual muscle testing (MMT) and compare to unaffected side. Assess abdominal and paraspinal muscle strength (i.e., trunk stability) within pain tolerance, while attempting to avoid trunk positions and ROM that cause pain. Isokinetic testing was found more sensitive than MMT for identifying weaker ankle plantar flexion strength in patients with sciatica due to L5 and/or S1 nerve compression.

• **Special tests:**
  – Slump test
  – SLR (Lasègue's) test. Reproduction of radicular symptoms with stretching of sciatic nerve indicates nerve root involvement. The SLR is sensitive for sciatica due to disc herniation at L5-S1, but has low specificity.
    - Patient relaxed in supine position, both knees extended
    - Examiner raises affected leg with knee extended
    - Test positive if symptoms are reproduced with lifting the leg and there is firm resistance to further elevating the leg
    - Disc compression is suggested when the leg angle is between 30 and 70° elevation and then subside on lowering leg, but return with passive dorsiflexion of foot
    - Specificity increases if SLR test on the unaffected leg also reproduces symptoms (called “crossover sign”) or if dorsiflexion of the foot or great toe increases pain
    - Sensitivity for disc herniation on the ipsilateral side is 90%, low specificity. Cross over sign is 90% specific for contralateral sign, low sensitivity
    - Based upon a 2015 study, men are “1.3 times” more likely than women to have a positive SLR. Additionally, patients younger than 60 are much more likely to have positive SLR with L5-S1 being noted as the most affected level.
  – McKenzie exam with repeated lumbar movements (flexion and extension) in standing and lying
  – For special tests related to piriformis syndrome, see *Clinical Review...Piriformis Syndrome*, referenced above.

### Assessment/Plan of Care

› **Contraindications/precautions**

• Only those contraindications/precautions applicable to this diagnosis are mentioned below, including with regard to modalities. Rehabilitation professionals should always use their professional judgment.
• Patients with this diagnosis might be at risk for falls; follow facility protocols for fall prevention and post fall prevention instructions at bedside, if inpatient. Ensure that patient and family/caregivers are aware of the potential for falls and educated about fall prevention strategies. Discharge criteria should include independence with fall prevention strategies.

• Evidence is lacking to support the use of thermal (heat or cold) and electrotherapeutic modalities to specifically alter sciatica or the course of recovery. Avoid use of ultrasound near surgical site (if applicable), malignant tumors, or nerve tissue in a patient who has recently had spinal invasive procedures or joint replacement.

• Avoid use of iontophoresis near surgical site (if applicable), metallic implants, wires, or staples.

• Avoid use of electrical stimulation:
  – Near surgical site (if applicable)
  – Near injured nerves, because both high- and low-frequency transcutaneous electrical nerve stimulation (TENS) can delay sciatic nerve regeneration
  – In patients with cardiac pacemakers, cardiac arrhythmias, thrombophlebitis, or DVT.

• **Cryotherapy** contraindications:
  – Raynaud’s syndrome
  – Medical instability
  – Cryoglobulinemia
  – Cold urticaria
  – Paroxysmal cold hemoglobinuria
  – Avoid applying cold over superficial nerves, areas of diminished sensation or poor circulation, or slow-healing wounds.

• **Cryotherapy** precautions:
  – Use caution with patients who are hypertensive as cold can cause a transient increase in blood pressure; discontinue treatment if there is an elevation in blood pressure.
  – Use caution with patients who are hypersensitive to cold.
  – Avoid aggressive treatment with cold modalities over an acute wound.
  – Use of cryotherapy with patients who have an aversion to cold might be counterproductive if being used to promote muscle relaxation and decrease pain.

• **Electrotherapy** contraindications/precautions (in some cases, when approved by the treating physician, electrotherapy might be used in the conditions listed below if the perceived benefits outweigh the perceived risks):
  – Cardiac pacemakers
  – Implanted stimulators
  – Uncontrolled hypertension/hypotension
  – Peripheral vascular disease
  – Thrombophlebitis
  – Pregnancy
  – Diminished sensation
  – Acute inflammation
  – Seizure history
  – Confused patients
  – Immature patients
  – Obesity
  – Osteoporosis
  – Use in close proximity to diathermy treatment.

› **Diagnosis/need for treatment:** Sciatica/disability in ADL due to pain and reduced lumbosacral and lower extremity mobility; trial of therapeutic exercises, manual therapy, and pain management indicated to resolve functional deficits, reduce pain, increase strength, and restore mobility.

› **Rule out:** Differential diagnosis might rule out:
  • Piriformis syndrome
    – Back Pocket Sciatica
  • Hamstring syndrome
  • Hip pathology
    – Hip dislocation can impinge sciatic nerve.
• Trauma to low back/buttock, injection site trauma
• Trauma to sciatic nerve
• Lumbosacral tumor/infection
• Back muscle strain
• Cauda equina
• Bertolotti's syndrome
• Diabetic Radiculopathy
• Lumbar plexitis
• Vertebral fracture, hip fracture, pelvic fracture
• Biceps femoris injury including: hematoma, strain, tear
• Spinal cysts or tumor
• Synovial cyst of fact joint
• Arachnoid cyst
• Neurofibromas
• Vascular impingement of sciatic nerve
• Gynecologic & peripartum causes
  – Endometrial tissue deposits (right sided more than left), ovarian cysts, uterine enlargement in pregnancy,
• Herpes Zoster(HZ)/Shingles
  – Prior to onset of shingles outbreak, reactivation of the HZ virus can mimic sciatica pain

Prognosis
• Researchers of an RCT (N=135) in the Netherlands found that physical therapy plus general practitioner care (n=67) improved perceived recovery at 1-year follow-up compared to general practitioner care only (n=68) in patients with sciatica. However, no significant difference was found between groups with regard to pain and disability. A cohort study (N=60) in Denmark found centralization of pain with McKenzie positioning was associated with improved prognosis in patients with sciatica.
• Researchers of a prospective study (N=283) in the Netherlands found that women took longer to recover from sciatica than men and reported greater pain and disability at 1-year follow-up.
• Researchers conducting an RCT in the Netherlands found that patients who received conservative treatment for sciatica were more likely to eventually undergo surgery if at the initiation of care they had higher pain intensity and greater functional limitations. A 2013 systematic review also found strong evidence that leg pain intensity in sciatica patients at baseline was a prognostic indicator for subsequent surgery.
• A 2011 systematic review of RCTs comparing surgery vs. conservative care for sciatica due to lumbar disc herniation found no significant differences in clinical outcomes between treatments after 1 and 2 years.
• Researchers conducting a cohort study of sciatica patients (N=379, 49% with disabling back pain) in the Netherlands found that disabling LBP at baseline was negatively associated with perceived recovery at 1-year follow-up, especially if a herniated disc with nerve root compression was absent on MRI.
• Researchers conducting systematic review of the literature in 2014 found that personalizing treatment, communication and care towards the patient as an individual was beneficial for patients. This might be as important as what treatment interventions (manual therapy, exercise) are selected.

Referral to other disciplines
• Orthopedist for medical management of pain or muscle spasms that possibly includes an epidural steroid injection. However, an RCT (N=160) in Finland found that injection of a methyl prednisolone bupivacaine combination near the spinal nerve root reduced pain in patients with sciatica on average for only about 2 weeks compared to patients who received the saline placebo.
• Nerve osteopath or chiropractor for manual manipulation of lumbar spine
• Skilled Orthopedic Manual physical therapist for joint mobilization/thrust
• Physical therapist certified in trigger point therapy/functional dry needling
– A 2015 study showed one in three patients with chronic sciatica to have active gluteal trigger points. All subjects with trigger points that had dry needling presented with short-term vasodilation and increase skin temperature\(^{(44)}\)

– While the research in this area is new, it is promising for patients with sciatic complaints

• Acupuncturist or pain management specialist for intractable pain

› Other considerations

• Bed rest is not helpful in the management of sciatica\(^{(21,45)}\)

– Based on a 2010 Cochrane systematic review that included 11 RCTs (N=1,963 patients with acute LBP and/or sciatica)

– Trials compared advice to stay active vs. advice to rest in bed

– In patients with sciatica, bed rest (whether 2-3 days or 7 days) had minimal or no beneficial effect on pain level or functional status, and might have contributed to weakness due to muscle inactivation

› Treatment summary

• General conservative approach\(^{(2)}\)

– Encourage resumption or continuation of ADLs within acceptable pain tolerance\(^{(21)}\)

– Therapeutic exercises to improve reduced flexibility and strength

– Functional training to correct deficits in posture, gait, and general mobility, as well as to improve body mechanics/technique during ADLs that provoke or aggravate pain

– Manual therapy to address muscle pain/spasms, improve joint mobility, decrease neural tension, restore normal flexibility

– Core strengthening, especially on lumbar stabilizers: TA, multifidus

- Isometric trunk and hip exercises might reduce neural tension and pain, and improve muscle strength and spinal ROM in patients with subacute sciatica\(^{(22)}\)

  - Based on an RCT (N=52 patients 14 days post onset of sciatica due to disc herniation) in Poland

  - The exercise group performed isometric exercises for activating the trunk and hip muscles 3 times a day for 20 days while the control group received usual care only

  - On follow-up, sciatica symptoms were significantly decreased and strength and ROM improved in the exercise group compared to the controls

– Ergonomic assessment and functional training (as indicated)

– Work hardening for return to work (as indicated)

– Strength & Conditioning/Sports specific training

– Fear-Avoidance belief training is an important part of a well-rounded physical therapy program\(^{(47)}\)

– In 2015, researchers determined patients with higher levels of kinesiophobia can decrease their leg pain with physical therapy treatment\(^{(43)}\)

• A 2013 systematic review and meta-analysis found evidence to support the clinical effectiveness of the following treatment strategies for sciatica: nonopioid medication, epidural injections, disc surgery, spinal manipulation, and acupuncture. The use of opioid analgesia, bed rest, education/advice (when used alone), percutaneous discectomy, or traction was not supported by the findings. Evidence was lacking to support “exercise therapy” because studies were widely heterogeneous in design\(^{(40,45)}\)

• A 2008 systematic review found that evidence was lacking to evaluate the effectiveness of TENS in the management of chronic pain\(^{(23)}\)

• A 2012 systematic review found that evidence was lacking to evaluate the effectiveness of ultrasound in the management of sciatic pain\(^{(24)}\)

• A 2013 Cochrane review (N=2,206) found that traction was probably not effective as a single treatment for patients with LBP and/or sciatica\(^{(41)}\)

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<th>Goal</th>
<th>Intervention</th>
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<tr>
<th>Pain due to sciatica</th>
<th>Reduce pain intensity score on VAS</th>
<th><strong>Therapeutic exercise</strong></th>
<th>Improvement indicated by increased pain-free mobility and “centralization” of symptoms</th>
<th>McKenzie self-treatments for sciatica(25)</th>
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<td>Centralization of pain with McKenzie positioning and exercises is associated with improved prognosis(15)</td>
<td>End-range back extension exercises such as standing back extension, push-up on elbows, shoulder blade squeeze (sitting), back bridge (supine), rowing with elastic band (sit or stand)</td>
<td>Home, workplace, and social activities as tolerated</td>
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<td><strong>Physical agents and mechanical modalities</strong></td>
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<td>Ice, analgesics, gentle back exercises</td>
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<td></td>
<td></td>
<td>Cryotherapeutic agents for pain management</td>
<td></td>
<td><strong>Devices and equipment</strong></td>
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<td></td>
<td></td>
<td>Efficacy of TENS in chronic pain management remains controversial(23)</td>
<td></td>
<td>Self-traction of the spine associated with therapeutic benefits(26)</td>
</tr>
<tr>
<td>No independent pain management program</td>
<td>Less reliance on pain medications</td>
<td><strong>Patient education</strong></td>
<td>Improvement indicated by increased pain-free mobility and “centralization” of symptoms</td>
<td>McKenzie self-treatments for sciatica(25)</td>
</tr>
<tr>
<td></td>
<td>Patient independent with pain management program</td>
<td>Prevention and self-care(27)</td>
<td></td>
<td>Home, workplace, and social activities as tolerated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instructions on the correct use and/or application of equipment</td>
<td></td>
<td>Ice, analgesics, gentle back exercises</td>
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<tr>
<td>Weakness of involved myotomes</td>
<td>Symmetry of lower extremity strength</td>
<td><strong>Therapeutic exercise</strong></td>
<td>Progress to dynamic exercises as tolerated</td>
<td>Provide patient with diagrams and written instructions</td>
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<td></td>
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<td>Resistance training, starting with isometric exercises</td>
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<tr>
<td>Reduced aerobic endurance</td>
<td>Improve endurance in ADLs</td>
<td><strong>Therapeutic exercise</strong></td>
<td>Increase duration and intensity per tolerance</td>
<td>Provide patient with diagrams and written instructions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aerobic exercise: stationary cycling, walking, dance, and aquatic exercises within pain tolerance</td>
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<tr>
<td>Impaired back and lower extremity ROM and flexibility</td>
<td>Increase ROM/flexibility of lumbar spine, hip, knee, and ankle joints</td>
<td><strong>Functional training</strong></td>
<td>Gradual improvement in lumbar flexibility and straight-leg raising test</td>
<td>Self-stretches</td>
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<tr>
<td>Decreased ability to perform ADLs/pain with ADLs</td>
<td>Improve ability to perform ADLs as tolerated to avoid chronicity and reduce disability</td>
<td><strong>Patient education regarding activities of daily living (ADLs)</strong></td>
<td>Steady increases in activity tolerance with resumption of regular activities</td>
<td>Resumption of ADLs as tolerated</td>
</tr>
<tr>
<td>Decreased abdominal and low back muscle strength and stability</td>
<td>Improve trunk muscle strength and stability</td>
<td><strong>Therapeutic exercise</strong></td>
<td>Progress as appropriate</td>
<td>Provide patient with diagrams and written instructions</td>
</tr>
<tr>
<td>Decreased ability to perform functional activities and sports/recreational activities</td>
<td>Optimize functional status/independence</td>
<td><strong>Functional training</strong></td>
<td>Task-specific exercises for reducing deficits in posture, gait, and general mobility</td>
<td>Provide patient, family, and caregivers with advice regarding functional activities that can be performed at home</td>
</tr>
<tr>
<td>Impaired lumbar proprioception and postural control[29]</td>
<td>Improve postural control</td>
<td><strong>Therapeutic exercise</strong></td>
<td>Progress per tolerance</td>
<td>Provide patient with home exercise program</td>
</tr>
</tbody>
</table>
**Desired Outcomes/Outcome Measures**

- Normal ROM
  - Goniometry
- Normal thoracolumbar strength
  - MMT
- Improved posture and gait
  - Gait And Posture Analysis
- Decreased pain
  - VAS, NPRS
- Perceived health
  - 12-item Short-Form Health Survey questionnaire \(^{(30)}\)
- Improved functional mobility
  - ODI Questionnaire: scores self-reported pain and disability in lumbar mobility. Higher scores indicate more perceived disability
  - RMD Questionnaire: scores back and leg pain intensity and function
- Improved Neurodynamics/decreased neural tension
  - Neurodynamic testing: Slump/SLR
- Improved flexibility
  - Muscle length testing

**Maintenance or Prevention**

- Maintain postural awareness and thoracolumbar control during ADLs
- Reduce modifiable risk factors such as obesity and smoking
- Maintain flexibility and strength with home exercise program

**Patient Education**

References

1. Fairbank JC. Sciatic: an archaic term [letter]. BMJ. 2007;335(7611):112. (X)


