

Herniated Lumbar Disc with Sciatica: Evaluation Summary

PHYSICAL EXAMINATION

- Thoracolumbar AROM
- Mannequin sign
- SLR (seated and lying)
- Maximum SLR (e.g., Slump) or confirmation tension tests (e.g., Bragard, Bowstring)
- Valsalva maneuver or cough test
- Sensory testing (in most cases, L4, L5, S1 dermatomes)
- Achilles and patellar reflexes (consider hamstring reflex)
- Muscle tests (especially ankle eversion, great toe extension and flexion, ankle plantar and dorsiflexion)
- Girth measurement of thigh and calf
- Palpation of lumbar spine and pelvis for painful restrictions, joint challenge, peripheralization or centralization
- Palpation of lumbar and pelvic soft tissue
- Consider **McKenzie** protocol to identify centralization maneuvers.
- If there are signs of a neurological disease not explained by the low back diagnosis, consider testing cranial nerves, cerebellum and upper extremity sensation, muscle strength, and stretch and pathological reflexes.

NOTE: Other orthopedic maneuvers or biomechanical procedures can be done as needed to explore other diagnoses, but may not be necessary initially when a herniated intervertebral disc diagnosis is made. In female patients, determine whether a pelvic examination is indicated.

Red Flags for Cauda Equina (Pp. 19-20)

This demands emergency referral, especially if symptoms have come on rapidly.

- Urinary retention (90% sensitivity)
- Incontinence
- Saddle anesthesia (80% sensitivity)
- Sexual dysfunction
- Common additional findings: some combination of unilateral/bilateral sciatica, altered SLR, sensory or motor deficits

Major Criteria for Diagnosis (Pp. 11-12)

RADICULAR CLUES

- **Presence of leg pain** (especially if dermatomal)
Often dominates, *may* be sharp, burning, electrical and superficial, worse than the back pain
- **Presence of dermatomal paresthesia**
- **Positive SLR and other tension tests:** pain past the knee between 35-70 degrees of elevation (especially if < 45°); confirm with other tension tests; XSLR uncommon but very specific
- **Neurologic deficits** 20% of cases will have no deficits

NOTE: Three of the above criteria—or two, with a positive imaging test—support a clinical diagnosis.

DISCOGENIC CLUES (as cause of radiculopathy)

- Decreased sagittal thoracolumbar ROM
- Mannequin sign
- Pain which centralizes with repetitive or sustained end range loading
- Positive Valsalva
- Sitting may be poorly tolerated.
- DeJeurine's triad
- Flexion load sensitivity

EVALUATION STEPS (Pp. 19-35)

1. Rule out causes for emergency or urgent referral.
2. Rule out organic disease, fracture.
3. Rule in the presence of a radicular syndrome.
4. Rule in herniated disc diagnosis. Rule out other potential diagnoses.
5. Determine type of herniation, probability of contained vs. uncontained (on clinical grounds).
6. Determine likely level of herniation and which nerve roots are involved (on clinical grounds).
7. Determine direction of herniation: medial, midline, lateral or far lateral herniation (on clinical grounds).
8. Estimate the severity of the condition.
9. Determine need for imaging.
10. Empirically determine if patient is a candidate for manipulation, flexion-distraction, **McKenzie** protocol.
11. Set outcome measurements.
12. Determine if there are significant psychosocial factors. This can be done on subsequent visits.
13. Determine if there are other weak links in the kinetic chain (e.g., overpronation). This can be done on subsequent visits.

RULE IN A RADICULAR SYNDROME (Pp. 21-24)

- 1) Is there nerve damage vs. a deep referred pain syndrome?
- 2) If there is suspected nerve damage, is the lesion in the nerve root, plexus or a peripheral entrapment/neuropathy?
 - Diabetic amyotrophy/neuropathy
 - Herpes zoster
 - HIV/AIDS
 - Lyme disease
 - Entrapment Syndromes: piriformis syndrome and peroneal nerve injury vs. common peroneal nerve injury
- 3) If a nerve root is involved, which one?
- 4) What is the nature and degree of the nerve root injury (irritated, soft neurological signs, hard signs)?

RULE OUT OTHER POTENTIAL DIAGNOSES (Pp. 24-26)

- Stenosis (central and lateral recess)
- Space occupying lesions such as tumors, cysts and hematomas
- Spinal Infection
- Spondylolisthesis
- Fracture
- Adhesions
- Instability
- Chemical irritation from disc degeneration, inflamed facet, etc.

SIGNS OF UNCONTAINED/SEQUESTERED HERNIATION (Pp. 26-27)

- Lumbar flexion-extension excursion < 25 degrees
- Positive XSLR
- A positive SLR below 30 degrees
- Peripheralization with lumbar extension
- Leg pain precedes back pain or without back pain
- Neurological deficits migrate

DETERMINE LEVEL OF HERNIATION (Pp. 27-28)

DETERMINE DIRECTION OF HERNIATION (Pp. 28-30)

- Midline
- Medial
- Lateral
- Far lateral

DETERMINE SEVERITY (Pp. 31-32)

- Neurological deficits
- Effect on ADL
- Pain severity

DETERMINE NEED FOR IMAGING (P. 32)

Radiographs are not necessary in the absence of red flags in the acute presentation (less than 7 weeks), but should be considered if there are significant neurologic deficits, cauda equina

syndrome, or in the subacute or chronic presentation.

Advanced imaging should *not* be ordered routinely if a herniation diagnosis can be made based on clinical grounds alone and is sufficient to begin a therapeutic trial of conservative care.

When to order an MRI (preferably) or CT

- Signs of cauda equina syndrome
- Progressive muscle weakness
- Herniated disc diagnosis in doubt
- Profound muscle weakness at first visit (relative indicator)
- Pre-surgical assessment

IDENTIFY YELLOW FLAGS (Pp. 32-35)

- Psychological factors
 - Catastrophizing
 - Fear avoidance behaviors
 - Depression and anxiety
 - Self-perception of poor health
 - Sexual abuse
- Other factors: complete work loss (because of LBP) in prior 12 months, substance abuse, perceived stress, heavy smoking and poor coping resources, and lack of social support.
- Worker's compensation issues
- Litigation
- Job environment: job control, work under time pressure, monotonous work, perceived workload, poor satisfaction with social relationships at work, and "mental overstrain."
- Education

Presence of Waddell's Signs

- Widespread (nonanatomic) tenderness to light touch
- Significant LBP with axial loading (light pressure to skull) or with full trunk rotation in a standing position (rotating hips and shoulders together so that there is no true twisting of the trunk)
- Lack of pain on sitting SLR when supine SLR was positive or a difference of 40 or 45 degrees between the two tests
- Unexplained weakness (e.g., giving way) and/or sensory testing that is not neurologically correlated
- A pattern of exaggeration (e.g., overreaction, grimacing, bracing, etc.)

WEAK LINK IN THE KINETIC CHAIN (P. 35)

Chart properly (see Appendix V).

Herniated Lumbar Disc with Sciatica: Management Summary

Acute/Initial Phase (Pp. 40-43)

Objectives

- Centralize pain and decrease inflammation; prevent further neurologic loss.
- Attempt to reduce herniation.
- Teach the patient how to protect and stabilize the low back.
- Prevent further deconditioning.
- Address/prevent illness behavior.

SUMMARY – Initial Treatment Options

Not all of these options need be utilized.

- Palpate the spine with patient seated, supine and prone (assess centralization, peripheralization and local response).
- Consider HVLA manipulation and/or mobilization.
- Consider flexion-distraction.
- Utilize soft tissue manipulation to treat associated myofascial dysfunctions (MFTP's, spasm, adhesions).
- Consider therapeutic modalities to control pain and inflammation.
- Consider home exercise for pain control (e.g., directional preference assessment and prescription).
- Teach the patient to protect the spine (e.g., abdominal brace, neutral pelvis, hip hinge).

PATIENT EDUCATION (P. 41)

- Set expectations.
- Progress into early phase of lumbar stabilization program.
- Address any significant current or potential psychosocial components.
- Give emergency instructions (e.g., signs of cauda equine syndrome).

PAIN CONTROL STRATEGY (choose as needed) (P. 40)

- Physical medicine (manual therapy/passive PT modality)
- OTC or botanical
- Referral for medical treatment

HOME CARE (P. 42)

- Give specific exercises.
- Encourage mild activity.
- Address home and work ergonomics.
- Modify activities (sitting, side lying, aggravating loads).
- Increase water and fiber intake to soften stool and reduce the chance for constipation.
- Use pain relief postures (e.g., 90/90) and other pain relief aids as necessary.
- Limit bed rest.
- Consider home traction (if necessary)
- Prescribe OTC sleep aids (if necessary)
- Short-term use of back belt (optional)
- Crutches (optional)

CLINICAL TIPS

- In view of the relatively serious nature of disc herniations, take special care in conducting and documenting PARQ conference.
- If prone extension exercises are prescribed, it is critical to teach the patient how to transition down to the floor and back again *without flexing the lumbar spine* (e.g., use hip hinging and modified kneeling or squat).
- Extension may peripheralize symptoms with far lateral disc herniations.
- Bed rest should be short term only. Active rest is preferable (i.e., bouts of activity which still manage to protect the back and may be punctuated with periods of rest).
- Normal activities should resume ASAP.
- A common relief position is to lie with knees bent and a pillow between the legs.

Evidence of Effectiveness of Common Medications

TABLE: The fractions listed in this table represent the number of studies cited over the number that were judged to be of higher quality by at least one systematic review (e.g., 3/2). Drugs with evidence of positive benefits are in bold.

	SCIATICA	ACUTE LBP	CHRONIC LBP
Anti-epileptics	Small benefit, consistent evidence of fair quality (3/2)	Unknown	Small to moderate benefit, poor quality evidence (1/1)
NSAIDs (e.g., Motrin)	No benefit, consistent evidence of fair quality (4/2)	Moderate benefit, consistent evidence of good quality (31/10)	Moderate benefit, consistent evidence of good quality (6/3)
Acetaminophen (e.g., Tylenol)	Unknown	Moderate benefit, fair quality, some inconsistency when compared to NSAIDs (3/0)	Moderate benefit, consistent evidence of good quality (2/1)
Skeletal muscle relaxants	No benefit based on one higher quality study (1/1)	Moderate benefit, consistent evidence of good quality (31/21)	Benefit unclear, poor quality (6/2)
systemic corticosteroid (oral, IM)	No benefit, consistent evidence good quality (3/3)	No benefit, fair quality evidence (1/1)	Unknown
Opioids (e.g., Tylenol 3, Vicodin)	Unknown	Moderate benefit, fair quality (1/1)	Moderate benefit, evidence of fair quality (7/1)
tricyclic anti-depressants (e.g., amitriptyline)	Unknown U	Unknown	Small to moderate effects, good quality (10/5)

Acetaminophen doses

- Ages 0-12 yrs: 15 mg/kg every 4 hrs (not to exceed adult dose) with a max of 5 doses.
- Ages 12 yrs and older: 325-650 mg every 4 hrs with a max dose of 4000mg.

Ibuprofen (Motrin, Advil) doses

- Ages 6 mos-12 yrs: 10 mg/kg every 6 hrs (not to exceed adult dose) with a max of 4 doses.
- Ages 12 yrs and older: 200-400 mg every 6 hrs with a max dose of 1200mg.

OTC/MEDS – NOTES & WARNINGS! (P. 61)

- **It is WSCC Clinic policy to screen all patients taking OTC NSAIDs and to provide them with an educational sheet on side effects.** (Consult the CSPE protocol on [NSAIDs](#) for side effects and screening at-risk patients.)
- Acetaminophen is a reasonable first choice of OTCs. If prescribed, analgesics should be taken at regular intervals, not on an “as needed” basis.
- Acetaminophen is an ingredient in many other OTC medications. It is important to survey the patient’s total intake so as not to exceed recommended doses.
- **Warning!** Patients who have been on systemic corticosteroids for weeks, months or years are susceptible to osteoporosis, attenuation of the transverse ligament of Atlas, and increased risk for spinal/peripheral joint infections, avascular necrosis and infections in general.
- In select cases, referral for corticosteroid injection may provide enough temporary relief to allow a patient to remain more active and to more fully participate in a physical rehabilitation program.

Choose Mode of Manual Therapy

(Pp. 48-55)

- Mobilization & HVLA (P. 48; Appendices VIIIa-d)
- Flexion-Di straction (P. 51; Appendix IX)
- Other Treatments: muscle energy technique (MET), blocking, long-axis traction, soft tissue manual therapy, neuromobilization of the sciatic nerve (“flossing”) (Pp. 52-55)

MANUAL THERAPY – CLINICAL TIPS & WARNINGS!

- Palpation loads when used as therapy may need to be sustained from 30 seconds up to several minutes.
- Tolerance to side-posture palpation/treatment may be influenced by whether the affected leg is side up or side down. In difficult cases, explore both positions.

- **If manual therapy or distraction worsens leg symptoms anytime during therapy, stop and re-evaluate.**
- **Clinical Warning for flexion-distraction!** It is safer if the practitioner under treats rather than over treats during a visit, especially when starting with a new patient. The most common reason for causing a flare-up is dropping the table into too much flexion.

Passive PT Modalities (Pp. 55-59)

For specific parameters, see CSPE protocol, [Physical Therapy Modalities](#).

PT MODALITIES TIPS

US & EMS: Ultrasound may be used in combination with EMS therapy. The dispersive pad is placed adjacent and, where appropriate, proximal to the treatment area.

“Active” Contrast Therapy: While patients are receiving contrast therapy, they can actively contract their muscles. This muscle pumping has a greater effect on edema, venous return and lymphatic fluid.

Initial Operational End-Point/Outcome Measures

CLINICAL WARNING! Progressive motor loss at any time during the treatment program should trigger a neurological/surgical consult.

In most acute cases expect approximately 50% improvement within the first three weeks of care. Outcome measurements include the following:

- Pain centralization
- Stabilization or improvement of motor signs
- Pain improvement at rest (e.g., mVAS)
- Decrease use of analgesics
- Improvement in the SLR and thoracolumbar AROM
- Improved ADLs (e.g., Oswestry, Roland Morris or the PSFS can be used).

NOTE: In cases that present with severe motor loss at the initial visit, either immediately seek medical/surgical consult or treat for 3-6 weeks while carefully monitoring motor status. If there is still no improvement at that time, a surgical consult should be considered.

Subacute Phase (Pp. 43-45)

Objectives

- Continue to control pain.
- Return to work with modified duties.
- Restore biomechanical function as it applies to joint function, flexibility, endurance, proprioceptive integrity, and aerobic conditioning.

OFFICE TREATMENT (P. 44)

- Continue soft tissue therapy
- Continue taking the patient through lumbar stabilization protocols and progress into proprioceptive training.
- Restore good biomechanics.

PATIENT EDUCATION (P. 44)

- Teach the patient how to protect the low back.

HOME CARE (P. 44)

- Emphasize progression through the stabilization program.
- Continue aerobic activities.
- If doing directional preference protocol, continue as needed.

NOTE: In the subacute phase, the patient should be weaned from any of these passive physical therapy modalities if they have been used at all.

Rehabilitation Phase (Pp. 45-46)

Objectives

- Address any flare-ups of back/leg pain.
- Improve low back and pelvic stabilizer strength to normative values.
- Continue to improve proprioceptive integrity and aerobic conditioning.
- Return to full work duties and ADLs with minimal residuals.

OFFICE TREATMENT (P. 45)

- Treat acute flare-ups as necessary (see acute intervention).
- Evaluate muscle endurance.
- Take patients through advanced steps of appropriate stabilization tracks.

PATIENT EDUCATION (P. 45)

- Periodically check in on the quality of home exercise programs.
- Continue to give postural and ergonomic advice as needed.

HOME CARE (P. 46)

- Continue directional preference protocols as needed to manage flare-ups.
- Continue lumbar stabilization and proprioceptive activities.
- Do muscle endurance exercises.
- Follow prescribed aerobic conditioning program.

Overall WSCC Rehabilitation “Menu”

- Neutral pelvis, hip hinge, abdominal bracing
- Directional preference exercises
- Posture and breath training
- Return to activity
- Floor exercises to re-program stability (quadruped, dead bug, side-bridge)
- Weight-bearing exercises (lunge, squat)
- Muscle balance exercises (stretches & activation)
- Proprioceptive training

See CSPE protocol, [Low Back Rehabilitation Program](#), for specific details.

NOTES & CLINICAL TIPS

- Many of the steps of a rehabilitation program can be introduced during mid- to late-subacute phase, based on patient tolerance and response.
- If patients improve early in the course of treatment but then plateau, up to 2-3 months of additional conservative care is indicated. (See Surgical Referral section.)
- If curl-ups are prescribed, a posterior pelvic tilt should not be held because of the possible injurious load it places on the disc fibers.

Clinical Outcome Measures (Pp. 64-65)

SUMMARY

If possible, consider all of the following:

- Neurological deficits
- Centralization/peripheralization
- Oswestry, Roland Morris or SF-36
- PSFS or any specific activity (e.g., sitting time)
- mVAS or VAS
- SLR
- Thoracolumbar AROM
- Analgesic use
- Functional Capacity Exam (FCE)
(See Appendix X)

NOTES & CLINICAL TIPS

- Motor deficits should be checked *every visit*, especially during the acute phase.
- The minimally clinically important difference (MCID) for Oswestry is 4-6 points and for Roland Morris is 3-5 points.
- In Worker's Compensation cases, an inclinometer must be used to measure spinal ROM for medically stationary workers.

Management Timeline/Milestones

First three days: Centralization of leg pain

End of first week: In the rare cases that patients are on bed rest, they are beginning to ambulate.

First 3 weeks: 50% improvement based on flexion-distraction treatment (usually extrapolated to various forms of manual therapy)

First 6 weeks: 50% improvement based on functional rehabilitation evaluation

At week 6: Refer for surgical consult if treating a profound muscle weakness that has not responded.

At 8-12 weeks: Refer for surgical consult patients that have had poor response to care and who have relative indication for surgery.

NOTE: Opinions of how long surgery can be delayed range from 6-8 weeks to 3-6 months.

Surgical Referral (Pp. 65-70)

Cauda Equina WARNING! In cauda equina cases, surgical intervention should be within 48 hours of the onset of urinary symptoms.

Absolute/Strong Indicators

- Cauda equina syndrome
- Progressive deficits (especially motor)
- Myelopathy

Relative Indicators

- Severe radicular pain
- Underlying stenosis
- Acute onset of severe muscle weakness/atrophy

Disputed Indicators

- Uncontained disc (extrusion or sequestration)

Non Indicators

- Size of herniation
- Stable neurological deficits

Negative Predictors for Surgical Outcomes

- Midline disc herniations
- Radiculopathy > 1 year
- Far lateral disc herniations
- No pain with sitting
- Bulging or protruding disc
- Ongoing litigation
- Low education level
- Heavy manual labor
- Low work satisfaction
- Longer duration of sick leave
- Anxiety, somatisation and passive avoidance coping
- Depression