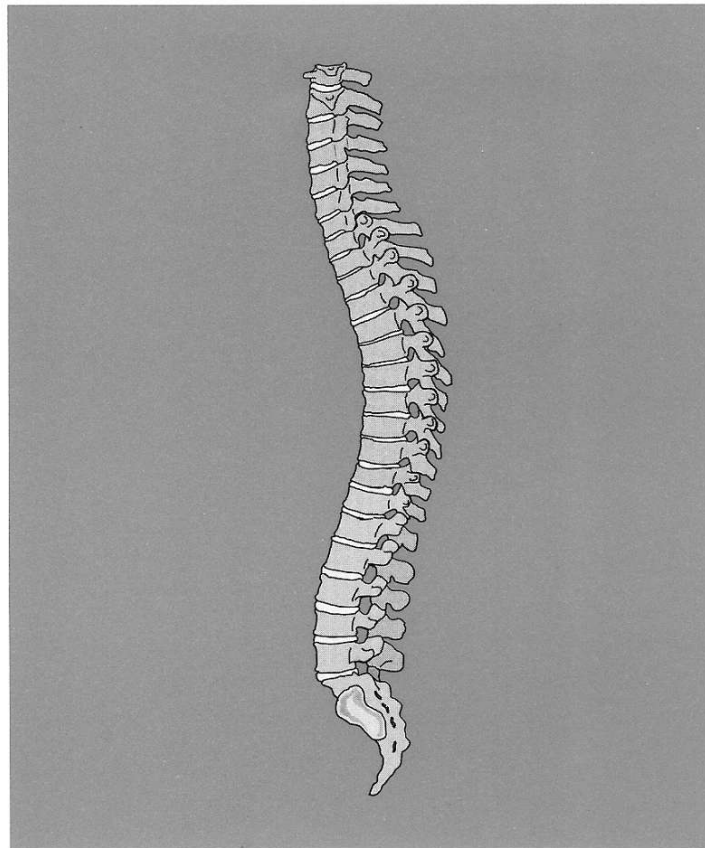


**Clinical Practice Parameter
for
Acute Low Back
Problems in Adults**

Kentucky Health Policy Board (KHPB)



**Published by the Kentucky Department of Workers Claims
June 1996**

June 12, 1996

RE: Clinical Practice Parameters and Workers Compensation

Dear Reader:

Provisions of the 1994 Workers Compensation Reform Act (House Bill 928) required the Commissioner of the Department of Workers Claims to promulgate regulations implementing utilization review and medical bill audit and adopting practice parameters. The purpose of medical bill audit in workers compensation is to assure that physician and hospital reimbursement conforms to duly adopted workers compensation fee schedules. Utilization review refers to systems which have been established by every carrier, self-insured employer, and group self-insurance fund to manage and assess patient care to assure that medically necessary care will be promptly and appropriately rendered in an effective manner. Practice parameters serve as specific criteria to be referenced in the utilization review decision-making process.

At the request of the Commissioner of the Department of Workers Claims, the Kentucky Health Policy Board undertook the challenge of developing a clinical practice parameter for acute low back problems in adults. I extend my thanks to each of the members of the Health Policy Board Low Back Committee who so generously gave of their time and expertise in developing the parameter contained in this book. Special gratitude is expressed to Dr. Beverly M. Gaines and Dr. James R. Bean, who were instrumental in shepherding the project to fruition. All of the members of the committee are to be applauded for toeing the line of science while deciding what treatment is efficacious.

The recommendations contained in the practice parameter are presumptively reasonable while the proponent of care outside of that recommended by the parameter must prove the medical necessity of that alternative treatment.

Utilization review is mandatory in workers compensation claims when:

Pre-certification is requested by a physician.

Elective surgery is recommended.

Placement of a patient into resident work hardening, pain management, or medical rehabilitation is planned.

The patient has missed thirty days of work or has been released from customary duties for sixty days.

Treatment includes a regimen to be performed beyond three months.

Treatment costs exceed \$3,000.

If you have any questions concerning the application of this clinical practice parameter, or need assistance in resolving a workers compensation question, please feel free to call the Department of Workers Claims Ombudsmen Office at (800)554-8601.

Walter W. Turner
Commissioner
Department of Workers Claims

This agency does not discriminate on the basis of race, color, national origin, sex, religion, age or disability in employment or provision of services.

KENTUCKY HEALTH POLICY BOARD CLINICAL PRACTICE PARAMETERS

PREAMBLE

The Kentucky Health Policy Board is directed by HB 250, the 1994 Kentucky Health Care Reform legislation, to develop practice parameters to be used by health care providers in the Commonwealth. The purposes of these clinical practice parameters are to:

- **improve quality of care and health outcomes**
- **assist clinical decision-making**
- **reduce variation in practice**
- **aid clinical judgment and decision-making**
- **educate providers and patients**

Multi-disciplinary panels of experts (representing professional organizations, licensure boards, academic institutions and community providers) from across the Commonwealth developed the practice parameters.

These practice parameters are *science-based guidelines*. While parameters describe the common elements of diagnosis and treatment, unique clinical circumstances must guide clinical decisions. *Delivery of quality care requires careful professional judgment* — balancing individual patient needs with scientific evidence.

Individual patient needs and preferences may necessitate deviation from a parameter. Providers *must document application* of the practice parameter and particularly *any decision to deviate* from the parameter. Practice parameters are not rigid; they are *clinically applicable and clinically flexible*.

The standardized format of the parameters enhances familiarity and use by providers. The successful implementation of these parameters requires *on-going education* of health care providers and patients.

The Kentucky Health Policy Board will *evaluate parameters annually, and update* the recommendations as needed. This review will integrate advances in technology and science as well as process and outcome data acquired in closed systems.

Any health care provider in the Commonwealth of Kentucky who has followed the practice guidelines approved by the board in the treatment of a patient shall be presumed to have met the *appropriate legal standard of care* in medical malpractice cases regardless of any unanticipated complication that may thereafter develop or be discovered.”

[KRS 216B.145(2)].

Dear Health Care Provider:

This Clinical Practice Parameter on Acute Low Back Problems in Adults has been developed for you by the Kentucky Health Policy Board in accordance with KRS 216B.145, the Health Care Reform Legislation enacted in 1994. This document was developed from the Clinical Practice Guideline on **Acute Low Back Problems in Adults: Assessment and Treatment** published by the Agency for Health Care Policy and Research (AHCPR) in December of 1994. A multi-disciplinary panel of health care professionals was convened by Beverly M. Gaines, M.D., Kentucky Health Policy Board member, to develop this practice parameter. The Committee members were:

James R. Bean, M.D., Chairperson
Richard A. Broeg, D.C.
Terrence Brown, P.T.
Gregory E. Gleis, M.D.
Mary Lea Gora Harper, Pharm. D.
Frank Hideg, D.C.
L. Douglas Kennedy, M.D.

Bobbie Kayser, P.T.
Scott R. Koch, M.D.
Andrew A. Meyer, Ph.D.
Robert L. Nold, Sr., M.D.
Cynthia Todd, MSN, R.N.
Frank P. Vannier, M.D.
Joseph L. Zerga, M.D.

This practice parameter was developed after an explicit, science-based review of the AHCPR guideline with the expert clinical judgment of the committee members being utilized to develop a document which is germane to the health care providers in the Commonwealth of Kentucky. Deliberate attention was paid to develop a practice parameter which can be used daily in your clinical practice. This document will be reviewed annually and updated as necessary.

Acute low back problems were selected as a topic for a practice parameter due to the prevalence of back problems, the wide variability in treatment, the ineffectiveness of some modes of treatment, the spontaneous recovery of many low back problems, and the cost involved in the evaluation and treatment of low back pain. The intent of the practice parameter is to focus on helping patients improve activity tolerance for commonly occurring low back pain problems and away from emphasis on the pain and limitations.

This Clinical Practice Parameter presents a clinical strategy for the assessment and management of Acute Low Back Problems. This document contains a statement about scope, condition, diagnosis, treatment, algorithms, indicators, outcomes, listing of major authorities and selected references. Decisions to adopt a particular recommendation must be made by practitioners in light of available resources and circumstances presented by the individual patient. The recommendations may not be appropriate for use in all circumstances. The provider is encouraged to use professional judgment at all times.

Sincerely,

Beverly M. Gaines, M.D.
Member
Kentucky Health Policy Board

James R. Bean, M.D.
Chairperson
Low Back Problems Committee

ACUTE LOW BACK PROBLEMS IN ADULTS

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STATEMENT OF CONDITION

Acute low back problems are defined as activity intolerance due to lower back or back-related leg symptoms of less than 3 months duration.

PURPOSE AND SCOPE

Low back problems affect virtually everyone at some time during their life. About 90 percent of patients with acute low back problems spontaneously recover activity tolerance within 1 month. The approach to a new episode in a patient with a recurrent low back problem is similar to that of a new acute episode.

The findings and recommendations included in the *Acute Low Back Problems in Adults* define a paradigm shift from focusing care exclusively on pain management toward helping patients improve activity tolerance. This document provides information on the detection of serious conditions that occasionally cause low back symptoms (such as spinal fracture, tumor, infection, cauda equina syndrome, or non-spinal conditions). However, treatment of these conditions is beyond the scope of this parameter. In addition, the parameter does not address the care of patients younger than 18 years or those with chronic back problems (back-related activity limitations of greater than 3 months duration).

INITIAL ASSESSMENT

- Seek potentially dangerous underlying conditions.
- In the absence of signs of dangerous conditions, special studies are not necessary since 90 percent of patients will recover spontaneously within 4 weeks.

A focused medical history and physical examination are sufficient to assess the patient with an acute or recurrent limitation due to low back symptoms of less than 4 weeks duration. Some patient responses and findings on the history and physical examination, referred to as “red flags” (Table 1), indicate the possible existence of serious underlying spinal conditions. Their absence rules out the need for special studies during the first 4 weeks of symptoms when spontaneous recovery is expected. The medical history and physical examination can also alert the clinician to non-spinal pathology (abdominal, pelvic, thoracic) that can present as low back symptoms. Acute low back symptoms can be classified into one of three working categories:

- *Potentially serious spinal condition* -- tumor, infection, spinal fracture, or a major neurologic compromise, such as cauda equina syndrome, suggested by a red flag.
- *Sciatica* -- back-related lower limb symptoms suggesting lumbosacral nerve root compromise.
- *Nonspecific back symptoms* -- occurring primarily in the back and suggesting neither nerve root compromise nor a serious underlying condition.

Medical History

Open-ended questions, such as those listed below, can gauge the need for further discussion or specific inquiries for more detailed information:

- *What are your symptoms?*
Pain, numbness, weakness, stiffness?
Located primarily in back, leg, or both? Constant or intermittent?

■ **Do you have any of the following?**

Sleep or appetite disturbance?
Irritability?
Anxiety?

■ **How do these symptoms limit you?**

How long can you sit, stand, walk?
How much weight can you lift?
What activities are affected?

■ **When did the current limitations begin?**

How long have your activities been limited?
More than four (4) weeks?
Have you had similar episodes previously?
Previous testing or treatment?

■ **What do you hope we can accomplish during this visit?**

Physical Examination

Guided by the medical history, the physical examination includes:

■ General observation of the patient.

■ A regional back exam.

■ Neurologic screening.

■ Testing for sciatic and/or nerve root tension.

The examination is mostly subjective since patient response or interpretation is required for all parts except reflex testing and circumferential measurements for atrophy.

Addressing Red Flags

Evidence of severe neurologic compromise on physical examination that correlates with the medical history may indicate a need for immediate consultation. The examination may help increase or reduce suspicions of tumor, infection, or significant trauma. When the medical history is suggestive of non-spinal pathology mimicking a back problem, examination of pulses, abdomen, pelvis, or other areas may be warranted.

Table 1. Red flags potentially serious conditions.

Condition	Medical History	Physical Examination
Possible Fracture	Major trauma, such as vehicle accident or fall from height. Minor trauma or even strenuous lifting (in older or potentially osteoporotic patient).	
Possible tumor or infection	Age over 50 or under 20. History of cancer. Constitutional symptoms, such as recent fever or chills or unexplained weight loss. Risk factors for spinal infection: recent bacterial infection (e.g., urinary tract infection); IV drug abuse; or immune suppression (from steroids, transplant or HIV). Pain that worsens when supine; severe nighttime pain.	
Possible cauda equina syndrome	Saddle anesthesia. Recent onset of bladder dysfunction, such as urinary retention, increased frequency, or overflow incontinence. Severe or progressive neurologic deficit in a lower extremity.	Unexpected laxity of the anal sphincter. Perianal/perineal sensory loss. Major motor weakness: quadriceps (knee extension weakness); ankle plantar flexors, evertors, and dorsiflexors (foot drop).

Observation and Regional Back Examination

Limping or coordination problems indicate the need for specific neurologic testing. Severe guarding of lumbar motion in all planes may support a suspected diagnosis of spinal infection, tumor, or fracture. However, given marked variations among persons with and without symptoms, range-of-motion measurements of the back are of limited value.

Vertebral point tenderness to palpation, when associated with other signs or symptoms, may be suggestive of, but not specific for, spinal fracture or infection. Palpable soft-tissue tenderness is, by itself, an even less specific or reliable finding.

Neurologic Screening

The neurologic examination includes tests that seek evidence of nerve root impairment, peripheral neuropathy, or spinal cord dysfunction. Over 90 percent of all clinically significant lower extremity radiculopathy due to disc herniation involves the L5 or S1 nerve root at the L4-5 or L5-S1 disc level. The clinical findings of nerve root compression are summarized in Figure 1.

Testing Muscle Strength. The patient's inability to toe walk (calf muscles, mostly S1 nerve root), heel walk (ankle and toe dorsiflexor muscles, primarily L5 and some L4 nerve roots), or do a single squat and rise (quadriceps muscles, mostly L4 nerve root) may indicate muscle weakness. Specific testing of the dorsiflexor muscles of the ankle or great toe (suggestive of L5 or some L4 nerve root dysfunction), hamstrings and ankle evertors (L5-S1) and toe flexors (S1) is also important.

- *Investigating Muscle Atrophy.* Circumferential measurements of the calf and thigh bilaterally can detect muscle atrophy. Differences of less than 2 cm in measurements of the two limbs at the same level may be a normal variation. Symmetrical muscle bulk and strength are expected unless the patient has a neurologic impairment or a history of lower extremity muscle or joint problem.

- *Reflexes.* The ankle jerk reflex tests mostly the S1 nerve root and the knee jerk reflex tests mostly the L4 nerve root; neither tests the L5 nerve root. The reliability of reflex testing can be diminished in the presence of adjacent joint or muscle problems. Up-going toes in response to stroking the plantar footpad (Babinski or extensor plantar response) may indicate upper motor-neuron abnormalities (such as myelopathy or demyelinating disease) rather than a common low back problem.

- *Sensory Examination.* Testing light touch or pressure on the medial lower leg (L4); and dorsal (L5) and lateral (S1) aspects of the foot (Figure 1) is usually sufficient for sensory screening.

Clinical Tests for Sciatic Tension

These tests may include:

- *The straight leg raising (SLR) test* (Figure 2) can detect tension on the L5 and/or S1 nerve root. SLR may reproduce leg pain by stretching nerve roots irritated by a disc herniation. Pain below the knee at less than 70 degrees of straight leg raising, aggravated by dorsiflexion of the ankle and relieved by ankle plantar flexion or external limb rotation, is most suggestive of tension on the L5 or S1 nerve root related to disc herniation. **Reproducing back pain alone with SLR testing does not indicate significant nerve root tension.**
- *Testing for Crossover pain* occurs when straight raising of the patient's well limb elicits pain in the leg with sciatica. Crossover pain is a stronger indication of nerve root compression than pain elicited from raising the straight painful limb.
- *The sitting knee extension test* (Figure 3) can also detect sciatic tension. The patient with significant nerve root irritation tends to complain or lean backward to reduce tension on the nerve.

Figure 1. Testing for lumbar nerve root compromise






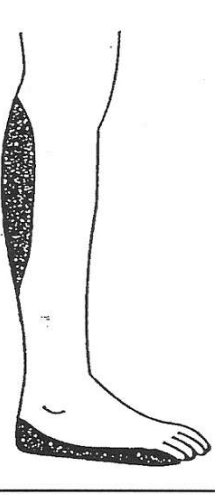
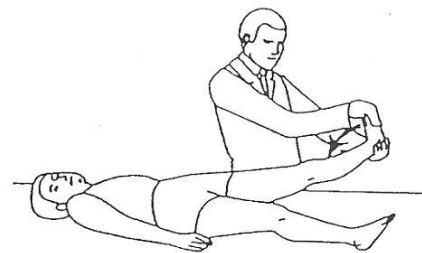
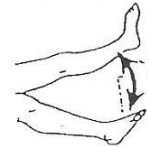
Nerve root	L4	L5	S1
Pain			
Numbness			
Motor weakness	Extension of quadriceps	Dorsiflexion of great toe and foot	Plantar flexion of great toe and foot
Screening Exam	Squat & rise	Heel walking	Walking on toes
Reflexes	Knee jerk diminished	None reliable	Ankle jerk diminished

Figure 2. Instruction for the Straight Leg Raising (SLR) Test

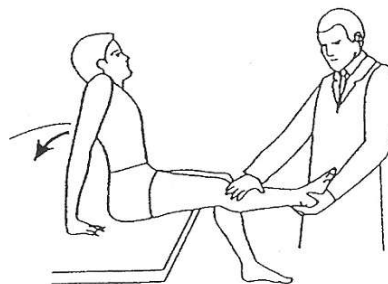
- (1) Ask the patient to lie as straight as possible on a table in the supine position.
- (2) With one hand placed above the knee of the leg being examined, exert enough firm pressure to keep the knee fully extended. Ask the patient to relax.
- (3) With the other hand cupped under the heel, slowly raise the straight limb. Tell the patient, "If this bothers you, let me know, and I will stop."
- (5) Estimate the degree of leg elevation that elicits complaint from the patient. Then determine the most distal area of discomfort: back, hip, thigh, knee, or below the knee.
- (6) While holding the leg at the limit of straight leg raising, dorsiflex the ankle. Note whether this aggravates the pain. Internal rotation of the limb can also increase the tension on the sciatic nerve and spinal nerve roots.



- (4) Monitor for any movement of the pelvis before complaints are elicited. True sciatic tension should elicit complaints before the hamstrings are stretched enough to move the pelvis.

Figure 3. Instruction for the Sitting Knee Extension Test

With the patient sitting on a table, both hip and knees flexed at 90 degrees, slowly extend the knee as if evaluating the patella or bottom of the foot. This maneuver stretches nerve roots as much as a moderate degree of supine SLR.



Inconsistent Findings and Pain Behavior

The patient who embellishes a medical history, exaggerates pain drawings, or provides responses on physical examination inconsistent with known physiology can be particularly challenging. A strongly positive supine straight leg raising test without complaint on sitting knee extension and inconsistent responses on examination indicate that nonphysical factors may be affecting the patient's responses. "Pain behaviors" (verbal or non-verbal communication of distress or suffering) such as amplified grimacing, distorted gait or posture, moaning, and rubbing of painful body parts may also cloud medical issues.

Interpreting inconsistencies or pain behaviors as malingering does not benefit the patient or the clinician. When examining these patients, be sensitive to their needs while attempting to identify psychological or socioeconomic pressures that may be influencing their behavior. The overall goal is always to facilitate the patient's recovery and avoid the development of chronic low back disability.

MANAGEMENT

- Education and patient comfort.
- Oral Pharmaceuticals and physical methods.
- Activity alteration.
- Work Activities.

Patient Education

If the initial assessment detects no serious condition, assure the patient that there is "no hint of a dangerous problem" and that "a rapid recovery can be expected." Provide patient education, which may include printed and audiovisual materials, information given by health care professionals, and educational programs. The need for education will vary among patients and during various stages of care.

Patients with sciatica may have a longer expected recovery time than patients with nonspecific back symptoms and thus may need more education and reassurance.

Any patient who does not recover within a few weeks may need more extensive education about back problems and the reassurance that special studies may be considered if recovery is slow.

Patient Comfort

Comfort is often a patient's first concern. Nonprescription analgesics will provide sufficient pain relief for most patients with acute low back symptoms. If treatment response is inadequate, as evidenced by continued symptoms and activity limitations, prescribed pharmaceutical or physical methods may be added. Comorbid conditions, side effects, cost, and provider/patient preference should guide the clinician's recommendation. Table 2 summarizes symptom control methods.

Table 2. Symptom Control Methods

Recommended			
Condition	Nonprescription Analgesics	Prescribed Pharmaceutical Methods	Prescribed Physical Methods
Nonspecific low back symptoms and sciatica	Acetaminophen (Safest), NSAIDs (Aspirin ¹ , Ibuprofen ¹ , Naproxen Sodium)	Other NSAIDs ¹	
Nonspecific low back symptoms	Acetaminophen (Safest), NSAIDs (Aspirin ¹ , Ibuprofen ¹ , Naproxen Sodium)	Other NSAIDs ¹	Manipulation (in place of medication or a shorter trial if combined with NSAIDs)
Sciatica	Acetaminophen (Safest), NSAIDs (Aspirin ¹ , Ibuprofen ¹ , Naproxen Sodium ¹)	Other NSAIDs ¹	
Options			
Condition	Nonprescription Analgesics	Prescribed Pharmaceutical Methods	Prescribed Physical Methods
Nonspecific low back symptoms and sciatica		Muscle relaxants ^{2,3,4} Opioids ^{2,3,4}	Manipulation (in place of medication or a shorter trial if combined with NSAIDs) ² Heat or cold modalities for home programs ² Physical agents and modalities ² (adjunctive to other recommended care) Few Days' rest ⁴ Shoe insoles ²
Nonspecific low back symptoms		Muscle relaxants ^{2,3,4} Opioids ^{2,3,4}	Heat or cold modalities for home programs ² Physical agents and modalities ² (adjunctive to other recommended care) Shoe insoles ²
sciatica		Muscle relaxants ^{2,3,4} Opioids ^{2,3,4}	Manipulation (in place of medication or a shorter trial if combined with NSAIDs) ² Heat or cold modalities for home programs ² Physical agents and modalities ² (adjunctive to other recommended care) Few Days' rest ⁴ Shoe insoles ²

¹Aspirin and other NSAID, are not recommended for use in combination with one another due to the risk of GI complications.

²Equivocal efficacy.

³Significant potential for producing drowsiness and debilitation; potential for dependency.

⁴Short course (few days only) for severe symptoms.

Oral Pharmaceuticals

The safest effective medication for acute low back problems appears to be acetaminophen. Nonsteroidal anti-inflammatory drugs (NSAIDs), including aspirin and ibuprofen, are also effective although they can cause gastrointestinal irritation/ulceration or (less commonly) renal or allergic problems. Phenylbutazone is not recommended due to risks of bone marrow suppression.

Acetaminophen may be used safely in combination with NSAIDs, other pharmacologic agents, or physical methods, especially in otherwise healthy patients.

Muscle relaxants seem no more effective than NSAIDs for treating patients with low back symptoms, and using them in combination with NSAIDs has no demonstrated benefit. Side effects, including drowsiness, have been reported in up to 30 percent of patients taking muscle relaxants.

Opioids appear no more effective than other analgesics for managing low back symptoms. Opioids should be avoided if possible and, when chosen, used only for a short time. Poor patient tolerance and side effects, such as clouded judgment, potential misuse/dependence, drowsiness, and decreased reaction time have been reported in up to 35 percent of patients. Patients should be warned of these potentially debilitating problems.

Physical Methods

- **Manipulation.** This is a safe and effective treatment for patients without radiculopathy, especially in the first month of acute low back symptoms. Manipulation may be an option for patients with radiculopathy or symptoms greater than one month. If manipulation has not resulted in symptomatic and functional improvement after 4 weeks of treatment, it should be stopped and the patient reevaluated.

- **Traction.** When applied to the spine, traction has not been found to be effective for treating acute low back symptoms.

- **Physical modalities.** Self-application of heat or cold therapy applied at home for temporary symptom relief is often adequate. Massage, ultrasound, or electrical stimulation (not transcutaneous electrical nerve stimulation or TENS) may be used selectively (not more than 2 modalities) adjunctive to other care during the period of acute pain for up to 3 weeks. TENS and other physical modalities have not been proven to be effective for treating acute low back problems.

- **Invasive techniques.** Methods such as *needle acupuncture* and *injection procedures* (injection of trigger points in the back; injection of facet joints; injection of steroids, lidocaine, or opioids in the epidural space) have not been proven to be effective for treating acute low back symptoms. Epidural steroid injections are an option for short-term relief of radicular pain after failure of conservative treatment and/or as a means of avoiding surgery.

- **Other miscellaneous therapies** have been evaluated. No evidence indicates that *shoe lifts* are effective in treating acute low back symptoms or limitations, especially when the difference in lower limb length is less than 2 cm. Shoe insoles are a safe and inexpensive option if requested by patients with low back symptoms who must stand for prolonged periods. Low back corsets and back belts, do not appear beneficial for treating acute low back symptoms, but may allow earlier return to work and other activities of daily living.

Activity Alteration

Most patients will not require bed rest. Prolonged bed rest or inactivity (more than 4 days) has potential debilitating effects, and its efficacy in the treatment of acute low back problems is unproven. Only patients with the most severe limitations (due primarily to leg pain) may require two to four days of bed rest.

- *Avoid undue back irritation.* Activities and postures that increase stress on the back also tend to aggravate back symptoms. Patients limited by back symptoms can minimize the stress of lifting by keeping any lifted object close to the body. Twisting, bending, and reaching while lifting also increase stress on the back. Sitting, although safe, may aggravate symptoms for some patients. Advise these patients to avoid prolonged sitting and to change position often. A soft support placed at the small of the back, armrests to support some body weight, and a slight recline of the chair back may make required sitting more comfortable.
- *Avoid debilitation.* Until the patient returns to normal activity, aerobic (endurance) conditioning exercise such as walking, stationary biking, and swimming may be recommended to help avoid debilitation from inactivity. Usually a gradually increasing regimen of aerobic exercise (up to 20 to 30 minutes daily) can be started within the first 2 weeks of symptoms. Such conditioning activities do not stress the back more than sitting for an equal time period on the side of the bed.

Patients should be informed that exercise may increase symptoms slightly at first. If intolerable, some exercise alteration is usually helpful.

Conditioning exercises for trunk muscles are more mechanically stressful to the back than aerobic exercise. Such exercises are not recommended during the first two weeks of symptoms, although they may help patients regain and maintain activity tolerance later in their recovery.

No evidence indicates that back-specific exercise machines are effective for treating acute low back problems. Neither does evidence support that stretching of the back helps patients with acute symptoms.

Work Activities

Clinicians may choose to offer specific instructions about activity at work for patients with acute limitations due to low back symptoms. The patient's age, general health, and perceptions of safe limits of sitting, standing, walking or lifting (noted on initial history) can help provide reasonable starting points for activity recommendations. Table 3 provides guidelines about sitting and unassisted lifting. The clinician should make clear to patients and employers that:

- Even moderately heavy unassisted lifting may aggravate back symptoms.
- Any restrictions are intended to allow for spontaneous recovery or time to build activity tolerance through exercise.

Activity restrictions are prescribed for a short time period only, depending upon work requirements (no benefits are apparent beyond 3 months).

Table 3. Guidelines for sitting and unassisted lifting.

Activity	Symptoms			
	None	Mild	Moderate	Severe
Sitting¹	50 min	40 min	30 min	20 min
Unassisted lifting²				
Men	80 lbs	60 lbs	20 lbs	20 lbs
Women	40 lbs	35 lbs	20 lbs	20 lbs

SPECIAL STUDIES AND DIAGNOSTIC CONSIDERATIONS

Routine testing (laboratory tests, plain x-rays of the lumbosacral spine) and imaging studies are not recommended during the first month of activity limitation due to back symptoms except when a red flag noted on history or examination indicates that the patient may have a dangerous low back or non-spinal condition.

If a patient's limitations due to low back symptoms do not improve in 4 weeks, reassessment is recommended. After again reviewing the patient's activity limitations, history, and physical findings, the clinician may then consider further diagnostic studies, and discuss these with the patient.

Timing and Limits of Special Studies

Waiting 4 weeks before considering special tests allows 90 percent of patients to recover and avoids unneeded procedures. This also reduces the potential confusion of falsely labeling age-related changes on imaging studies (commonly noted in patients older than 30 without back symptoms) as the cause of the acute symptoms. In the absence of either red flags or persistent activity

limitations due to continuous limb symptoms, imaging studies (especially plain x-rays) rarely provide information that changes the clinical approach to the acute low back problem.

Selection of Special Studies

Prior to ordering imaging studies the clinician should have noted either of the following:

- The emergence of a red flag.
- Physiologic evidence of tissue insult or neurologic dysfunction.

Physiologic evidence may be in the form of definitive nerve findings on physical examination, electrodiagnostic studies (when evaluating sciatica), and a laboratory test or bone scan (when evaluating nonspecific low back symptoms). Findings that identify specific nerve root compromise on the neurologic examination (see Figure 1) are sufficient physiologic evidence to warrant imaging. When the neurologic examination is less clear, however, further physiologic evidence of nerve root dysfunction should be considered before ordering an imaging study. Electromyography (EMG) including H-reflex tests may be useful to identify subtle local neurologic dysfunction in patients with leg symptoms lasting longer than 3-4 weeks.

¹Without getting up and moving around.

²Modification of NIOSH Lifting Guidelines, 1981, 1993. Gradually increase unassisted lifting limits to 60 lbs (men) and 35 lbs (women) by 3 months even with continued symptoms. Instruct patient to limit twisting, bending, reaching while lifting and to hold lifted object close to the body.

Laboratory tests such as erythrocyte sedimentation rate (ESR), complete blood count (CBC), and urinalysis (UA), as well as pelvic and rectal examinations are useful to screen for medical diseases. A bone scan can detect physiologic reactions to suspected spinal tumor, infection, or occult fracture.

If physiologic evidence indicates tissue insult or nerve impairment, consultation with a specialist may help the primary clinician select the most clinically valuable study to define a potential anatomic cause and avoid duplication of testing by the specialist. Discography is not recommended for assessing patients with acute low back symptoms.

In general, an imaging study may be an appropriate consideration for the patient whose limitations due to consistent symptoms have persisted for 1 month or more:

- When surgery is being considered for treatment of a specific detectable loss of neurologic function.
- To further evaluate potentially serious spinal pathology.

Infrequently, imaging studies may be appropriate in the first 4 weeks when sciatic pain is uncontrolled and surgery is being considered.

Reliance upon imaging studies alone to evaluate the source of low back symptoms, however, carries a significant risk of diagnostic confusion, because the imaging findings may be unrelated to the patient's symptoms. Imaging studies should be correlated with clinical findings.

MANAGEMENT CONSIDERATION AFTER SPECIAL STUDIES

Surgical Considerations

During the first 3 months of acute low back symptoms, surgery should be considered only when serious spinal pathology or nerve root dysfunction obviously due to a herniated lumbar disc or other cause of nerve root compression is detected. The presence of a herniated lumbar disc on an imaging study, however, does not necessarily imply nerve root dysfunction. Unrelated findings occur in imaging studies in up to 30% of people without symptoms at age 30. Studies of asymptomatic adults commonly demonstrate intervertebral disc herniations that apparently do not entrap a nerve root or cause symptoms.

Therefore, nerve root decompression can be considered for a patient if all of the following criteria exist:

- Sciatica is both severe and disabling.
- Symptoms of sciatica persist without improvement for longer than 4 weeks or with extreme progression (rapidly progressive neurologic deficit or uncontrolled sciatic pain).
- Strong physiologic evidence of dysfunction of a specific nerve root with intervertebral disc herniation or other cause of nerve root compression is confirmed at the corresponding level and side by findings on an imaging study.

Patients with acute low back pain alone, without findings of serious conditions or significant nerve root compression, rarely benefit from a surgical consultation.

Many patients with strong clinical findings of nerve root dysfunction due to disc herniation recover activity tolerance within 1 month; no evidence indicates that delaying surgery for this period worsens outcomes.

With or without an operation, more than 80 percent of patients with obvious surgical indications eventually recover.

Direct and indirect nerve root decompression for herniated discs. Direct methods of nerve root decompression include laminotomy (expansion of the interlaminar space for access to the nerve root and the offending disc fragments), microdiscectomy (laminotomy using a microscope), and laminectomy (total removal of laminae).

Methods of indirect nerve root decompression include chemonucleolysis, the injection of chymopapain or other enzymes to dissolve the inner disc. Such chemical treatment methods are less efficacious than standard or microdiscectomy and have rare but serious complications. Any of these methods is preferable to percutaneous discectomy (indirect, mechanical disc removal through a lateral disc puncture).

Management of spinal stenosis. This disorder usually results from soft tissue and bony encroachment of the spinal canal and nerve roots. Spinal stenosis typically has a gradual onset and begins in older adults. It is characterized by nonspecific limb symptoms, called *neurogenic claudication* or *pseudoclaudication*, that decrease the amount of time a person can comfortably stand and walk. The symptoms are commonly bilateral and rarely associated with strong focal findings on examination.

Neurogenic claudication, however, can be confused or coexist with *vascular claudication*, in which leg pain also limits walking. The symptoms of vascular insufficiency can be relieved by simply standing still, while neurogenic claudication symptoms usually require the patient to flex the lumbar spine or sit.

Elderly patients with spinal stenosis who tolerate their daily activities usually do not require surgery unless they develop new signs of bowel or bladder dysfunction. Decisions on treatment should take into account the patient's preference, lifestyle, other medical problems, and risks of surgery. Surgery for spinal stenosis is rarely considered during the first 3 months of symptoms. Except for cases of trauma-related spinal fracture or dislocation, fusion alone usually is not considered during the first 3 months following onset of low back symptoms.

Further Management Considerations

Following diagnostic or surgical procedures, the management of most patients is focused on improving physical conditioning through an incrementally increased exercise program. The goal of this program is to build activity tolerance and overcome individual limitations due to back symptoms. At this point in treatment, symptom control methods are only an adjunct to making prescribed exercises more tolerable.

- The exercise program is begun with low stress aerobic activities to improve general stamina (walking, riding a bicycle, and swimming).
- Then, exercises to condition specific trunk muscles can be added. The back muscles may need to be in better condition than before the problem occurred. Otherwise, the back may continue to be painful and easily irritated by even mild activity. Following back surgery, recovery of activity tolerance may be delayed until protective muscles are conditioned well enough to compensate for any remaining structural changes.
- Finally, specific training to perform activities required at home or work can begin. The objective of this program is to increase the patient's tolerance in carrying out actual daily duties.

When patients demonstrate difficulty regaining the ability to tolerate the activities they are required (or would like) to do, the clinician may pose the following diagnostic and treatment questions:

- Could the patient have a serious, undetected medical condition? A careful review of the medical history and physical examination is warranted.
- Are the patient's activity goals realistic? Exploring briefly the patient's expectations, both short- and long-term, of being able to perform specific activities at home, work, or recreation may help the patient assess whether such activity levels are actually achievable.

- If for any reason the achievement of activity goals seems unlikely, what are the patient's remaining options? To answer this question, the patient often is required to gather specific information from family, friends, employers, or others. If, on follow up visits, the patient has made no effort to gather such information, the clinician can point out that low back symptoms alone rarely prevent a patient from addressing questions so important to his or her future. This observation can lead to an open, nonjudgmental discussion of common but complicated psychosocial problems or other issues that often can interfere with a patient's recovery from low back problems. The clinician can then help the patient address or arrange further evaluation of any specific problem limiting the patient's progress. This can usually be accomplished as the patient continues, with the clinician's encouragement, to build activity tolerance through safe, simple exercises.

Summary of Parameter Recommendations

The ratings in parentheses indicate the scientific evidence supporting each recommendation according to the following scale:

- A = strong research-based evidence (multiple relevant and high-quality scientific studies).
- B = moderate research-based evidence (one relevant, high-quality scientific study or multiple adequate scientific studies).
- C = limited research-based evidence (at least one adequate scientific study in patients with low back pain).
- D = panel interpretation of evidence not meeting inclusion criteria for research-based evidence.

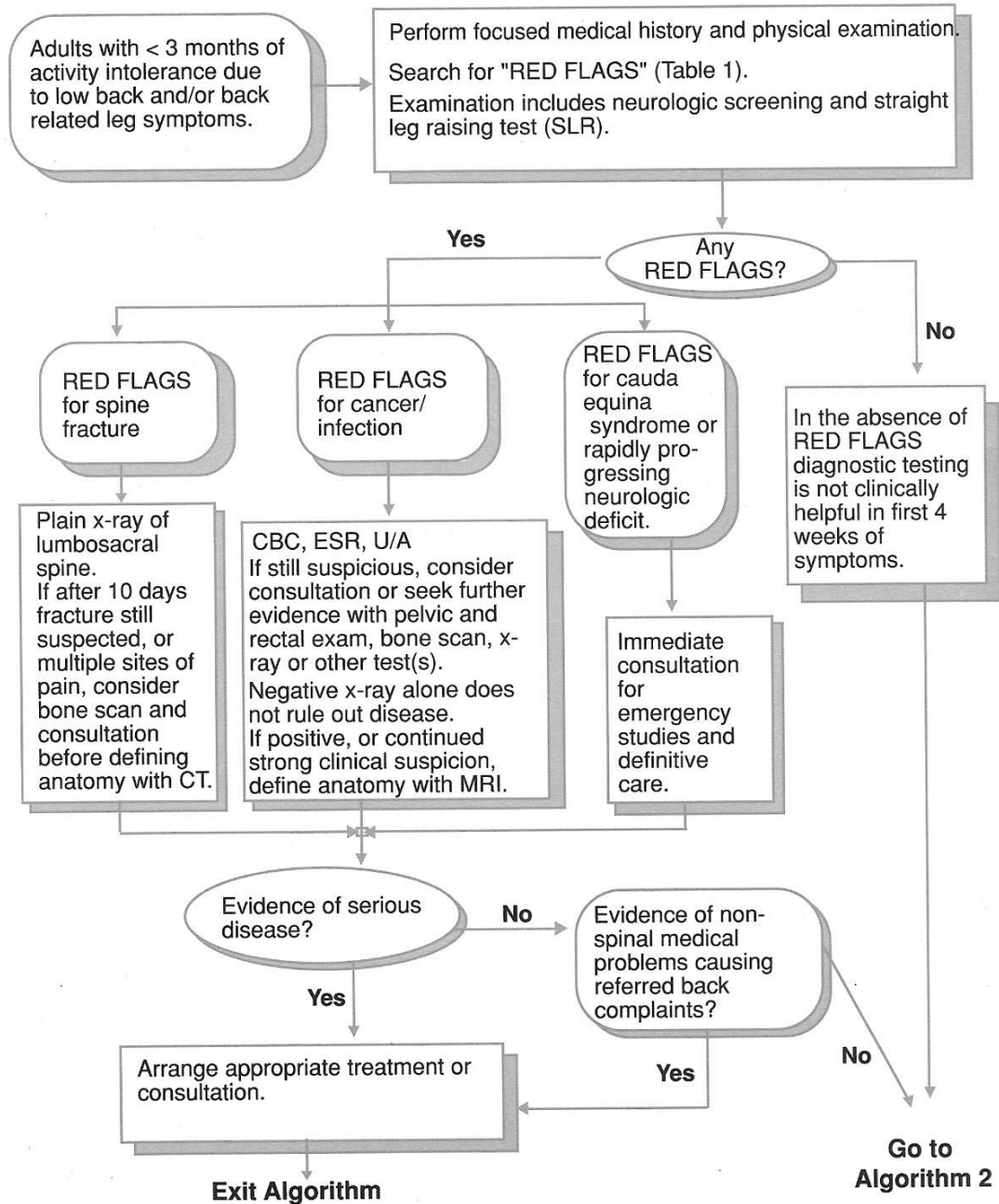
The number of studies meeting panel review criteria is noted for each category.

Table 4. Summary of Parameter Recommendations			
	Recommended	Option	Not Recommended
History and physical exam 34 studies	Basic history (B). History of cancer/infection (B). Signs/symptoms of cauda equina syndrome (C). History of significant trauma (C). Psychosocial history (C). Straight leg raising test (B). Focused neurological exam (B).	Pain drawing and visual analog scale (D).	
Patient education 14 studies	Patient education about low back symptoms (B). Back school in occupational settings (C).	Back school in non-occupational settings (C).	
Medication 23 studies	Acetaminophen (C). NSAIDs (B).	Muscle relaxants (C). Opioids, short course (C). Antidepressants, sleep disorder (D).	Opioid use long term (C). Phenylbutazone (C). Oral steroids (C). Colchicine (B). Antidepressants (C).
Physical treatment methods 42 studies ¹	Manipulation of low back pain, especially during the first month of symptoms (B).	Manipulation for patients with radiculopathy (C). Manipulation for patients with symptoms >1 month (C). Self-application of heat or cold to low back. Shoe insoles (C). Corset for use in occupational setting (C). Selective physical modalities(D) ¹ .	Manipulation for patients with undiagnosed neurologic deficits (D). Prolonged course of manipulation (D). Traction (B). Biofeedback (C). Shoe lifts (D). Corset for treatment (D). TENS (D).

	Recommended	Option	Not Recommended
Injections 26 studies		Epidural steroid injections for radicular pain to avoid surgery (C).	Trigger point injections (C). Ligamentous injections (C). Facet joint injections (D). Needle acupuncture (D). Epidural injections for back pain without radiculopathy (D).
Bed rest 4 studies		Bed rest of 2-4 days for severe radiculopathy (D).	Bed rest > 4 days (B).
Activities and exercise 20 studies	Temporary avoidance of activities that increase mechanical stress on spine (D). Gradual return to normal activities (B). Low-stress aerobic exercise (C). Conditioning exercises for trunk muscles after 2 weeks (C). Exercise quotas (C).		Back-specific exercise machines (D). Therapeutic stretching of back muscles (D).
Detection of physiologic abnormalities 14 studies	If no improvement after 1 month, consider: Bone scan (C). Needle EMG and H-reflex tests to clarify nerve root dysfunction (C). Pelvic/rectal exams (D).		EMG for clinically obvious radiculopathy (D). Surface EMG and F-wave tests (C). Thermography (C).
X-rays of L-S spine 18 studies	When red flags for fracture present (C). When red flags for cancer or infection present (C).		Routine use in first month of symptoms in absence of red flags (B). Routine oblique views (B).
Imaging 18 studies	CT or MRI when cauda equina syndrome, tumor, infection, or fracture strongly suspected (C). MRI test of choice for patients with prior back surgery (D). After 1 month MRI or CT if surgery considered.	Myelography or CT-myelography for preoperative planning (D).	Use of imaging test before one month unless red flags (B) or uncontrollable sciatica (D) present. Discography or CT-discography (C).

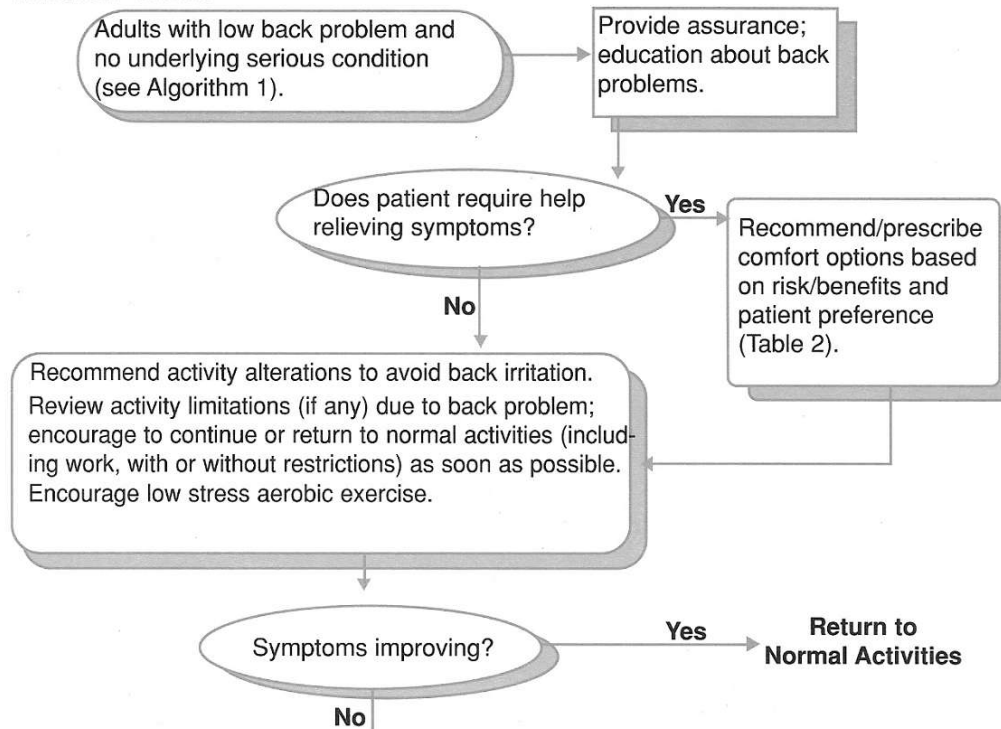
	Recommended	Option	Not Recommended
Surgical considerations 14 studies	Discuss surgical options with patients with persistent and severe sciatica and clinical evidence of nerve root compromise after 1 month of conservative therapy (B). Standard discectomy and microdiscectomy of similar efficacy in treatment of herniated disc (B). Chymopapain, used after ruling out allergic sensitivity, acceptable but less efficacious than discectomy to treat herniated disc (C).		Disc surgery in patients with back pain alone, no red flags, and no nerve root compression (D). Percutaneous discectomy less efficacious than chymopapain (C). Surgery for spinal stenosis within the first 3 months of symptoms (D). Stenosis surgery when justified by imaging test rather than patient's functional status (D). Spinal fusion during the first 3 months of symptoms in the absence of fracture, dislocation, complications of tumor or infection (C).
Psychosocial factors	Social, economic, and psychological factors can alter patient response to symptoms and treatment (D).		Referral for extensive evaluation/treatment prior to exploring patient expectations or psychosocial factors (D).

Algorithm 1. Initial evaluation of acute low back problem.

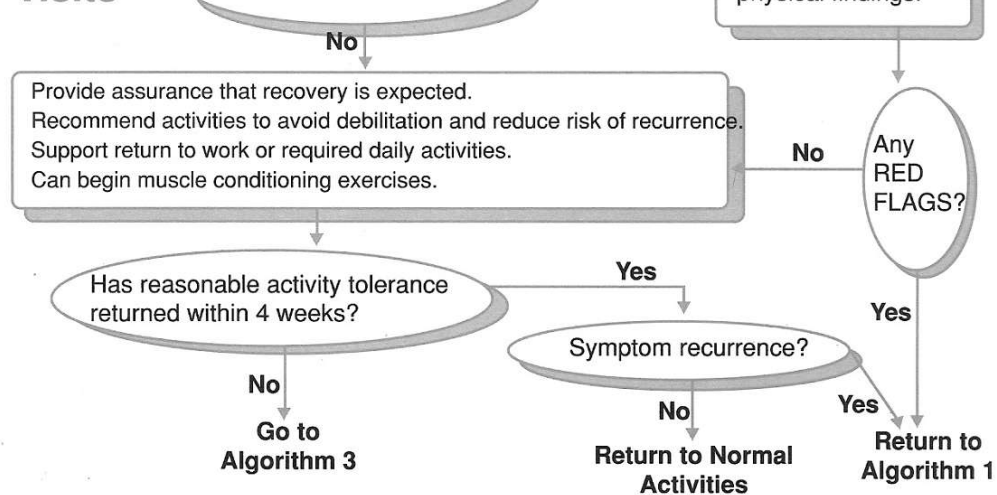


Algorithm 2. Treatment of acute low back problem on initial and follow-up visits

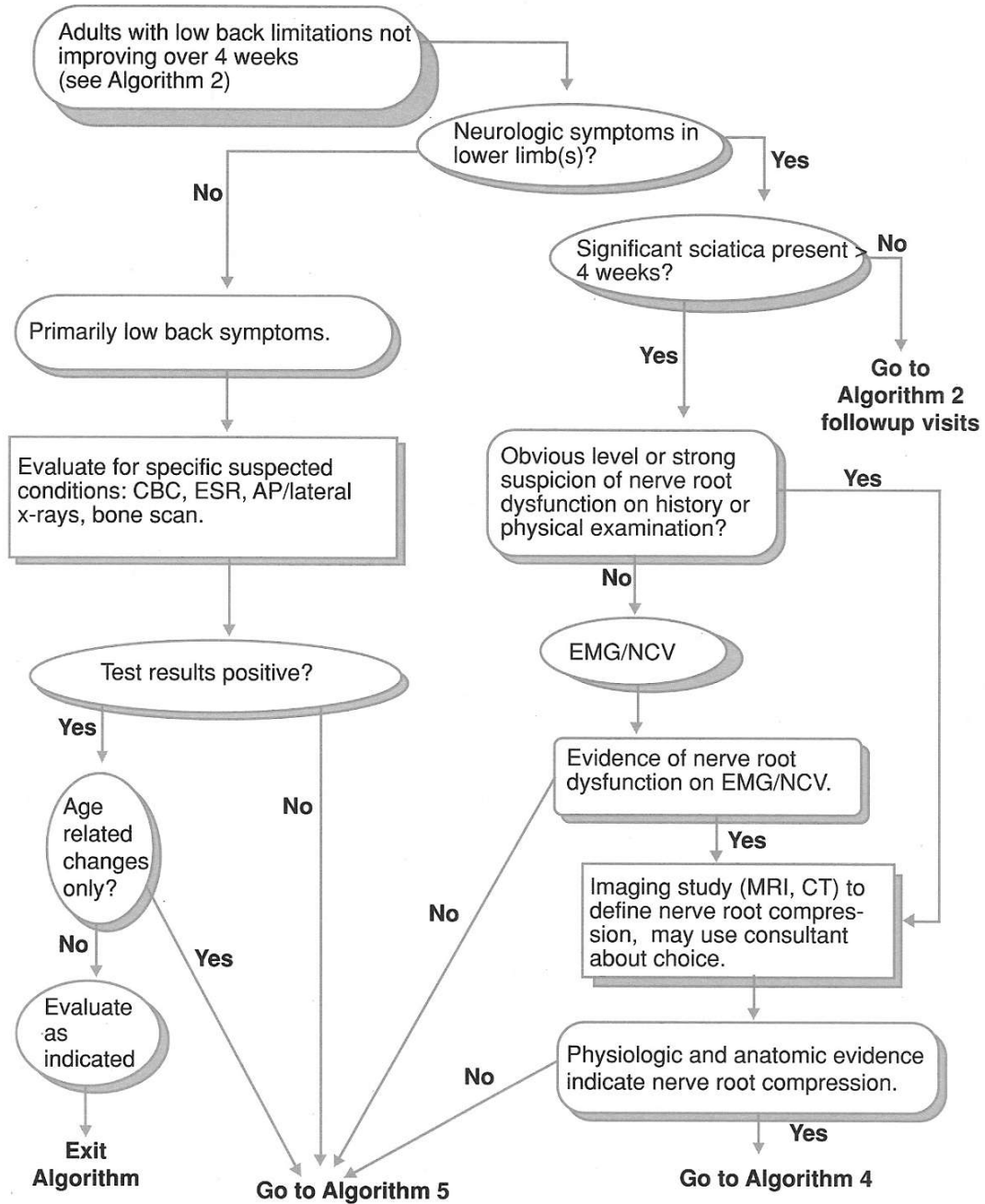
Initial visit



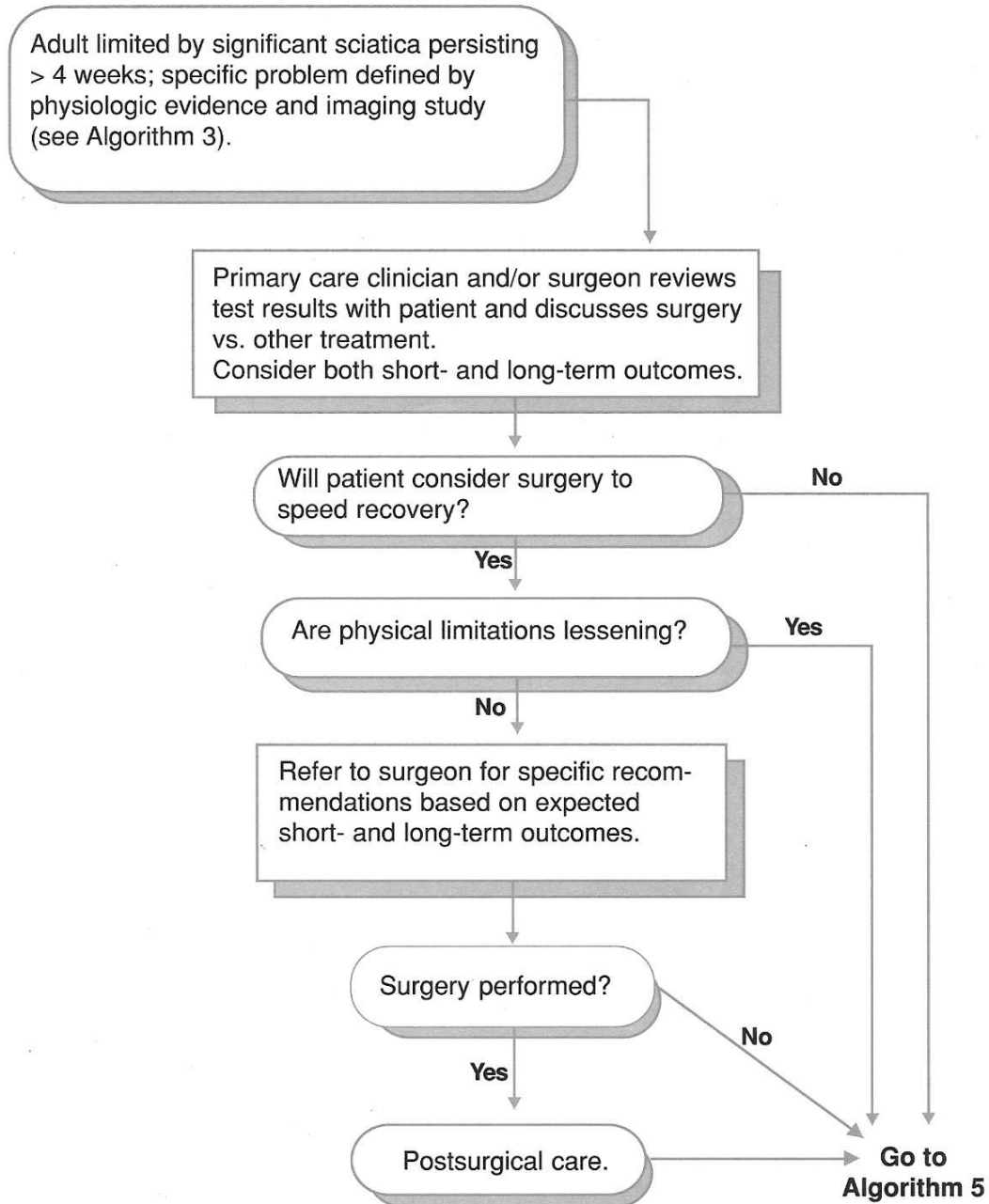
Follow-up visits



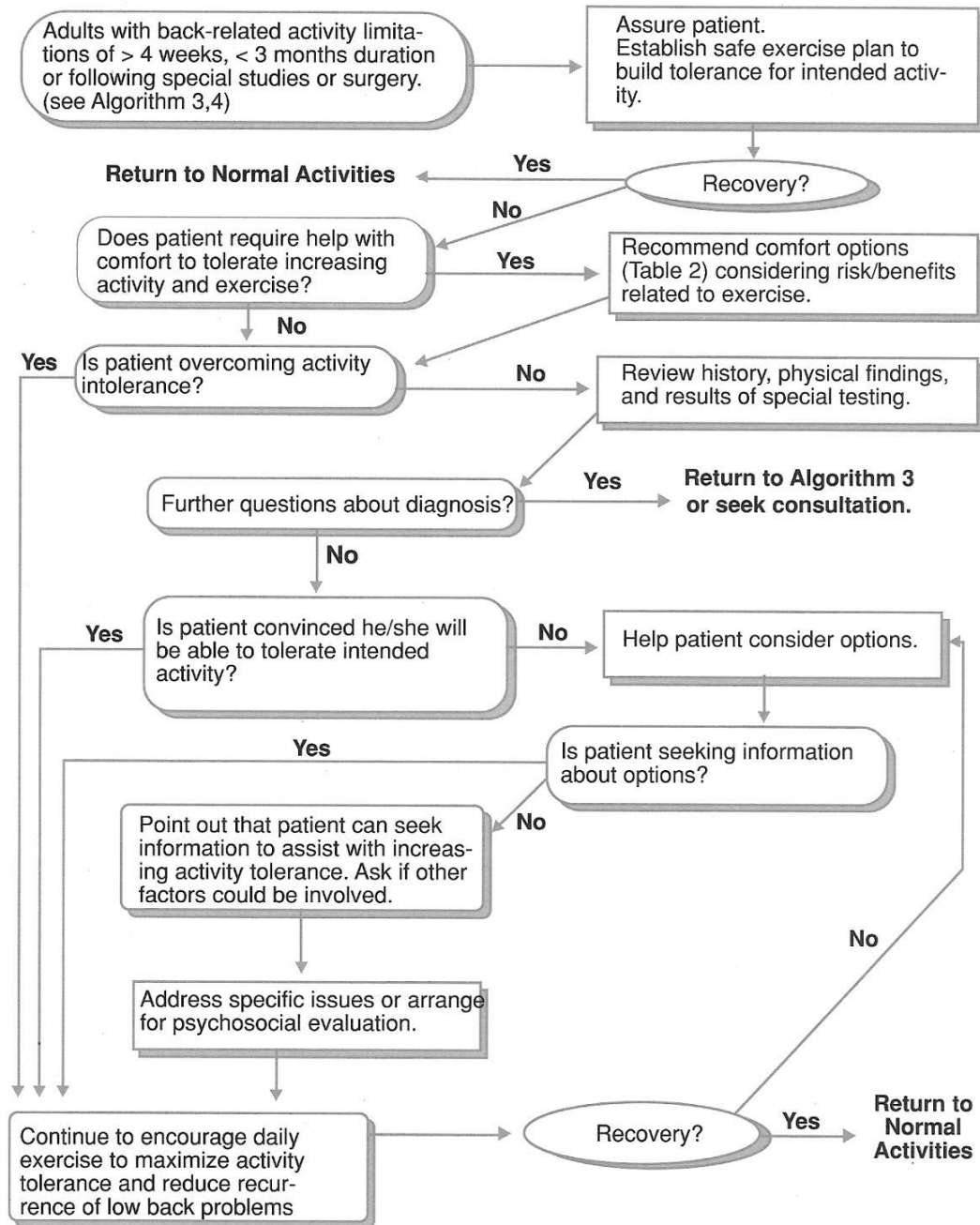
Algorithm 3. Evaluation of the slow-to-recover patient (symptoms > 4 weeks)



Algorithm 4. Surgical considerations for patients with persistent sciatica.



Algorithm 5. Further management of acute low back problem



Glossary

Acute low back problem. Activity limitation(s) due to low back symptoms (back pain or back-related leg pain) present less than 3 months.

Biofeedback. The use of auditory and visual signals reflecting a patient's muscular activity to allow the patient to facilitate or extinguish this muscle action. In patients with low back pain, the objective is to reduce pain by reducing muscle tension.

Cauda equina syndrome. Compression (usually due to the extrinsic pressure of a massive, centrally herniated disc) on a sheaf of nerve roots from the lower cord segments, often resulting in bilateral motor weakness of the lower extremities, saddle anesthesia, and urine retention or incontinence from loss of sphincter function.

Chemoneucleolysis. The injection of a proteolytic enzyme (e.g., chymopapain) into the nucleus pulposus of a disc.

CT-myelography. Computerized tomography done after contrast media has been injected into the dural sac.

Diathermy. Therapeutic elevation of the temperature of deep tissues by means of high frequency short-wave or microwaves.

Discography. The injection of a water-soluble imaging material directly into the nucleus pulposus of a disc to assess the extent of disc damage and characterize the pain response.

Discectomy. The surgical removal of all or part of a herniated intervertebral disc compressing a nerve root. When microscopic or visually aided surgical techniques are used, this procedure is referred to as microdiscectomy.

Electromyography (EMG). An examination of the electrical activity of a motor unit, useful in determining the site of injury in a peripheral nerve and in detecting spinal nerve root lesions as well as primary muscle diseases. Needle EMG involves the insertion of needle electrodes into muscle; surface EMG uses surface electrodes instead of needle insertion.

Ergonomics. The study of the proper and efficient use of the body in work and recreation, including the design and operation of machines and the physical environment.

Herniated disc. Herniation of the central gelatinous material (nucleus pulposus) of an intervertebral disc through its fibrous outer covering (annulus fibrosis).

Nerve conduction studies. Tests of peripheral nerves performed by stimulating the nerve at one point and measuring the action potential either at another point along the nerve (sensory conduction) or of the muscle innervated by the nerve (motor conduction).

Neurogenic claudication. Symptoms of bilateral leg pain, numbness, and weakness on walking or standing, relieved by sitting or spinal flexion, related to neural compression, usually spinal stenosis.

Radiculopathy. Dysfunction of a nerve root often caused by compression of the root. Pain, sensory impairment, weakness, or depression of deep tendon reflexes may be noticed in the distribution of nerves derived from the involved nerve root.

Saddle anesthesia. Loss of sensation in the skin over the perineum, indicative of dysfunction of sacral nerve roots.

Sciatica. Pain radiating down the posterior leg(s) below the knee along the distribution of the sciatic nerve, usually related to mechanical pressure and/or inflammation of lumbosacral nerve roots.

Spinal manipulation. Manual therapy for symptomatic relief and functional improvement of the back in which loads are applied to the spine using short or long lever methods. The selected spinal joint is moved to its end range of voluntary motion, followed by application of an impulse load.

Spinal stenosis. A narrowing of the spinal canal that may produce a bony constriction of the cauda equina and the emerging nerve roots.

Spondylolisthesis. Forward subluxation of the body of a lumbar vertebra on the vertebra below.

Spondylolysis. A cleft through the posterior vertebral arch, loosening its normally firm attachment to contiguous vertebrae.

Straight leg raising (SLR). A procedure of stretching the sciatic nerve to see if radicular symptoms are reproduced. Each hip is alternately flexed with the knee extended; the extent to which the leg opposite the pain can be lifted is evidence of a positive “crossed” straight leg raising test.

Transcutaneous electrical nerve stimulation (TENS). A small battery-operated device, worn by the patient, which provides continuous electrical pulses via surface electrodes with the goal of providing symptomatic relief by modifying pain perception.

Traction. When used for low back problems, intermittent or continuous force is applied along the axis of the spine in an attempt to elongate the spine. The type most commonly used for low back problems is pelvic traction in which a girdle around the patient’s pelvis is attached to weights hung at the foot of the bed.

Trigger point. A well-localized point of tenderness. In low back problems, these points are usually located in the paravertebral areas.

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