

**Diagnosis and Treatment of Low Back Pain:
A Joint Clinical Practice Guideline from the American College of Physicians
(ACP)
and the
American Pain Society (APS)**

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Roger Chou, MD; Amir Qaseem, MD, PhD, MHA; Vincenza Snow, MD; Donald Casey, MD, MPH, MBA; J. Thomas Cross Jr., MD, MPH; Paul Shekelle, MD, PhD; and Douglas K. Owens, MD, MS, for the Clinical Efficacy Assessment Subcommittee of the American College of Physicians and the American College of Physicians/American Pain Society Low Back Pain Guidelines Panel

This article has 131 references.

Recommendation 1:

Clinicians should conduct a focused history and physical examination to help place patients with low back pain into 1 of 3 broad categories:

- 1) Nonspecific low back pain
- 2) Back pain potentially associated with radiculopathy or spinal stenosis
- 3) Back pain potentially associated with another specific spinal cause

The history should include assessment of psychosocial risk factors, which predict risk for chronic disabling back pain.

Recommendation 2:

Clinicians should not routinely obtain imaging or other diagnostic tests in patients with nonspecific low back pain.

Recommendation 3:

Clinicians should perform diagnostic imaging and testing for patients with low back pain when severe or progressive neurologic deficits are present or when serious underlying conditions are suspected on the basis of history and physical examination.

Recommendation 4:

Clinicians should evaluate patients with persistent low back pain and signs or symptoms of radiculopathy or spinal stenosis with magnetic resonance imaging (preferred) or computed tomography only if they are potential candidates for surgery or epidural steroid injection (for suspected radiculopathy).

Recommendation 5:

Clinicians should provide patients with evidence-based information on low back pain with regard to their expected course, advise patients to remain active, and provide information about effective self-care options.

Recommendation 6:

For patients with low back pain, clinicians should consider the use of medications with proven benefits in conjunction with back care information and self-care.

Clinicians should assess severity of baseline pain and functional deficits, potential benefits, risks, and relative lack of long-term efficacy and safety data before initiating therapy.

For most patients, first-line medication options are acetaminophen or nonsteroidal anti-inflammatory drugs.

Recommendation 7:

For patients who do not improve with selfcare options, clinicians should consider the addition of nonpharmacologic therapy with proven benefits—for acute low back pain, spinal manipulation.

For chronic or subacute low back pain, intensive interdisciplinary rehabilitation, exercise therapy, acupuncture, massage therapy, spinal manipulation, yoga, cognitive-behavioral therapy, or progressive relaxation.

THESE AUTHORS ALSO NOTE:

“Low back pain is the fifth most common reason for all physician visits in the United States.”

One quarter of U.S. adults reported having low back pain lasting at least 1 whole day in the past 3 months.

The total direct health care costs attributable to low back pain in the U.S. was about \$26.3 billion in 1998.

Additional indirect costs related to days lost from work are substantial, with approximately 2% of the U.S. work force compensated for back injuries each year.

About “one third of patients report persistent back pain of at least moderate intensity 1 year after an acute episode, and 1 in 5 [20%] report substantial limitations in activity.”

“Approximately 5% of the people with back pain disability account for 75% of the costs associated with low back pain.”

The literature search for this guideline included studies from MEDLINE (1966 through November 2006), the Cochrane Database of Systematic Reviews, the Cochrane Central Register of Controlled Trials, and EMBASE.

RECOMMENDATIONS: EVALUATION OF LOW BACK PAIN

Recommendation 1:

Clinicians should conduct a focused history and physical examination to help place patients with low back pain into 1 of 3 broad categories: nonspecific low back pain, back pain potentially associated with radiculopathy or spinal stenosis, or back pain potentially associated with another specific spinal cause. The history should include assessment of psychosocial risk factors, which predict risk for chronic disabling back pain.

“More than 85% of patients who present to primary care have low back pain that cannot reliably be attributed to a specific disease or spinal abnormality.”

Specific disorders that cause low back pain include:

Ankylosing spondylitis	0.3% to 5% of cases
Compression fracture	4%
Symptomatic herniated disc	4%
Spinal stenosis	3%
Cancer	0.7%
Cauda equina syndrome	0.04%
Spinal infection	0.01%

“Cauda equina syndrome is most commonly associated with massive midline disc herniation, but is rare.”

Clinicians should inquire about:

- Location of pain
- Frequency of symptoms
- Duration of pain
- History of previous symptoms
- Prior treatment and response to treatment

“The possibility of low back pain due to problems outside the back, such as pancreatitis, nephrolithiasis, or aortic aneurysm, or systemic illnesses, such as endocarditis or viral syndromes, should be considered.”

All patients should be evaluated for rapidly progressive or severe neurologic deficits, fecal incontinence, and bladder dysfunction.

“The most frequent finding in the cauda equina syndrome is urinary retention (90% sensitivity). In patients without urinary retention, the probability of the cauda equina syndrome is approximately 1 in 10,000.”

Clinicians should also ask about risk factors for cancer and infection.

Risk factors for back pain caused by cancer include:

- 1) A history of cancer (positive likelihood ratio (9% increased risk)
- 2) Unexplained weight loss (positive likelihood ratio (1.2% increased risk)
- 3) Failure to improve after 1 month (1.2% increased risk)
- 4) Age older than 50 years (1.2% increased risk)

Features predicting the presence of vertebral infection include:

- 1) Fever
- 2) Intravenous drug use
- 3) Recent infection

Risk factors for vertebral compression fracture include:

- 1) Older age
- 2) History of osteoporosis
- 3) Steroid use
- 4) Ankylosing spondylitis

“More than 90% of symptomatic lumbar disc herniations (back and leg pain due to a prolapsed lumbar disc compressing a nerve root) occur at the L4/L5 and L5/S1 levels.”

A focused examination should include:

- 1) Straight-leg-raise testing:

A positive straight-leg-raise test is defined as reproduction of the patient’s sciatica between 30 and 70 degrees of leg elevation, which has a 91% sensitivity but only a 26% specificity for diagnosing herniated disc.

- 2) A neurological examination that includes:

Superficial sensation on the legs

L4 nerve root

Knee strength
Patellar reflex

L5 nerve root

Great toe and foot dorsiflexion strength

S1 nerve root

Foot plantarflexion
Ankle reflexes

“Evidence on the utility of history and examination for identifying lumbar spinal stenosis is sparse.”

Stenosis patients may exhibit:

- 1) Claudication and radiating leg pain
- 2) Changing symptoms on downhill treadmill testing
- 3) Pain relieved by sitting
- 4) Age older than 65 years

Psychosocial factors that may predict poorer low back pain outcomes include:

- 1) Depression
- 2) Passive coping strategies
- 3) Job dissatisfaction
- 4) Higher disability levels
- 5) Disputed compensation claims
- 6) Somatization [the conversion of mental experiences into bodily symptoms].

Patients with acute low back pain generally experience substantial improvement in the first month after initial presentation, "suggesting that a reasonable approach is to reevaluate patients with persistent, unimproved symptoms after 1 month."

"In patients with severe pain or functional deficits, older patients, or patients with signs of radiculopathy or spinal stenosis, earlier or more frequent reevaluation may also be appropriate."

Recommendation 2:

Clinicians should not routinely obtain imaging or other diagnostic tests in patients with nonspecific low back pain.

"There is no evidence that routine plain radiography in patients with nonspecific low back pain is associated with a greater improvement in patient outcomes than selective imaging."

"Plain radiography is recommended for initial evaluation of possible vertebral compression fracture in selected higher-risk patients, such as those with a history of osteoporosis or steroid use."

"Plain radiography may be a reasonable initial option for imaging recommendations in patients with symptoms suggesting radiculopathy or spinal stenosis."

"Thermography and electrophysiologic testing are not recommended for evaluation of nonspecific low back pain."

Recommendation 3:

Clinicians should perform diagnostic imaging and testing for patients with low back pain when severe or progressive neurologic deficits are present or when serious underlying conditions are suspected on the basis of history and physical examination.

“Prompt work-up with MRI or CT is recommended in patients who have severe or progressive neurologic deficits or are suspected of having a serious underlying condition (such as vertebral infection, the cauda equina syndrome, or cancer with impending spinal cord compression) because delayed diagnosis and treatment are associated with poorer outcomes.”

“Magnetic resonance imaging is generally preferred over CT if available because it does not use ionizing radiation and provides better visualization of soft tissue, vertebral marrow, and the spinal canal.”

Plain radiography or measurement of erythrocyte sedimentation rate (a rate 20 mm/h is associated with 78% sensitivity and 67% specificity for cancer.

Suspicious of cancer at initial evaluation should be followed with MRI.

It is acceptable “to directly perform MRI in patients with a history of cancer, the strongest predictor of vertebral cancer.”

“For patients older than 50 years of age without other risk factors for cancer, delaying imaging while offering standard treatments and reevaluating within 1 month may also be a reasonable option.”

Recommendation 4

Clinicians should evaluate patients with persistent low back pain and signs or symptoms of radiculopathy or spinal stenosis with MRI (preferred) or CT only if they are potential candidates for surgery or epidural steroid injection (for suspected radiculopathy).

“The natural history of lumbar disc herniation with radiculopathy in most patients is for improvement within the first 4 weeks with noninvasive management.”

Plain radiography cannot visualize discs or accurately evaluate the degree of spinal stenosis.

Recommendation 5:

Clinicians should provide patients with evidence-based information on low back pain with regard to their expected course, advise patients to remain active, and provide information about effective self-care options.

“Clinicians should inform all patients of the generally favorable prognosis of acute low back pain with or without sciatica, including a high likelihood for substantial improvement in the first month.”

General advice on self-management for nonspecific low back pain should include recommendations to remain active.

“Application of heat by heating pads or heated blankets is a self-care option for short-term relief of acute low back pain.”

In patients with chronic low back pain, a medium-firm mattress is generally better than a firm mattress.

“There is insufficient evidence to recommend lumbar supports or the application of cold packs (75) as self-care options.”

Recommendation 6:

For patients with low back pain, clinicians should consider the use of medications with proven benefits in conjunction with back care information and selfcare. Clinicians should assess severity of baseline pain and functional deficits, potential benefits, risks, and relative lack of long-term efficacy and safety data before initiating therapy. For most patients, first-line medication options are acetaminophen or nonsteroidal anti-inflammatory drugs (NSAIDs).

Acetaminophen is associated with asymptomatic elevations of [liver enzymes].

“Nonselective NSAIDs are more effective for pain relief than is acetaminophen, but they are associated with well-known gastrointestinal and renovascular risks.”

“There is an association between exposure to cyclooxygenase-2–selective or most nonselective NSAIDs and increased risk for myocardial infarction.”

Opioid analgesics are an option when used judiciously in patients with acute or chronic low back pain who have severe, disabling pain that is not controlled with acetaminophen and NSAIDs, but they have substantial risks, including aberrant drug-related behaviors with long-term use in patients vulnerable or potentially vulnerable to abuse or addiction.

Muscle relaxants are an option for short-term relief of acute low back pain, but all are associated with central nervous system adverse effects (primarily sedation).

Antidepressants in the selective serotonin reuptake inhibitor class have not been shown to be effective for low back pain.

Herbal therapies, such as devil’s claw, willow bark, and capsicum, seem to be safe options for acute exacerbations of chronic low back pain.

“Systemic corticosteroids are not recommended for treatment of low back pain with or without sciatica, because they have not been shown to be more effective than placebo.”

Recommendation 7

For patients who do not improve with self-care options, clinicians should consider the addition of nonpharmacologic therapy with proven benefits—for acute low back pain, spinal manipulation; for chronic or subacute low back pain, intensive interdisciplinary rehabilitation, exercise therapy, acupuncture, massage therapy, spinal manipulation, yoga, cognitive-behavioral therapy, or progressive relaxation.

“For acute low back pain (duration 4 weeks), spinal manipulation administered by providers with appropriate training is associated with small to moderate short-term benefits.”

“Supervised exercise therapy and home exercise regimens are not effective for acute low back pain.”

“For chronic low back pain, moderately effective nonpharmacologic therapies include acupuncture, exercise therapy, massage therapy, yoga, cognitive-behavioral therapy or progressive relaxation, spinal manipulation, and intensive interdisciplinary rehabilitation.

Continuous or intermittent traction has not been shown to be effective in patients with sciatica.

“Transcutaneous electrical nerve stimulation and intermittent or continuous traction (in patients with or without sciatica) have not been proven effective for chronic low back pain.”

“There is insufficient evidence to recommend interferential therapy, low-level laser therapy, shortwave diathermy, or ultrasonography.”

KEY POINTS FROM DAN MURPHY

- 1) Low back pain should be placed into 1 of 3 broad categories:
 - A)) Nonspecific low back pain
 - B)) Back pain potentially associated with radiculopathy or spinal stenosis
 - C)) Back pain potentially associated with another specific spinal cause

- 2) Clinicians should not routinely obtain imaging or other diagnostic tests in patients with nonspecific low back pain. **[This is very important because if one does routinely expose radiographs on patients in the nonspecific low back pain category, there is the potential for insurance issues and chiropractic state board actions. If one’s chiropractic techniques require routine radiography, I believe that the best rebuttal to this document is the Practicing Chiropractor’s Committee on Radiology Protocols {PCCRP} produced by the ICA and Christopher Kent, DC. This document can be found at www.pccrp.org].**

- 3) Clinicians should perform diagnostic imaging and testing for patients with low back pain when severe or progressive neurologic deficits are present or when serious underlying conditions are suspected on the basis of history and physical examination.
- 4) Clinicians should evaluate patients with persistent low back pain and signs or symptoms of radiculopathy or spinal stenosis with magnetic resonance imaging (preferred) or computed tomography only if they are potential candidates for surgery or epidural steroid injection (for suspected radiculopathy).
- 5) For patients who do not improve with selfcare options, clinicians should consider the addition of nonpharmacologic therapy with proven benefits—for acute low back pain, spinal manipulation. **[Important: spinal manipulation is the only non-drug recommendation in this document for acute low back pain].**
- 6) For chronic or subacute low back pain, intensive interdisciplinary rehabilitation, exercise therapy, acupuncture, massage therapy, spinal manipulation, yoga, cognitive-behavioral therapy, or progressive relaxation. **[Important: spinal manipulation is also recommended for subacute and chronic low back pain].**
- 7) “Low back pain is the fifth most common reason for all physician visits in the United States.”
- 8) One quarter of U.S. adults reported having low back pain lasting at least 1 whole day in the past 3 months.
- 9) The total direct health care costs attributable to low back pain in the U.S. was about \$26.3 billion in 1998.
- 10) Additional indirect costs related to days lost from work are substantial, with approximately 2% of the U.S. work force compensated for back injuries each year.
- 11) About “one third of patients report persistent back pain of at least moderate intensity 1 year after an acute episode, and 1 in 5 [20%] report substantial limitations in activity.”
- 12) “Approximately 5% of the people with back pain disability account for 75% of the costs associated with low back pain.”
- 13) “More than 85% of patients who present to primary care have low back pain that cannot reliably be attributed to a specific disease or spinal abnormality.”
- 14) “Cauda equina syndrome is most commonly associated with massive midline disc herniation.”

15) "The most frequent finding in the cauda equina syndrome is urinary retention (90% sensitivity). In patients without urinary retention, the probability of the cauda equina syndrome is approximately 1 in 10,000."

16) Specific disorders that cause low back pain include:

Ankylosing spondylitis	0.3% to 5% of cases
Compression fracture	4%
Symptomatic herniated disc	4%
Spinal stenosis	3%
Cancer	0.7%
Cauda equina syndrome	0.04%
Spinal infection	0.01%

17) All patients should be evaluated for rapidly progressive or severe neurologic deficits, fecal incontinence, and bladder dysfunction.

18) Clinicians should also ask about risk factors for cancer and infection.

19) Risk factors for back pain caused by cancer include:

- A) A history of cancer (positive likelihood ratio (9% increased risk)
- B) Unexplained weight loss (positive likelihood ratio (1.2% increased risk)
- C) Failure to improve after 1 month (1.2% increased risk)
- D) Age older than 50 years (1.2% increased risk)

20) Features predicting the presence of vertebral infection include:

- A) Fever
- B) Intravenous drug use
- C) Recent infection

21) Risk factors for vertebral compression fracture include:

- A) Older age
- B) History of osteoporosis
- C) Steroid use
- D) Ankylosing spondylitis

22) "More than 90% of symptomatic lumbar disc herniations (back and leg pain due to a prolapsed lumbar disc compressing a nerve root) occur at the L4/L5 and L5/S1 levels."

23) "Evidence on the utility of history and examination for identifying lumbar spinal stenosis is sparse."

24) Stenosis patients may exhibit:

- A) Claudication and radiating leg pain
- B) Changing symptoms on downhill treadmill testing
- C) Pain relieved by sitting
- D) Age older than 65 years

- 25) Patients with acute low back should be reevaluated if they have persistent, unimproved symptoms after 1 month.
- 26) "There is no evidence that routine plain radiography in patients with nonspecific low back pain is associated with a greater improvement in patient outcomes than selective imaging."
- 27) "Plain radiography is recommended for initial evaluation of possible vertebral compression fracture in selected higher-risk patients, such as those with a history of osteoporosis or steroid use."
- 28) Plain radiography is acceptable for imaging in patients with symptoms suggesting radiculopathy or spinal stenosis.
- 29) "Prompt work-up with MRI or CT is recommended in patients who have severe or progressive neurologic deficits or are suspected of having a serious underlying condition (such as vertebral infection, the cauda equina syndrome, or cancer with impending spinal cord compression) because delayed diagnosis and treatment are associated with poorer outcomes."
- 30) "Magnetic resonance imaging is generally preferred over CT if available because it does not use ionizing radiation and provides better visualization of soft tissue, vertebral marrow, and the spinal canal."
- 31) Suspicions of cancer at initial evaluation should be followed with MRI.
- 32) It is acceptable "to directly perform MRI in patients with a history of cancer, the strongest predictor of vertebral cancer."
- 33) "For patients older than 50 years of age without other risk factors for cancer, delaying imaging while offering standard treatments and reevaluating within 1 month may also be a reasonable option."
- 34) "The natural history of lumbar disc herniation with radiculopathy in most patients is for improvement within the first 4 weeks with noninvasive management."
- 35) Plain radiography cannot visualize discs or accurately evaluate the degree of spinal stenosis.
- 36) General advice on self-management for nonspecific low back pain should include recommendations to remain active.
- 37) "Application of heat by heating pads or heated blankets is a self-care option for short-term relief of acute low back pain."

- 38) Acetaminophen is associated with asymptomatic elevations of [liver enzymes].
- 39) NSAIDs are associated with well-known gastrointestinal and renovascular risks.
- 40) "There is an association between exposure to cyclooxygenase-2-selective or most nonselective NSAIDs and increased risk for myocardial infarction."
- 41) Opioid analgesics have substantial risks, including aberrant drug-related behaviors with long-term use in patients vulnerable or potentially vulnerable to abuse or addiction.
- 42) Muscle relaxants all are associated with central nervous system adverse effects (primarily sedation).
- 43) Antidepressants in the selective serotonin reuptake inhibitors are not effective for low back pain.
- 44) Herbal therapies, such as devil's claw, willow bark, and capsicum, seem to be safe options for acute exacerbations of chronic low back pain.
- 45) "Systemic corticosteroids are not recommended for treatment of low back pain with or without sciatica, because they have not been shown to be more effective than placebo."
- 46) "For acute low back pain (duration 4 weeks), spinal manipulation administered by providers with appropriate training is associated with small to moderate short-term benefits."
- 47) "Supervised exercise therapy and home exercise regimens are not effective for acute low back pain." **[Important]**
- 48) "For chronic low back pain, moderately effective nonpharmacologic therapies include acupuncture, exercise therapy, massage therapy, yoga, cognitive-behavioral therapy or progressive relaxation, spinal manipulation, and intensive interdisciplinary rehabilitation."
- 49) "Transcutaneous electrical nerve stimulation and intermittent or continuous traction (in patients with or without sciatica) have not been proven effective for chronic low back pain."

IMPORTANT NOTES FROM DAN MURPHY

- 1) The Co-chairs and members of the American College of Physicians/American Pain Society Low Back Pain Guidelines Panel included one chiropractor, Donald R. Murphy, DC, DACAN.

2) “Note: Clinical practice guidelines are ‘guides’ only and may not apply to all patients and all clinical situations. Thus, they are not intended to override clinicians’ judgment.” **[Very Important]**

Glossary

Acute low back pain

Low back pain present for fewer than 4 weeks.

Cauda equina syndrome

Compression on nerve roots from the lower cord segments, usually due to a massive, centrally herniated disc, which can result in urinary retention or incontinence from loss of sphincter function, bilateral motor weakness of the lower extremities, and saddle anesthesia.

Chronic low back pain

Low back pain present for more than 3 months.

Herniated disc

Herniation of the nucleus pulposus of an intervertebral disc through its fibrous outer covering, which can result in compression of adjacent nerve roots or other structures.

Neurogenic claudication

Symptoms of leg pain (and occasionally weakness) on walking or standing, relieved by sitting or spinal flexion, associated with spinal stenosis.

Nonspecific low back pain

Pain occurring primarily in the back with no signs of a serious underlying condition (such as cancer, infection, or cauda equina syndrome), spinal stenosis or radiculopathy, or another specific spinal cause (such as vertebral compression fracture or ankylosing spondylitis). Degenerative changes on lumbar imaging are usually considered nonspecific, as they correlate poorly with symptoms.

Radiculopathy

Dysfunction of a nerve root associated with pain, sensory impairment, weakness, or diminished deep tendon reflexes in a nerve root distribution.

Sciatica

Pain radiating down the leg below the knee in the distribution of the sciatic nerve, suggesting nerve root compromise due to mechanical pressure or inflammation. Sciatica is the most common symptom of lumbar radiculopathy.

Spinal stenosis

Narrowing of the spinal canal that may result in bony constriction of the cauda equina and the emerging nerve roots.

Straight-leg-raise test

A procedure in which the hip is flexed with the knee extended in order to passively stretch the sciatic nerve and elicit symptoms suggesting nerve root tension. A positive test is usually considered reproduction of the patient's sciatica when the leg is raised between 30 and 70 degrees. Reproduction of the patient's sciatica when the unaffected leg is lifted is referred to as a positive "crossed" straight-leg-raise test.

Subacute low back pain

Low back pain present from between 4 weeks to 3 months.

Interventions Glossary

Acupressure

An intervention consisting of manipulation with the fingers instead of needles at specific acupuncture points.

Acupuncture

An intervention consisting of the insertion of needles at specific acupuncture points.

Back school

An intervention consisting of education and a skills program, including exercise therapy, in which all lessons are given to groups of patients and supervised by a paramedical therapist or medical specialist.

Brief individualized educational interventions

Individualized assessment and education about low back pain problems without supervised exercise therapy or other specific interventions. As we defined them, brief educational interventions differ from back schools because they do not involve group education or supervised exercise.

Exercise

A supervised exercise program or formal home exercise regimen, ranging from programs aimed at general physical fitness or aerobic exercise to programs aimed at muscle strengthening, flexibility, stretching, or different combinations of these elements.

Functional restoration (also called *physical conditioning*, *work hardening*, or *work conditioning*)

An intervention that involves simulated or actual work tests in a supervised environment in order to enhance job performance skills and improve strength, endurance, flexibility, and cardiovascular fitness in injured workers.

Interdisciplinary rehabilitation (also called *multidisciplinary therapy*)

An intervention that combines and coordinates physical, vocational, and behavioral components and is provided by multiple health care professionals with different clinical backgrounds.

Interferential therapy

The superficial application of a medium-frequency alternating current modulated to produce low frequencies up to 150 Hz. It is thought to increase blood flow to tissues and provide pain relief and is considered more comfortable for patients than transcutaneous electrical nerve stimulation.

Low-level laser therapy

The superficial application of lasers at wavelengths between 632 and 904 nm to the skin in order to apply electromagnetic energy to soft tissue. Optimal treatment parameters (wavelength, dosage, dose-intensity, and type of laser) are uncertain.

Massage

Soft tissue manipulation using the hands or a mechanical device through a variety of specific methods.

Neuroreflexotherapy

A technique from Spain characterized by the temporary implantation of staples superficially into the skin over trigger points in the back and referred tender points in the ear. Neuroreflexotherapy is believed to stimulate different zones of the skin than acupuncture.

Percutaneous electrical nerve stimulation (PENS)

An intervention that involves inserting acupuncture-like needles and applying low-level electrical stimulation. It differs from electroacupuncture in that the insertion points target dermatomal levels for local pathology, rather than acupuncture points.

Progressive relaxation

A technique which involves the deliberate tensing and relaxation of muscles, in order to facilitate the recognition and release of muscle tension.

Self-care options

Interventions that can be readily implemented by patients without seeing a clinician or that can be implemented on the basis of advice provided at a routine clinic visit.

Self-care education book

Reading material (books, booklets, or leaflets) that provide education and self-care advice for patients with low back pain.

Shortwave diathermy

Therapeutic elevation of the temperature of deep tissues by application of short-wave electromagnetic radiation with a frequency range from 10–100 MHz.

Spa therapy

An intervention involving several interventions, including mineral water bathing, usually with heated water, typically while staying at a spa resort.

Spinal manipulation

Manual therapy in which loads are applied to the spine by using short- or long-lever methods and high-velocity thrusts are applied to a spinal joint beyond its restricted range of movement. Spinal mobilization, or low-velocity, passive movements within or at the limit of joint range, is often used in conjunction with spinal manipulation.

Traction

An intervention involving drawing or pulling in order to stretch the lumbar spine.

Transcutaneous electrical nerve stimulation (TENS)

Use of a small, battery-operated device to provide continuous electrical impulses via surface electrodes, with the goal of providing symptomatic relief by modifying pain perception.

Yoga

An intervention distinguished from traditional exercise therapy by the use of specific body positions, breathing techniques, and an emphasis on mental focus.