

even when still experiencing pain, and (6) the importance of improvement in activity levels, not just pain relief.

PROGRESSIVE ENDURANCE EXERCISE AND FITNESS ACTIVITIES

I Presently, most national guidelines for patients with chronic low back pain endorse progressive aerobic exercise with moderate to high levels of evidence.^{5,20,46,56,265} High-intensity exercise has also been demonstrated to have a positive effect on patients with chronic low back pain.^{47,68,225,246-248,275,277} The samples of these studies included patients with long-term duration of symptoms that were primarily confined to the lumbopelvic region without generalized pain complaints.

Patients with low back pain and related generalized pain are believed to have increased neural sensitivity to afferent stimuli, including proprioception and movement. This sensitizing process has been termed *central sensitization*.^{44,229,320} Along with underlying psychosocial factors, deficits in aerobic fitness,^{91,162,274,299,322} and tissue deconditioning, this sensitizing process is believed to impact a person’s functional status and pain perception. Aerobic fitness has been hypothesized to be an important component of reducing pain and improving/maintaining function of these patients.

I Findings in patients with generalized pain complaints have demonstrated altered central pain processing, supporting that these patients should

be managed at lower-intensity levels of training.^{228,229} Endurance exercise has been demonstrated to have a positive effect on global well-being (standardized mean difference [SMD], 0.44; 95% CI: 0.13, 0.75), physical functioning (SMD, 0.68; 95% CI: 0.41, 0.95), and pain (SMD, 0.94; 95% CI: -0.15, 2.03) associated with fibromyalgia syndrome.⁴⁰ Excessively elevated levels of exercise intensity may be responsible for increased symptom complaints due to increases in immune activation with release of proinflammatory cytokines,²⁰⁸ blunted increases in muscular vascularity leading to widespread muscular ischemia,⁹³ and inefficiencies in the endogenous opioid and adrenergic pain-inhibitory mechanism.²⁸¹

A Clinicians should consider (1) moderate- to high-intensity exercise for patients with chronic low back pain without generalized pain, and (2) incorporating progressive, low-intensity, submaximal fitness and endurance activities into the pain management and health promotion strategies for patients with chronic low back pain with generalized pain.

RECOMMENDED LOW BACK PAIN IMPAIRMENT/FUNCTION-BASED CLASSIFICATION CRITERIA WITH RECOMMENDED INTERVENTIONS*

Patients with low back pain often fit more than 1 impairment/function-based category, and the most relevant impairments of body function, primary intervention strategy, and the associated impairment/function-based category(ies) are expected to change during the patient’s episode of care.

ICF-Based Category (With ICD-10 Associations)	Symptoms	Impairments of Body Function	Primary Intervention Strategies
Acute Low Back Pain with Mobility Deficits Lumbosacral segmental/somatic dysfunction	<ul style="list-style-type: none"> Acute low back, buttock, or thigh pain (duration 1 month or less) Unilateral pain Onset of symptoms is often linked to a recent unguarded/awkward movement or position 	<ul style="list-style-type: none"> Lumbar range of motion limitations Restricted lower thoracic and lumbar segmental mobility Low back and low back-related lower extremity symptoms are reproduced with provocation of the involved lower thoracic, lumbar, or sacroiliac segments 	<ul style="list-style-type: none"> Manual therapy procedures (thrust manipulation and other nonthrust mobilization techniques) to diminish pain and improve segmental spinal or lumbopelvic motion Therapeutic exercises to improve or maintain spinal mobility Patient education that encourages the patient to return to or pursue an active lifestyle
Subacute Low Back Pain with Mobility Deficits Lumbosacral segmental/somatic dysfunction	<ul style="list-style-type: none"> Subacute, unilateral, low back, buttock, or thigh pain May report sensation of back stiffness 	<ul style="list-style-type: none"> Symptoms reproduced with <i>end-range</i> spinal motions Symptoms reproduced with provocation of the involved lower thoracic, lumbar, or sacroiliac segments 	<ul style="list-style-type: none"> Manual therapy procedures to improve segmental spinal, lumbopelvic, and hip mobility Therapeutic exercises to improve or maintain spinal and hip mobility

(continued)

ICF-Based Category (With ICD-10 Associations)	Symptoms	Impairments of Body Function	Primary Intervention Strategies
Subacute Low Back Pain with Mobility Deficits Lumbar segmental/somatic dysfunction (continued)		<ul style="list-style-type: none"> • Presence of 1 or more of the following: <ul style="list-style-type: none"> - Restricted thoracic range of motion and associated segmental mobility - Restricted lumbar range of motion and associated segmental mobility - Restricted lumbopelvic or hip range of motion and associated accessory mobility 	<ul style="list-style-type: none"> • Focus on preventing recurring low back pain episodes through the use of (1) therapeutic exercises that address coexisting coordination impairments, strength deficits, and endurance deficits, and (2) education that encourages the patient to pursue or maintain an active lifestyle
Acute Low Back Pain with Movement Coordination Impairments Spinal instabilities	<ul style="list-style-type: none"> • Acute exacerbation of recurring low back pain that is commonly associated with referred lower extremity pain • Symptoms often include numerous episodes of low back and/or low back-related lower extremity pain in recent years 	<ul style="list-style-type: none"> • Low back and/or low back-related lower extremity pain at rest or produced with <i>initial to mid-range</i> spinal movements • Low back and/or low back-related lower extremity pain reproduced with provocation of the involved lumbar segment(s) • Movement coordination impairments of the lumbopelvic region with low back flexion and extension movements 	<ul style="list-style-type: none"> • Neuromuscular re-education to promote dynamic (muscular) stability to maintain the involved lumbar structures in less symptomatic, mid-range positions • Consider the use of temporary external devices to provide passive restraint to maintain the involved lumbar structures in less symptomatic, mid-range positions • Self-care/home management training pertaining to (1) postures and motions that maintain the involved spinal structures in neutral, symptom-alleviating positions, and (2) recommendations to pursue or maintain an active lifestyle
Subacute Low Back Pain with Movement Coordination Impairments Spinal instabilities	<ul style="list-style-type: none"> • Subacute, recurring low back pain that is commonly associated with referred lower extremity pain • Symptoms often include numerous episodes of low back and/or low back-related lower extremity pain in recent years 	<ul style="list-style-type: none"> • Lumbar pain with <i>mid-range</i> motions that <i>worsen with end-range</i> movements or positions • Low back and low back-related lower extremity pain reproduced with provocation of the involved lumbar segment(s) • Lumbar hypermobility with segmental mobility assessment may be present • Mobility deficits of the thorax and/or lumbopelvic/hip regions • Diminished trunk or pelvic-region muscle strength and endurance • Movement coordination impairments while performing self-care/home management activities 	<ul style="list-style-type: none"> • Neuromuscular re-education to provide dynamic (muscular) stability to maintain the involved lumbar structures in less symptomatic, mid-range positions during <i>self-care</i>-related functional activities • Manual therapy procedures and therapeutic exercises to address identified thoracic spine, ribs, lumbopelvic, or hip mobility deficits • Therapeutic exercises to address trunk and pelvic-region muscle strength and endurance deficits • Self-care/home management training in maintaining the involved structures in mid-range, less symptom-producing positions • Initiate community/work reintegration training in pain management strategies while returning to community/work activities

(continued)

ICF-Based Category (With ICD-10 Associations)	Symptoms	Impairments of Body Function	Primary Intervention Strategies
<p>Chronic Low Back Pain with Movement Coordination Impairments</p> <p>Spinal instabilities</p>	<ul style="list-style-type: none"> Chronic, recurring low back pain and associated (referred) lower extremity pain 	<p>Presence of 1 or more of the following:</p> <ul style="list-style-type: none"> Low back and/or low back-related lower extremity pain that <i>worsens with sustained end-range</i> movements or positions Lumbar hypermobility with segmental motion assessment Mobility deficits of the thorax and lumbopelvic/hip regions Diminished trunk or pelvic-region muscle strength and endurance Movement coordination impairments while performing community/work-related recreational or occupational activities 	<ul style="list-style-type: none"> Neuromuscular re-education to provide dynamic (muscular) stability to maintain the involved lumbosacral structures in less symptomatic, mid-range positions during <i>household, occupational, or recreational</i> activities Manual therapy procedures and therapeutic exercises to address identified thoracic spine, ribs, lumbopelvic, or hip mobility deficits Therapeutic (strengthening) exercises to address trunk and pelvic-region muscle strength and endurance deficits Community/work reintegration training in pain management strategies while returning to community/work activities
<p>Acute Low Back Pain with Related (Referred) Lower Extremity Pain</p> <p>Flatback syndrome Lumbago due to displacement of intervertebral disc</p>	<ul style="list-style-type: none"> Acute low back pain that is commonly associated with referred buttock, thigh, or leg pain Symptoms are often worsened with flexion activities and sitting 	<ul style="list-style-type: none"> Low back and lower extremity pain that can be centralized and diminished with specific postures and/or repeated movements Reduced lumbar lordosis Limited lumbar extension mobility Lateral trunk shift may be present Clinical findings consistent with subacute or chronic low back pain with movement coordination impairments classification criteria 	<ul style="list-style-type: none"> Therapeutic exercises, manual therapy, or traction procedures that promote centralization and improve lumbar extension mobility Patient education in positions that promote centralization Progress to interventions consistent with the Subacute or Chronic Low Back Pain with Movement Coordination Impairments intervention strategies
<p>Acute Low Back Pain with Radiating Pain</p> <p>Lumbago with sciatica</p>	<ul style="list-style-type: none"> Acute low back pain with associated radiating (narrow band of lancinating) pain in the involved lower extremity Lower extremity paresthesias, numbness, and weakness may be reported 	<ul style="list-style-type: none"> Lower extremity radicular symptoms that are present at rest or produced with <i>initial to mid-range</i> spinal mobility, lower-limb tension tests/straight leg raising, and/or slump tests Signs of nerve root involvement may be present <p>It is common for the symptoms and impairments of body function in patients who have acute low back pain with radiating pain to also be present in patients who have acute low back pain with related (referred) lower extremity pain</p>	<ul style="list-style-type: none"> Patient education in positions that reduce strain or compression to the involved nerve root(s) or nerves Manual or mechanical traction Manual therapy to mobilize the articulations and soft tissues adjacent to the involved nerve root(s) or nerves that exhibit mobility deficits Nerve mobility exercises in the pain-free, non-symptom-producing ranges to improve the mobility of central (dural) and peripheral neural elements
<p>Subacute Low Back Pain with Radiating Pain</p> <p>Lumbago with sciatica</p>	<ul style="list-style-type: none"> Subacute, recurring, mid-back and/or low back pain with associated radiating pain in the involved lower extremity Lower extremity paresthesias, numbness, and weakness may be reported 	<ul style="list-style-type: none"> Mid-back, low back, and back-related radiating pain or paresthesia that are reproduced with <i>mid-range</i> and worsen with <i>end range</i>: <ol style="list-style-type: none"> Lower limb tension testing/straight leg raising tests, and/or... Slump tests May have lower extremity sensory, strength, or reflex deficits associated with the involved nerve(s) 	<ul style="list-style-type: none"> Manual therapy to mobilize the articulations and soft tissues adjacent to the involved nerve root(s) or nerves that exhibit mobility deficits Manual or mechanical traction Nerve mobility and slump exercises in the mid- to end ranges to improve the mobility of central (dural) and peripheral neural elements

(continued)

ICF-Based Category (With ICD-10 Associations)	Symptoms	Impairments of Body Function	Primary Intervention Strategies
Chronic Low Back Pain with Radiating Pain Lumbago with sciatica	<ul style="list-style-type: none"> Chronic, recurring, mid- and/or low back pain with associated radiating pain in the involved lower extremity Lower extremity paresthesias, numbness, and weakness may be reported 	<ul style="list-style-type: none"> Mid-back, low back, or lower extremity pain or paresthesias that are reproduced with <i>sustained end-range</i> lower-limb tension tests and/or slump tests Signs of nerve root involvement may be present 	<ul style="list-style-type: none"> Manual therapy and therapeutic exercises to address thoracolumbar and lower-quarter nerve mobility deficits Patient education pain management strategies
Acute or Subacute Low Back Pain with Related Cognitive or Affective Tendencies Low back pain Disorder of central nervous system, specified as central nervous system sensitivity to pain	<ul style="list-style-type: none"> Acute or subacute low back and/or low back-related lower extremity pain 	One or more of the following: <ul style="list-style-type: none"> Two positive responses to Primary Care Evaluation of Mental Disorders screen and affect consistent with an individual who is depressed High scores on the Fear-Avoidance Beliefs Questionnaire and behavioral processes consistent with an individual who has excessive anxiety or fear High scores on the Pain Catastrophizing Scale and cognitive process consistent with rumination, pessimism, or helplessness 	<ul style="list-style-type: none"> Patient education and counseling to address specific classification exhibited by the patient (ie, depression, fear-avoidance, pain catastrophizing)
Chronic Low Back Pain with Related Generalized Pain Low back pain Disorder of central nervous system Persistent somatoform pain disorder	<ul style="list-style-type: none"> Low back and/or low back-related lower extremity pain with symptom duration for longer than 3 months Generalized pain not consistent with other impairment-based classification criteria presented in these clinical guidelines 	One or more of the following: <ul style="list-style-type: none"> Two positive responses to Primary Care Evaluation of Mental Disorders screen and affect consistent with an individual who is depressed High scores on the Fear-Avoidance Beliefs Questionnaire and behavioral processes consistent with an individual who has excessive anxiety and fear High scores on the Pain Catastrophizing Scale and cognitive process consistent with rumination, pessimism, or helplessness 	<ul style="list-style-type: none"> Patient education and counseling to address specific classification exhibited by the patient (ie, depression, fear-avoidance, pain catastrophizing) Low-intensity, prolonged (aerobic) exercise activities

**Recommendation for classification criteria based on moderate evidence.*

CLINICAL GUIDELINES

Summary of Recommendations

B RISK FACTORS

Current literature does not support a definitive cause for initial episodes of low back pain. Risk factors are multifactorial, population specific, and only weakly associated with the development of low back pain.

E CLINICAL COURSE

The clinical course of low back pain can be described as acute, subacute, recurrent, or chronic. Given the high prevalence of recurrent and chronic low back pain and the associated costs, clinicians should place high priority on interventions that prevent (1) recurrences and (2) the transition to chronic low back pain.

B DIAGNOSIS/CLASSIFICATION

Low back pain, without symptoms or signs of serious medical or psychological conditions, associated with clinical findings of (1) mobility impairment in the thoracic, lumbar, or sacroiliac regions, (2) referred or radiating pain into a lower extremity, and (3) generalized pain, is useful for classifying a patient with low back pain into the following International Statistical Classification of Diseases and Related Health Problems (ICD) categories: low back pain, lumbago, lumbosacral segmental/somatic dysfunction, low back strain, spinal instabilities, flatback syndrome, lumbago due to displacement of intervertebral disc, lumbago with sciatica, and the associated International Classification of Functioning, Disability, and Health (ICF) impairment-based category of low back pain (b28013 Pain in back, b28018 Pain in body part, specified as pain in buttock, groin, and thigh) and the following, corresponding impairments of body function:

- Acute or subacute low back pain with mobility deficits (b7101 Mobility of several joints)
- Acute, subacute, or chronic low back pain with movement coordination impairments (b7601 Control of complex voluntary movements)
- Acute low back pain with related (referred) lower extremity pain (b28015 Pain in lower limb)
- Acute, subacute, or chronic low back pain with radiating pain (b2804 Radiating pain in a segment or region)
- Acute or subacute low back pain with related cognitive or affective tendencies (b2703 Sensitivity to a noxious stimulus, b1522 Range of emotion, b1608 Thought functions, specified as the tendency to elaborate physical symptoms for cognitive/ideational reasons, b1528 Emotional functions, specified as the tendency to elaborate physical symptoms for emotional/affective reasons)
- Chronic low back pain with related generalized pain (b2800 Generalized pain, b1520 Appropriateness of emotion, b1602 Content of thought)

The ICD diagnosis of *lumbosacral segmental/somatic dysfunction* and the associated ICF diagnosis of **acute low back pain with mobil-**

ity deficits are made with a reasonable level of certainty when the patient presents with the following clinical findings:

- Acute low back, buttock, or thigh pain (duration of 1 month or less)
- Restricted lumbar range of motion and segmental mobility
- Low back and low back-related lower extremity symptoms reproduced with provocation of the involved lower thoracic, lumbar, or sacroiliac segments

The ICD diagnosis of *lumbosacral segmental/somatic dysfunction* and the associated ICF diagnosis of **subacute low back pain with mobility deficits** are made with a reasonable level of certainty when the patient presents with the following clinical findings:

- Subacute, unilateral low back, buttock, or thigh pain
- Symptoms reproduced with *end-range* spinal motions and provocation of the involved lower thoracic, lumbar, or sacroiliac segments
- Presence of thoracic, lumbar, pelvic girdle, or hip active, segmental, or accessory mobility deficits

The ICD diagnosis of *spinal instabilities* and the associated ICF diagnosis of **acute low back pain with movement coordination impairments** are made with a reasonable level of certainty when the patient presents with the following clinical findings:

- Acute exacerbation of recurring low back pain and associated (referred) lower extremity pain
- Symptoms produced with *initial* to *mid-range* spinal movements and provocation of the involved lumbar segment(s)
- Movement coordination impairments of the lumbopelvic region with low back flexion and extension movements

The ICD diagnosis of *spinal instabilities* and the associated ICF diagnosis of **subacute low back pain with movement coordination impairments** are made with a reasonable level of certainty when the patient presents with the following clinical findings:

- Subacute exacerbation of recurring low back pain and associated (referred) lower extremity pain
- Symptoms produced with *mid-range* motions that *worsen with end-range* movements or positions and provocation of the involved lumbar segment(s)
- Lumbar segmental hypermobility may be present
- Mobility deficits of the thorax and pelvic/hip regions may be present
- Diminished trunk or pelvic-region muscle strength and endurance
- Movement coordination impairments while performing self-care/home management activities

The ICD diagnosis of *spinal instabilities* and the associated ICF diag-

nosis of **chronic low back pain with movement coordination impairments** are made with a reasonable level of certainty when the patient presents with the following clinical findings:

- Chronic, recurring low back pain and associated (referred) lower extremity pain
- Presence of 1 or more of the following:
 - Low back and/or low back-related lower extremity pain that *worsens with sustained end-range* movements or positions
 - Lumbar hypermobility with segmental motion assessment
 - Mobility deficits of the thorax and lumbopelvic/hip regions
 - Diminished trunk or pelvic-region muscle strength and endurance
 - Movement coordination impairments while performing commu- nity/work-related recreational or occupational activities

The ICD diagnosis of *flatback syndrome*, or *lumbago due to displacement of intervertebral disc*, and the associated ICF diagnosis of **acute low back pain with related (referred) lower extremity pain** are made with a reasonable level of certainty when the patient presents with the following clinical findings:

- Low back pain, commonly associated with referred buttock, thigh, or leg pain, that worsens with flexion activities and sitting
- Low back and lower extremity pain that can be centralized and diminished with positioning, manual procedures, and/or repeated movements
- Lateral trunk shift, reduced lumbar lordosis, limited lumbar extension mobility, and clinical findings associated with the subacute or chronic low back pain with movement coordination impairments category are commonly present

The ICD diagnosis of *lumbago with sciatica* and the associated ICF diagnosis of **acute low back pain with radiating pain** are made with a reasonable level of certainty when the patient presents with the following clinical findings:

- Acute low back pain with associated radiating pain in the involved lower extremity
- Lower extremity paresthesias, numbness, and weakness may be reported
- Symptoms are reproduced or aggravated with *initial to mid-range* spinal mobility, lower-limb tension/straight leg raising, and/or slump tests
- Signs of nerve root involvement (sensory, strength, or reflex deficits) may be present

It is common for the symptoms and impairments of body function in patients who have **acute low back pain with radiating pain** to also be present in patients who have **acute low back pain with related (referred) lower extremity pain**.

The ICD diagnosis of *lumbago with sciatica* and the associated ICF diagnosis of **subacute low back pain with radiating pain** are made with a reasonable level of certainty when the patient presents with the following clinical findings:

- Subacute, recurring mid-back and/or low back pain with associat-

ed radiating pain and potential sensory, strength, or reflex deficits in the involved lower extremity

- Symptoms are reproduced or aggravated with *mid-range* and *worsen with end-range* lower-limb tension/straight leg raising and/or slump tests

The ICD diagnosis of *lumbago with sciatica* and the associated ICF diagnosis of **chronic low back pain with radiating pain** are made with a reasonable level of certainty when the patient presents with the following clinical findings:

- Chronic, recurring mid-back and/or low back pain with associated radiating pain and potential sensory, strength, or reflex deficits in the involved lower extremity
- Symptoms are reproduced or aggravated with *sustained end-range* lower-limb tension/straight leg raising and/or slump tests

The ICD diagnosis of *low back pain/low back strain/lumbago* and the associated ICF diagnosis of **acute or subacute low back pain with related cognitive or affective tendencies** are made with a reasonable level of certainty when the patient presents with the following clinical findings:

- Acute or subacute low back and/or low back-related lower extremity pain
- Presence of 1 or more of the following:
 - Two positive responses to Primary Care Evaluation of Mental Disorders for depressive symptoms
 - High scores on the Fear-Avoidance Beliefs Questionnaire and behavior consistent with an individual who has excessive anxiety or fear
 - High scores on the Pain Catastrophizing Scale and cognitive processes consistent with individuals with high helplessness, rumination, or pessimism about low back pain

The ICD diagnosis of *low back pain/low back strain/lumbago* and the associated ICF diagnosis of **chronic low back pain with related generalized pain** are made with a reasonable level of certainty when the patient presents with the following clinical findings:

- Low back and/or low back-related lower extremity pain with symptom duration for longer than 3 months
- Generalized pain not consistent with other impairment-based classification criteria presented in these clinical guidelines
- Presence of depression, fear-avoidance beliefs, and/or pain catastrophizing

A DIFFERENTIAL DIAGNOSIS

Clinicians should consider diagnostic classifications associated with serious medical conditions or psychosocial factors and initiate referral to the appropriate medical practitioner when (1) the patient's clinical findings are suggestive of serious medical or psychological pathology, (2) the reported activity limitations or impairments of body function and structure are not consistent with those presented in the diagnosis/classification section of these guidelines, or (3) the patient's symptoms are not resolving with interventions aimed at normalization of the patient's impairments of body function.

A EXAMINATION – OUTCOME MEASURES

Clinicians should use validated self-report questionnaires, such as the Oswestry Disability Index and the Roland-Morris Disability Questionnaire. These tools are useful for identifying a patient's baseline status relative to pain, function, and disability and for monitoring a change in a patient's status throughout the course of treatment.

F EXAMINATION – ACTIVITY LIMITATION AND PARTICIPATION RESTRICTION MEASURES

Clinicians should routinely assess activity limitation and participation restriction through validated performance-based measures. Changes in the patient's level of activity limitation and participation restriction should be monitored with these same measures over the course of treatment.

A INTERVENTIONS – MANUAL THERAPY

Clinicians should consider utilizing thrust manipulative procedures to reduce pain and disability in patients with mobility deficits and acute low back and back-related buttock or thigh pain. Thrust manipulative and nonthrust mobilization procedures can also be used to improve spine and hip mobility and reduce pain and disability in patients with subacute and chronic low back and back-related lower extremity pain.

A INTERVENTIONS – TRUNK COORDINATION, STRENGTHENING, AND ENDURANCE EXERCISES

Clinicians should consider utilizing trunk coordination, strengthening, and endurance exercises to reduce low back pain and disability in patients with subacute and chronic low back pain with movement coordination impairments and in patients post-lumbar microdiscectomy.

A INTERVENTIONS – CENTRALIZATION AND DIRECTIONAL PREFERENCE EXERCISES AND PROCEDURES

Clinicians should consider utilizing repeated movements, exercises, or procedures to promote centralization to reduce symptoms in patients with acute low back pain with related (referred) lower extremity pain. Clinicians should consider using repeated exercises in a specific direction determined by treatment response to improve mobility and reduce symptoms in patients with acute, subacute, or chronic low back pain with mobility deficits.

C INTERVENTIONS – FLEXION EXERCISES

Clinicians can consider flexion exercises, combined with other interventions such as manual therapy, strengthening exercises, nerve

mobilization procedures, and progressive walking, for reducing pain and disability in older patients with chronic low back pain with radiating pain.

C INTERVENTIONS – LOWER-QUARTER NERVE MOBILIZATION PROCEDURES

Clinicians should consider utilizing lower-quarter nerve mobilization procedures to reduce pain and disability in patients with subacute and chronic low back pain and radiating pain.

D INTERVENTIONS – TRACTION

There is conflicting evidence for the efficacy of intermittent lumbar traction for patients with low back pain. There is preliminary evidence that a subgroup of patients with signs of nerve root compression along with peripheralization of symptoms or a positive crossed straight leg raise will benefit from intermittent lumbar traction in the prone position. There is moderate evidence that clinicians should not utilize intermittent or static lumbar traction for reducing symptoms in patients with acute or subacute, nonradicular low back pain or in patients with chronic low back pain.

B INTERVENTIONS – PATIENT EDUCATION AND COUNSELING

Clinicians should not utilize patient education and counseling strategies that either directly or indirectly increase the perceived threat or fear associated with low back pain, such as education and counseling strategies that (1) promote extended bed-rest or (2) provide in-depth, pathoanatomical explanations for the specific cause of the patient's low back pain. Patient education and counseling strategies for patients with low back pain should emphasize (1) the promotion of the understanding of the anatomical/structural strength inherent in the human spine, (2) the neuroscience that explains pain perception, (3) the overall favorable prognosis of low back pain, (4) the use of active pain coping strategies that decrease fear and catastrophizing, (5) the early resumption of normal or vocational activities, even when still experiencing pain, and (6) the importance of improvement in activity levels, not just pain relief.

A INTERVENTIONS – PROGRESSIVE ENDURANCE EXERCISE AND FITNESS ACTIVITIES

Clinicians should consider (1) moderate- to high-intensity exercise for patients with chronic low back pain without generalized pain, and (2) incorporating progressive, low-intensity, submaximal fitness and endurance activities into the pain management and health promotion strategies for patients with chronic low back pain with generalized pain.

AFFILIATIONS AND CONTACTS

AUTHORS

Anthony Delitto, PT, PhD
 Professor and Chair
 School of Health & Rehabilitation
 Sciences
 University of Pittsburgh
 Pittsburgh, Pennsylvania
 delitto@pitt.edu

Steven Z. George, PT, PhD
 Associate Professor
 Assistant Department Chair
 Department of Physical Therapy
 Center for Pain Research and
 Behavioral Health
 University of Florida
 Gainesville, Florida
 szgeorge@phhp.ufl.edu

Linda Van Dillen, PT, PhD
 Associate Professor in Physical
 Therapy and Orthopaedic Surgery
 Associate Director of Musculoskeletal
 Research
 Program in Physical Therapy
 School of Medicine
 Washington University
 St Louis, Missouri
 vandillenl@wustl.edu

Julie M. Whitman, PT, DSc
 Manual Physical Therapy Fellowship
 Director
 Transition DPT Director
 Evidence In Motion
 Louisville, Kentucky
 julie@eimpt.com

Gwendolyn A. Sowa, MD, PhD
 Assistant Professor
 Department of Physical Medicine and
 Rehabilitation

Co-Director, Ferguson Laboratory
 for Orthopaedic and Spine
 Research
 Department of Orthopaedic
 University of Pittsburgh
 Pittsburgh, PA

Paul Shekelle, MD, PhD
 Director
 Southern California Evidence-Based
 Practice Center
 RAND Corporation
 Santa Monica, California
 shekelle@rand.org

Thomas R. Denninger, DPT
 Proaxis Therapy
 Greenville, South Carolina
 tom.denninger@proaxistherapy.com

Joseph J. Godges, DPT, MA
 ICF Practice Guidelines
 Coordinator
 Orthopaedic Section, APTA, Inc
 La Crosse, Wisconsin
 icf@orthopt.org

REVIEWERS

J. Haxby Abbott, MScPT, PhD
 University of Otago
 Dunedin School of Medicine
 Dunedin, New Zealand
 haxby.abbott@otago.ac.nz

Roy D. Altman, MD
 Professor of Medicine
 Division of Rheumatology and
 Immunology
 David Geffen School of Medicine at
 UCLA
 Los Angeles, CA
 journals@royaltman.com

Matthew Briggs, DPT
 Coordinator, Sports Physical Therapy
 Residency
 The Ohio State University
 Columbus, Ohio
 matt.briggs@osumc.edu

David Butler, PT, GDAMT, M SPP SC
 Director
 Neuro Orthopaedic Institute
 Senior Lecturer
 Division of Health Sciences
 University of South Australia
 Adelaide, Australia
 david@noigroup.com

Joseph P. Farrell, DPT, M App Sci
 Senior Clinical Faculty
 PT Fellowship in Advanced Orthopedic
 Manual Therapy
 Kaiser Permanente
 Hayward, California
 jfarrell235@gmail.com

Amanda Ferland, DPT
 Clinic Director
 MVP Physical Therapy
 Federal Way, Washington
 aferland@mvppt.com

Helene Fearon, PT
 Fearon & Levine Consulting
 Phoenix, Arizona
 helenefearon@fearonlevine.com

Julie M. Fritz, PT, PhD
 Associate Professor
 University of Utah
 Clinical Outcomes Research
 Scientist
 Intermountain Healthcare
 Salt Lake City, Utah
 julie.fritz@hsc.utah.edu

Joy MacDermid, PT, PhD
 Associate Professor
 School of Rehabilitation Science
 McMaster University
 Hamilton, Ontario, Canada
 madderj@mcmaster.ca

James W. Matheson, DPT
 Larsen Sports Medicine and
 Physical Therapy
 Hudson, Wisconsin
 jw@eipconsulting.com

Philip McClure, PT, PhD
 Professor
 Department of Physical Therapy
 Arcadia University
 Glenside, Pennsylvania
 mcclure@arcadia.edu

Stuart M. McGill, PhD
 Professor
 Department of Kinesiology
 Director, Spine Biomechanics
 Laboratory
 University of Waterloo
 Waterloo, Ontario, Canada
 mcgill@uwaterloo.ca

Leslie Torburn, DPT
 Principal and Consultant
 Silhouette Consulting, Inc.
 San Carlos, California
 torburn@yahoo.com

Mark Werneke, PT, MS
 Spine Rehabilitation
 CentraState Medical Center
 Freehold, New Jersey
 mwerneke@centrastate.com