

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Nonpharmacological Treatment of Low Back Pain

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Treatment of acute low back pain

GENERAL APPROACH TO CARE

- The goal of care is short-term symptomatic relief
- Most will improve within four weeks
- We typically advise nonpharmacologic treatment with superficial heat

GENERAL APPROACH TO CARE

- Massage, acupuncture, and spinal manipulation are other reasonable options
- There are no data demonstrating superiority of one modality over another
- We do not advise bed rest for patients with acute low back pain

GENERAL APPROACH TO CARE

- Activity modification should generally be minimal, with patients returning to activities of daily living and work as soon as possible
- We emphasize the importance of avoiding prolonged periods of inactivity
- Do not routinely refer patients with acute low back pain for exercise or physical therapy
- Return-to-work recommendations should be individualized

NONPHARMACOLOGIC THERAPIES

- Heat
- Massage
- Acupuncture
- Spinal manipulation
- Exercise and physical therapy

- Other

Cold

Muscle energy technique

Traction

Lumbar supports

Mattress recommendations

Yoga

Paraspinal injections

Heat

- Heat is often applied with the rationale that it may reduce muscle spasm
- 2006 systematic review including six studies of low back pain found moderate evidence that a heat wrap may reduce pain and disability for patients with pain of less than three months' duration, although the benefit was small and short-lived

French SD, Cameron M, Walker BF, et al. Superficial heat or cold for low back pain. Cochrane Database Syst Rev 2006; :CD004750.

Massage

- There is no evidence that massage offers clinical benefits for acute low back pain

Furlan AD, Giraldo M, Baskwill A, et al. Massage for low-back pain. Cochrane Database Syst Rev 2015; :CD001929.

- A randomized trial found that compared with usual care, when massage was chosen by the patient, it was associated with increased patient satisfaction

Eisenberg DM, Post DE, Davis RB, et al. Addition of choice of complementary therapies to usual care for acute low back pain: a randomized controlled trial. Spine (Phila Pa 1976) 2007; 32:151.

Acupuncture

- The evidence of benefit in acute low back pain is limited
- Randomized trials of acupuncture tend to be small and heterogeneous in methodology, and blinding is difficult
- Systematic reviews of acupuncture for acute low back pain have found inconsistent results

Liu L, Skinner M, McDonough S, et al. Acupuncture for low back pain: an overview of systematic reviews. Evid Based Complement Alternat Med 2015; 2015:328196.

Spinal manipulation

- A form of manual therapy that involves the movement of a joint near the end of the clinical range of motion
- Based upon the available evidence, spinal manipulation appears to confer modest improvements in pain and function

Spinal manipulation

- 2017 systematic review and meta-analysis of spinal manipulative therapy for acute low back pain
- Fifteen trials (1711 patients) provided moderate-quality evidence of improvement in visual analog pain scale, and 12 trials (1381 patients) showed moderate-quality evidence of improvement in function

Paige NM, Miake-Lye IM, Booth MS, et al. Association of Spinal Manipulative Therapy With Clinical Benefit and Harm for Acute Low Back Pain: Systematic Review and Meta-analysis. JAMA 2017; 317:1451.

Spinal manipulation

- Minor transient adverse events such as increased pain, muscle stiffness, and headache were reported in 50 to 67 percent of patients
- Serious adverse events (eg, worsening lumbar disc herniation, cauda equina syndrome) following spinal manipulation are rare
- There is little evidence to guide the duration of therapy
- Most clinical trials have evaluated courses of twice-weekly manipulation for two to three weeks
- Chiropractor, osteopath, massage therapist, physical therapist

Exercise and physical therapy

- Self-care exercises done by the patient and supervised exercises in the context of physical therapy
- we do not refer patients with acute low back pain for exercise or physical therapy
- selectively refer patients with risk factors for developing chronic low back pain (eg, poor functional or health status, psychiatric comorbidities)

Exercise and physical therapy

- some studies do show modest efficacy of exercise therapy in selected cases of acute low back pain (<4 weeks)

Brennan GP, Fritz JM, Hunter SJ, et al. Identifying subgroups of patients with acute/subacute "nonspecific" low back pain: results of a randomized clinical trial. Spine (Phila Pa 1976) 2006; 31:623.

Fritz JM, Delitto A, Erhard RE. Comparison of classification-based physical therapy with therapy based on clinical practice guidelines for patients with acute low back pain: a randomized clinical trial. Spine (Phila Pa 1976) 2003; 28:1363.

Exercise and physical therapy

- Systematic reviews have not clearly demonstrated a treatment benefit of generalized exercise therapy compared with other conservative treatments
- In one systematic review of 11 randomized trials of exercise in patients with acute low back pain, exercise therapy was not more effective than no treatment or other conservative treatments

Hayden JA, van Tulder MW, Malmivaara A, Koes BW. Exercise therapy for treatment of non-specific low back pain. Cochrane Database Syst Rev 2005; :CD000335

Exercise and physical therapy

- Early referral to a physical therapist may benefit patients with acute back pain who are at higher risk of developing chronic back pain, but this is unproven
- Studies that have assessed such an approach showed improved outcomes for disability and lost work time, the majority of patients in these studies (>80 percent) had subacute or chronic rather than acute low back pain

Cold

- Application of cold is often recommended for patients with acute back pain
- It may help reduce edema
- Not penetrate far below the skin
- A 2006 systematic review found only three studies evaluating cold for low back pain and was unable to find evidence of benefit

French SD, Cameron M, Walker BF, et al. Superficial heat or cold for low back pain. Cochrane Database Syst Rev 2006; :CD004750

Muscle energy technique

- Is a treatment that involves alternating periods of resisted muscle contractions and assisted stretching
- A 2015 systematic review of randomized trials found no evidence of effectiveness in patients with acute low back pain

Franke H, Fryer G, Ostelo RW, Kamper SJ. Muscle energy technique for non-specific low-back pain. Cochrane Database Syst Rev 2015; :CD009852

Traction

- No evidence that traction is beneficial for acute low back pain
- A 2013 systematic review including 32 randomized trials of traction for low back pain (with or without sciatica) concluded that traction provides no benefits

Wegner I, Widyahening IS, van Tulder MW, et al. Traction for low-back pain with or without sciatica. Cochrane Database Syst Rev 2013; :CD003010

Lumbar supports

- No evidence to suggest that lumbar supports such as corsets or braces have therapeutic value for most patients with acute low back pain

Mattress recommendations

- The role of mattresses has not been studied in acute low back pain

Yoga

- Studies on yoga and back pain have primarily focused on chronic low back pain
- There is no evidence to support the use of yoga in acute low back pain

Paraspinal injections

- Epidural spinal, trigger point, or facet joint injections
- There is little evidence to support any type of injection for nonspecific acute low back pain

Subacute and chronic low back pain

Self-care advice

- All patients with low back pain, regardless of duration or severity, should be instructed in self-care techniques
- Maintaining activity as tolerated

Self-care advice

- Patients who require a period of bedrest to relieve severe symptoms should be encouraged to return to normal activities as soon as possible
- A systematic review of randomized trials has found that bedrest did not improve either function or pain, compared with usual activity, for patients with sciatica
- Self-care education books based on evidence-based guidelines (such as The Back Book)
- Several randomized trials have shown self-care education books to be similar in effectiveness

Bed mattress choice

- Evidence regarding how bed mattress choice impacts back pain is limited
- A medium-firm mattress may be the preferred mattress choice for patients with chronic back pain

Lumbar supports

- No compelling evidence that lumbar supports are effective in patients with chronic low back pain
- A systematic review of eight trials for the use of lumbar supports in the treatment of low back pain found overall poor study quality, inadequate randomization, and generally low compliance with the intervention

van Duijvenbode IC, Jellema P, van Poppel MN, van Tulder MW. Lumbar supports for prevention and treatment of low back pain. Cochrane Database Syst Rev 2008; :CD001823

Lumbar supports

- A French multicenter open-label randomized trial published subsequent to the systematic review found that use of an elastic belt in patients with subacute low back pain modestly reduced the need for pain medication and improved functional status at 30 and 90 days

Calmels P, Queneau P, Hamonet C, et al. Effectiveness of a lumbar belt in subacute low back pain: an open, multicentric, and randomized clinical study. *Spine (Phila Pa 1976)* 2009; 34:215

Lumbar supports

- Thus, while lumbar supports are not routinely recommended, they may provide some benefit for patients with subacute low back pain who are actively engaged in recommended therapies, such as exercise, and who will remain active

ACTIVITY AND PHYSICAL TREATMENTS

- In addition to self-care instruction, all patients with subacute and chronic low back pain should be advised to remain as active as possible and to incorporate physical therapies into their treatment plan

Exercise therapy

- Different types of exercise are commonly used
- Exercise programs include motor control exercise (also known as specific stabilization exercise), core strengthening (eg, abdominal and trunk extensor), flexion/extension movements, directional preference, general physical fitness, aerobic exercise, mind-body exercises (eg, yoga and Pilates), and functional restoration programs

Back schools

- Back school is an intervention consisting of education and a skill program, including exercise therapy
- A systematic review found inconsistent evidence on effectiveness of back schools versus placebo or waitlist controls, though most trials found no benefits
- Results were better for trials in an occupational setting and for more intensive programs based on the original Swedish back school

Spinal manipulation

- Form of manual therapy that involves the movement of a joint beyond its usual end range of motion, but not past its anatomic range of motion (termed the "paraphysiologic zone")
- 2011 meta-analysis including 26 randomized trials, Spinal manipulation had small short-term effects on reducing pain and improving functional status compared with other interventions

Rubinstein SM, van Middelkoop M, Assendelft WJ, et al. Spinal manipulative therapy for chronic low-back pain. Cochrane Database Syst Rev 2011; :CD008112.

Acupuncture

- Insertion of needles at specific predetermined acupuncture points
- Systematic reviews found acupuncture moderately more effective than no treatment for short-term (<3 months) pain relief and improvement in function, and more effective than sham acupuncture for pain relief, but not for improvement in function

Massage

- A systematic review including 25 trials found limited evidence for short-term benefits of massage
- There was evidence of short-term improvement in symptoms for subacute and chronic low back pain, but no long-term benefits
- Another review has results against it

PSYCHOLOGIC AND MULTIDISCIPLINARY INTERVENTIONS

- Cognitive behavioral therapy
- Mind-body interventions
- Multidisciplinary (interdisciplinary) rehabilitation
- Functional restoration

Cognitive behavioral therapy

- A systematic review found cognitive behavioral therapy (CBT) superior to waitlist control for short-term pain relief, although there were no differences in function
- Results were less conclusive for other types of psychologic intervention

Mind-body interventions

- such as meditation and mindfulness techniques
- There is some evidence that these interventions may be effective, but more research is needed to define optimal approaches
- meta-analysis of seven randomized controlled trials involving 864 patients with low back pain, mindfulness-based stress reduction (MBSR) was associated with modest short-term improvements in pain intensity and physical functioning

Multidisciplinary (interdisciplinary) rehabilitation

- combines physical, vocational, and behavioral components provided by multiple health care professionals
- Graded exercise therapy with a psychosocial approach, generally involving a psychologist
- Multidisciplinary programs may not be available in many communities
- They are usually practiced in pain clinics or rehabilitation centers
- systematic reviews found intensive interdisciplinary therapy more effective than non-interdisciplinary rehabilitation for both chronic and subacute low back pain

Functional restoration

- Rehabilitation program for chronic spine pain sufferers that aims to increase physical functioning, improve pain-coping skills, promote the return to a productive lifestyle at home or at work, and limit the need for future spine treatments
- known as work hardening or work conditioning
- improve strength, endurance, flexibility, and fitness

PHYSICAL MODALITIES

- Interferential therapy
- Low-level laser therapy
- Ultrasound
- Shortwave diathermy
- Traction
- Transcutaneous electrical nerve stimulation
- Percutaneous electrical nerve stimulation

Interferential therapy

- superficial application of a medium-frequency alternating current, modulated to produce low frequencies up to 150 Hz
- No convincing evidence from three trials that interferential therapy is effective for chronic low back pain

Low-level laser therapy

- single wavelength of light, between 632 and 904 nm
- four trials found laser therapy superior to sham therapy for pain relief
- another trial found no difference between laser and sham in patients also receiving exercise
- A systematic review found some evidence of short-term benefit in relief of low back pain
- The review concluded that data were insufficient to draw conclusions regarding effectiveness

Ultrasound

- few studies have evaluated ultrasound
- usually performed in combination with other physical therapy modalities
- Its beneficial effect is thought to be due to heating of deep tissues
- A systematic review concluded that ultrasound is ineffective in the treatment of chronic low back pain

Shortwave diathermy

- elevation of the temperature of deep tissues by application of shortwave electromagnetic radiation with a frequency range from 10 to 100 MHz
- Two trials found no differences between shortwave diathermy and sham diathermy manipulation for chronic low back pain

Traction

- drawing or pulling in order to stretch the lumbar spine
- systematic review found no convincing evidence from nine trials that continuous or intermittent traction is more effective than placebo, sham, or no treatment

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

Transcutaneous electrical nerve stimulation (TENS)

- A systematic review included one small ($n = 30$) trial that found TENS superior to placebo ,

Cheing GL, Hui-Chan CW. Transcutaneous electrical nerve stimulation: nonparallel antinociceptive effects on chronic clinical pain and acute experimental pain. Arch Phys Med Rehabil 1999; 80:305.

- but a larger ($n = 145$), well-blinded trial found no differences between TENS and sham TENS on any measured outcome

Deyo RA, Walsh NE, Martin DC, et al. A controlled trial of transcutaneous electrical nerve stimulation (TENS) and exercise for chronic low back pain. N Engl J Med 1990; 322:1627.

Percutaneous electrical nerve stimulation (PENS)

- insertion of acupuncture-like needles and applying low-level electrical stimulation
- Although several trials found PENS moderately to substantially superior to sham PENS for pain relief, effects on function were inconsistent,
- all trials had methodologic shortcomings,
- some trials only measured outcomes at the end of a two-week course of treatment

Noninvasive Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline From the American College of Physicians

Amir Qaseem, MD, PhD, MHA; Timothy J. Wilt, MD, MPH; Robert M. McLean, MD; and Mary Ann Forciea, MD; for the Clinical Guidelines Committee of the American College of Physicians*

Description: The American College of Physicians (ACP) developed this guideline to present the evidence and provide clinical recommendations on noninvasive treatment of low back pain.

Methods: Using the ACP grading system, the committee based these recommendations on a systematic review of randomized, controlled trials and systematic reviews published through April 2015 on noninvasive pharmacologic and nonpharmacologic treatments for low back pain. Updated searches were performed through November 2016. Clinical outcomes evaluated included reduction or elimination of low back pain, improvement in back-specific and overall function, improvement in health-related quality of life, reduction in work disability and return to work, global improvement, number of back pain episodes or time be-

muscle relaxants (moderate-quality evidence). (Grade: strong recommendation)

Recommendation 2: *For patients with chronic low back pain, clinicians and patients should initially select nonpharmacologic treatment with exercise, multidisciplinary rehabilitation, acupuncture, mindfulness-based stress reduction (moderate-quality evidence), tai chi, yoga, motor control exercise, progressive relaxation, electromyography biofeedback, low-level laser therapy, operant therapy, cognitive behavioral therapy, or spinal manipulation (low-quality evidence). (Grade: strong recommendation)*

Recommendation 3: *In patients with chronic low back pain who have had an inadequate response to nonpharmacologic therapy,*

Description: The American College of Physicians (ACP) developed this guideline to present the evidence and provide clinical recommendations on noninvasive treatment of low back pain.

Methods: Using the ACP grading system, the committee based these recommendations on a systematic review of randomized, controlled trials and systematic reviews published through April 2015 on noninvasive pharmacologic and nonpharmacologic treatments for low back pain. Updated searches were performed through November 2016. Clinical outcomes evaluated included reduction or elimination of low back pain, improvement in back-specific and overall function, improvement in health-related quality of life, reduction in work disability and return to work, global improvement, number of back pain episodes or time between episodes, patient satisfaction, and adverse effects.

Target Audience and Patient Population: The target audience for this guideline includes all clinicians, and the target patient population includes adults with acute, subacute, or chronic low back pain.

Recommendation 1: *Given that most patients with acute or subacute low back pain improve over time regardless of treatment, clinicians and patients should select nonpharmacologic treatment with superficial heat (moderate-quality evidence), massage, acupuncture, or spinal manipulation (low-quality evidence). If pharmacologic treatment is desired, clinicians and patients should select nonsteroidal anti-inflammatory drugs or skeletal*

muscle relaxants (moderate-quality evidence). (Grade: strong recommendation)

Recommendation 2: *For patients with chronic low back pain, clinicians and patients should initially select nonpharmacologic treatment with exercise, multidisciplinary rehabilitation, acupuncture, mindfulness-based stress reduction (moderate-quality evidence), tai chi, yoga, motor control exercise, progressive relaxation, electromyography biofeedback, low-level laser therapy, operant therapy, cognitive behavioral therapy, or spinal manipulation (low-quality evidence). (Grade: strong recommendation)*

Recommendation 3: *In patients with chronic low back pain who have had an inadequate response to nonpharmacologic therapy, clinicians and patients should consider pharmacologic treatment with nonsteroidal anti-inflammatory drugs as first-line therapy, or tramadol or duloxetine as second-line therapy. Clinicians should only consider opioids as an option in patients who have failed the aforementioned treatments and only if the potential benefits outweigh the risks for individual patients and after a discussion of known risks and realistic benefits with patients. (Grade: weak recommendation, moderate-quality evidence)*

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For author affiliations, see end of text.

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