

LOW BACK PAIN

“Low Back pain” highlights the main points that clinicians should know for applying the Whole Health approach to those with back pain. For additional details, see Low Back Pain.

INTRODUCTION

Back pain is the most common type of pain in the United States. At some point in their lives, 9 out of 10 people experience it, and 50% of working people experience it annually.[1] It is the fifth most common reason for all physician visits in the United States. The total annual costs of low back pain (LBP), including lost wages and reduced productivity, are more than \$50 billion annually.[2] Five percent of the people with back pain disability account for 75% of the costs associated with it.[3]

Acute back pain lasts up to 6 weeks. Subacute pain lasts 6-12 weeks, and chronic LBP is any pain present for longer than that. Most acute cases resolve, but there is a 20%-35% recurrence rate, and 5%-20% of people with acute pain will develop chronic pain.[2] The most important predictors of ongoing disability from chronic low back pain are fear avoidance and inappropriate pain coping behaviors, nonorganic signs on a physical exam, and psychiatric comorbidities.

Because chronic back pain is notoriously difficult to treat, it is the most common reason for Americans to seek complementary approaches.[4] In the VA, it is one of the top five conditions for which complementary therapies are offered, along with stress management, anxiety, posttraumatic stress disorder, and depression.[5]

EVIDENCE FOR MAINSTREAM MEDICINE

The consensus across major international LBP guidelines is that imaging including plain radiographs, CTs, and MRIs are of limited value in the majority of patients with back pain.[6] This is due to the fact that abnormal findings are common in individuals who are asymptomatic and that findings poorly correlate with symptom severity and clinical outcomes.

For most patients, first-line medication options for low back pain should be acetaminophen or nonsteroidal anti-inflammatory drugs (NSAIDs).[6] Recent research even suggests that chronic opioid use can decrease the pain threshold through the development of opioid-induced pain sensitivity, a process called opioid-induced hyperalgesia.[7] Additionally, epidural steroid injections do not confer long-term pain or function benefit and do not mitigate progression to surgery.[2] Surgery should be reserved for the most severe cases, given that fewer than 50% of patients who have back surgery report excellent or good outcomes.[2]

A WHOLE HEALTH APPROACH TO BACK PAIN

Clinical Practice Guidelines issued by the American College of Physicians (ACP) and the American Pain Society (APS) in 2007 state that for chronic or subacute LBP physicians should consider intensive

interdisciplinary rehab, exercise therapy, acupuncture, massage therapy, spinal manipulation, yoga, cognitive behavioral therapy (CBT), or progressive relaxation.[3] A multifaceted approach involving the incorporation of multiple modalities has been shown to be most effective. These modalities are reviewed here according to the following outline: Working Your Body, Food and Drink, Power of the Mind, and Specific CAM therapies, including Dietary Supplements, Spinal Manipulation Therapies, and Acupuncture.

WORKING YOUR BODY

Back pain results in stiffness and loss in strength and range of motion as the body protects itself against pain triggers. The longer the pain lasts, the worse the problem becomes as the individual starts to carry the body in a new position of dysfunction and imbalance, which can exacerbate pain syndromes. Healing occurs through a process of regaining balance, musculoskeletal flexibility, strength, and function. Examples of therapies that work the body are general exercise, physical therapy, yoga, Pilates, the McKenzie method, and water therapy.

GENERAL EXERCISE

A 2009 systematic review showed that exercise programs (including general physical fitness, aerobic exercise, muscle strengthening, flexibility, and stretching) reduce sick leave and improve pain and disability in chronic LBP.[8]

Evidence-based recommendations published by the National Institute of Clinical Excellence (NICE) from the United Kingdom for the management of LBP state the following:[9]

- Advise people with low back pain that staying physically active is likely to be beneficial.
- Advise people with LBP to exercise.
- Consider offering a structured exercise program tailored to the person.
- Exercise programs may include the following: aerobic activity, movement instruction, muscle strengthening, postural control, and stretching.

PHYSICAL THERAPY (PT)

PT is a well-established modality for helping regain movement, strength, flexibility, and function. Research has shown that when the physical therapist is able to match a program to the unique needs of the individual, the benefits are much greater than those obtained from simply following a treatment algorithm for LBP.[10]

YOGA

Yoga is considered a spiritual science of self-realization with the goal of restoring wholeness in body, mind, and spirit.[11] Some schools of yoga focus more on philosophy, while others focus more on

physical and mental practices. Yoga includes physical postures (asanas), ethical disciplines, breath control (pranayama), sensory methods, affirmations and visualizations, prayer and mantra, and meditation. It improves strength, flexibility, and balance, leading to optimized joint alignment and function. It also enhances parasympathetic function leading to decreased cortisol and an increased release of neurotransmitters such as norepinephrine, serotonin, substance P, and nitric oxide.[11] A 2011 meta-analysis of eight randomized controlled trials (RCTs) and 743 patients found that yoga decreases pain and improves disability post-treatment and at follow-up. It found that the different types of yoga (Hatha, Iyengar, Viniyoga) yielded statistically significant similar effects.[12] Currently, some international guidelines (from the National Institute for Health and Care Excellence, the American College of Physicians, and the American Pain Society) recommend yoga as a treatment for chronic low back pain.[3][9]

MCKENZIE METHOD

The McKenzie method is a type of physical therapy/exercise that uses self-treatment strategies and passive procedures by a trained therapist. A 2004 systematic review of six trials found decreased pain and disability in the short term (less than 3 months) compared to other standard therapies such as NSAIDs, educational booklets, back massage with back care advice, strength training with therapist supervision, and spinal mobilization.[13] For chronic, nonspecific LBP, this method was slightly more effective than Back School methods for disability but not pain intensity immediately after treatment.[14] A 2014 trial found the McKenzie method to be superior to electrophysical agents.[15]

AQUA-/HYDRO-/BALNEOTHERAPY

Aquatic therapy and hydrotherapy are therapeutic measures that involve water. Balneotherapy is the treatment of disease by bathing in water between 34 and 36 degrees Celsius (sometimes referred to as spa therapy). Warm water is thought to enhance blood flow, block nociceptive input, and improve strength and flexibility while mitigating the effects of gravity on joints. A systematic review of seven RCTs (three on aquatic exercise, four on balneotherapy) between 1990 and 2008 determined that aquatic exercise had a small but statistically significant short-term effect on pain relief and measures of locomotor disease (e.g., arthritis, rheumatoid disease, and low back pain[16]). Long-term effectiveness was unclear.

FOOD AND DRINK

ANTI-INFLAMMATORY DIET

Evidence shows that a balanced diet of whole foods including fruits, vegetables, whole grains, and lean meats, along with the elimination of processed sugars, manufactured foods, and unhealthy fats (omega-6 fats and trans fats), helps reduce pain and inflammation.[17] Additionally, omega-3 fatty acids, B vitamins, vitamin D, fiber, and antioxidants also have properties that reduce pain and inflammation. It is

best to get these nutrients through diet rather than as a supplement, if possible. See The Anti-Inflammatory Diet for more information.

POWER OF THE MIND

The psychological effects of pain have been studied extensively. Findings emphasize the importance of addressing emotional and psychological well-being when treating low back pain. Interestingly, studies evaluating severity of pain found a correlation between psychological distress and degree of pain but did not find a correlation when looking at extent of disc protrusion on an MRI scan and degree of pain.[10] Psychological distress appears to be a major determinant of pain severity.

There are a number of psychological interventions that a patient can choose from. For more on specific behavioral therapies related to back pain, see also Self-Management of Chronic Pain.

MINDFULNESS MEDITATION

As described in Mindful Awareness, mindfulness is the nonjudgmental cultivation of awareness where thoughts, emotions, and physical sensations arise. Mindfulness-based stress reduction (MBSR) was created as an 8-week course to enhance learners mindful awareness. The meditations taught include sitting, walking, body scan, compassion, breathing, and other meditation techniques.[18] MBSR teaches individuals to manage their experience of stress (such as pain) by responding more effectively and less reactionarily.[19] MBSR has become increasingly popular in the last 30 years with more than 600 MBSR practitioners in North America and Europe.[19] See Meditation, as well as Power of the Mind in general, for more information.

The most commonly used mindfulness-based intervention is mindfulness-based stress reduction (MBSR). MBSR teaches individuals to manage their experience of stress (such as pain) by responding in a less reactionary way when pain arises.[19] Imaging studies have shown that mindfulness activates multiple areas of the brain. Functional MRI studies show that it leads to inhibition of the anterior cingulate cortex leading to subsequent pain reduction. A study of 27 adults with chronic LBP who completed an 8-week MBSR course consisting of daily meditations using body scan, sitting practice, and walking meditation noted improved pain, sleep, mood, attention, and energy.[20]

EMOTIONAL AWARENESS

Internalizing stress or holding it in can exacerbate pain. Disclosing and exploring these emotions is effective at treating chronic pain. John Sarno, MD, and Howard Schubiner, MD, have done extensive work on this topic. Dr. Sarno's approach was used to study patients with LBP. It was found to produce a 52% reduction in pain, decreased medication use, and improved activity level.[21]

For more information on this approach see the following:

- *Healing Back Pain: The Mind-Body Connection*, by John Sarno. New York: Warner Books; 1991.
- *The Mind-Body Prescription*, by John Sarno. New York: Warner Books; 1998.

- *The Divided Mind*, by John Sarno. New York: Harper Collins; 2006.
- Mind-Body Awareness Writing Exercise on the University of Wisconsin-Madison Department of Family Medicine Integrative Medicine website. Available at
- [Mind Body Medicine for the 21st Century](#) website, by Howard Schubiner, MD.

HYPNOSIS

One moderate-quality trial of hypnotherapy showed improved pain in hypnosis and relaxation groups over a placebo group. There was no difference between the hypnosis and relaxation groups.[22]

SPECIFIC COMPLEMENTARY APPROACHES

DIETARY SUPPLEMENTS

Note: Please see the [Passport to Whole Health, Chapter 15 on Dietary Supplements](#) for more information about how to determine whether or not a specific supplement is appropriate for a given individual. Supplements are not regulated with the same degree of oversight as medications, and it is important that clinicians keep this in mind. Products vary greatly in terms of accuracy of labeling, presence of adulterants, and the legitimacy of claims made by the manufacturer.

Glucosamine

Glucosamine is theorized to restore cartilage and have anti-inflammatory properties. A double-blind RCT of 250 patients with chronic LBP and osteoarthritis (OA) of the lumbar spine did not show improvement in pain or disability compared to placebo after six months and one year of supplementation with 1,500 milligrams oral glucosamine sulfate.[23]

Willow Bark (from *Salix* species)

Willow bark comes from a family of deciduous trees and shrubs commonly known as white willow or European willow (*Salix alba*) and purple willow (*Salix purpurea*).[2] Willow bark contains salicylates and is the precursor to aspirin. Therefore, it should be used with caution in people with an aspirin allergy and avoided in patients on anticoagulants and antiplatelet drugs. Many countries in Europe have approved willow bark for the treatment of pain and other inflammatory conditions.

Routes of administration include tea, capsule, or tincture. The recommended dose for low back pain is 240 milligrams per day.[2] This dose is considered probably safe when used for up to eight weeks according to Natural Standard Database.[24] High doses can be associated with side effects such as GI effects, headaches, allergies, and renal irritation. It has been rated evidence grade B for low back pain. Willow bark has proven to be better than placebo for short-term improvements in acute exacerbation of chronic low back pain, according to a 2006 Cochrane review.[25]

Devils Claw (*Harpagophytum procumbens*)

Also known as grapple plant, wood spider, and harpago, devils claw acts as an anti-inflammatory and analgesic.[2] Recommended dosing is 2,400 milligrams (50 grams of harpagoside per dose of an aqueous extract of *H. procumbens*), divided three times daily via tablet or capsule.[2] Devils claw is generally well tolerated with few recorded adverse effects.[26] It may increase stomach acid, decrease blood glucose, and decrease blood pressure.[25] A 2006 Cochrane review found two high-quality trials that showed strong evidence for short-term improvements in pain compared to placebo.[25] It is rated evidence grade B by Natural Standard for low back pain.[26]

Capsaicin (*Capsicum frutescens*)

Capsaicin is widely available over the counter in remedies used to counteract shingles pain. It depletes substance P and has a small effect on short-term recovery when compared to placebo.[27] A 2006 Cochrane review found two trials showing moderate evidence for reduced pain and function over placebo in the short-term for acute exacerbations of chronic LBP.[25] Side effects can include burning, stinging, and erythema, which tend to diminish with ongoing use. Ten percent of patients discontinue treatment because of these effects.[28]

Spinal Manipulation

Various forms of spinal manipulation have been used for more than 2,000 years. Many different health professionals use spinal manipulation therapy (SMT), including osteopaths, chiropractors, and allopaths trained in manipulation.[29] SMT involves the use of high-velocity impulse or thrust at the synovial joint at or near the end of the physiologic range of motion. The clinician controls the velocity, magnitude, and direction of the impulse.[29]

All major international guidelines recommend spinal manipulations as a treatment option for acute and chronic LBP (e.g., NICE, ACP, APS, European Guidelines, the Italian Clinical Guidelines, Belgian Healthcare Knowledge Centre). Clinical practice guidelines recommend manipulation when patients have failed to improve with usual care or according to patient preference.[2] The 2009 NICE guidelines recommend offering a course of manual therapy, including spinal manipulation, comprising up to a maximum of nine sessions over a period of 12 weeks.[9]

This particular area has been fairly intensively researched. The Agency for Healthcare Research and Quality (AHRQ) through the U.S. Department of Health and Human Services reviewed 265 RCTs and 5 non-RCTs through 2010 using Medline, Cochrane, CINAHL, and EMBASE by AHRQ. They concluded the following:[30]

- Spinal manipulation was significantly more effective than placebo, or equivalent to pain medication, for reducing the intensity of LBP immediately or in the short term (evidence grade: low).[30]
- SMT was the same as placebo when comparing disability, flexibility, mobility, and pain medication use.[30]
- SMT was better than no treatment in post-treatment pain.[30]
- SMT was better than acupuncture in improving pain and function in chronic non-specific low back pain (evidence grade: low).[30]

- Results from studies comparing manipulation to massage, medication, or physiotherapy (massage, analgesic currents, and diathermy) were inconsistent, either in favor of manipulation or indicating no significant difference between the two (evidence grade: low).[30]
- A greater number of manipulation treatments alone or combined with PT decreased pain and improved disability.[30]
- 12 systematic reviews of 69 trials published through 2006 using Cochrane found the following:[31]
 - SMT was moderately superior to sham manipulation and therapies thought to be ineffective and harmful.[31]
 - There was no difference between manipulation and general care or analgesic, PT, and back school.[31]
 - The risk of an adverse event was estimated at less than 1 per 1 million patient visits.[31]
- Evidence is insufficient to conclude that benefits of manipulation vary according to profession or the presence or absence of radiating pain.[3]
- One RCT found SMT better than medical care (exercise, bed rest, analgesics) at improving disability, but not pain in adults over age 55. The type of manipulation (high-velocity low-amplitude or low-velocity variable-amplitude) did not change the outcomes.[27]
- Two RCTs found improved pain and disability when comparing SMT alone to SMT with exercise and analgesics.[27]

See Osteopathic Medicine for additional information.

Mobilization

In contrast to SMT, mobilization is low-grade velocity and passive movement that remains within the patients range of motion and control. It can be thought of as including all non-thrust manual therapies. Examples include muscle energy, myofascial release, strain/counterstrain, and cranial sacral therapy.[29] It is superior to no treatment for reducing pain and improving range of motion in some studies, and it has been found to be better than PT for reducing back pain and related disability, but there are no studies comparing mobilization with the use of pain medications; many studies are inconclusive.[27][29][32]

Acupuncture

Acupuncture was developed as a part of traditional Chinese medicine in the first few centuries BCE. It has been practiced in Western countries for several hundred years. The first published American medical accounts of acupuncture for pain management were in the 1970s. In recent decades, different schools and forms of acupuncture have developed, but they all abide by the same basic theory. For more information on theory and technique, see Acupuncture and Traditional Chinese Medicine.

Evidence for Acupuncture for Back Pain

AHRQ reviewed 265 RCTs and 5 non-RCTs through 2010 using Medline, Cochrane, CINAHL, and EMBASE by AHRQ. Studies were of moderate and low quality. They concluded the following:[30]

- Acupuncture for nonspecific LBP was associated with significantly lower pain intensity than placebo but only immediately post-treatment (evidence grade: moderate).
- Acupuncture was not different than placebo in post-treatment disability, pain medication intake, or global improvement (evidence grade: moderate).
- Acupuncture was superior to no treatment in improving pain intensity, disability, functioning, well-being, (evidence grade: moderate), and range of mobility (evidence grade: low) immediately after the treatment.
- In general trials, comparing sham acupuncture produced equivocal results.
- Results comparing to usual treatments such as pain medication were mixed (evidence grade: moderate, low).
- Results showed better immediate pain and disability compared to PT (evidence grade: low) and no difference in health care utilization compared to massage (evidence grade: low).
- Acupuncture was more cost effective than usual care or no treatment.

Fifty-one RCTs included in three systematic reviews were reviewed by an expert panel convened by the American Pain Society and American College of Physicians. The studies were rated 7-8 out of 10 for quality. All studies had methodological shortcomings.[3] The expert panel concluded the following:

- Evidence for acupuncture versus sham is inconclusive.
- Acupuncture is moderately more effective than no treatment for short-term (<6 week) pain relief and functional improvement.
- Acupuncture was moderately superior for long-term (>6 week) pain relief compared to sham transcutaneous electrical nerve stimulation (TENS) and compared to no treatment.
- One higher-quality trial found no difference in pain 1 year after acupuncture compared with a self-care education book. However, another found acupuncture superior to usual care and use of medications.
- Acupuncture has equivalent efficacy to massage, analgesic medications, and TENS. In two trials it was found to be inferior to spinal manipulation for short-term pain relief (low quality rating).
- Acupuncture when combined with other interventions significantly improved function through 12 months (4 high-quality trials).

Acupuncture Use Guidelines

The 2009 NICE guidelines suggest offering people with back pain a course of acupuncture that consists of up to 10 sessions over a period of up to 12 weeks.[9] Clinical practice guidelines issued in 2007 by the American Pain Society and the American College of Physicians recommended that physicians consider acupuncture when patients with chronic low back pain do not respond to conventional treatment.[3]

Massage

Massage has been used for thousands of years. In the United States, interest in it began to increase during World War I and then declined in the 1940s and 1950s with the availability of pharmaceuticals and technology. Between 1990 and 1997 the percentage of Americans using massage increased from 6.9% to 11.1%. One in five visits to massage therapists is for back pain.[27]

There are many forms of massage, including Western, Eastern, and hybrid forms. Swedish massage is the most common type in the United States. Therapists use long, slow strokes; kneading; and circular movements on superficial layers of muscle. Other common types of massage include aromatherapy massage, hot stone massage, deep tissue massage, Thai massage, and trigger point massage. Some common licenses or certifications for massage therapists include licensed massage therapist (LMT), licensed massage practitioner (LMP), certified massage therapist (CMT), national certification for therapeutic massage and bodywork (NCTMB), and national certification for therapeutic massage (NCTM). See Massage Therapy for more information.

Evidence

Research for massage can be broken down based on findings related to acute and subacute pain and chronic pain.[29]

- ***Nonspecific acute/subacute pain.*** For pain of shorter duration, massage:
 - Is superior to placebo or no treatment for reducing pain and disability.
 - Is better than PT at improving back pain or disability.
 - When combined with exercise, leads to greater pain reduction and improved disability relative to either massage or exercise alone.
 - Was equivalent to soft tissue manipulation and exercise in terms of how much it reduced immediate or short-term pain.
- ***Chronic nonspecific pain.*** In terms of chronic pain, massage:
 - Did not differ from untreated or placebo in immediate and short-term pain intensity or disability.[27]
 - Was more effective as acupressure than in the form of Swedish massage.[2]
 - Leads to improvement in pain and functioning similar to exercise.[2]
 - Combined with exercise, was better than exercise alone in reducing pain.[29]
 - Led to better short-term improvement in pain as compared to mobilization, relaxation, PT, acupuncture, and self-care education.[2]
 - Has not been compared directly to pain medications in clinical trials to date.

Guidelines and Risks

Clinical Practice Guidelines issued in 2007 by the American Pain Society and the American College of Physicians recommended that physicians consider massage when patients with chronic low back pain do not respond to conventional treatment.[3] Minor pain or discomfort is experienced in fewer than 15% of patients after massage.[2] Side effects may include temporary pain or discomfort, bruising, swelling, sensitivity, or allergy to massage oils. Massage should not be done in any area where there have been blood clots, fractures, open or healing wounds, skin infections, areas of bone cancer, or recent surgery.

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