Back Pain (Complementary/Alternative Medicine)

View online at http://pier.acponline.org/physicians/alternative/camdz417/camdz417.html

Module Updated: 2012-04-06
CME Expiration: 2015-04-06

Authors
Rei-Yeuh Chang, MD, MSc
Malcolm Koo, PhD

Back Pain (Complementary/Alternative Medicine)
Rei-Yeuh Chang, MD, MSc
Malcolm Koo, PhD

Table of Contents
1. General Considerations .................................................................................................................. 2
2. Likely Effective ............................................................................................................................... 3
3. Possibly Effective ............................................................................................................................ 10
4. Unknown Effectiveness .................................................................................................................. 14
5. Possibly Ineffective ........................................................................................................................ 16
References ............................................................................................................................................. 18
Glossary .................................................................................................................................................. 23

Quality Ratings: The preponderance of data supporting guidance statements are derived from:
- level 1 studies, which meet all of the evidence criteria for that study type;
- level 2 studies, which meet at least one of the evidence criteria for that study type; or
- level 3 studies, which meet none of the evidence criteria for that study type or are derived from expert opinion, commentary, or consensus.

Study types and criteria are defined at http://smartmedicine.acponline.org/criteria.html

Disclaimer: The information included herein should never be used as a substitute for clinical judgement and does not represent an official position of the American College of Physicians. Because all PIER modules are updated regularly, printed web pages or PDFs may rapidly become obsolete. Therefore, PIER users should compare the module updated date on the official web site with any printout to ensure that the information is the most current available.

CME Statement: The American College of Physicians is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing education for physicians. The American College of Physicians designates this enduring material for a maximum of 1 AMA PRA Category 1 Credit™. Physicians should claim only credit commensurate with the extent of their participation in the activity. Purpose: This activity has been developed for internists to facilitate the highest quality professional work in clinical applications, teaching, consultation, or research. Upon completion of the CME activity, participants should be able to demonstrate an increase in the skills and knowledge required to maintain competence, strengthen their habits of critical inquiry and balanced judgement, and to contribute to better patient care. Disclosures: Rei-Yeuh Chang, MD, MSc, current author of this module, has no financial relationships with pharmaceutical companies, biomedical device manufacturers, or health-care related organizations. Malcolm Koo, PhD, current author of this module, has no financial relationships with pharmaceutical companies, biomedical device manufacturers, or health-care related organizations. Rei-Yeuh Chang, MD, MSc, current author of this module, has no financial relationships with pharmaceutical companies, biomedical device manufacturers, or health-care related organizations. Malcolm Koo, PhD, current author of this module, has no financial relationships with pharmaceutical companies, biomedical device manufacturers, or health-care related organizations. Deborah Korenstein, MD, FACP, Co-Editor, PIER, has no financial relationships with pharmaceutical companies, biomedical device manufacturers, or health-care related organizations. Richard B. Lynn, MD, FACP, Co-Editor, PIER, has no financial relationships with pharmaceutical companies, biomedical device manufacturers, or health-care related organizations.

PIER is copyrighted ©2014 by the American College of Physicians. 190 N. Independence Mall West, Philadelphia, PA 19106, USA.
Movement of a joint with an oscillating or controlled force

General Considerations .................................................24
Likely Effective ........................................................................25
Possibly Effective .............................................................33
Unknown Effectiveness ......................................................38
Possibly Ineffective ...........................................................40
1. General Considerations

1.1 Managing patients using complementary and alternative-medicine therapies for back pain

Evidence
- Substantial evidence suggests both that large numbers of Americans use alternative therapies and that they frequently fail to disclose the use of such therapies to their physicians (1).
- A population-based Canadian study found that approximately 40% of patients with chronic low back pain used CAM therapies, with approximately 75% of them using chiropractic, 55% using massage, and 20% using acupuncture. Most of these individuals used CAM in addition to conventional care rather than in place of it (2).

Comments
- Ask patients about CAM therapies that they may already be using or may have tried in the past. Patients may be reluctant to discuss the use of CAM therapies with a physician.
- Investigate the local availability of CAM therapies before recommending a treatment. When possible, develop dialogue or working relationships with CAM providers to understand better the treatments they use. CAM therapies are not universally available: the choice of therapy may depend on local availability.
- If possible, counsel and educate patients about what to expect from CAM therapies. Counseling and educating patients about what to expect from their back-pain treatment may prevent disappointment and facilitate a more objective appraisal of the treatment's effectiveness.
- Follow up on results of treatment. Following up on results may prevent dissatisfied patients from dropping out of care.
- CAM therapies are commonly used for back pain. Although numerous studies report benefit, many of them suffer from serious methodologic flaws (3).
2. Likely Effective

2.1 Massage therapy

Evidence

- A well-designed, randomized trial (n=262) with blinded assessment compared massage, acupuncture, and self-care educational materials for persistent (subacute or chronic) low back pain. At 10 weeks, massage was more effective than self-care for reducing symptoms and disability and more effective than acupuncture in reducing disability. At 1 year, massage was no better than self-care but provided more relief of symptoms than acupuncture (4).

- A randomized, sham-controlled (with laser therapy) trial found that massage used in conjunction with exercise and posture education was more beneficial for low back pain than massage alone or exercise and posture education alone (5).

- A randomized study of massage therapy vs. progressive relaxation for chronic low back pain (10 sessions over 5 weeks) showed benefit from massage in pain reduction and improved anxiety and sleep (6).

- A Cochrane review of massage concluded, “For subacute (and early chronic) [low back pain], there is moderate evidence that massage improves pain intensity and pain quality, compared to sham treatment. These effects were similar to the effects for exercise and manipulation” (7).

- A systematic review of the literature up to 2010 on complementary and alternative-medicine therapies in adults with back, neck, or thoracic pain concluded that massage was superior to placebo or no treatment in reducing pain and disability only among subjects with acute and subacute low back pain (8).

- In a prospective, three-arm, parallel-group study, 401 patients with chronic low back pain were randomly assigned to receive either structural massage, relaxation massage, or usual care. The study personnel who assessed outcomes were blinded to treatment assignment. After 10 weekly treatments, both massage therapies showed significantly better improvement in function and symptoms compared with usual care. The two types of massage therapy provided similar results (9).

Comments

- Consider massage therapy as treatment for subacute or chronic low back pain that has failed to respond to analgesics and activity modification.

- Administer 6 to 10 treatments over 4 to 6 weeks for maximal benefit.

- Note that massage therapy used in conjunction with therapeutic exercise and posture education may be more effective than massage alone.

- Do not use massage therapy in patients with:
  - Phlebitis
  - Deep venous thrombosis
  - Advanced osteoporosis
  - Local burns
  - Skin infection
  - Open wounds
  - Fractures
  - History of sexual assault
  - Difficulty with close physical contact
• Massage therapy consists of mobilization of the soft tissues of the body by either manual or mechanical methods.

• There is no single specific physiologic goal of massage therapy, and its influence is likely multifactorial. Probable effects of massage therapy include increased local blood flow, stimulation of tissue mechanoreceptors and sensory receptors, induction of relaxation, and increased local lymphatic flow.

• Massage therapy is becoming a commonly used modality for low back pain and other musculoskeletal conditions. Training and licensure are not standardized in the U.S. but may be standardized at the state level.

• Care should be taken to ensure that massage therapy be used in a time-limited fashion for most low back conditions. Therapies that at times provide short-term relief of pain without lasting benefits may foster patient dependence.

2.2 Acupuncture\{harm_minor\}

Evidence

• Data supporting the use of acupuncture are often contradictory. Almost all studies have been performed in persons with chronic low back pain. Most studies suffer from poor design and/or small sample size. Some randomized, controlled, observer-blinded studies have found benefit for patients with chronic low back pain and evidence of an effect lasting longer than the treatment period (10; 11; 12). Other studies suggest that there is little benefit or that the benefit may be equal to that of placebo or transcutaneous nerve stimulation (4; 13; 14). There is no convincing evidence supporting the use of acupuncture for acute back pain.

• A 1997 NIH consensus statement noted that the evidence for use of acupuncture in low back pain was equivocal but stated that it may be used as an adjunctive treatment or acceptable alternative or as part of a comprehensive management plan for low back pain (15).

• A 1998 meta-analysis of nine randomized, controlled trials found acupuncture to be better than various comparison interventions for back pain, but it was unclear whether it was superior to placebo (16).

• A 2003 review considered data from six additional randomized, controlled trials. The largest trial randomized 262 patients to one of three treatment arms and found acupuncture to be less effective than massage and equal to self-care educational materials (4; 17).

• A 2005 Cochrane review of acupuncture and dry-needling for low back pain found 35 randomized, controlled trials in six different languages. It noted evidence of pain relief and functional improvement for chronic low back pain (immediately after therapy or on short-term follow-up). Although the effects are small, acupuncture used as an adjunct to conventional therapies appears to relieve pain and improve function in chronic low back pain more than the conventional therapies alone. Only 3 of the studies concerned acute low back pain, and no conclusion was possible for that diagnosis (18).

• In a randomized, controlled trial of 159 pregnant women with low back pain and posterior pelvic pain, 1 week of continuous auricular acupuncture at three points was associated with a statistically significant reduction in pain compared with sham auricular acupuncture and no treatment (19).

• An overview of systematic reviews (published between 2000 and 2010) of the effectiveness of acupuncture for rheumatic conditions identified six systematic reviews on low back pain. Of those, three arrived at a clearly positive conclusion, and three had unequivocal conclusions (20).

• A systematic review of the literature up to 2010 on complementary and alternative-medicine therapies in adults with back, neck, or thoracic pain concluded that acupuncture was associated with significantly lower pain intensity than placebo but only immediately after treatment (8).
Comments

- Consider 6 to 10 acupuncture treatments over a period of 4 to 8 weeks as an adjunctive treatment for chronic low back pain that has not responded to standard therapies.

- By inserting needles into specific points on meridians (channels) through which "Chi" (energy) flows, traditional acupuncturists believe that the body's energy system will be balanced or corrected, leading to healing of an affected organ or system.

- Because no physical evidence of meridians or Chi has been found, some physicians and other Western practitioners have theorized that acupuncture points are near nerve or muscle structures that can be stimulated to release opioid compounds or serotonin. Some researchers have noted that analgesia from acupuncture does not develop quickly nor resolve quickly, suggesting a central mechanism mediated by neurohumoral factors (21).

- In addition to manual stimulation of acupuncture points with needles, some acupuncturists use electrical acupuncture (the needle is connected to an electrical stimulator), moxibustion (burning the herb Artemisia vulgaris at the end of the needle), or injection acupuncture (injection of herbal extracts into the acupuncture point).

- Be aware that many states do not license acupuncturists who are not physicians or chiropractors.

- In chronic low back pain, the relationships between pain perception and psychological state are important. To understand the contradictory findings from controlled trials of acupuncture for chronic low back pain, a single-blinded, placebo-controlled, randomized crossover trial was conducted on 40 patients with chronic low back pain. Patients were categorized as either low or high level of psychiatric comorbidity based on a model consisting of Beck Depression Inventory II, Pain Anxiety Symptoms Scale, and NEO Personality Inventory-Short Form. Results indicated that psychiatric comorbidity did not significantly affect the analgesic benefits of acupuncture or placebo needling in chronic low back pain (22).

2.3 Spinal manipulation{harm_moderate}

Evidence

- There are more than 50 randomized studies of spinal manipulation in the literature, as well as many meta-analyses and systematic reviews. A meta-analysis published in 1992 was the first to suggest definitive benefit of spinal manipulation for acute low back pain (23). In 1996, a high-quality systematic review found no conclusive evidence of benefit and noted that most trials have suffered from poor quality (24). Although the interpretation of this literature continues to be controversial, subsequent reviews have considered additional trials and concluded that spinal manipulation is efficacious in the short term for both acute (25; 26) and chronic (3; 25; 27) low back pain.

- Although some studies suggest that patients with acute low back pain benefit from spinal manipulation (28), there is no convincing evidence that its effect is greater than the use of paracetamol and advice to remain active (29).

- In a randomized, controlled trial comparing spinal manipulative therapy in addition to standard care with standard care alone in 104 patients with acute low back pain, reductions in pain intensity were similar in experimental and control groups (30).

- Numerous well-designed studies have found spinal manipulation to be superior to "usual care" or placebo/sham treatments for chronic low back pain (31; 32; 33; 34; 35).

- Although most spinal manipulation trials use high-velocity, low-amplitude, or other rotational techniques, there is evidence that distraction-manipulation is also effective. A randomized trial for chronic low back pain compared trunk exercises provided by physical therapists (n=112) and flexion-distraction manipulation provided by chiropractors (n=123). Both groups improved after 4 weeks of treatment. Patients in the manipulation group had significantly greater relief from pain...
than those in the exercise group. In a subgroup analysis, patients with moderate to severe chronic pain did better with manipulation, whereas those with moderate to severe recurrent pain did better with exercise (36). At 1 year, subjects treated with manipulation had a statistically significant improvement in pain compared with those in the trunk-exercise group ($P=0.02$), with no difference in disability (37).

- A randomized, controlled trial of 112 patients with low back pain who satisfied a clinical prediction rule compared the effectiveness of three different manual physical-therapy techniques. There were significant differences in the numerical pain rating scale at 1-week, 4-weeks, and 6-month follow-ups between thrust manipulation (supine thrust manipulation and side-lying thrust manipulation) and nonthrust manipulation. The study design did not include a control group or a placebo manipulation-technique group (38).

- The addition of passive modalities (heat, ice, ultrasound, electrical stimulation) to manipulative therapy does not appear to result in added benefit (39).

- A systematic review of the literature up to 2010 on complementary and alternative-medicine therapies in adults with back, neck, or thoracic pain concluded that spinal manipulation was significantly better than placebo or no treatment in reducing low back pain immediately or in the short term after treatment (8).

- A randomized trial on 205 outpatients with chronic nonspecific low back pain reported that spinal manipulation provided significant greater pain relief (measured by the numerical pain rating scale) and reduction in Roland Morris Disability score than either the Swedish back school or individual physiotherapy at 3-month, 6-month, and 12-month follow-ups. However, it must be noted that the lack of blinding in the study participants might have positively influenced the results in the spinal manipulation group, as spinal manipulation was given by a physician while the other two interventions were given by a physiotherapist (40).

- A Cochrane review of the literature up to June 2009 identified 26 randomized, controlled trials that assessed the effectiveness of spinal manipulative therapy on chronic low back pain. High-quality evidence suggested that there was a small statistically significant but not clinical relevant difference between spinal manipulative therapy and other interventions for reducing pain and improving function in patients with chronic low back pain. Only very low-quality evidence indicated that spinal manipulative therapy was not significantly more effective than inert interventions for short–term pain relief or functional status (41).

- A randomized trial of 301 individuals with chronic low back pain concluded that spinal manipulation was not significantly better than supervised exercise therapy or home exercise in pain relief, both short and long term (42).

**Comments**

- Spinal manipulation is beneficial for low back pain; however, evidence does not support it as being more effective than other standard treatments for acute or chronic low back pain (43; 44; 45). Consider spinal manipulation (a trial of 8 to 12 treatments over 1 month to determine therapeutic benefit) for low back pain of more than 2 weeks’ duration. There appears to be little overall difference in benefit between spinal manipulation and exercise or physical therapy in many populations studied (43; 46; 47; 48).

- Using spinal manipulation in addition to usual medical care appears to be of little benefit in treating acute low back pain (29).

- Recognize that if clinically significant improvement is apparent, continued treatment at a reduced frequency is warranted until maximum improvement is reached, which usually occurs within 6 to 10 weeks.

- Caution patients with local tumor or metastasis, significant osteopenia or osteoporosis, active inflammatory arthritis, long-term steroid use, or anticoagulant use to avoid spinal manipulation.
(high-velocity, thrusting) but, rather, to consult chiropractors, osteopaths, and physical therapists who provide nonthrusting forms of manual therapy (mobilization) that may be beneficial.

- Low back pain can result from nociceptive input from most tissues of the lumbar spine, including discs, facets, ligaments, and muscles. Back pain (or, more specifically, low back or lumbar pain) is a common condition that affects most individuals at some point in their lives. Low back pain is generally considered acute if duration is less than 3 weeks, subacute if duration is greater than 3 weeks but less than 3 months, and chronic if duration is greater than 3 months. Low back pain is considered uncomplicated if there are no lower-extremity symptoms suggesting radiculopathy and no evidence of neurologic deficit (loss of deep tendon reflexes, motor strength, or sensation).

- Although no one specific effect of spinal manipulation has been shown to be responsible for its therapeutic benefit, several factors likely contribute to its effect, including stimulation of mechanoreceptors and modulation of central spinal reflexes, release of entrapped synovial folds or plica between facet joint surfaces, and disruption of adhesions caused by abnormal motion or inactivity.

- A Swedish study suggested that patients were more satisfied with manual therapy or an intensive training program than with usual care from a general practitioner (49). This finding may account for some of the comparative benefit of spinal manipulation (50).

- There is emerging evidence that some subgroups of patients with uncomplicated low back pain respond better to manipulative treatment than others. A randomized, controlled trial found that patients having four of five criteria (symptom duration less than 6 days, no symptoms distal to knee, score <19 on a fear-avoidance measure, at least one hypomobile lumbar segment, one or both hips with more than 35° of internal rotation) had an odds of improvement of 60.8 (92% chance of successful outcome) compared with 2.4 in those who received manipulation but did not meet the criteria (51).

- The cost-effectiveness of spinal manipulation is largely unknown and is likely variable depending on the economic and geographic parameters of the population studied. A Canadian technology report noted that there was insufficient evidence to judge the cost-effectiveness of chiropractic treatment for low back pain as compared with physical therapy and medical care (52). Adding alternative therapies to usual medical care does not appear to reduce the cost of care for acute low back pain (53).

- It is sometimes difficult to determine the exact form of manual therapy used in a study. At this time there is little evidence to recommend one method or school of spinal manipulation over another.

- Preliminary evidence suggests that spinal manipulation may be of benefit to patients with sciatica (54), but no well-designed randomized trials have been completed to specifically address that condition.

- Complications from lumbar manipulation are extremely rare but include disc herniation, cauda equina syndrome, abdominal aortic aneurysm rupture, and fracture.

- Side effects may include local discomfort (53%), radiating discomfort (10%), or tiredness (11%) (55). Most side effects resolve after 24 to 48 hours of initiating treatment.

- Care should be taken to ensure that spinal manipulation is used in a time-limited fashion for most low back conditions. At times, manipulation may provide short-term relief of pain without lasting benefits and thus foster patient dependence.

### 2.4 Willow bark extract (salicin)

#### Evidence

- A single randomized, double-blind, placebo-controlled study (n=210) showed that willow bark extract (120 and 240 mg) was beneficial for exacerbations of chronic low back pain (56).
• An open, randomized, postmarketing study \((n=228)\) found no difference in effect of willow bark extract containing 240 mg of salicin and 12.5 mg of rofecoxib when used to treat exacerbations of chronic low back pain \(57\).

• A Cochrane review concluded that there is some evidence that taking 240 mg of salicin per day provides short-term benefit for acute exacerbations of chronic, nonspecific low back pain \(58\).

Comments
• Consider willow bark extract (salicin), 120 to 240 mg once per day, for acute low back pain or exacerbations of chronic low back pain.
• Continue therapy for up to 1 week before expecting benefit.
• Avoid willow bark extract in patients with aspirin sensitivity or allergy, current gastrointestinal ulceration, or in those taking anticoagulants.
• Willow bark extract contains flavonoids, tannins, and salicin, which is a prodrug that is rapidly metabolized to acetylsalicylic acid (aspirin) on absorption, inhibiting cyclooxygenase and lipoxygenase; nonetheless, the benefit of willow bark extract may be the result of other mechanisms, as 240 mg of salicin is equivalent to only 50 mg of acetylsalicylic acid.
• Because willow bark extract contains salicin, a precursor to salicylic acid \(240 \text{ mg salicin} = 50 \text{ mg acetylsalicylic acid}\), there is potential for side effects similar to those of aspirin, although an extract with 240 mg of salicin per day affects platelet aggregation much less than typical doses of aspirin.
• Willow bark is available in several forms (extract, tincture, dried herb, and powdered herb). Only the extract (standardized to 120 or 240 mg of salicin) has been used in clinical studies.
• There are no reliable data regarding possible interactions with other herbs or medications. Cautionary statements are made based on the known and potential effects of the presumed active ingredient, salicin.

2.5 Devil's claw \(\text{(Harpagophytum procumbens)}\) {harm_moderate}

Evidence
• A randomized, double-blind, placebo-controlled study compared placebo and two separate dosages of \text{Harpagophytum} extract \(50\) or 100 mg of harpagoside per day) for treatment of acute exacerbations of chronic low back pain \(n=183\). More patients were pain free during week 4 of the trial in the two treatment groups \(6\) and 10, respectively, vs. 3 in the placebo group, with statistical significance of \(P=0.027\) using a one-tailed test \(59\).
• A small trial of \text{Harpagophytum} extract \(\text{(Doloteffin®, 60 mg of harpagoside per day; } n=43)\) vs. rofecoxib \(12.5 \text{ mg/d; } n=36\) for chronic back pain found no difference in outcome using multiple patient-generated measures at 6 weeks \(60\). This study was underpowered.
• A Cochrane review concluded that there is strong evidence that taking devil's claw containing 50 to 100 mg of harpagoside per day was better than placebo for short-term improvement of acute or chronic back pain \(58\; 61\).
• Additional studies in the non-English literature report benefit \(62\).

Comments
• Consider devil's claw \(\text{(Harpagophytum procumbens extract)}\), standardized to 50 to 100 mg of harpagoside per day, for acute or acute-on-chronic low back pain.
• Note that 6,000 mg of crude preparation is equal to 50 mg of harpagoside.
• Advise patients that they may experience occasional gastrointestinal upset.
Devil's claw is thought to have anti-inflammatory properties and is often promoted as treatment for arthritis and joint-related symptoms.

This botanical remedy is derived from the roots and tubers of the devil’s claw (*Harpagophytum procumbens*) plant.

Although devil’s claw is thought to have anti-inflammatory properties, that mechanism has not been clearly established (63; 64). Evidence suggests that harpagoside may interfere with gene transcription and suppress the expression of cyclooxygenase-2 (65).

Constituents include the presumed active ingredient, harpagoside, in addition to harpagide, procumbide, stigmasterol, β-sitosterol, triterpenes, and flavonoids.

Minor side effects, primarily gastrointestinal, occur in approximately 3% of subjects in randomized studies (66). At least one case of purpura associated with the concurrent use of devil’s claw and warfarin has been noted (67).

There is no evidence to support long-term use of devil's claw.
3. Possibly Effective

3.1 Homeopathic remedies{harm_minor}

Evidence
- A single multicenter, randomized, double-blind trial \((n=161)\) of Spiroflor SRL® (a homeopathic gel) and a commonly used capsicum-based topical treatment found no difference in pain relief but fewer side effects and adverse reactions in the homeopathic-gel group \((68)\).
- A German randomized, pilot study \((n=43)\) of homeopathic treatment vs. physical therapy \((2\) months of treatment) found benefit for the homeopathy group based on changes in Oswestry and visual analog scale scores but no effect 18.5 months later \((69)\).

Comments
- Consider topical application of the homeopathic gel Spiroflor SRL® for acute low back pain in conjunction with other therapies for patients who seek it.
- Homeopathy is based on two theoretical premises. The first premise is that “like cures like;” therefore, substances that are known to produce symptoms when administered to healthy persons are given to ill persons with those symptoms. The second premise is that the more diluted the preparation of the substance, the more potent it is.
- There are no known risks of homeopathic remedies when they are used to complement standard medical therapies for back pain.
- Few experts in the use of CAM therapies recommend homeopathic treatment of low back pain \((70)\).

3.2 Acupressure{harm_minor}

Evidence
- A randomized, \(2 \times 2\) factorial design study in the German literature compared acupressure and Swedish (classical) massage with or without exercise \((n=109)\) and found acupressure to be superior when used with or without exercise for low back pain \((71)\).
- A randomized trial from Taiwan comparing 1 month of treatment with acupressure or physical therapy for chronic back pain \((n=188)\) found acupressure to provide more reduction of pain and disability based on both the Roland Morris and modified Oswestry scores. Major limitations of this study include the lack of a standardized comparison group ("routine" physical therapy), the fact that acupressure was provided by only one practitioner, and the lack of a control for time or attention \((72)\).
- There is a single uncontrolled study \((n=66)\) of shiatsu massage for low back pain that suggests benefit \((73)\).

Comments
- Consider short-term treatment with acupressure \((6\) to 10 treatments over 4 to 8 weeks) for low back pain in conjunction with other therapies for patients who seek it.
- Acupressure is a Chinese form of massage that uses digital pressure over acupuncture points to normalize the flow of energy (Chi); it is often used to treat painful conditions and reduce stress.
- Shiatsu is a similar form of massage with Japanese origins in which the practitioner applies pressure with the hands, elbows, knees, or feet.
- Complications, side effects, and contraindications are similar to those of classical massage.

3.3 Chondroitin sulfate{harm_minor}

Evidence
• One study of uncertain quality in the non-English (Russian) literature used a chondroitin-based product (1,000 mg/d for 24 weeks) to treat 30 patients with back pain attributed to “osteochoondrosis.” Improvement was noted in 73% (74).

• Multiple trials have suggested benefit (pain reduction) in knee osteoarthritis from chondroitin sulfate. A 2000 meta-analysis found a pooled effect size of 0.8 among trials of higher quality (75).

**Comments**

• Consider chondroitin sulfate, up to 1,200 mg/d (as used in arthritis), for treatment of chronic low back pain associated with degenerative spinal disease in conjunction with other therapies for patients who seek it.

• Chondroitin sulfate is thought to be chondroprotective and has been shown to provide modest pain relief in studies of knee osteoarthritis.

• Many cases of chronic low back pain are caused by osteoarthritic changes in the synovial facet joints.

• The most common side effects experienced are gastrointestinal upset, nausea, constipation, and diarrhea.

• There are no known interactions of chondroitin sulfate with medications, herbs, or other supplements.

• Preparations of chondroitin sulfate are often poorly standardized. Refer to the ConsumerLab Web site for independent testing of specific brands.

### 3.4 Balneotherapy and spa therapy{harm_minor}

**Evidence**

• A meta-analysis of spa therapy and balneotherapy for low back pain found three randomized trials meeting criteria for spa therapy \( n=442 \) and two for balneotherapy \( n=138 \). A 26.6% difference on a visual analog pain scale was found in favor of spa therapy over a wait-list control group. For balneotherapy, there was an 18.8% difference over the control groups. It was concluded that the evidence, although limited, indicates that these therapies might prove effective for low back pain (76).

**Comments**

• Balneotherapy uses hot baths that contain natural mineral content, most often for the treatment of pain. Spa therapy combines hydrotherapy or balneotherapy with exercise and other physical-therapy techniques. Although these therapies are often combined in literature reviews, their mechanisms of action could be different. For that reason, it has been suggested that they be considered separate therapies (77).

• Although spa therapy has been reported to be beneficial, it may be very difficult to discern what individual factors are responsible for improvement. At least one study has attempted to determine the contribution of individual treatments to its overall effect. It was concluded that the largest contributions to its long-term effects on low back pain were from the more traditional physical therapy treatments: exercise and spinal traction (78).

• Spa therapy is considered usual treatment in some European countries but not in North America (79).

### 3.5 Pilates{harm_minor}

**Evidence**

• A small \( n=39 \) randomized, controlled trial with 12-month follow-up compared specific Pilates exercises (using specialized exercise equipment) to usual medical care (Canada). The Pilates group
had significantly lower disability (Roland Morris Questionnaire) and pain (numerical rating scale) after the intervention. The improved disability scores were maintained at 12 months (80).

- Pilates (CovaTech method) was compared with the back school method, using exercises for treatment of chronic low back pain in a randomized study (n=53) with blinded observers and a 6-month follow-up. Both groups met in small groups of 7 subjects. Both groups improved similarly (Oswestry disability scale and visual analog scale), although the Pilates group had better compliance and perceived benefit (81).

- A systematic review with meta-analysis of the literature up to March 2009 identified seven randomized, controlled trials comparing pain and disability in individuals with persistent nonspecific low back pain who were treated with Pilates exercises. When compared with minimal intervention, Pilates-based exercise provided significant pain relief but not a significant difference in disability scores. However, the results should be interpreted with caution because of the low quality of existing studies and the heterogeneity of pooled studies (82).

**Comments**

- Pilates is a form of exercise that promotes core strengthening and coordinated movement. It has traditionally been used by performing artists. In recent years, it has become a popular form of exercise, with classes available in many community facilities and health clubs. The limited evidence available suggests that it may be helpful for chronic low back pain.

- Factors to be considered when determining the appropriateness of Pilates training are the same as used when prescribing traditional strengthening exercises for back pain.

- Pilates-based exercises appeared to be no more effective than other forms of exercise to reduce nonspecific low back pain (82).

3.6 **Yoga**

**Evidence**

- A randomized, controlled, three-arm trial (yoga vs. conventional back exercise classes vs. a self-care book) was done for patients with chronic low back pain. The primary outcomes were the Roland Disability Scale and a “bothersomeness” of pain scale, with follow-up at 6, 12, and 26 weeks. All groups improved. The yoga group had more improvement (statistically and clinically significant) than the book group for all follow-up points. The yoga group and exercise group were statistically but not clinically different at 12 weeks. Only the yoga group continued to improve past 12 weeks based on the bothersomeness scores (83).

- One randomized, controlled trial evaluated 24 weeks of Iyengar yoga therapy on 90 patients with chronic low back pain. Significantly greater reductions in functional disability and pain intensity were seen in the yoga group when compared with the control group at 24 weeks. There was also a trend for the yoga group to reduce their use of pain medications compared with the control group (84).

- In a prospective study, 313 adults with chronic or recurrent low back pain were randomly assigned to a 12-week class of yoga or usual care. All participants received a back-pain education booklet. The yoga group had better back function as measured by the Roland-Morris Disability Questionnaire at 3 months (primary endpoint; \( P<0.001 \)) as well as 6 and 12 months. The yoga and usual-care groups had similar back pain and general health scores at 3, 6, and 12 months. The yoga group had better pain self-efficacy scores at 3 and 6 months but not at 12 months. Two of the 157 usual-care participants and 12 of 156 yoga participants reported adverse events, mostly increased pain, the majority of which was reported as probably related to yoga (85).

3.7 **Methylene blue injection**

**Evidence**
• A small (n=71) randomized, controlled trial with 24-month follow-up compared intradiscal methylene-blue injection to placebo. The methylene-blue group had significantly lower self-reported pain assessed by a 101-point numerical rating scale and the Oswestry Disability Index compared with the placebo (86).

Comments

• The impressive self-reported pain reduction from using methylene-blue injection for the treatment of chronic discogenic low back pain (86) has led to doubts about the credibility of the study results (87) and cautions about potent neurotoxic effects of methylene blue (88).

• More independent replication studies are needed to confirm the efficacy and safety of using intradiscal methylene blue as a treatment for back pain.

3.8 Behavioral therapy{harm_minor}

Evidence

• A Cochrane review of 30 randomized trials concluded that operant therapy is more effective than waiting list, and behavioral therapy is more effective than usual care for short-term management of chronic low back pain (89).

Comments

• The main assumption underlying a behavioral-therapy approach is that pain and its resulting disability are influenced by psychological and social factors in addition to somatic pathology; therefore, the goal of behavioral therapy is to alter maladaptive thoughts.

• Acute pain behaviors may be reinforced by external factors and eventually develop into a chronic pain problem in the model of operant conditioning principles of B.F. Skinner; therefore, operant therapy involves removing positive reinforcement of pain behaviors, such as attention of the spouse and medical personnel.

• It is still unknown what type of patients benefit most from what type of behavioral therapy (89).

3.9 Combined chiropractic interventions{harm_moderate}

Evidence

• A Cochrane review compared the use of combined chiropractic interventions (rather than spinal manipulation alone) with other therapies in treatment of low back pain. When compared with other treatments, combined chiropractic interventions slightly improved pain and disability in the short term and pain in the medium term for acute and subacute low back pain (90).

Comments

• Combined chiropractic interventions involve manual treatments, including spinal manipulation, in combination with physical-therapy modalities, exercise programs, nutritional advice, orthotics, lifestyle modification, and/or other patient education.

• There are no trials comparing combined chiropractic interventions with no treatment; therefore, no conclusion about this can be drawn (90).
4. Unknown Effectiveness

4.1 Glucosamine{harm_minor}

Evidence
- Some trials have suggested benefit (pain reduction) in knee osteoarthritis from glucosamine sulfate (91; 92), although others have found no effect (93; 94).
- A meta-analysis of studies using glucosamine sulfate for osteoarthritis found an effect size of only 0.3 among trials with higher-quality scores (75).

Comments
- Do not recommend glucosamine sulfate for treatment of low back pain.
- Glucosamine sulfate occurs naturally in cartilage and is also produced synthetically.
- It is thought to be chondroprotective and has been shown to provide modest pain relief in some studies of knee osteoarthritis.
- It is often promoted as being effective for low back pain due to spinal arthritis. There are no published studies of the effect of glucosamine sulfate on low back pain, but benefit is plausible considering the results of studies in osteoarthritis.
- Although some in vitro and animal studies have suggested the potential for glucosamine to affect sensitivity to insulin, oral glucosamine does not appear to worsen insulin resistance or endothelial cell dysfunction (95).
- A large, NIH-funded trial is currently recruiting patients with osteoarthritis to help determine the role of glucosamine sulfate in its treatment.

4.2 Rolfing®{harm_moderate}

Evidence
- A single case report of Rolfing® used in conjunction with movement therapy suggests possible benefit for chronic low back pain (96). No other studies of Rolfing® for low back pain were found in the peer-reviewed literature.

Comments
- Do not recommend Rolfing® (structural integration) as treatment for acute or chronic low back pain.
- Rolfing® is a system of soft-tissue massage and movement education, which is believed to result in more efficient muscle use and movement patterns.

4.3 Therapeutic climbing{harm_moderate}

Evidence
- A small randomized, controlled study was conducted to compare therapeutic climbing with a standard exercise regime in 28 patients with chronic low back pain. No significant differences were observed in back pain-related disability (measured by the Hannover Functional Ability Questionnaire) either before versus after or between the two treatments. Four (29%) of the individuals in the therapeutic climbing group had less than 70% participation over the four-week study period (97).

Comments
- Given the limited evidence, therapeutic climbing should be considered of unknown effectiveness.
- Climbing is being used therapeutically in different contexts, particularly in Germany. Therapeutic climbing generally involves specific climbing exercises to achieve muscular training or as a means of mobilization. In addition, it may increase confidence and self-efficacy.
5. Possibly Ineffective

5.1 Bipolar magnets\(\text{harm}_\text{minor}\)

**Evidence**
- A small, randomized, double-blind, placebo-controlled, crossover pilot study \((n=20)\) found no clinical effect of bipolar magnets on chronic low back pain \((98)\).

**Comments**
- Do not recommend bipolar permanent magnets as treatment for low back pain.
- Despite their popularity, there have been few studies examining the effect of permanent magnets on musculoskeletal pain. Studies have suggested that permanent magnets may be beneficial for chronic pelvic pain \((99)\) and knee pain \((100)\). There is no apparent benefit for pain related to carpal tunnel syndrome \((101)\).
- Proposed mechanisms of how permanent magnets might work include increasing circulation, reducing inflammation, improving cellular pH balance, and effecting calcium transport and balance.
- Magnets may interfere with heart devices (pacemakers or implantable cardioverter defibrillators) and should be kept at least 6 inches away from them.
- The National Institute of Dental and Craniofacial Research is currently conducting a randomized, double-blind, placebo-controlled study using permanent magnets for low back pain with sciatica.

5.2 Feldenkrais Method®\(\text{harm}_\text{minor}\)

**Evidence**
- A nonrandomized study of Feldenkrais® in patients with nonspecific musculoskeletal pain syndromes included 53 persons with back pain, but a direct comparison was not made for that subgroup. There was no difference among the three treatment groups in subscale scores for the 36-Item Short Form Health Survey \((102)\).

**Comments**
- Do not recommend Feldenkrais® (awareness through movement, functional integration) as treatment for acute or chronic low back pain.
- The Feldenkrais Method® is a system of body movement education that is believed to enhance awareness of movement and improve function of movement. The expected results are that a person will be able to move more efficiently and comfortably and with less pain.
- Feldenkrais® practitioners undergo an extensive, apprentice-like training program. There is theoretical potential for benefit for numerous conditions due to its possible effects on the motor control system. Unfortunately, this therapeutic paradigm has been inadequately studied.

5.3 Reflexology\(\text{harm}_\text{minor}\)

**Evidence**
- A pragmatic study in the United Kingdom examined the effect of adding reflexology or relaxation to usual general practitioner care. Patients with chronic low back pain \((n=243)\) were randomly assigned to usual care, usual care with reflexology, or usual care with relaxation. There were no significant differences in pain or function between the groups immediately after treatment or at 6 months’ follow-up \((103)\).

**Comments**
- There does not appear to be a benefit from adding reflexology (or relaxation therapy) to usual medical care for chronic back pain. This study addresses the effectiveness of using reflexology in the U.K. health system but not efficacy in more controlled settings.
5.4 Intra-annular radiofrequency thermal disc therapy\{harm\_minor\}

**Evidence**
- In a small randomized, double-blind, placebo-controlled study \((n=20)\) in patients with chronic discogenic low back pain for more than 6 months, there was no significant difference in pain intensity with percutaneous intradiscal radiofrequency thermocoagulation therapy using the discTRODE™ probe as compared with sham treatment 6 months after the procedure. Two of the 10 patients in each of the intradiscal radiofrequency and sham-treatment groups reported increased pain levels 12 months after the procedure (104).

**Comments**
- Do not recommend percutaneous intradiscal radiofrequency thermocoagulation as treatment for chronic low back pain.

5.5 Qigong\{harm\_minor\}

**Evidence**
- A systematic review of the literature up to February 2009 identified four randomized, controlled trials and three controlled clinical trials assessing the effectiveness of internal qigong for pain management. Overall, there is no convincing evidence to suggest that internal qigong is an effective modality for pain management (105).

**Comments**
- Internal qigong is a self-directed energy healing intervention involving movement and meditation.
References


Back Pain (CAM)


Glossary

CAM
complementary and alternative medicine

NIH
National Institutes of Health

Terms

Low back pain
Pain occurring in the region of the lumbar spine and upper posterior pelvis, usually superior to the gluteal folds and inferior to the lower ribs

Manipulation
Movement of a joint using a thrusting motion, often producing a "popping" sound

Mobilization
Movement of a joint with an oscillating or controlled force

General Considerations

Managing patients using complementary and alternative-medicine therapies for back pain

Evidence

- Substantial evidence suggests both that large numbers of Americans use alternative therapies and that they frequently fail to disclose the use of such therapies to their physicians (1).

- A population-based Canadian study found that approximately 40% of patients with chronic low back pain used CAM therapies, with approximately 75% of them using chiropractic, 55% using massage, and 20% using acupuncture. Most of these individuals used CAM in addition to conventional care rather than in place of it (2).

Comments

- Ask patients about CAM therapies that they may already be using or may have tried in the past. Patients may be reluctant to discuss the use of CAM therapies with a physician.

- Investigate the local availability of CAM therapies before recommending a treatment. When possible, develop dialogue or working relationships with CAM providers to understand better the treatments they use. CAM therapies are not universally available: the choice of therapy may depend on local availability.

- If possible, counsel and educate patients about what to expect from CAM therapies. Counseling and educating patients about what to expect from their back-pain treatment may prevent disappointment and facilitate a more objective appraisal of the treatment's effectiveness.

- Follow up on results of treatment. Following up on results may prevent dissatisfied patients from dropping out of care.

- CAM therapies are commonly used for back pain. Although numerous studies report benefit, many of them suffer from serious methodologic flaws (3).
Likely Effective

Massage therapy{harm_minor}

Evidence

- A well-designed, randomized trial (n=262) with blinded assessment compared massage, acupuncture, and self-care educational materials for persistent (subacute or chronic) low back pain. At 10 weeks, massage was more effective than self-care for reducing symptoms and disability and more effective than acupuncture in reducing disability. At 1 year, massage was no better than self-care but provided more relief of symptoms than acupuncture (4).

- A randomized, sham-controlled (with laser therapy) trial found that massage used in conjunction with exercise and posture education was more beneficial for low back pain than massage alone or exercise and posture education alone (5).

- A randomized study of massage therapy vs. progressive relaxation for chronic low back pain (10 sessions over 5 weeks) showed benefit from massage in pain reduction and improved anxiety and sleep (6).

- A Cochrane review of massage concluded, “For subacute (and early chronic) [low back pain], there is moderate evidence that massage improves pain intensity and pain quality, compared to sham treatment. These effects were similar to the effects for exercise and manipulation” (7).

- A systematic review of the literature up to 2010 on complementary and alternative-medicine therapies in adults with back, neck, or thoracic pain concluded that massage was superior to placebo or no treatment in reducing pain and disability only among subjects with acute and subacute low back pain (8).

- In a prospective, three-arm, parallel-group study, 401 patients with chronic low back pain were randomly assigned to receive either structural massage, relaxation massage, or usual care. The study personnel who assessed outcomes were blinded to treatment assignment. After 10 weekly treatments, both massage therapies showed significantly better improvement in function and symptoms compared with usual care. The two types of massage therapy provided similar results (9).

Comments

- Consider massage therapy as treatment for subacute or chronic low back pain that has failed to respond to analgesics and activity modification.

- Administer 6 to 10 treatments over 4 to 6 weeks for maximal benefit.

- Note that massage therapy used in conjunction with therapeutic exercise and posture education may be more effective than massage alone.

- Do not use massage therapy in patients with:
  - Phlebitis
  - Deep venous thrombosis
  - Advanced osteoporosis
  - Local burns
  - Skin infection
  - Open wounds
  - Fractures
• History of sexual assault  
• Difficulty with close physical contact

• Massage therapy consists of mobilization of the soft tissues of the body by either manual or mechanical methods.

• There is no single specific physiologic goal of massage therapy, and its influence is likely multifactorial. Probable effects of massage therapy include increased local blood flow, stimulation of tissue mechanoreceptors and sensory receptors, induction of relaxation, and increased local lymphatic flow.

• Massage therapy is becoming a commonly used modality for low back pain and other musculoskeletal conditions. Training and licensure are not standardized in the U.S. but may be standardized at the state level.

• Care should be taken to ensure that massage therapy be used in a time-limited fashion for most low back conditions. Therapies that at times provide short-term relief of pain without lasting benefits may foster patient dependence.

camdz417-leff_2

Acupuncture\{harm_minor\}

Evidence

• Data supporting the use of acupuncture are often contradictory. Almost all studies have been performed in persons with chronic low back pain. Most studies suffer from poor design and/or small sample size. Some randomized, controlled, observer-blinded studies have found benefit for patients with chronic low back pain and evidence of an effect lasting longer than the treatment period (10; 11; 12). Other studies suggest that there is little benefit or that the benefit may be equal to that of placebo or transcutaneous nerve stimulation (4; 13; 14). There is no convincing evidence supporting the use of acupuncture for acute back pain.

• A 1997 NIH consensus statement noted that the evidence for use of acupuncture in low back pain was equivocal but stated that it may be used as an adjunctive treatment or acceptable alternative or as part of a comprehensive management plan for low back pain (15).

• A 1998 meta-analysis of nine randomized, controlled trials found acupuncture to be better than various comparison interventions for back pain, but it was unclear whether it was superior to placebo (16).

• A 2003 review considered data from six additional randomized, controlled trials. The largest trial randomized 262 patients to one of three treatment arms and found acupuncture to be less effective than massage and equal to self-care educational materials (4; 17).

• A 2005 Cochrane review of acupuncture and dry-needling for low back pain found 35 randomized, controlled trials in six different languages. It noted evidence of pain relief and functional improvement for chronic low back pain (immediately after therapy or on short-term follow-up). Although the effects are small, acupuncture used as an adjunct to conventional therapies appears to relieve pain and improve function in chronic low back pain more than the conventional therapies alone. Only 3 of the studies concerned acute low back pain, and no conclusion was possible for that diagnosis (18).

• In a randomized, controlled trial of 159 pregnant women with low back pain and posterior pelvic pain, 1 week of continuous auricular acupuncture at three points was associated with a statistically significant reduction in pain compared with sham auricular acupuncture and no treatment (19).
An overview of systematic reviews (published between 2000 and 2010) of the effectiveness of acupuncture for rheumatic conditions identified six systematic reviews on low back pain. Of those, three arrived at a clearly positive conclusion, and three had unequivocal conclusions (20).

A systematic review of the literature up to 2010 on complementary and alternative-medicine therapies in adults with back, neck, or thoracic pain concluded that acupuncture was associated with significantly lower pain intensity than placebo but only immediately after treatment (8).

Comments

Consider 6 to 10 acupuncture treatments over a period of 4 to 8 weeks as an adjunctive treatment for chronic low back pain that has not responded to standard therapies.

By inserting needles into specific points on meridians (channels) through which “Chi” (energy) flows, traditional acupuncturists believe that the body's energy system will be balanced or corrected, leading to healing of an affected organ or system.

Because no physical evidence of meridians or Chi has been found, some physicians and other Western practitioners have theorized that acupuncture points are near nerve or muscle structures that can be stimulated to release opioid compounds or serotonin. Some researchers have noted that analgesia from acupuncture does not develop quickly nor resolve quickly, suggesting a central mechanism mediated by neurohumoral factors (21).

In addition to manual stimulation of acupuncture points with needles, some acupuncturists use electrical acupuncture (the needle is connected to an electrical stimulator), moxibustion (burning the herb Artemis vulgaris at the end of the needle), or injection acupuncture (injection of herbal extracts into the acupuncture point).

Be aware that many states do not license acupuncturists who are not physicians or chiropractors.

In chronic low back pain, the relationships between pain perception and psychological state are important. To understand the contradictory findings from controlled trials of acupuncture for chronic low back pain, a single-blinded, placebo-controlled, randomized crossover trial was conducted on 40 patients with chronic low back pain. Patients were categorized as either low or high level of psychiatric comorbidity based on a model consisting of Beck Depression Inventory II, Pain Anxiety Symptoms Scale, and NEO Personality Inventory-Short Form. Results indicated that psychiatric comorbidity did not significantly affect the analgesic benefits of acupuncture or placebo needling in chronic low back pain (22).

camdz417-leff_3

Spinal manipulation{harm_moderate}

Evidence

There are more than 50 randomized studies of spinal manipulation in the literature, as well as many meta-analyses and systematic reviews. A meta-analysis published in 1992 was the first to suggest definitive benefit of spinal manipulation for acute low back pain (23). In 1996, a high-quality systematic review found no conclusive evidence of benefit and noted that most trials have suffered from poor quality (24). Although the interpretation of this literature continues to be controversial, subsequent reviews have considered additional trials and concluded that spinal manipulation is efficacious in the short term for both acute (25; 26) and chronic (3; 25; 27) low back pain.

Although some studies suggest that patients with acute low back pain benefit from spinal manipulation (28), there is no convincing evidence that its effect is greater than the use of paracetamol and advice to remain active (29).
In a randomized, controlled trial comparing spinal manipulative therapy in addition to standard care with standard care alone in 104 patients with acute low back pain, reductions in pain intensity were similar in experimental and control groups (30).

Numerous well-designed studies have found spinal manipulation to be superior to “usual care” or placebo/sham treatments for chronic low back pain (31; 32; 33; 34; 35).

Although most spinal manipulation trials use high-velocity, low-amplitude, or other rotational techniques, there is evidence that distraction-manipulation is also effective. A randomized trial for chronic low back pain compared trunk exercises provided by physical therapists (n=112) and flexion-distraction manipulation provided by chiropractors (n=123). Both groups improved after 4 weeks of treatment. Patients in the manipulation group had significantly greater relief from pain than those in the exercise group. In a subgroup analysis, patients with moderate to severe chronic pain did better with manipulation, whereas those with moderate to severe recurrent pain did better with exercise (36). At 1 year, subjects treated with manipulation had a statistically significant improvement in pain compared with those in the trunk-exercise group (P=0.02), with no difference in disability (37).

A randomized, controlled trial of 112 patients with low back pain who satisfied a clinical prediction rule compared the effectiveness of three different manual physical-therapy techniques. There were significant differences in the numerical pain rating scale at 1-week, 4-weeks, and 6-month follow-ups between thrust manipulation (supine thrust manipulation and side-lying thrust manipulation) and nonthrust manipulation. The study design did not include a control group or a placebo manipulation-technique group (38).

The addition of passive modalities (heat, ice, ultrasound, electrical stimulation) to manipulative therapy does not appear to result in added benefit (39).

A systematic review of the literature up to 2010 on complementary and alternative-medicine therapies in adults with back, neck, or thoracic pain concluded that spinal manipulation was significantly better than placebo or no treatment in reducing low back pain immediately or in the short term after treatment (8).

A randomized trial on 205 outpatients with chronic nonspecific low back pain reported that spinal manipulation provided significant greater pain relief (measured by the numerical pain rating scale) and reduction in Roland Morris Disability score than either the Swedish back school or individual physiotherapy at 3-month, 6-month, and 12-month follow-ups. However, it must be noted that the lack of blinding in the study participants might have positively influenced the results in the spinal manipulation group, as spinal manipulation was given by a physician while the other two interventions were given by a physiotherapist (40).

A Cochrane review of the literature up to June 2009 identified 26 randomized, controlled trials that assessed the effectiveness of spinal manipulative therapy on chronic low back pain. High-quality evidence suggested that there was a small statistically significant but not clinical relevant difference between spinal manipulative therapy and other interventions for reducing pain and improving function in patients with chronic low back pain. Only very low-quality evidence indicated that spinal manipulative therapy was not significantly more effective than inert interventions for short-term pain relief or functional status (41).

A randomized trial of 301 individuals with chronic low back pain concluded that spinal manipulation was not significantly better than supervised exercise therapy or home exercise in pain relief, both short and long term (42).

Comments

Spinal manipulation is beneficial for low back pain; however, evidence does not support it as being more effective than other standard treatments for acute or chronic low back pain (43; 44; 45). Consider spinal manipulation (a trial of 8 to 12 treatments over 1 month to determine therapeutic benefit) for low back pain of more than 2 weeks' duration. There appears to be little overall
difference in benefit between spinal manipulation and exercise or physical therapy in many populations studied (43; 46; 47; 48).

- Using spinal manipulation in addition to usual medical care appears to be of little benefit in treating acute low back pain (29).
- Recognize that if clinically significant improvement is apparent, continued treatment at a reduced frequency is warranted until maximum improvement is reached, which usually occurs within 6 to 10 weeks.
- Caution patients with local tumor or metastasis, significant osteopenia or osteoporosis, active inflammatory arthritis, long-term steroid use, or anticoagulant use to avoid spinal manipulation (high-velocity, thrusting) but, rather, to consult chiropractors, osteopaths, and physical therapists who provide nonthrusting forms of manual therapy (mobilization) that may be beneficial.

Low back pain can result from nociceptive input from most tissues of the lumbar spine, including discs, facets, ligaments, and muscles. Back pain (or, more specifically, low back or lumbar pain) is a common condition that affects most individuals at some point in their lives. Low back pain is generally considered acute if duration is less than 3 weeks, subacute if duration is greater than 3 weeks but less than 3 months, and chronic if duration is greater than 3 months. Low back pain is considered uncomplicated if there are no lower-extremity symptoms suggesting radiculopathy and no evidence of neurologic deficit (loss of deep tendon reflexes, motor strength, or sensation).

Although no one specific effect of spinal manipulation has been shown to be responsible for its therapeutic benefit, several factors likely contribute to its effect, including stimulation of mechanoreceptors and modulation of central spinal reflexes, release of entrapped synovial folds or plica between facet joint surfaces, and disruption of adhesions caused by abnormal motion or inactivity.

A Swedish study suggested that patients were more satisfied with manual therapy or an intensive training program than with usual care from a general practitioner (49). This finding may account for some of the comparative benefit of spinal manipulation (50).

There is emerging evidence that some subgroups of patients with uncomplicated low back pain respond better to manipulative treatment than others. A randomized, controlled trial found that patients having four of five criteria (symptom duration less than 6 days, no symptoms distal to knee, score <19 on a fear-avoidance measure, at least one hypomobile lumbar segment, one or both hips with more than 35° of internal rotation) had an odds of improvement of 60.8 (92% chance of successful outcome) compared with 2.4 in those who received manipulation but did not meet the criteria (51).

The cost-effectiveness of spinal manipulation is largely unknown and is likely variable depending on the economic and geographic parameters of the population studied. A Canadian technology report noted that there was insufficient evidence to judge the cost-effectiveness of chiropractic treatment for low back pain as compared with physical therapy and medical care (52). Adding alternative therapies to usual medical care does not appear to reduce the cost of care for acute low back pain (53).

It is sometimes difficult to determine the exact form of manual therapy used in a study. At this time there is little evidence to recommend one method or school of spinal manipulation over another.

Preliminary evidence suggests that spinal manipulation may be of benefit to patients with sciatica (54), but no well-designed randomized trials have been completed to specifically address that condition.

Complications from lumbar manipulation are extremely rare but include disc herniation, cauda equina syndrome, abdominal aortic aneurysm rupture, and fracture.
• Side effects may include local discomfort (53%), radiating discomfort (10%), or tiredness (11%) (55). Most side effects resolve after 24 to 48 hours of initiating treatment.

• Care should be taken to ensure that spinal manipulation is used in a time-limited fashion for most low back conditions. At times, manipulation may provide short-term relief of pain without lasting benefits and thus foster patient dependence.

camdz417-leff_4

Willow bark extract (salicin){harm_moderate}

Evidence

• A single randomized, double-blind, placebo-controlled study (n=210) showed that willow bark extract (120 and 240 mg) was beneficial for exacerbations of chronic low back pain (56).

• An open, randomized, postmarketing study (n=228) found no difference in effect of willow bark extract containing 240 mg of salicin and 12.5 mg of rofecoxib when used to treat exacerbations of chronic low back pain (57).

• A Cochrane review concluded that there is some evidence that taking 240 mg of salicin per day provides short-term benefit for acute exacerbations of chronic, nonspecific low back pain (58).

Comments

• Consider willow bark extract (salicin), 120 to 240 mg once per day, for acute low back pain or exacerbations of chronic low back pain.

• Continue therapy for up to 1 week before expecting benefit.

• Avoid willow bark extract in patients with aspirin sensitivity or allergy, current gastrointestinal ulceration, or in those taking anticoagulants.

• Willow bark extract contains flavonoids, tannins, and salicin, which is a prodrug that is rapidly metabolized to acetylsalicylic acid (aspirin) on absorption, inhibiting cyclooxygenase and lipoxygenase; nonetheless, the benefit of willow bark extract may be the result of other mechanisms, as 240 mg of salicin is equivalent to only 50 mg of acetylsalicylic acid.

• Because willow bark extract contains salicin, a precursor to salicylic acid (240 mg salicin = 50 mg acetylsalicylic acid), there is potential for side effects similar to those of aspirin, although an extract with 240 mg of salicin per day affects platelet aggregation much less than typical doses of aspirin.

• Willow bark is available in several forms (extract, tincture, dried herb, and powdered herb). Only the extract (standardized to 120 or 240 mg of salicin) has been used in clinical studies.

• There are no reliable data regarding possible interactions with other herbs or medications. Cautionary statements are made based on the known and potential effects of the presumed active ingredient, salicin.

camdz417-leff_5

Devil's claw (Harpagophytum procumbens){harm_moderate}

Evidence

• A randomized, double-blind, placebo-controlled study compared placebo and two separate dosages of Harpagophytum extract (50 or 100 mg of harpagoside per day) for treatment of acute exacerbations of chronic low back pain (n=183). More patients were pain free during week 4 of the
trial in the two treatment groups (6 and 10, respectively, vs. 3 in the placebo group), with statistical significance of \( P=0.027 \) using a one-tailed test (59).

- A small trial of *Harpagophytum* extract (Doloteffin®, 60 mg of harpagoside per day; \( n=43 \)) vs. rofecoxib (12.5 mg/d; \( n=36 \)) for chronic back pain found no difference in outcome using multiple patient-generated measures at 6 weeks (60). This study was underpowered.

- A Cochrane review concluded that there is strong evidence that taking devil's claw containing 50 to 100 mg of harpagoside per day was better than placebo for short-term improvement of acute or chronic back pain (58; 61).

- Additional studies in the non-English literature report benefit (62).

**Comments**

- Consider devil's claw (*Harpagophytum procumbens* extract), standardized to 50 to 100 mg of harpagoside per day, for acute or acute-on-chronic low back pain.

- Note that 6,000 mg of crude preparation is equal to 50 mg of harpagoside.

- Advise patients that they may experience occasional gastrointestinal upset.

- Devil's claw is thought to have anti-inflammatory properties and is often promoted as treatment for arthritis and joint-related symptoms.

- This botanical remedy is derived from the roots and tubers of the devil’s claw (*Harpagophytum procumbens*) plant.

- Although devil's claw is thought to have anti-inflammatory properties, that mechanism has not been clearly established (63; 64). Evidence suggests that harpagoside may interfere with gene transcription and suppress the expression of cyclooxygenase-2 (65).

- Constituents include the presumed active ingredient, harpagoside, in addition to harpagide, procumbide, stigmasterol, \( \beta \)-sitosterol, triterpenes, and flavonoids.

- Minor side effects, primarily gastrointestinal, occur in approximately 3% of subjects in randomized studies (66). At least one case of purpura associated with the concurrent use of devil's claw and warfarin has been noted (67).

- There is no evidence to support long-term use of devil's claw.
Possibly Effective

**Homeopathic remedies**

**Evidence**
- A single multicenter, randomized, double-blind trial (n=161) of Spiroflor SRL® (a homeopathic gel) and a commonly used capsicum-based topical treatment found no difference in pain relief but fewer side effects and adverse reactions in the homeopathic-gel group (68).
- A German randomized, pilot study (n=43) of homeopathic treatment vs. physical therapy (2 months of treatment) found benefit for the homeopathy group based on changes in Oswestry and visual analog scale scores but no effect 18.5 months later (69).

**Comments**
- Consider topical application of the homeopathic gel Spiroflor SRL® for acute low back pain in conjunction with other therapies for patients who seek it.
- Homeopathy is based on two theoretical premises. The first premise is that “like cures like;” therefore, substances that are known to produce symptoms when administered to healthy persons are given to ill persons with those symptoms. The second premise is that the more diluted the preparation of the substance, the more potent it is.
- There are no known risks of homeopathic remedies when they are used to complement standard medical therapies for back pain.
- Few experts in the use of CAM therapies recommend homeopathic treatment of low back pain (70).

**Acupressure**

**Evidence**
- A randomized, 2 x 2 factorial design study in the German literature compared acupressure and Swedish (classical) massage with or without exercise (n=109) and found acupressure to be superior when used with or without exercise for low back pain (71).
- A randomized trial from Taiwan comparing 1 month of treatment with acupressure or physical therapy for chronic back pain (n=188) found acupressure to provide more reduction of pain and disability based on both the Roland Morris and modified Oswestry scores. Major limitations of this study include the lack of a standardized comparison group ("routine" physical therapy), the fact that acupressure was provided by only one practitioner, and the lack of a control for time or attention (72).
- There is a single uncontrolled study (n=66) of shiatsu massage for low back pain that suggests benefit (73).

**Comments**
- Consider short-term treatment with acupressure (6 to 10 treatments over 4 to 8 weeks) for low back pain in conjunction with other therapies for patients who seek it.
- Acupressure is a Chinese form of massage that uses digital pressure over acupuncture points to normalize the flow of energy (Chi); it is often used to treat painful conditions and reduce stress.
• Shiatsu is a similar form of massage with Japanese origins in which the practitioner applies pressure with the hands, elbows, knees, or feet.
• Complications, side effects, and contraindications are similar to those of classical massage.

**camdz417-peff_3**

**Chondroitin sulfate**

**Evidence**
- One study of uncertain quality in the non-English (Russian) literature used a chondroitin-based product (1,000 mg/d for 24 weeks) to treat 30 patients with back pain attributed to “osteochondrosis.” Improvement was noted in 73% (74).
- Multiple trials have suggested benefit (pain reduction) in knee osteoarthritis from chondroitin sulfate. A 2000 meta-analysis found a pooled effect size of 0.8 among trials of higher quality (75).

**Comments**
- Consider chondroitin sulfate, up to 1,200 mg/d (as used in arthritis), for treatment of chronic low back pain associated with degenerative spinal disease in conjunction with other therapies for patients who seek it.
- Chondroitin sulfate is thought to be chondroprotective and has been shown to provide modest pain relief in studies of knee osteoarthritis.
- Many cases of chronic low back pain are caused by osteoarthritic changes in the synovial facet joints.
- The most common side effects experienced are gastrointestinal upset, nausea, constipation, and diarrhea.
- There are no known interactions of chondroitin sulfate with medications, herbs, or other supplements.
- Preparations of chondroitin sulfate are often poorly standardized. Refer to the ConsumerLab Web site for independent testing of specific brands.

**camdz417-peff_4**

**Balneotherapy and spa therapy**

**Evidence**
- A meta-analysis of spa therapy and balneotherapy for low back pain found three randomized trials meeting criteria for spa therapy (n=442) and two for balneotherapy (n=138). A 26.6% difference on a visual analog pain scale was found in favor of spa therapy over a wait-list control group. For balneotherapy, there was an 18.8% difference over the control groups. It was concluded that the evidence, although limited, indicates that these therapies might prove effective for low back pain (76).

**Comments**
- Balneotherapy uses hot baths that contain natural mineral content, most often for the treatment of pain. Spa therapy combines hydrotherapy or balneotherapy with exercise and other physical-therapy techniques. Although these therapies are often combined in literature reviews, their mechanisms of action could be different. For that reason, it has been suggested that they be considered separate therapies (77).
• Although spa therapy has been reported to be beneficial, it may be very difficult to discern what individual factors are responsible for improvement. At least one study has attempted to determine the contribution of individual treatments to its overall effect. It was concluded that the largest contributions to its long-term effects on low back pain were from the more traditional physical therapy treatments: exercise and spinal traction (78).

• Spa therapy is considered usual treatment in some European countries but not in North America (79).

camdz417-peff_5

Pilates\{harm_minor\}

Evidence
• A small \((n=39)\) randomized, controlled trial with 12-month follow-up compared specific Pilates exercises (using specialized exercise equipment) to usual medical care (Canada). The Pilates group had significantly lower disability (Roland Morris Questionnaire) and pain (numerical rating scale) after the intervention. The improved disability scores were maintained at 12 months (80).

• Pilates (CovaTech method) was compared with the back school method, using exercises for treatment of chronic low back pain in a randomized study \((n=53)\) with blinded observers and a 6-month follow-up. Both groups met in small groups of 7 subjects. Both groups improved similarly (Oswestry disability scale and visual analog scale), although the Pilates group had better compliance and perceived benefit (81).

• A systematic review with meta-analysis of the literature up to March 2009 identified seven randomized, controlled trials comparing pain and disability in individuals with persistent nonspecific low back pain who were treated with Pilates exercises. When compared with minimal intervention, Pilates-based exercise provided significant pain relief but not a significant difference in disability scores. However, the results should be interpreted with caution because of the low quality of existing studies and the heterogeneity of pooled studies (82).

Comments
• Pilates is a form of exercise that promotes core strengthening and coordinated movement. It has traditionally been used by performing artists. In recent years, it has become a popular form of exercise, with classes available in many community facilities and health clubs. The limited evidence available suggests that it may be helpful for chronic low back pain.

• Factors to be considered when determining the appropriateness of Pilates training are the same as used when prescribing traditional strengthening exercises for back pain.

• Pilates-based exercises appeared to be no more effective than other forms of exercise to reduce nonspecific low back pain (82).

camdz417-peff_6

Yoga\{harm_moderate\}

Evidence
• A randomized, controlled, three-arm trial (yoga vs. conventional back exercise classes vs. a self-care book) was done for patients with chronic low back pain. The primary outcomes were the Roland Disability Scale and a “bothersomeness” of pain scale, with follow-up at 6, 12, and 26 weeks. All groups improved. The yoga group had more improvement (statistically and clinically significant) than the book group for all follow-up points. The yoga group and exercise group were
statistically but not clinically different at 12 weeks. Only the yoga group continued to improve past 12 weeks based on the bothersomeness scores (83).

- One randomized, controlled trial evaluated 24 weeks of Iyengar yoga therapy on 90 patients with chronic low back pain. Significantly greater reductions in functional disability and pain intensity were seen in the yoga group when compared with the control group at 24 weeks. There was also a trend for the yoga group to reduce their use of pain medications compared with the control group (84).

- In a prospective study, 313 adults with chronic or recurrent low back pain were randomly assigned to a 12-week class of yoga or usual care. All participants received a back-pain education booklet. The yoga group had better back function as measured by the Roland-Morris Disability Questionnaire at 3 months (primary endpoint; \( P<0.001 \)) as well as 6 and 12 months. The yoga and usual-care groups had similar back pain and general health scores at 3, 6, and 12 months. The yoga group had better pain self-efficacy scores at 3 and 6 months but not at 12 months. Two of the 157 usual-care participants and 12 of 156 yoga participants reported adverse events, mostly increased pain, the majority of which was reported as probably related to yoga (85).

**Methylene blue injection**

**Evidence**

- A small \( n=71 \) randomized, controlled trial with 24-month follow-up compared intradiscal methylene-blue injection to placebo. The methylene-blue group had significantly lower self-reported pain assessed by a 101-point numerical rating scale and the Oswestry Disability Index compared with the placebo (86).

**Comments**

- The impressive self-reported pain reduction from using methylene-blue injection for the treatment of chronic discogenic low back pain (86) has led to doubts about the credibility of the study results (87) and cautions about potent neurotoxic effects of methylene blue (88).

- More independent replication studies are needed to confirm the efficacy and safety of using intradiscal methylene blue as a treatment for back pain.

**Behavioral therapy**

**Evidence**

- A Cochrane review of 30 randomized trials concluded that operant therapy is more effective than waiting list, and behavioral therapy is more effective than usual care for short-term management of chronic low back pain (89).

**Comments**

- The main assumption underlying a behavioral-therapy approach is that pain and its resulting disability are influenced by psychological and social factors in addition to somatic pathology; therefore, the goal of behavioral therapy is to alter maladaptive thoughts.

- Acute pain behaviors may be reinforced by external factors and eventually develop into a chronic pain problem in the model of operant conditioning principles of B.F. Skinner; therefore, operant therapy involves removing positive reinforcement of pain behaviors, such as attention of the spouse and medical personnel.
• It is still unknown what type of patients benefit most from what type of behavioral therapy (89).

**camdz417-peff_9**

**Combined chiropractic interventions\{harm_moderate\}**

**Evidence**

• A Cochrane review compared the use of combined chiropractic interventions (rather than spinal manipulation alone) with other therapies in treatment of low back pain. When compared with other treatments, combined chiropractic interventions slightly improved pain and disability in the short term and pain in the medium term for acute and subacute low back pain (90).

**Comments**

• Combined chiropractic interventions involve manual treatments, including spinal manipulation, in combination with physical-therapy modalities, exercise programs, nutritional advice, orthotics, lifestyle modification, and/or other patient education.

• There are no trials comparing combined chiropractic interventions with no treatment; therefore, no conclusion about this can be drawn (90).
Unknown Effectiveness

**Glucosamine**

**Evidence**

- Some trials have suggested benefit (pain reduction) in knee osteoarthritis from glucosamine sulfate (91; 92), although others have found no effect (93; 94).
- A meta-analysis of studies using glucosamine sulfate for osteoarthritis found an effect size of only 0.3 among trials with higher-quality scores (75).

**Comments**

- Do not recommend glucosamine sulfate for treatment of low back pain.
- Glucosamine sulfate occurs naturally in cartilage and is also produced synthetically.
- It is thought to be chondroprotective and has been shown to provide modest pain relief in some studies of knee osteoarthritis.
- It is often promoted as being effective for low back pain due to spinal arthritis. There are no published studies of the effect of glucosamine sulfate on low back pain, but benefit is plausible considering the results of studies in osteoarthritis.
- Although some in vitro and animal studies have suggested the potential for glucosamine to affect sensitivity to insulin, oral glucosamine does not appear to worsen insulin resistance or endothelial cell dysfunction (95).
- A large, NIH-funded trial is currently recruiting patients with osteoarthritis to help determine the role of glucosamine sulfate in its treatment.

**Rolfing®**

**Evidence**

- A single case report of Rolfing® used in conjunction with movement therapy suggests possible benefit for chronic low back pain (96). No other studies of Rolfing® for low back pain were found in the peer-reviewed literature.

**Comments**

- Do not recommend Rolfing® (structural integration) as treatment for acute or chronic low back pain.
- Rolfing® is a system of soft-tissue massage and movement education, which is believed to result in more efficient muscle use and movement patterns.

**Therapeutic climbing**

**Evidence**
A small randomized, controlled study was conducted to compare therapeutic climbing with a standard exercise regime in 28 patients with chronic low back pain. No significant differences were observed in back pain-related disability (measured by the Hannover Functional Ability Questionnaire) either before versus after or between the two treatments. Four (29%) of the individuals in the therapeutic climbing group had less than 70% participation over the four-week study period (97).

Comments

- Given the limited evidence, therapeutic climbing should be considered of unknown effectiveness.
- Climbing is being used therapeutically in different contexts, particularly in Germany. Therapeutic climbing generally involves specific climbing exercises to achieve muscular training or as a means of mobilization. In addition, it may increase confidence and self-efficacy.
Possibly Ineffective

Bipolar magnets\{harm\_minor\}

Evidence
- A small, randomized, double-blind, placebo-controlled, crossover pilot study \((n=20)\) found no clinical effect of bipolar magnets on chronic low back pain \(98\).

Comments
- Do not recommend bipolar permanent magnets as treatment for low back pain.
- Despite their popularity, there have been few studies examining the effect of permanent magnets on musculoskeletal pain. Studies have suggested that permanent magnets may be beneficial for chronic pelvic pain \(99\) and knee pain \(100\). There is no apparent benefit for pain related to carpal tunnel syndrome \(101\).
- Proposed mechanisms of how permanent magnets might work include increasing circulation, reducing inflammation, improving cellular pH balance, and effecting calcium transport and balance.
- Magnets may interfere with heart devices (pacemakers or implantable cardioverter defibrillators) and should be kept at least 6 inches away from them.
- The National Institute of Dental and Craniofacial Research is currently conducting a randomized, double-blind, placebo-controlled study using permanent magnets for low back pain with sciatica.

Feldenkrais Method®\{harm\_minor\}

Evidence
- A nonrandomized study of Feldenkrais® in patients with nonspecific musculoskeletal pain syndromes included 53 persons with back pain, but a direct comparison was not made for that subgroup. There was no difference among the three treatment groups in subscale scores for the 36-Item Short Form Health Survey \(102\).

Comments
- Do not recommend Feldenkrais® (awareness through movement, functional integration) as treatment for acute or chronic low back pain.
- The Feldenkrais Method® is a system of body movement education that is believed to enhance awareness of movement and improve function of movement. The expected results are that a person will be able to move more efficiently and comfortably and with less pain.
- Feldenkrais® practitioners undergo an extensive, apprentice-like training program. There is theoretical potential for benefit for numerous conditions due to its possible effects on the motor control system. Unfortunately, this therapeutic paradigm has been inadequately studied.

Reflexology\{harm\_minor\}
Evidence

- A pragmatic study in the United Kingdom examined the effect of adding reflexology or relaxation to usual general practitioner care. Patients with chronic low back pain (n=243) were randomly assigned to usual care, usual care with reflexology, or usual care with relaxation. There were no significant differences in pain or function between the groups immediately after treatment or at 6 months' follow-up (103).

Comments

- There does not appear to be a benefit from adding reflexology (or relaxation therapy) to usual medical care for chronic back pain. This study addresses the effectiveness of using reflexology in the U.K. health system but not efficacy in more controlled settings.

Intra-annular radiofrequency thermal disc therapy\{harm_minor\}

Evidence

- In a small randomized, double-blind, placebo-controlled study (n=20) in patients with chronic discogenic low back pain for more than 6 months, there was no significant difference in pain intensity with percutaneous intradiscal radiofrequency thermocoagulation therapy using the discTRODE™ probe as compared with sham treatment 6 months after the procedure. Two of the 10 patients in each of the intradiscal radiofrequency and sham-treatment groups reported increased pain levels 12 months after the procedure (104).

Comments

- Do not recommend percutaneous intradiscal radiofrequency thermocoagulation as treatment for chronic low back pain.

Qigong\{harm_minor\}

Evidence

- A systematic review of the literature up to February 2009 identified four randomized, controlled trials and three controlled clinical trials assessing the effectiveness of internal qigong for pain management. Overall, there is no convincing evidence to suggest that internal qigong is an effective modality for pain management (105).

Comments

- Internal qigong is a self-directed energy healing intervention involving movement and meditation.


PIER is copyrighted ©2014 by the American College of Physicians. 190 N. Independence Mall West, Philadelphia, PA 19106, USA.

Page 43 of 46


Back Pain (CAM)


CAM  
complementary and alternative medicine

NIH  
National Institutes of Health

Terms

Low back pain  
Pain occurring in the region of the lumbar spine and upper posterior pelvis, usually superior to the gluteal folds and inferior to the lower ribs

Manipulation  
Movement of a joint using a thrusting motion, often producing a “popping” sound

Mobilization  
Movement of a joint with an oscillating or controlled force