Evidence Summary for Management of Non-specific Chronic Low-Back Pain
(from Randomized Controlled Trials [RCTs] and Systematic Reviews of RCTs)

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Background

This evidence summary is part of a tool kit designed to help family physicians manage low-back pain more effectively. The tool kit was developed under the leadership of the Physicians of Ontario Collaborating for Knowledge Exchange and Transfer (POCKET). Materials in the tool kit on the management of acute low-back pain were developed based on guidelines endorsed by the Guidelines Advisory Committee. In response to consultation with the POCKET network of informal opinion leaders or "Educationally Influential" family physicians, an evidence summary on the management of non-specific chronic low-back pain was also included.

Methods

This evidence summary is based on a non-systematic review of the literature on the management of non-specific chronic low-back pain, conducted by a team at the Institute for Work & Health affiliated with the Cochrane Back Review Group. The team first drew from findings from a high quality evidence-based guideline conducted by a reputable international group (It is called the European Guideline for the Management of Chronic Non-specific Low Back Pain, November 2004)[6]. Recommendations from this guideline cited several published systematic reviews from *The Cochrane Database of Systematic Reviews*. When we required more detail than the Guideline provided, we consulted specific Cochrane Reviews[1,11,12,15,16,18] and a current evidence-based overview[25]. An additional Hayden et al review[14] was a companion analysis to one of the Cochrane Reviews[15].

The evidence has been updated three times since 2004. Published after the European Guideline on the management of non-specific low-back pain, results from an evidence-based overview[26], the Joint American College of Physicians and the American Pain Society Clinical Practice Guidelines for the diagnosis and treatment of low-back pain[2,3,4] and a number of new or updated Cochrane Reviews[5,7-10,13,17,19-22,27] were incorporated.

The framework used to summarize the evidence is based on the method guidelines for systematic reviews in the Cochrane Back Review Group[24].

Note to Physicians Using this Evidence Summary

This guide provides family physicians with a quick overview of the evidence (available as of February 2009) around managing non-specific chronic low-back pain. Non-specific chronic low-back pain is defined as pain or stiffness that persists for 12 weeks or more localized below the costal margin and above the inferior gluteal folds, with or without leg pain. Non-specific low-back pain is not attributed to a pathology (such as infection, tumour, osteoporosis, fracture or inflammatory arthritis)[adapted from 23].

Evidence-based decision-making incorporates the best available evidence along with **YOUR** clinical experience and knowledge of your patient. We hope that this evidence summary will be a useful reference tool in your practice as you consider how to best manage patients with non-specific chronic low-back pain. It's worth noting that this summary is based on evidence from published systematic reviews of randomized controlled trials (RCTs). When systematic reviews have not yet been completed, the summary uses findings from RCTs. Although RCTs are considered the "gold standard," these studies have potential sources of bias that may affect the results. RCTs generally address efficacy, and are conducted under ideal conditions. In "real world" practice, clinicians and patients should weigh the beneficial and harmful effects of each approach according to individual circumstances and priorities.

Levels of evidence[24]

Strong evidence = consistent findings among multiple high-quality randomized controlled trials (RCTs)

Moderate evidence = consistent findings among multiple low-quality RCTs and/or one high-quality RCT

Limited evidence = one low-quality RCT

Conflicting evidence = inconsistent findings among multiple randomized trials (RCTs)

No evidence from trials = no RCTs

Effective Treatment (moderate to strong evidence)

Treatments: Non-drug	Evidence	Limitations & Considerations
Acupuncture	• Acupuncture is more effective than no treatment or sham treatment at < 3-month follow-up[3,4,12]. • There are no differences in effectiveness compared with other conventional therapies such as spinal manipulation, analgesics, self care[3,4,12].	• Evidence suggests it is better to prescribe acupuncture in combination with some rehabilitation therapy, such as exercises, physiotherapy or back care education, rather than alone[3,12].
Back schools An intervention that consists of an education and a skills program, including exercises, in which all lessons are given to groups of patients and supervised by a paramedical therapist or medical specialist[6].	• Back schools conducted in occupational settings are more effective than other conservative treatments (such as simple advice and exercise) in reducing pain and improving function[3,6,16]. • Evidence is conflicting for the effectiveness of back schools compared to placebo or wait-list controls in a general, non-occupational population[3,6,16].	• Study follow-up was limited to < 3 months[6,16].
Behavioural therapy Involves procedures where changes in cognition and behaviour are the main goals of the treatment offered. The main assumption of a behavioural approach is that pain and pain disability are not only influenced by somatic pathology, if found, but also by psychological and social factors[6].	• Cognitive-behavioural therapy is more effective than no treatment, placebo and wait-list control in reducing pain and improving function and behavioural outcomes[6,18].	• Study follow-up was limited to < 3 months[6,18].

Effective Treatment (moderate to strong evidence) (continued)

Treatments: Non-drug	Evidence	Limitations & Considerations
Brief educational interventions Examples include: minimal contact with a health-care professional (one or two sessions); the use of self-management patient-led groups; the provision of educational booklets; the use of Internet and e-mail discussion groups[2].	• Brief education addressing concerns and encouraging return to usual activities is more effective than usual care in increasing return to work at > 1-year follow-up[6]. • When brief education is directed at encouraging self care, it is more effective than usual care in reducing disability but not pain at 3-12 month follow-up[6].	• Study follow-up was limited to < 3 months[6,18].
Exercise therapy A series of specific movements with the aim of training or developing the body to promote good physical health[15].	• Exercise therapy is more effective than no treatment and other conservative treatments in reducing pain and improving function at >1-year follow-up[3,4,15]. • Meta-analysis (statistical method to pool data from several RCTs) found effect sizes were small[3,4,15]. • Exercise slightly reduced sick leave during the first year and increased the proportion of patients who had returned to work at one year, although no benefit was observed in the severely disabled subgroup, or in those receiving disability payments[3].	• The most effective strategy was individually designed exercises delivered in supervised format (e.g. home exercises with regular therapist follow-up)[14]. • Adding conservative treatments, such as advice to stay active, NSAIDs or manual therapy, resulted in a further reduction in pain and improved function[14].
Massage	• Massage is more effective than sham treatment in reducing pain and improving function[3,4,11]. • Effectiveness compared to other conventional therapies is inconclusive (effects were lower than effects of spinal manipulation and TENS, equal to corset and exercise, but superior to joint mobilization, relaxation, physical therapy, self-care education or acupuncture)[3,4,11]. • Massage was more likely to work when combined with exercises (usually stretching) and education. It seems that acupressure or pressure point massage techniques provide more relief than classic (Swedish) massage, although more research is needed to confirm this[11].	

Effective Treatment (moderate to strong evidence) (continued)

Treatments: Non-drug	Evidence	Limitations & Considerations
Multidisciplinary (intensive) treatment programs Includes medical, physical exercise, vocational and behavioural components; provided by at least three health-care professionals with different clinical backgrounds (e.g. physician, physiotherapist, occupational therapist, chiropractor, psychologist); intensive = > 100 hours[3,4,6].	• Intensive multidisciplinary treatment programs are more effective than less intensive programs in reducing pain, improving function and return to work at > 1 year follow-up[3,4,6].	• Availability may be a constraint as such programs are not offered everywhere, wait lists may be long and typically these are not OHIP-funded (i.e. payers are WSIB or private insurers).
Spinal manipulation	• Spinal manipulation is more effective than sham manipulation, traction, corsets or topical gels in reducing pain and improving function at < 3-months, and 3-12-month follow-up[1,3,4]. • Spinal manipulation is as effective as other conventional therapies, such as analgesics, physical therapy, exercises and back schools, in reducing pain and improving function at < 3 months and 3-12 month follow-up[1,3,4].	• Including data from observational studies, the risk for a serious adverse event was estimated as less than 1 per 1 million patient visits[3].
Yoga	• Viniyoga is more effective than conventional exercise or a self-care educational book in improving function and reducing medication use[3,4]. • The evidence for Iyengar yoga is conflicting[3,4].	

Effective Treatment (moderate to strong evidence)

Treatments: Drug	Evidence	Cautions
Analgesics (acetaminophen, opioids)	• Tramadol was more effective than placebo for pain relief and improving function[8]. • However, there is conflicting evidence whether tramadol is more effective than other analgesics, including opioids[2]. • Acetaminophen was less effective than diflunisal for pain relief in one RCT, but has fewer side effects; there are no RCTs that compare acetaminophen to placebo for chronic back pain[2,19].	• Risk of addiction[6]. • Moderate side effects of headaches, nausea, constipation, dizziness or sweating, sexual impotence[6,8]. • Study follow-up was limited to < 3 months[6].
Herbal medicine	• A daily dose of 50 or 100 mg harpagoside in an aqueous extract of Harpagophytum procumbens ("Devil's claw") reduces pain more than placebo in the short term[13]. • A daily dose of 240 mg salicin from an extract of Salix alba ("White willow") reduces pain more than either placebo or a daily dose of 120 mg of salicin, but shows similar effectiveness as a daily dose of 12.5 mg rofecoxib in the short term[13]. • A plaster of Capsicum frutescens reduces pain and improves function more than placebo, but there is no statistically significant or clinically relevant differences in effectiveness between Spiroflor SLR homeopathic gel and Cremor Capsici Compositus FNA gel in the short term[13]. • There are no statistically significant or clinically relevant differences in effectiveness between a daily dose of 60 mg harpagoside in an aqueous extract of Harpagophytum procumbens and a daily dose of 12.5 mg rofecoxib in the short term[13].	• The long-term effect on return to work was not evaluated in the studies[13]. • Trials assessed the effects on individuals with acute episodes of chronic low-back pain[13]. • Adverse effects reported in the trials were primarily confined to mild, transient gastrointestinal complaints[13].

Effective Treatment (moderate to strong evidence) (continued)

Treatments: Drug	Evidence	Cautions

Muscle relaxants	• Benzodiazapenes are more effective for short-term pain relief than placebo[2,6].
	• For non-benzodiazapenes:
	  ◦ Flupirtin is more effective than placebo for short- term pain relief and overall improvement, but not for relieving muscle spasm[26].
	  ◦ Tolperisone is more effective than placebo for short-term improvement but not for relief of pain or muscle spasm[26].
		• Other pain-relieving drugs with fewer serious side effects should be considered first[2].
		• Side effects are drowsiness, dizziness, addiction, allergic side effects, reversible reduction of liver function, gastrointestinal events[2,26].
		• Study follow-up was limited to < 3 months[2].

Non-steroidal anti-inflammatory drugs (NSAIDs)	• NSAIDs are more effective than placebo in relieving pain and improving function[6,19]. • NSAIDs are effective for short-term symptomatic relief in patients with chronic low-back pain without sciatica; however, effect sizes are small[2,19]. • No specific type of NSAID is clearly more effective[2,19]. • For patients with sciatica, there is no evidence that NSAIDs are more effective than placebo[19].	• In most RCTs, study follow-up was limited to < 3 months. • Must consider risk associated with long-term use of NSAIDs (gastrointestinal and cardiovascular)[6]. • Selective COX-2 inhibitors showed fewer side effects compared to traditional NSAIDs in the RCTs included in this review. However, recent studies have shown that COX-2 inhibitors are associated with increased cardiovascular risks in specific patient populations[2,19].

Conflicting Evidence

Treatments: Non-drug	Evidence
Electrical muscle stimulation	• Inconsistent findings from multiple RCTs[6].
Individual patient education	• Individual education was as effective as non-educational interventions, such as spinal stabilization, physiotherapy, yoga or exercises, for long-term pain, short-term back pain-specific function, short- and long-term generic functional status and global improvement[9]. • Written educational materials were less effective than non-educational interventions for improving low-back pain-related functional status in the long-term[9].
Low-level laser	• Inconsistent findings from multiple small RCTs[3,6]. • Low-level laser therapy was more effective than sham laser at improving pain and disability in the short and intermediate term; however the effect sizes were small and not clinically significant[27]. • Laser therapy was less effective than exercise at improving pain and disability[27].
Lumbar supports	• Inconsistent findings among multiple RCTs[22]. • Lumbar supports are less effective than no treatment for reducing pain, but more effective for reducing disability[22]. • There was no significant difference between lumbar supports and other conservative treatments for reducing pain, disability or time away from work[22]. • There is no clear evidence to support the use of one type of lumbar support over another[22].
Superficial hot and cold therapy (thermal therapy)	• Inconsistent findings for heat versus cold and other treatments, and cold versus other treatments from multiple RCTs[3,10].
Transcutaneous Electrical Nerve Stimulation (TENS)	• Inconsistent findings from multiple RCTs[3,17].

Conflicting evidence (continued)

Treatments: Drug	Evidence
Antidepressants	• Inconsistent findings from multiple RCTs and systematic reviews[2,21]. • Side effects include drowsiness, dry mouth, dizziness and constipation[6]. • Patients with renal disease, glaucoma, pregnancy, chronic obstructive pulmonary disease and cardiac failure should not be treated with antidepressants[6]. • Study follow-up was limited to < 3 months[6].
Anti-epileptics (Gabapentin)	• Inconsistent findings for pain and disability from multiple RCTs[2].
Epidural steroid injections	• Inconsistent findings from multiple RCTs[6].
Trigger point injections	• Inconsistent findings among multiple RCTs[6].

No evidence from RCTs

Treatments: Non-drug	Evidence
Bed rest	• No RCTs published for chronic low-back pain[6].
Naturopathic medicine	• No RCTs published for chronic low-back pain[26].

Not Effective Treatment (moderate to strong evidence)

Treatments: Non-drug	Evidence
EMG (Electromyographic) biofeedback	• Effects the same as placebo and wait-list control[23]. • Compared to other treatments (e.g. progressive relaxation training) the evidence is conflicting[23].
Traction	• Effects the same as sham[3,5]. • Effects the same as other therapies such as Interferential current therapy and Isometric exercises[3,5]. • Adverse events can include aggravation of neurological signs and symptoms, but are poorly recorded in most RCTs[3].

Not Effective Treatment (moderate to strong evidence)

Treatments: Drug	Evidence
Facet joint injections	• Effects of corticosteroids the same as sham injections for short term pain relief and improvement of disability[20]. • Effects of corticosteroids the same as sodium hyaluronate or facet nerve blocks (neither is a satisfactory treatment for chronic low-back pain)[20]. • Effects of lidocaine better than saline for short-term pain relief[20]. • Minor side effects reported in the trials ranged from headache, dizziness and transient local pain to nausea and vomiting[20]. • Rare but more serious complications of injection therapy have been mentioned in the literature, such as cauda equina syndrome, septic facet joint arthritis, discitis, paraplegia, paraspinal abscesses and meningitis[20].
Prolotherapy	• Effects the same as control injections[7].

Not Effective Treatment (limited evidence)

Treatments: Non-drug	Evidence
Interferential current therapy	• Effects the same as lumbar traction + massage[3,6]. • No published RCTs compare interferential current therapy to placebo or sham[6].
Shortwave diathermy	• Less effective than sham diathermy or other treatments in two small RCTs[3].
Therapeutic ultrasound	• Inconsistent results compared to sham for pain reduction[3].

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