ClinicalEvidence

draft

Low back pain (acute): non-drug treatments

abridged-title: Low back pain (acute): non-drug treatments [id: 1102] [date: 2015-09-01]

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ABSTRACT

INTRODUCTION: Low back pain affects about 70% of people in resource-rich countries at some point in their lives. Acute low back pain can be self-limiting; however, 1 year after an initial episode, as many as 33% of people still have moderate-intensity pain and 15% have severe pain. Acute low back pain has a high recurrence rate; 75% of those with a first episode have a recurrence. Although acute episodes may resolve completely, they may increase in severity and duration over time. METHODS AND OUTCOMES: We conducted a systematic overview, aiming to answer the following clinical question: What are the effects of non-drug treatments for acute low back pain? We searched: Medline, Embase, The Cochrane Library, and other important databases up to October 2013 (BMJ Clinical Evidence reviews are updated periodically; please check our website for the most up-to-date version of this review). RESULTS: At this update, searching of electronic databases retrieved 1379 studies. After deduplication and removal of conference abstracts, 720 records were screened for inclusion in the overview. Appraisal of titles and abstracts led to the exclusion of 598 studies and the further review of 120 full publications. Of the 120 full articles evaluated, five systematic reviews and four RCTs were added at this update. We performed a GRADE evaluation for 46 PICO combinations. CONCLUSIONS: In this systematic overview, we categorised the efficacy for nine interventions based on information relating to the effectiveness and safety of acupuncture, advice to stay active, back exercises, massage, multidisciplinary treatment programmes (for acute and subacute low back pain), spinal manipulation, temperature treatments (short-wave diathermy, ultrasound, ice, heat), and transcutaneous electrical nerve stimulation (TENS).

QUESTIONS

INTERVENTIONS

Key points

- Low back pain is pain, muscle tension, or stiffness, localised below the costal margin and above the inferior gluteal folds, with or without referred or radicular leg pain (sciatica), and is defined as acute when pain persists for less than 12 weeks.

  Low back pain affects about 70% of people in resource-rich countries at some point in their lives.

  Acute low back pain may be self-limiting, although there is a high recurrence rate with less-painful symptoms recurring in 50% to 80% of people within 1 year of the initial episode; 1 year later, as many as 33% of people still experience moderate-intensity pain and 15% experience severe pain.
- We searched for evidence of effectiveness from RCTs and systematic reviews of RCTs.
- With regard to non-drug treatments, advice to stay active (be it as a single treatment or in combination with other interventions such as back schools, a graded activity programme, or behavioural counselling) may be effective.
- There is conflicting evidence as to whether spinal manipulation improves pain or function compared with sham treatments.
- We found insufficient evidence to judge the effectiveness of acupuncture, massage, multidisciplinary treatment programmes (for either acute or subacute low back pain), TENS, or temperature treatments in treating people with acute low back pain.
- Back exercises may decrease recovery time compared with no treatment, but there is considerable heterogeneity among studies with regard to the definition of back exercise. There is a large disparity in results among studies of generic exercise and among those of specific back exercise.
- Overall, the literature is full of methodological limitations. Inadequate design and reporting of trials frequently produce low- or very low-quality evidence. The results are often inconclusive, insufficient, or contradictory.

Clinical context

GENERAL BACKGROUND

Up to 85% of patients with low back pain cannot be given a definitive diagnosis, the cause or mechanism of injury is often unknown and there is little consensus on appropriate management. As a result, acute low back pain has become a complex and costly therapeutic challenge.

FOCUS OF THE REVIEW

The dose, contents, and settings of treatment programmes vary widely in non-drug treatments for acute low back pain; patient characteristics are often dissimilar. An examination of the quantity and quality of this research is required so that the context of treatment conclusions can be better understood.

COMMENTS ON EVIDENCE

The literature is full of methodological limitations; inadequate design and reporting of trials frequently produce low- or very low-quality evidence. The results are often inconclusive, insufficient, or contradictory.

SEARCH AND APPRAISAL SUMMARY

The update literature search for this review was carried out from the date of the last search, December 2009, to October 2013. For more information on the electronic databases searched and criteria applied during assessment of studies for potential relevance to the overview, please see the Methods section. Searching of electronic databases retrieved 1379 studies. After deduplication and removal of conference abstracts, 720 records were screened for inclusion in the overview. Appraisal of titles and abstracts led to the exclusion of 598 studies and the further review of 120 full publications. Of the 120 full articles evaluated, five systematic reviews and four RCTs were added at this update.

DEFINITION	Low back pain is pain, muscle tension, or stiffness, localised below the costal margin and above the inferior gluteal folds, with or without referred or radicular leg pain (sciatica). [1] For this overview, acute low back pain is defined as pain that persists for less than 12 weeks. Non-specific low back pain is a meaningless term but is used by some people to label back pain that is not attributable to a recognisable pathology or symptom pattern (such as infection, tumour, osteoporosis, rheumatoid arthritis, fracture, or inflammation). [1] This overview excludes acute low back pain with symptoms or signs at presentation that suggest a specific underlying pathoanatomical condition. Studies solely of sciatica (lumbosacral radicular syndrome), herniated discs, or both were also excluded. Unless otherwise stated, people included in this overview had a new episode of acute low back pain (i.e., of <12 weeks' duration). Some included RCTs further subdivided acute low back pain of less than 12 weeks' duration into acute (<6 weeks' duration) or subacute (6–12 weeks' duration).
INCIDENCE/ PREVALENCE	More than 70% of people in resource-rich countries will experience low back pain at some time in their lives. [2] Each year, 15% to 45% of adults suffer low back pain, and 1/20 (5%) people present to a healthcare professional with a new episode. Low back pain is most common between the ages of 35 and 55 years. [2] About 30% of European workers reported that their work caused low back pain. In a Canadian study, 67% of people (not involved in workers' compensation claims) struggled to name one specific cause or precipitating event that led to their symptoms. [3] Prevalence rates from different countries range from 13% to 44%.
AETIOLOGY/ RISK FACTORS	Symptoms, pathology, and radiological appearances are poorly correlated. An anatomical source of pain cannot be identified in about 80% of people. About 4% of people with low back pain in primary care have compression fractures, and only about 1% have a tumour. [4] The prevalence of prolapsed intervertebral disc is about 1% to 3%. [2] Ankylosing spondylitis and spinal infections are less common. [4] Risk factors for the development of back pain include heavy physical work; frequent bending, twisting, or lifting; and prolonged static postures, including sitting. Psychosocial risk factors include anxiety, depression, and mental stress at work. [2] [5]
PROGNOSIS	Acute low back pain may be self-limiting, although acute low back pain has a high recurrence rate with symptoms recurring in 50% to 80% of people within 1 year; [6] 1 year after the initial episode, as many as 33% of people still endure moderate-intensity pain and 15% experience severe pain. The longer the period of sick leave, the less likely return to work becomes. [2] [7]
AIMS OF INTERVENTION	Aims include: to relieve pain, to improve function, to reduce time taken to return to work, to develop coping strategies for pain, with minimal adverse effects from treatment; and to prevent the development of chronic back pain (see definition in overview on Low back pain [chronic]). [8] [9]

OUTCOMES

Symptom improvement pain intensity (visual analogue or numerical rating scale), overall improvement (self-reported or observed), medication use, intervention-specific outcomes (such as coping and pain behaviour for behavioural treatment); **functional improvement** back pain-specific functional status (such as Roland Morris disability questionnaire, Oswestry questionnaire, intervention-specific outcomes [e.g., strength and flexibility for exercise]); **return to work** impact on employment (days of sick leave, number of people returned to work); and **adverse effects**. **Treatment effects** Some people have argued that the small effects of treatments are a consequence of the favourable natural history of most low back pain episodes. [10] The theory is that control groups have improved substantially, so there is not 'room' for large treatment effects. To evaluate this argument, one review examined the baseline and follow-up scores from the acute trials in a meta-analysis. [10] The study found that the theory of no 'room' for improvement does not seem consistent with the data; there is scope for treatment effects (i.e., mean between-group differences as large as 40 points that can be demonstrated in acute low back pain trials). Another argument used to explain small treatment effects in the low back pain literature is that most trials are conducted on samples from clinically heterogeneous populations. It is probable that specific treatments have large treatment effects on specific subgroups of patients with low back pain. [10]

METHODS

Search strategy *BMJ Clinical Evidence* search and appraisal October 2013. Databases used to identify studies for this systematic overview include: Medline 1966 to October 2013, Embase 1980 to October 2013, The Cochrane Database of Systematic Reviews 2013, issue 9 (1966 to date of issue), the Database of Abstracts of Reviews of Effects (DARE), and the Health Technology Assessment (HTA) database. **Inclusion criteria** Study design criteria for inclusion in this overview were systematic reviews and RCTs published in English, at least single-blinded, and containing 20 or more individuals (10 in each arm). There was no maximum loss to follow-up. There was no minimum length of follow-up. We excluded all studies described as 'open', 'open label', or not blinded unless blinding was impossible. *BMJ Clinical Evidence* does not necessarily report every study found (e.g., every systematic review). Rather, we report the most recent, relevant and comprehensive studies identified through an agreed process involving our evidence team, editorial team, and expert contributors. **Evidence evaluation** A systematic literature search was conducted by our evidence team, who then assessed titles and abstracts, and finally selected articles for full text appraisal against inclusion and exclusion criteria agreed a priori with our expert contributors. In consultation with the expert contributors, studies were selected for inclusion and all data relevant to this overview extracted into the benefits and harms section of the overview. In addition, information that did not meet our predefined criteria for inclusion in the benefits and harms section, may have been reported in the 'Further information on studies' or 'Comment' section. **Adverse effects** All serious adverse effects, or those adverse effects reported as statistically significant, were included in the harms section of the overview. Pre-specified adverse effects identified as being clinically important were also reported, even if the results were not statistically significant. Although *BMJ Clinical Evidence* presents data on selected adverse effects reported in included studies, it is not meant to be, and cannot be, a comprehensive list of all adverse effects, contraindications, or interactions of included drugs or interventions. A reliable national or local drug database must be consulted for this information. **Comment and Clinical guide sections** In the Comment section of each intervention, our expert contributors may have provided additional comment and analysis of the evidence, which may include additional studies (over and above those identified via our systematic search) by way of background data or supporting information. As *BMJ Clinical Evidence* does not systematically search for studies reported in the Comment section, we cannot guarantee the completeness of the studies listed there or the robustness of methods. Our expert contributors add clinical context and interpretation to the Clinical guide sections where appropriate. **Structural changes this update** At this update, we removed the following previously reported questions: What are the effects of oral drug treatments for acute low back pain? What are the effects of local injections for acute low back pain? **Data and quality** To make numerical data in our overviews more readable, we round many percentages to the nearest whole number. Readers should be aware of this approximation when relating percentages to summary statistics such as relative risks (RRs) and odds ratios (ORs). *BMJ Clinical Evidence* does not report all methodological details of included studies. Rather, it reports by exception any methodological issue or more general issue that may affect the weight a reader may put on an individual study, or the generalisability of the result. These issues may be reflected in the overall GRADE analysis. We have performed a GRADE evaluation of the quality of evidence for interventions included in this review (see table, p 22). The categorisation of the quality of the evidence (into high, moderate, low, or very low) reflects the quality of evidence available for our chosen outcomes in our defined populations of interest. These categorisations are not necessarily a reflection of the overall methodological quality of any individual study, because the *BMJ Clinical Evidence* population and outcome of choice may represent only a small subset of the total outcomes reported, and population included, in any individual trial. For further details of how we perform the GRADE evaluation and the scoring system we use, please see our website (www.clinicalevidence.com).

QUESTION What are the effects of non-drug treatments for acute low back pain?

abridged-title: Non-drug treatments

OPTION ADVICE TO STAY ACTIVE

abridged-title: Advice to stay active [id: 1102_I21]

intervention-title: Advice to stay active [efficacy: likely-to-be-beneficial]

substantive-change: **Advice to stay active** One systematic review updated. [11] Categorisation unchanged (likely to be beneficial). [status: new-evidence-conclusions-confirmed]

Symptom improvement
Advice to stay active compared with bed rest Advice to stay active is more effective than bed rest at reducing pain at 3 to 12 weeks post episode (moderate-quality evidence).

Functional improvement
Advice to stay active compared with no advice or traditional medical treatment (including analgesics as required, advice to rest, and "let pain be your guide") Advice to stay active with or without other treatments may be more effective than traditional medical treatment alone (including analgesics as required, advice to rest, and "let pain be your guide") at reducing chronic disability at up to 1 year. However, evidence was weak and the size of effects was unclear (very low-quality evidence).

Advice to stay active compared with bed rest Advice to stay active is more effective than bed rest at improving functional outcomes at 3 to 12 weeks post episode (moderate-quality evidence).

Return to work
Advice to stay active compared with no advice or traditional medical treatment (including analgesics as required, advice to rest, and "let pain be your guide") Advice to stay active with or without other treatments may be more effective than traditional medical treatment alone (including analgesics as required, advice to rest, and "let pain be your guide") at reducing sick leave. However, evidence was weak and the size of effects was unclear (very low-quality evidence).

Advice to stay active compared with bed rest Advice to stay active seems to be more effective than bed rest at reducing initial sick leave and sick leave at 3 to 4 weeks and 12 weeks in people with acute low back pain (moderate-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 22 .

Benefits:

We found two systematic reviews (search date 2009, 10 RCTs, 1923 people; [11] and 1996, 6 RCTs, 1957 people [12]). We have reported from the larger, more recent first systematic review where possible.

Advice to stay active versus no advice or traditional medical treatment:
The first systematic review did not report this comparison. The second review did not pool data, but reported consistent findings among included RCTs. [12] The review compared advice to stay active with or without other treatments versus those other treatments alone. The review found that advice to stay active significantly reduced sick leave (significance not assessed; reported as significant) and reduced chronic disability at up to 1 year compared with traditional medical treatment (including analgesics as required, advice to rest, and "let pain be your guide"). See Comment, p 4 . [12]

Advice to stay active versus bed rest:
The first review found that advice to stay active significantly reduced pain and significantly improved functional status at 3 to 4 weeks' follow-up and at 12 weeks' follow-up compared with bed rest (pain: 2 RCTs, 400 people; 3–4 weeks: SMD 0.22, 95% CI 0.02 to 0.41; 12 weeks: SMD 0.25, 95% CI 0.05 to 0.45; functional status: 2 RCTs, 400 people; 3–4 weeks: SMD 0.29, 95% CI 0.09 to 0.49; 12 weeks: SMD 0.24, 95% CI 0.04 to 0.44). [11] The first RCT identified by the review found that advice to stay active significantly reduced sick leave at 3 to 4 weeks' follow-up and at 12 weeks' follow-up compared with bed rest (3–4 weeks: MD 3.4 days, 95% CI 1.64 days to 5.16 days; 12 weeks: MD 4.5 days, 95% CI 1.37 days to 7.63 days). The second RCT identified by the review found that bed rest increased initial sick leave compared with advice to stay active in people followed up at 12 weeks (86% with bed rest *v* 52% with advice to stay active; P <0.001). [11]

Advice to stay active versus specific back exercises:
See option on Back exercises, p 6 .

Harms:

Advice to stay active versus no advice or traditional medical treatment:
The review [12] gave no information on adverse effects.

Advice to stay active versus bed rest:
The review gave no information on adverse effects. [11] One previous systematic review assessing harms [12] found that adverse effects of bed rest included joint stiffness, muscle wasting, loss of bone mineral density, pressure sores, and venous thromboembolism (see overview on Thromboembolism).

Advice to stay active versus back exercises:
See Harms of Back exercises, p 6 .

Comment:

Limitations in methods preclude meaningful quantification of effect sizes. Advice to stay active was provided either as a single treatment or in combination with other interventions such as a graded activity programme or behavioural counselling.

The first review based classification of bias on four criteria: concealment of allocation, co-interventions, intention-to-treat analysis or losses to follow-up, and blinding of outcome assessor. [11] The review separately analysed: RCTs that included people with acute low back pain, with or without radiating pain, but excluded people with neurological deficits (called the acute simple low back pain group); RCTs that included people with verified neurological deficits (called the sciatica group); and RCTs that included people with and without verified neurological deficits (called the mixed low back pain group). [11] We have only reported the results for the acute simple low back pain group here. However, within this group the proportion of people with radiating pain to the legs varied from none in some RCTs to 30% of the study population in others.

Bed rest versus advice to stay active
In the analysis comparing advice to stay active versus bed rest for pain, one RCT that found significantly better pain outcomes for bed rest compared with advice to stay active was excluded from the meta-analysis: the RCT was categorised as being at high risk of bias, and the applicability of the included population (80 male combat trainees in an army hospital) to the general population was questionable. [11] This RCT also found that bed rest significantly reduced length of sick leave compared with advice to stay active. [11]

Clinical guide
Staying in bed longer than 48 hours not only will not help but it may delay recovery. Staying in bed for any prolonged period can increase stiffness and pain. Without movement, muscle strength and flexibility decrease. With bed rest, about 1% of muscular strength is lost each day. It becomes more difficult to return to any activity as muscles become weaker and joints get stiffer; the result is that recovery can take longer.

OPTION ACUPUNCTURE

abridged-title: Acupuncture [id: 1102_I5]

intervention-title: Acupuncture [efficacy: unknown-effectiveness]

substantive-change: **Acupuncture** Option restructured. One systematic review added. [13] Categorisation unchanged (unknown effectiveness). [status: new-evidence-conclusions-confirmed]

Symptom improvement
Acupuncture compared with no treatment or control We don't know whether acupuncture is more effective than sham needling at reducing pain as we found insufficient evidence (very low-quality evidence).

Acupuncture compared with NSAIDs We don't know whether acupuncture is more effective than NSAIDs at reducing pain, as the evidence was weak and inconsistent (low-quality evidence).

Acupuncture compared with paracetamol (acetaminophen) We don't know how electroacupuncture and paracetamol (acetaminophen) compare at relieving pain, as we found insufficient evidence (low-quality evidence).

Functional improvement
Acupuncture compared with no treatment or control We don't know whether acupuncture is more effective than sham needling at improving functional status as we found insufficient evidence (very low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 22 .

Benefits:

Acupuncture versus no treatment or control:
We found one systematic review (search date 2011, 11 RCTs, 1139 patients with acute or subacute [<12 weeks] non-specific low back pain). [13] Three RCTs compared acupuncture with sham acupuncture. For acute back pain, one session of acupuncture provided significantly better pain relief than sham acupuncture (2 RCTs, 100 people, mean difference on pain visual analogue scale [VAS] −9.38, 95% CI −17.00 to −1.76, P = 0.02), but there was no difference for function on the Modified-Modified Schober Test (1 RCT, 60 people, 19.26 with acupuncture *v* 19.03 with sham, reported as not significant, P >0.05) or Japanese Orthopaedic Association score (1 RCT, 40 people, 6.2 with acupuncture *v* 6.9 with sham, P = 0.47). For subacute back pain, three to 12 sessions of acupuncture were no better than sham acupuncture for average pain intensity or change in Roland Morris Disability Questionnaire at the end of treatment or 3 months' follow-up (reported as not significant, P value not reported). Worst pain (measured by VAS) was also no better immediately after treatment (reported as not significant, P value not reported), but was better at the 3-month follow-up (1 RCT, 48 people, mean difference 18.7, 95% CI 1.5 to 36.0, P = 0.034).

Acupuncture versus NSAIDs:
The systematic review identified seven studies that compared acupuncture with NSAIDs. [13] Significantly more patients reported overall improvement (cured or improved) immediately after the intervention with acupuncture (5 RCTs, 657 people, 335/343 [98%] with acupuncture *v* 274/314 [87%] with medication, RR 1.11, 95% CI 1.06 to 1.16, P <0.00001). [13] However, analysis of the two RCTs (360 people) with low risk of bias only revealed a trend towards a significant difference in overall improvement (cure or improved) immediately after treatment (RR 1.14, 95% CI 0.99 to 1.30, P = 0.06). Only one RCT reported slightly longer-term results, at 1 month, and found better overall improvement with acupuncture than with medication (1 RCT, 295 people, 146/147 [99%] with acupuncture *v* 138/148 [93%] with medication, RR 1.07, 95% CI 1.02 to 1.11, P = 0.006).

Acupuncture versus paracetamol (acetaminophen):
We found one systematic review (search date 1995), which identified one RCT (40 people) that found that electroacupuncture significantly reduced pain after 6 weeks compared with paracetamol (change in pain scores from baseline [on a 100-point visual analogue scale]: from 54.4 to 13.7 with paracetamol *v* from 52.7 to 3.3 with electroacupuncture; reported as significant; P value not reported). [14] No data were available for functional improvement or return to work.

Harms:

One systematic review (search date 1996) found that serious, rare adverse effects included infections (HIV, hepatitis, bacterial endocarditis) and visceral trauma (pneumothorax, cardiac tamponade). [15]

Acupuncture versus no treatment or control:
The review reported one RCT (60 people) in which three patients developed mild hypodermal bleeding. [13]

Acupuncture versus NSAIDs:
One RCT (60 people) included in the review reported that three people reported tiredness in the acupuncture group at 2 weeks and 16 people in the NSAIDs group had gastrointestinal problems at 1 week, which decreased to 12 people at 2 weeks. [13]

Acupuncture versus paracetamol (acetaminophen):
The review gave no information on adverse effects for this comparison. [14]

Comment:

None.

OPTION BACK EXERCISES

abridged-title: Back exercises [id: 1102_l16]

intervention-title: Back exercises (insufficient evidence for generic back exercises and conflicting evidence for specific back exercises) [efficacy: unknown-effectiveness]

substantive-change: **Back exercises** Two systematic reviews [11] [19] and two RCTs added. [21] [22] Categorisation unchanged (unknown effectiveness). [status: new-evidence-conclusions-confirmed]

Symptom improvement

Generic back exercise compared with usual care or no treatment (acute low back pain of <6 weeks' duration) We don't know whether generic exercise is more effective than usual care or no treatment at improving pain as we found insufficient evidence (very low-quality evidence).

Specific back exercise compared with passive treatments Mechanical diagnosis and therapy (MDT) may be more effective when compared with passive treatments (a combined analysis of educational booklets, bed rest, ice packs, and massage) at reducing pain at 7 days (low-quality evidence).

Specific back exercise compared with advice to stay active MDT may be no more effective than advice to stay active at reducing pain intensity at 12 weeks (low-quality evidence).

Specific back exercise compared with flexion exercises We don't know whether MDT is more effective than flexion exercises at reducing pain at 8 weeks as we found insufficient evidence (low-quality evidence).

Specific back exercise compared with heat treatment We don't know whether MDT is more effective than heat treatment at reducing pain as we found insufficient evidence (low-quality evidence).

Functional improvement

Generic back exercise compared with usual care or no treatment (acute and subacute back pain) We don't know whether generic exercise is more effective than usual care or no treatment at improving function as we found insufficient evidence (very low-quality evidence).

Specific back exercise compared with passive treatments MDT may be more effective at reducing disability at 7 days but not at 4 weeks compared with passive treatments (a combined analysis of educational booklets, bed rest, ice packs, and massage) (low-quality evidence).

Specific back exercise compared with advice to stay active MDT may reduce disability at 12 weeks compared with advice to stay active; however, the evidence is limited (low-quality evidence).

Specific back exercise compared with flexion exercises MDT may be more effective than flexion exercises at improving disability scores at 5 days but evidence was very limited (very low-quality evidence).

Specific back exercise compared with spinal manipulation MDT may reduce disability at 5 days and at 4 weeks compared with spinal manipulation but evidence was limited (low-quality evidence).

Specific back exercise compared with heat treatment We don't know whether MDT is more effective than heat treatment at increasing function as we found insufficient evidence (low-quality evidence).

Specific back exercise compared with NSAIDs We don't know whether MDT is more effective than NSAIDs at 3 months at improving short-term disability, as we found insufficient evidence (low-quality evidence).

Return to work

Generic back exercise compared with usual care or no treatment (subacute low back pain of 6–12 weeks' duration) We don't know whether generic exercise is more effective than usual care or no treatment at reducing absenteeism in the work place or at reducing time taken to return to work, as we found insufficient evidence (very low-quality evidence).

Specific back exercise compared with advice to stay active We don't know how back exercises and advice to stay active compare at reducing sick leave at up to 12 weeks, as we found insufficient evidence (very-low quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 22 .

Benefits:

We found five systematic reviews, [11] [16] [17] [18] [19] one additional RCT, [20] and two subsequent RCTs. [21] [22] The first review (search date 2004, 17 RCTs; see Comment, p 6) included RCTs of back exercises versus placebo, no treatment, or other conservative treatments. [16] The second review (search date 2003, 6 RCTs, 518 people) included RCTs of mechanical diagnosis and therapy (MDT) versus passive treatment, advice to stay active, flexion exercises, spinal manipulation, back school, or strengthening. [17] The third review (search date 2003, 3 RCTs, number of people included not clear) included RCTs of MDT versus the NSAID ketoprofen, massage/advice, or passive movement/mobilisation. [18] The fourth systematic review (search date 2009) assessed advice to stay active; it found one RCT on advice to stay active versus back exercises. [11] The fifth systematic review (search date 2010) found one four-armed RCT not identified by the other reviews that compared specific back exercise (MDT) with heat treatment, with combination of exercise, and with heat with education control. [19]

The methodological quality of RCTs identified by the first review was assessed by the adequacy of four criteria: randomisation, allocation concealment, follow-up, and outcome blinding. [16] Studies were classed as high quality if they met all four criteria. The review identified 11 RCTs in people with acute back pain and six RCTs in people with subacute back pain; one RCT in each group was categorised as being of high quality. Methodological quality in the second and third reviews was based on the PEDro scale. [17] The second review identified five RCTs in people with acute low

back pain, one RCT in people with subacute low back pain, and three RCTs in a mixed population of acute/subacute low back pain; all but one of the identified RCTs were high quality (score of 5+/10). [17] In the third review, two of the three RCTs identified were high quality (5+/10). [18] The first and second reviews identified six RCTs, one of which was also identified by the third review (see Comment, p 6). The second and third reviews identified three RCTs assessing the effects of MDT (see Comment, p 6). [17] [18] All three reviews defined the included RCTs as either acute (<6 weeks' duration), subacute (6–12 weeks' duration), or duration not subgrouped (<12 weeks). The first review used both a qualitative rating system and a quantitative pooling of data where possible. [16] The second review pooled data (only statistically homogeneous RCTs) to compare MDT with passive therapy (combined data on educational booklet, ice packs, massage, and bed rest) and advice to stay active (random effects model). [17] The third review transformed pain and disability scores to a score ranging from 0 to 100. To describe treatment effect for individual studies, mean and 95% confidence intervals were calculated for between-group differences (see Comment). [18] The second review pooled data based on treatments, whereas the third review pooled data based on outcomes, and so we have reported meta-analyses from only the second review.

Generic back exercise versus usual care or no treatment for acute low back pain (<6 weeks' duration):

The first review reported that 10 of 11 RCTs identified had non-exercise comparisons. [16] The review found no significant difference between generic exercise and no treatment in change in pain or function measured at the earliest follow-up (scale 0–100; pain: 3 RCTs, 491 people; WMD –0.59, 95% CI –12.9 to +11.51; function: 3 RCTs, 491 people; WMD –2.82, 95% CI –15.35 to +9.71; see Comment, p 6). One high-quality RCT in an occupational setting found that mobilising home exercises were less effective than usual care, and one low-quality RCT in a healthcare setting found that a therapist-delivered endurance programme improved short-term functioning more than no treatment. Of the remaining eight RCTs, six studies identified by the review found no statistically significant or clinically important difference between exercise therapy and usual care/no treatment, and the results of two RCTs were unclear. [16]

Generic back exercise versus usual care or no treatment for subacute low back pain (6–12 weeks' duration):

The first review reported that, in six included RCTs, seven exercise groups (total number of exercise groups not reported) had a non-exercise comparison. [16] One high-quality and one low-quality RCT found that a graded exercise intervention reduced absenteeism outcomes in the workplace compared with usual care, and one low-quality RCT found improved functioning with exercise plus behavioural therapy compared with usual care. Two poor-quality RCTs found no difference in outcomes between exercise and the comparative treatments (including usual care), and one poor-quality RCT reported unclear results. One subsequent RCT (134 people with low back pain for at least 4 weeks before inclusion) compared graded exercise with usual care. [20] The RCT found no significant difference in pain severity (11-point visual analogue scale [VAS]: 0 = no pain to 10 = very severe pain) or functional status (Roland Morris Disability Questionnaire) between graded exercise and usual care, although there were greater improvements in both outcomes with graded exercise (between-group difference at 12 months: pain severity [favours graded exercise]: –0.2, 95% CI –1.2 to +0.8; P = 0.67: functional status [favours graded exercise]: –0.6, 95% CI –2.8 to +1.5; P = 0.56). The RCT found that people assigned to the graded-exercise group returned to work faster than those assigned to usual care (median duration of first continuous period of sick leave after randomisation: 54 days with graded activity *v* 67 days with usual care; significance not assessed). Graded exercise consisted of twice-weekly exercise sessions lasting 60 minutes each until the people either achieved full return to work or the maximum therapy duration of 3 months had been completed.

The first subsequent RCT involved 246 people with subacute low back pain randomised into an exercise group (including circuit training and stretching; 1 hour three times a week for 8 weeks) or a no additional intervention group; both groups received a brief intervention before randomisation, which included information, reassurance, advice to stay active, and advice on stretching and resuming normal activities. [21] There were no significant differences between the groups in pain, function (Roland Morris Disability Questionnaire), or return to work at any follow-up time up to 2 years (results shown graphically; all reported as not significant, P values not reported).

The second subsequent RCT involved 100 people with subacute low back pain, randomised to an online occupational postural and exercise intervention or a usual care control group. [22] Exercise and education materials used in the intervention were developed as an online resource, and included video demonstrations recorded in a laboratory. All sessions included exercises combining postural stability (for abdominal, lumbar, hip and thigh muscles), strengthening, flexibility, mobility, and stretching. Outcome measures included the STarT Back Screening Tool (SBST). No differences were found on mean total SBST score recorded at 9 months (–1.01, 95% CI –1.790 to +0.118); however, a significant difference was found on analysis of variance (ANOVA, P = 0.019).

Specific back exercise versus usual care or no treatment:
The reviews identified no RCTs for this comparison. [17] [18] [19]

Specific back exercise versus passive treatments (combined analysis of educational booklets, bed rest, ice packs, and massage):
The second review (4 RCTs, 681 people) found that MDT significantly decreased pain and disability at 1 week compared with passive therapy (combined data on educational booklets, bed rest, ice packs, and massage) (2 RCTs, 470 people; pain: WMD –4.16, 95% CI –7.12 to –1.20; disability: WMD –5.22, 95% CI –8.28 to –2.16; absolute numbers and P values not reported). [17] However, there was no significant difference between groups in disability at 4 weeks (3 RCTs, 495 people; WMD –1.06, 95% CI –3.21 to +1.10; absolute numbers and P value not reported).

Specific back exercise versus advice to stay active:
The second review found a significant decrease in disability after 12 weeks' treatment with MDT compared with advice to stay active (2 RCTs, 261 people; WMD [0–100 point scale] 3.85, 95% CI 0.30 to 7.39; absolute numbers not reported; P value not reported). [17] There was no significant difference between groups in pain intensity at 12 weeks (WMD +5.02, 95% CI –1.19 to +11.22; absolute numbers not reported).

The fourth systematic review also reported on one of the studies included in the above meta-analysis. [11] It reported that length of sick leave was not statistically different between the advice to stay active group and the exercise group at 4 weeks' or at 12 weeks' follow-up (107 people, 4 weeks: MD +1.6 days; 95% CI: –0.25 to +3.45 days; 12 weeks: MD +2.5 days; 95% CI: –0.58 to +5.58 days). The systematic review noted that the actual exercises used in the RCT were poorly defined, and therefore the directness of the results was unclear. [11]

Specific back exercise versus flexion exercises:
The second review did not pool data for this comparison because of clinical and statistical heterogeneity among studies. [17] One high-quality RCT (149 people with acute low back pain with or without radiation) identified by the review found no significant difference between treatment groups in pain at 8 weeks (data presented graphically; reported as not significant; P value not reported). [23] One low-quality RCT (24 people) [24] identified by the review [17] found a greater improvement in mean disability scores (ODI) at 5 days' follow-up with MDT compared with flexion exercise (data presented graphically in the RCT; no further details reported: mean difference [0 to 100-point scale] between groups reported in the review: –22 points, 95% CI –26 points to –18 points). [17] [24]

Specific back exercise versus spinal manipulation:
The second review [17] identified one high-quality RCT (24 people with acute or subacute low back pain). [25] The RCT did not carry out a statistical analysis. [25] The review found a significant improvement in disability (ODI) with MDT at 5 days and 4 weeks compared with spinal manipulation (mean difference [0 to 100-point scale]; 5 days: 17 points, 95% CI 8 points to 27 points; 4 weeks; 22 points, 95% CI 10 points to 33 points). [17]

Specific back exercise versus heat treatment:
The fourth systematic review identified one four-armed RCT, 100 people with acute or subacute low back pain. [19] This review found no significant difference between McKenzie-based directional preference exercises (25 people) and heat treatment (25 people) for pain relief (visual analogue scale [VAS]) and functional outcomes (Roland Morris Disability Questionnaire [RMDQ] and Rating of Perceived Capacity-Spine [RPC-S]) on day 4 of a 5-day intervention and at 2-day follow-up (P values not reported).

Specific back exercise versus NSAIDs:
The third review (1 RCT, 260 people) found no significant difference in short-term disability between MDT and the NSAID ketoprofen (follow-up at <3 months), although results favoured MDT (mean AR –4.2, 95% CI –9.8 to +1.4; absolute numbers not reported). [18]

Harms:

Generic back exercise versus usual care or no treatment for acute low back pain:
The first review reported that few identified RCTs reported on harms (about 26% of RCTs). [16] Overall, in the review (which included RCTs on acute, subacute, and chronic low back pain), 12 RCTs reported mild negative reactions associated with the exercise programme, such as increased low back pain, and soreness in a minority of people, [16] although this is a natural and innocuous reaction, particularly in those starting an exercise programme for the first time or after prolonged inactivity. No further details were provided. The subsequent RCTs gave no information on adverse effects. [20] [26]

Generic back exercise versus usual care or no treatment for subacute low back pain:
See Harms of Back exercises versus usual care or no treatment for acute low back pain.

Specific back exercise versus usual care or no treatment:
The reviews identified no RCTs for this comparison. [17] [18] [19]

Specific back exercise versus passive treatments (combined analysis of educational booklets, bed rest, ice packs, and massage):
The reviews gave no information on adverse effects for this comparison. [17] [19]

Specific back exercise versus advice to stay active:
The reviews gave no information on adverse effects for this comparison. [11] [17]

Specific back exercise versus flexion exercises:
The review gave no information on adverse effects for this comparison. [17]

Specific back exercise versus spinal manipulation:
The review gave no information on adverse effects for this comparison. [17]

Specific back exercise versus heat treatment:
The review gave no information on adverse effects for this comparison. [19]

Specific back exercise versus NSAIDs:
The review gave no information on adverse effects for this comparison. NSAIDs may cause gastrointestinal and other complications (see overview on NSAIDs). [18]

Comment:

There was considerable variation in the exercise programmes undertaken in RCTs identified by the reviews. In the first review, subgroup meta-analysis for different specific types of exercise, or comparisons against specific individual conservative treatments, were not reported. [16] The review included RCTs of exercise, this being defined as "a series of specific movements with the aim of training or developing the body by a routine practice or as physical training to promote good physical health". Individual RCT outcome data for pain and function were converted to a scale from 0 to 100 points to allow the pooling of data. The review considered that a 20-point (out of 100) improvement in pain and a 10-point (out of 100) improvement in functional outcomes were clinically important differences. The review categorised populations of included RCTs as being healthcare (primary, secondary, or tertiary), occupational (occupational healthcare, in compensatory situations), and general or mixed (people recruited through advertisement for trials), to differentiate those studies in people in typical treatment settings (healthcare, occupational) from those in people who may not normally present for treatment. The review noted that, overall, the methodological quality of included RCTs was poor, with only 54% adequately describing the exercise intervention. The second review concluded that, when evaluating treatment effects of individual RCTs, MDT was as effective at all follow-up times as an educational booklet, advice to stay active, and strengthening exercises. Comparisons with flexion exercises and spinal manipulative therapy yielded statistically significant differences favouring MDT; however, no placebo-controlled trial was identified. [17] In the first subsequent RCT, it is not clear which component of the complex intervention — the graded activity instruction, the exercises, or the combination of both modalities — is the most important. Because no placebo therapy was used, the attention of the therapist may have had a role in the positive effects. [20] A possible criticism of generic-exercise studies is that all patients in the exercise groups receive the same treatment, regardless of a patient's preference for extension or flexion exercises. According to the McKenzie system, this type of pre-selection is essential to determine a directional preference for certain exercises.

Generic back exercise versus non-exercise interventions for acute low back pain (<6 weeks' duration):
The first review found no significant difference between exercise and other non-surgical treatments (advice to stay active, education, and usual care) in change in pain or function measured at the earliest follow-up (scale 0–100; pain: 7 RCTs, 606 people; WMD +0.31, 95% CI –0.10 to +0.72; function: 6 RCTs, 534 people; WMD –1.34, 95% CI –5.5 to +2.81). [16] Results were similar at intermediate and long-term follow-up.

Generic back exercise versus non-exercise interventions for subacute low back pain (6–12 weeks' duration):
The first review found no significant difference between exercise and all other comparisons (including no treatment, usual care, advice to stay active, and education) in change in pain or function measured at the earliest follow-up (scale 0–100; pain: 5 RCTs, 608 people; WMD –1.89, 95% CI –4.91 to +1.13; function: 4 RCTs, 579 people; WMD –1.07, 95% CI –5.32 to +3.18). [16] Results were similar at intermediate follow-up. The review concluded that there was insufficient evidence to support or refute the effectiveness of exercise for pain or function in subacute low back pain.

Clinical guide
For specific exercises, there is a growing, but still limited, evidence for short-term pain reduction and increased function. Given the methodological flaws mentioned above, and the lack of relevant detail of the primary studies, it is not possible to either support or oppose the use of exercise in patients with acute low back pain.

OPTION MASSAGE

abridged-title: Massage [id: 1102_I22]
intervention-title: Massage [efficacy: unknown-effectiveness]
substantive-change: No description. [status: no-new-evidence]

Symptom improvement
Massage compared with placebo massage, sham massage, no massage, or usual care Massage (with or without usual care) may be more effective than usual care alone or placebo massage at improving pain at short-term follow-up (1 week) in people with acute low back pain, but we don't know about longer term follow-up, because evidence was weak (very low-quality evidence).

Specific back exercise compared with passive treatments Passive treatment (a combined analysis of educational booklets, bed rest, ice packs, and massage) may be less effective at 7 days than mechanical diagnosis and therapy (MDT) at reducing pain (low-quality evidence).

Functional improvement
Massage compared with placebo massage, sham massage, no massage, or usual care We don't know whether massage is more effective than usual care alone or placebo massage at improving function at short-term follow-up (1 week) in people with acute low back pain (very low-quality evidence).

Specific back exercise compared with passive treatments Passive treatment (a combined analysis of educational booklets, bed rest, ice packs, and massage) may be less effective than MDT at 7 days but not at 4 weeks at reducing disability (low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 22 .

Benefits:

Massage versus placebo massage, sham massage, no massage, or usual care:
We found one systematic review (search date 2008, 13 RCTs). [27] The review included massage in both acute and chronic low back pain. Of the 13 RCTs included in the review, two RCTs met our inclusion criteria. The types of massage technique, duration, and frequency of treatments varied among the studies.

The first three-armed RCT (60 people) included in the review compared massage (20 people) with an inert control group comprising placebo massage therapy (20 people) and waiting list control (20 people). Massage was applied with a mechanical device (one 30-minute session of deep cross-friction massage with the aid of a copper myofascial T-bar [roptrotherapy] applied to the lumbar pelvic region). The review reported that massage was significantly better than placebo and no treatment (waiting list) for reducing pain and improving function at 1 week (mean pain measured by 100-mm visual analogue scale [VAS]; massage *v* placebo massage: SMD −1.08, 95% CI −1.74 to −0.41; massage *v* waiting list: reported as significant; P value not reported; mean function measured by Oswestry Disability Index; massage *v* placebo massage: SMD −2.52, 95% CI −3.37 to −1.67; massage *v* waiting list: reported as significant; P value not reported). [27] The review noted that allocation sequence generation and concealment were unclear and the study was not blinded.

The second RCT (61 people) included in the review compared the addition of massage to usual care (not described in the RCT) versus usual care alone. Massage was acupressure with a specific oil for 8 sessions with relaxation with a digital electronic muscle stimulator on acupoints before the massage. The RCT found that massage plus usual care significantly improved pain at short-term follow-up but not function (pain measured by VAS, mean difference −0.38, 95% CI −0.54 to −0.22; function measured by range of measures such as flexion, walking time, daily activities, mean difference −0.10, 95% CI −0.21 to +0.01). [27] The review reported that the acupuncture massage group had 39% greater reduction in pain intensity than the usual care group at 1 week after the end of treatment (P = 0.0001). It reported that electrical stimulation on acupuncture points followed by acupressure with aromatic lavender oil had no significant effects on housework, work, or leisure time. The review reported that allocation concealment was not clear, participants and carers were not blinded to intervention and assessment, co-interventions were not described, and 16% of people were lost to follow-up.

Massage versus back exercises:
See Benefits of Back exercises, p 6 .

Harms:

Massage versus placebo massage, sham massage, no massage, or usual care:
The review gave no information on adverse effects. [27]

Massage versus back exercises:
See Harms of Back exercises, p 6 .

Comment:

The review defined massage as soft tissue manipulation using the hands or a mechanical device (examples include Shiatsu, Rolfing [soft tissue manipulation], Swedish massage, reflexology, craniosacral therapy, as part of physiotherapy, copper myofascial T-bar). [27] Massage could be applied to any body part (lumbar region only or to the whole body) and any technique could be used (e.g., cyriax, friction, kneading, and hacking).

OPTION MULTIDISCIPLINARY TREATMENT PROGRAMMES (ACUTE LOW BACK PAIN)

abridged-title: Multidisciplinary programmes (acute low back pain) [id: 1102_I1211213804347]

intervention-title: Multidisciplinary treatment programmes (for acute low back pain) [efficacy: unknown-effectiveness]

substantive-change: No description. [status: no-new-evidence]

Symptom improvement
Multidisciplinary treatment programmes for acute low back pain compared with usual care We don't know whether graded activity is more effective than usual care at 26 weeks at reducing pain intensity as we found insufficient evidence (very low-quality evidence).

Functional improvement
Multidisciplinary treatment programmes for acute low back pain compared with usual care We don't know whether graded activity is more effective than usual care at improving functional status as we found insufficient evidence (very low-quality evidence).

Return to work
Multidisciplinary treatment programmes for acute low back pain compared with usual care People undergoing graded activity (even when combined with workplace intervention) may occasionally take longer to return to work than those having usual care (very low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 22 .

Benefits:

Multidisciplinary treatment programmes versus no treatment or usual care:
We found one RCT assessing the effects of a multidisciplinary treatment programme in people with acute low back pain analysed in two publications. [28] [29] The RCT (196 people with low back pain who had been on sick leave for 2–6 weeks) randomised people initially to a workplace intervention (96 people) or usual care (100 people). [28] At 8 weeks after the start of the person's sick leave, people (112 people) underwent a second round of randomisation to either graded activity or usual care.

One report analysed the effects of the combination of graded activity plus workplace intervention (27 people) versus the effects of either treatment alone and usual care as a group (85 people): the study did not correct for the effects of the workplace intervention or graded activity in the control comparison group. [28] At 12 months' follow-up, the study found no significant difference in the number of days off work between groups receiving both the workplace intervention and graded activity compared with those receiving either treatment alone or usual care (median number of days off work: 143 with combined treatment *v* 126 without combined treatment; P = 0.49). The RCT also found no significant difference between groups in pain intensity and functional status (improvement in pain intensity [measured using a visual analogue scale, where 0 = no pain and 10 = severe pain]: 2.9 with combined treatment *v* 3.3 without combined treatment; improvement in functional status [measured using Roland Morris questionnaire]: 8.3 with combined treatment *v* 8.7 without combined treatment; number of people in analysis not reported; both comparisons reported as not significant; P values not reported).

The second analysis of this study assessed the effects of graded activity versus usual care. [29] At 26 weeks, the RCT found that people in the graded activity group had a small, but significant, worsening in pain intensity compared with the usual-care group (mean improvement from baseline on a 10-point visual analogue scale: 92 people analysed: 3.7 with graded activity *v* 3.2 with usual care; reported by the authors to be a significant difference in favour of usual care; P value not re-

ported). [29] While statistically significant, the results were not clinically significant. People undergoing graded activity took significantly longer to return to work compared with those receiving usual care (intention-to-treat analysis: median time taken to return to work: 139 days with graded activity *v* 111 days with usual care; HR 0.52, 95% CI 0.32 to 0.86; P <0.01). However, there was no significant difference between groups in functional status (mean improvement from baseline on Roland Morris questionnaire: 91 people analysed: 7.9 with graded activity *v* 7.5 with usual care; reported as not significant; P value not reported). The RCT reported that, of the 55 people assigned to graded activity, 27 received workplace intervention, and of the 57 assigned to usual care, 26 received the workplace intervention. Subgroup analysis of those who had not received workplace intervention (59 people) found no significant difference in median number of days taken to return to work between graded activity and usual care (HR 0.86, 95% CI 0.40 to 1.84; P = 0.69). The RCT did not carry out a subgroup analysis for those who received the workplace intervention. Graded activity comprised physiotherapist-supervised exercise programmes (26 sessions lasting 1 hour/week) emphasising return to work based on operant conditioning principles. The workplace intervention consisted of ergonomic workplace assessment, modifications plus case management, and additional treatments (physiotherapy, manual therapy, Cesar therapy, and chiropractic care). The results presented should be interpreted with caution. The number of people who received both the workplace intervention and graded activity is unclear. Of the 55 people randomised to graded activity, 19 did not receive the clinical intervention, and, of the 36 people receiving graded activity, it is unclear how many had previously received the workplace intervention and were followed up for 12 months.

Harms: The RCT gave no information on adverse effects. [28] [29]

Comment: There was a considerable time lag between randomisation and the start of the graded activity programme, which, together with poor compliance in this group, could explain the observed delay in return to work. [29]

Clinical guide
Multidisciplinary rehabilitation programmes are typically expensive and may not be necessary for uncomplicated acute low back problems. Multidisciplinary programmes typically include treatments provided by two or more healthcare providers with different professional training to obtain different perspectives and approaches to recovery. The term 'multidisciplinary' does not imply a mandatory roster of specialists and does not dictate the nature of the treatment.

OPTION MULTIDISCIPLINARY TREATMENT PROGRAMMES (SUBACUTE LOW BACK PAIN)

abridged-title: Multidisciplinary programmes (subacute low back pain) [id: 1102_I17]

intervention-title: Multidisciplinary treatment programmes (for subacute low back pain) [efficacy: unknown-effectiveness]

substantive-change: **Multidisciplinary treatment programmes (subacute low back pain)** One RCT added to Comment, p 13 section. [32] Categorisation unchanged (unknown effectiveness). [status: new-evidence-conclusions-confirmed]

Return to work
Multidisciplinary treatment programmes for subacute back pain compared with usual care Multidisciplinary treatment, with or without a workplace visit, may be more effective than usual care at reducing sick leave in people with subacute low back pain. However, evidence was weak and interventions varied between studies (very low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 22 .

Benefits: **Multidisciplinary treatment programmes versus no treatment or usual care:**
We found two systematic reviews (search date 2002, 2 RCTs, 233 people with subacute low back pain, duration between 4 weeks and 3 months; [30] and 1998–2006, 2 RCTs, 928 people with subacute low back pain, duration 5–12 weeks). [31]

The first review found that multidisciplinary treatment, including a workplace visit, significantly reduced sick leave compared with usual care (time to return to work: 10 weeks with multidisciplinary treatment *v* 15 weeks with usual care in first RCT; RR for return to work rate 2.4, 95% CI 1.2 to 4.9 in second RCT). [30] However, both studies identified in the review were of low quality; methodological deficiencies included lack of blinding, reporting of co-interventions, and unclear reporting of loss to follow-up.

The second review included two studies excluded from the first review as not being multidisciplinary (see Comment, p 13). [31] The first RCT (457 people, low back pain 8–12 weeks) included in the review used an intervention of light mobilisation and individualised information on prognosis and

activity in the setting of a university clinic, while the control group was people in primary care. [31] The review reported that the intervention group had an earlier return to work at 1 year (OR 1.60; CI, P value, and absolute numbers not reported), but differences between groups diminished over the second year (reported as not significant; P value not reported). In the third year, sick leave was 127.7 days with the intervention compared with 169.6 days with control (statistical analysis between groups not reported). In the second included study (489 people, described as subchronic low back pain, initial sick leave of 5–11 weeks), consecutive people were assigned by alternate allocation to either intervention or control groups. Control was not specified in the review. The intervention group received a light mobilisation programme based on education and advice, and monitoring of conventional treatment. The review reported that the intervention significantly improved return to work compared with control at 5 years (based on data from an insurance office: 81% with intervention *v* 66% with control; absolute numbers not reported; P <0.001). The review reported that during the follow-up period, 72% of people in the intervention group and 74% of people in the control group had sickness absence because of low back pain (statistical analysis between groups not reported). However, this study was by alternate allocation and the results should be interpreted with caution. [31]

Harms: The reviews gave no information on adverse effects. [30] [31]

Comment: The first review included inpatient and outpatient programmes that were multidisciplinary. [30] To be multidisciplinary they had to consist of a physician's consultation plus either a psychological, social, or vocational intervention, or any combination. Trials in which rehabilitation was exclusively or predominantly medical were excluded, and back schools were also excluded from the review. [30] However, multidisciplinary programmes do not always include a psychosocial aspect, as is evident in the second review. [31] The second review defined multidisciplinary interventions as those involving two or more healthcare disciplines. [31]

We found one subsequent RCT of 33 active duty service members at a US navy base with subacute low back pain (4–12 weeks) randomised to the 'Backs to Work' multidisciplinary programme (up to 3 hours per day, 3 days a week for 4 weeks; graded physical reconditioning and CBT) versus usual care (included one or more of temperature treatments, electrical stimulation, traction, exercises, back class, and spinal manipulation, 2 to 3 times a week at the discretion of the clinician). [32] All participants were back to full duty at the end of the programme; there was no significant difference in functional performance (P value not reported) or pain at the end of the programme (pain, measured on a 10 point scale: 3.1 with usual care *v* 1.8 with the Backs to Work programme, P = 0.074). The study also looked at the effect on psychological outcomes including distress and subclinical depression. The applicability of the included population to the general population is questionable.

Clinical guide
Multidisciplinary rehabilitation programmes are typically expensive and may not be necessary for uncomplicated acute low back problems. Multidisciplinary programmes are typically taken to comprise treatments provided by two or more healthcare providers with different professional training to obtain different perspectives and approaches to recovery. The term 'multidisciplinary' does not imply a mandatory roster of specialists and does not dictate the nature of the treatment.

OPTION SPINAL MANIPULATION

abridged-title: Spinal manipulation [id: 1102_I3]

intervention-title: Spinal manipulation (unknown effectiveness due to conflicting evidence) [efficacy: unknown-effectiveness]

substantive-change: **Spinal manipulation** One systematic review updated, [33] one systematic review added, [35] and one RCT added. [36] Categorisation unchanged (unknown effectiveness). [status: new-evidence-conclusions-confirmed]

Symptom improvement
Spinal manipulation compared with placebo or sham treatment We don't know whether spinal manipulative therapy is more effective than placebo or sham therapy at improving symptoms, as the evidence was weak and inconsistent (very low-quality evidence).

Spinal manipulation compared with NSAIDs We don't know whether spinal manipulation and NSAIDs differ at improving pain at up to 12 days in people with acute low back pain (very low-quality evidence).

Spinal manipulation compared with muscle relaxants We don't know how spinal manipulation and muscle relaxants compare at improving pain in people with acute low back pain (very low-quality evidence).

Functional improvement
Spinal manipulation compared with placebo or sham treatment We don't know whether spinal manipulation is more effective than placebo or sham therapy at improving disability in either the short or long term (low-quality evidence).

Spinal manipulation compared with specific back exercise Spinal manipulation may be less effective than back exercise such as mechanical diagnosis and therapy (MDT) at decreasing disability at 5 days and at 4 weeks, but evidence was limited (low-quality evidence).

Spinal manipulation compared with NSAIDs We don't know how spinal manipulation and NSAIDs compare at improving function, as the evidence was limited (low-quality evidence).

Spinal manipulation compared with muscle relaxants We don't know how spinal manipulation and muscle relaxants compare at improving function in people with acute low back pain (very low-quality evidence).

Return to work
Spinal manipulation compared with NSAIDs We don't know how spinal manipulation and NSAIDs compare at reducing time off work, as the evidence was limited (low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 22 .

Benefits:

We found two systematic reviews (search dates 2011, 20 RCTs, 2674 people; [33] and 2006, 4 RCTs, 149 people [10]). The systematic reviews did not report adverse effects, so we report these from one RCT [34] included in the first systematic review. [33]

We found a third systematic review (search date 2007) that identified one RCT (112 people) comparing spinal manipulation with NSAIDs. [35]

We found one subsequent RCT (3 arms, 101 people with acute low back pain) [36] comparing spinal manipulation plus placebo, sham manipulation plus placebo, and sham manipulation plus diclofenac. There were a high number of drop-outs due to treatment failure in the sham manipulation plus placebo group (10/22 [45%]), which led to this group being stopped prematurely. As a result there were no data to report for this arm.

Spinal manipulation versus placebo or sham treatment:
The first review identified one three-armed RCT (192 people with "uncomplicated low back pain" of 2 to 6 weeks' duration) [37] comparing spinal manipulation (n = 50) with sham manipulation (n = 53). [33] The third arm assessed muscle relaxants plus sham manipulation. For the outcomes of pain and functional status, spinal manipulation was not significantly better than sham at 1 month follow-up (pain: 74 people, MD –0.50, 95% CI –1.39 to +0.39, P = 0.27; functional status: 94 people, SMD –0.35, 95% CI –0.76 to +0.06, P = 0.094). No data were available for recovery or return to work. However, this study was at high risk of bias due to lack of blinding and loss to follow-up.

The first review also compared spinal manipulation with inert interventions (detuned diathermy or ultrasound) or an educational booklet (used in the largest RCT). It found that for pain, spinal manipulation was not significantly better than these inert interventions at 1 week follow-up (3 RCTs, 311 people, MD +0.14, 95% CI –0.69 to +0.96, P = 0.75); however, spinal manipulation was significantly better at reducing pain at 1 month (1 RCT, 178 people, MD –1.20, 95% CI –2.01 to –0.39, P = 0.0038) and 3 months (1 RCT, 181 people, MD –1.20, 95% CI –2.11 to –0.29, P = 0.0095). For the outcome of functional status, spinal manipulation was not significantly better than the other interventions assessed at 1 week follow-up (2 RCTs, 205 people, SMD –0.08, 95% CI –0.37 to +0.21, P = 0.59), and spinal manipulation was not significantly better at 1 and 3 months (1 month: 1 RCT, 178 people, SMD –0.27, 95% CI –0.58 to +0.04, P = 0.091; 3 months: 1 RCT, 181 people, SMD –0.28, 95% CI –0.59 to +0.02, P = 0.072). For the outcome of recovery at 1 week (2 RCTs, 263 people), the review showed non-significant results (RR 0.96, 95% CI 0.50 to 1.85, P = 0.90, I^2 = 58%). One of the two RCTs also reported longer-term outcomes and showed no significant difference in recovery at 1 or 3 months' follow-up (1 month: RR 0.98, 95% CI 0.86 to 1.11, P = 0.61; 3 months: RR 1.00, 95% CI 0.98 to 1.02, P = 1.0). No data were reported for return to work.

The second review identified four RCTs (149 people) evaluating the analgesic effects of spinal manipulation estimated by placebo-controlled trials in people with non-specific low back pain. [10] In this review, RCTs using a placebo consisting of what might now be considered to be an active treatment were excluded (see Comment). The review extracted data on outcomes from the first assessment after the end of therapy because the review considered that this time point was where the largest analgesic effects would be observed. It did not include a description of individual interventions used in each RCT. The review found no significant difference between spinal manipulation and placebo in pain (pain measured by analgesic efficacy [100-point scale]: 4 RCTs, 149 people;

RR presented graphically; absolute numbers and figures for point estimate of RR and CI not reported; individual RCTs in analysis not reported; see Comment). [10]

Spinal manipulation versus back exercises:
See Benefits of Back exercises, p 6 .

Spinal manipulation versus NSAIDs:
The third systematic review identified one three-armed RCT that found no significant difference between NSAIDs (36 people) and physiotherapy (34 people) or spinal manipulation (38 people) in pain after 4 and 12 days (mean change in pain intensity on 4-point scale; 4 days: –0.9 with diflunisal *v* –0.9 with physiotherapy *v* –1.1 with spinal manipulation, mechanical diagnosis and therapy [MDT], or both; 12 days: –1.7 with diflunisal *v* –1.6 with physiotherapy *v* –1.7 with spinal manipulation, MDT, or both; reported as no significant difference; P value not reported). [35] However, the study lacked power because of the small groups.

In the subsequent RCT, two of the arms assessed spinal manipulation plus placebo tablets (n = 37), and sham manipulation plus diclofenac (n = 38). [36] At the end of treatment (day 7–9), pain was less in the spinal manipulation group (results presented graphically, absolute numbers not reported, significance not assessed); however, there was no statistical difference in mean cumulative dose or number of days of rescue medication (paracetamol) between groups (2.22 tablets and 1.19 days with spinal manipulation *v* 6.41 tablets and 1.92 days with diclofenac, P values not reported). The authors noted a large inter-individual variation in use of rescue medication. Functional status was better in the spinal manipulation group (mean reduction in Roland Morris Disability score 7.71 with spinal manipulation *v* 4.75 with diclofenac, reported as significant, P value not reported). The RCT noted that from all functional status data (including mean, median, and minimum Roland Morris Disability score) there was a significant difference between groups (P = 0.0134). There was no difference in time off work between the groups (1.24 *v* 1.80 days, reported as not significant, P value not reported).

Spinal manipulation versus muscle relaxants:
The first systematic review identified one three-armed RCT (192 people with 'uncomplicated low back pain' of 2 to 6 weeks' duration) comparing spinal manipulation plus placebo (n = 50) with sham manipulation plus muscle relaxants (n = 53). [33] The third arm assessed sham manipulation alone. The systematic review did not report results for this comparison, so we have reported directly from the RCT. [37] For the outcome of functional status (assessed by Oswestry Disability Index), there was no significant difference among the three groups at 1 month follow-up (P = 0.087 among groups). For pain all groups showed a significant improvement from baseline (P <0.0001, no between-group analysis reported for spinal manipulation versus muscle relaxants). No data were available for return to work.

Harms:

Spinal manipulation versus placebo or sham treatment:
The first systematic review reported one RCT [34] that had two serious adverse events in each arm, none of which were thought to be related to the treatment. [33] The other systematic reviews gave no information on adverse effects. [10] Another systematic review assessed harms of spinal manipulation. [38] In RCTs identified by the review that used a trained therapist to select people and perform spinal manipulation, the risk of serious complications was low, with an estimated risk of vertebrobasilar strokes of 1/20,000 to 1/1,000,000 people and risk of cauda equina syndrome of less than 1/1,000,000 manipulations. [39]

One systematic overview of non-pharmacological therapies reported that five systematic reviews consistently found that serious adverse events after spinal manipulation (such as worsening lumbar disc herniation or cauda equina syndrome) were very rare. [40]

Spinal manipulation versus back exercises:
See Harms of Back exercises, p 6 .

Spinal manipulation versus NSAIDs:
The review gave no information on adverse effects for this comparison. [35] The subsequent RCT reported no adverse events in either group. [36]

Spinal manipulation versus muscle relaxants:
Neither the systematic review nor the RCT reported on adverse effects for this comparison. [33] [37]

Comment:

The first systematic review reported a meta-analysis of seven studies comparing spinal manipulation to any other non-drug intervention (including exercise, physiotherapy, back school, and massage). [33] Three of the studies were in a mixed population of people with acute, subacute, and chronic

low back pain. For the outcome of pain, spinal manipulation was not significantly better than other interventions at 1 week to 12 months' follow-up (1 week: 3 RCTs, 383 people, MD 0.06, 95% CI –0.53 to +0.65, P = 0.84; 1 month: 3 RCTs, 606 people, MD –0.15, 95% CI –0.49 to +0.18, P = 0.37; 3 to 6 months: 2 RCTs, 548 people, MD –0.20, 95% CI –1.13 to +0.73, P = 0.67, I^2 = 81%, heterogeneity not explained; 12 months: 1 RCT, 314 people, MD +0.40, 95% CI –0.08 to +0.88, P = 0.10). For functional status, spinal manipulation was not significantly better than other interventions (1 week: 1 RCT, 241 people, SMD +0.07, 95% CI –0.18 to +0.33, P = 0.56; 1 month: 3 RCTs, 681 people, SMD –0.11, 95% CI –0.26 to +0.05, P = 0.96; 3 to 6 months: 2 RCTs, 548 people, SMD –0.09, 95% CI –0.33 to +0.15, P = 0.46, I^2 = 51%; 12 months: 2 RCTs, 437 people, SMD +0.06, 95% CI –0.14 to +0.25, P = 0.57). There was also no significant difference in recovery at 1 month (2 RCTs, 59/65 [91%] with spinal manipulation *v* 45/52 [87%] with other intervention, RR 1.06, 95% CI 0.94 to 1.21, P = 0.35) or at 3 months (1 RCT, 29/33 [88%] with spinal manipulation *v* 17/25 [68%] with other intervention, RR 1.29, 95% CI 0.96 to 1.74, P = 0.091). Similar proportions of participants were no longer on sick leave at 1 month (1 RCT, 143/172 [83%] *v* 114/139 [82%], RR 1.01, 95% CI 0.91 to 1.12, P = 0.12) and at 6 months (1 RCT, 158/174 [91%] *v* 118/139 [85%], RR 1.07, 95% CI 0.98 to 1.16, P = 0.12). The review gave no information on adverse effects.

Clinical guide

Spinal manipulation is not advised in people with severe or progressive neurological deficit. [41]

The first review included RCTs that compared manipulation or mobilisation for low back pain with another treatment or control (the review noted that manipulation differed from mobilisation in that manipulation focused on a different range of motion of the involved joint; the review reported that both hands-on treatments were included in the review). [33] The second review did not specify what was included under the term 'spinal manipulative therapy'. [10]

The distinction between placebo effects and specific treatment effects is often ill-defined in non-pharmaceutical treatment trials. Thus, the selection of a comparison group often requires considerable thought to ensure that the placebo intervention does not share some of the specific therapeutic components of the experimental intervention. This issue is more of a concern when placebos are designed to resemble the experimental intervention. In some placebo-controlled trials, the placebo treatment is actually used in clinical practice as a treatment. [10]

The lack of identification of RCTs in each analysis in the second review and the lack of descriptions of trials are omissions that make interpretation of results very difficult. [10] On the basis of published studies, there is little high-quality evidence of benefit of spinal manipulation.

OPTION TEMPERATURE TREATMENTS (SHORT-WAVE DIATHERMY, ULTRASOUND, ICE, AND HEAT)

abridged-title: Temperature treatments [id: 1102_I9]

intervention-title: Temperature treatments (short-wave diathermy, ultrasound, ice, heat) [efficacy: unknown-effectiveness]

substantive-change: **Temperature treatments (short-wave diathermy, ultrasound, ice, and heat)** Option restructured; evidence re-evaluated. Categorisation unchanged (unknown effectiveness). [status: no-new-evidence-existing-evidence-reevaluated]

Symptom improvement

Heat wrap compared with placebo or non-heated wrap Heat wrap seems to be more effective than placebo or non-heated wrap at improving pain relief at 5 days (moderate-quality evidence).

Heat wrap compared with paracetamol (acetaminophen) Heat wrap may be more effective than paracetamol (acetaminophen) at improving pain at 1 to 4 days (low-quality evidence).

Heat wrap compared with NSAID (ibuprofen) Heat wrap may be more effective than NSAID at improving pain at 1 and 4 days (low-quality evidence).

Heat wrap compared with mechanical diagnosis and therapy (MDT) We don't know whether heat wrap is more effective than MDT at relieving pain at 2 to 7 days as we found insufficient evidence (low-quality evidence).

Ultrasound compared with medication We don't know whether ultrasound or analgesics (not specified) are more effective at relieving pain as we found insufficient evidence (very low-quality evidence).

Functional improvement

Heat wrap compared with placebo or non-heated wrap Heat wrap seems to be more effective than placebo or non-heated wrap at improving disability at 5 days (moderate-quality evidence).

Heat wrap compared with paracetamol (acetaminophen) Heat wrap may be more effective than paracetamol (acetaminophen) at improving disability at 4 days (low-quality evidence).

Heat wrap compared with NSAID (ibuprofen) Heat wrap may be more effective than NSAID at improving disability at 4 days (low-quality evidence).

Heat wrap compared with MDT We don't know whether heat wrap is more effective than MDT at improving function at 2 to 7 days, as we found insufficient evidence (low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 22 .

Benefits:

We found one systematic review (search date 2005, 5 RCTs, 856 people with acute or subacute low back pain) [42] assessing the effects of heat treatments on acute low back pain. The review reported that only a small proportion of the data were suitable for pooling (pooling was not possible for most outcomes and comparisons). We found no review or RCTs on the effects of short-wave diathermy or cold therapies in people with acute low back pain.

Heat wrap versus placebo or non-heated wrap:
The review found that heat wrap therapy significantly improved pain relief, reduced pain, and improved disability at 5 days compared with placebo or non-heated wrap (pain relief [scale range 0–5, higher score favours heat]: 2 RCTs, 258 people; WMD 1.06, 95% CI 0.68 to 1.45; pain [measured using a visual analogue scale, range 0–100, lower score favours heat]: 1 RCT, 90 people; WMD –32.20, 95% CI –38.69 to –25.71; disability [measured using Roland Morris questionnaire, lower score favours heat]: 2 RCTs, 258 people; WMD –2.12, 95% CI –3.07 to –1.18). [42]

Heat wrap versus paracetamol (acetaminophen):
The review found that heat wrap significantly improved pain relief at both 1 and 4 days' treatment, and improved disability at 4 days' treatment compared with paracetamol (acetaminophen) (1 RCT, 226 people; pain relief at 1 day: WMD 0.90, 95% CI 0.50 to 1.30; pain relief at 4 days: WMD 0.74, 95% CI 0.31 to 1.17; disability at 4 days: WMD 2.00, 95% CI 0.86 to 3.14). [42]

Heat wrap versus NSAID (ibuprofen):
The review found that heat wrap significantly improved pain relief at both 1 and 4 days' treatment and improved disability at 4 days' treatment compared with ibuprofen (1 RCT, 226 people; pain relief at 1 day: WMD 0.65, 95% CI 0.25 to 1.05; pain relief at 4 days: WMD 1.05, 95% CI 0.62 to 1.48; disability at 4 days: WMD 2.20, 95% CI 1.11 to 3.29). [42]

Heat wrap versus mechanical diagnosis and therapy (MDT):
The review found no significant difference between heat wrap and MDT in pain relief or function at 2 or 7 days' follow-up (1 RCT, 50 people; pain relief [higher score favours heat]; 2 days: 1.40 with heat wrap *v* 1.00 with MDT; WMD +0.40, 95% CI –0.15 to +0.95; 7 days: 2.30 with heat wrap *v* 2.00 with MDT; WMD +0.30, 95% CI –0.68 to +1.28; function: 2 days: –0.90 with heat wrap *v* –0.20 with MDT; WMD –0.70, 95% CI –2.09 to +0.69; 7 days: –2.80 with heat wrap *v* –2.30 with MDT; WMD –0.50, 95% CI –2.72 to +1.72). [42]

Ultrasound versus medication:
We found one systematic review (search date 1995), which identified one RCT (73 people) and found that ultrasound treatment significantly increased the proportion of people who were pain free after 4 weeks compared with analgesics (unspecified) (41% with ultrasound *v* 7% with analgesics; reported as significant; P value not reported). [14]

Harms:

Heat wrap versus placebo or non-heated wrap:
The review reported that skin pinkness, which resolved quickly, was reported as an adverse effect of heat wrap therapy. [42] The first subsequent RCT reported that no serious adverse effects were associated with heat wrap treatment. [43]

Heat wrap versus paracetamol (acetaminophen):
The review gave no information on adverse effects for this comparison. [42] See review on Paracetamol (acetaminophen) poisoning.

Heat wrap versus NSAID (ibuprofen):
The review gave no information on adverse effects for this comparison. [42] NSAIDs may cause gastrointestinal and other complications (see review on NSAIDs).

Heat wrap alone versus MDT:
The review gave no information on specific adverse effects for this comparison. [42]

Ultrasound versus medication:
The review gave no information on adverse effects for this comparison. [14]

Comment: Of the five RCTs identified in the review, one was in people with acute low back pain, and four were in people with subacute low back pain. [42] Four RCTs declared receipt of industry funding.

We found two subsequent RCTs [43] [44] that compared heat wraps combined with another intervention. These did not meet our inclusion criteria for this overview, and are therefore not reported further.

OPTION TENS

abridged-title: TENS [id: 1102_I10]
intervention-title: TENS [efficacy: unknown-effectiveness]
substantive-change: No description. [status: no-new-evidence]

Symptom improvement
TENS compared with placebo We don't know whether TENS is more effective than placebo at improving pain in people with acute low back pain (very low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 22 .

Benefits: **TENS versus placebo:**
We found one systematic review (search date 2006), [10] which identified two RCTs reporting on the analgesic effects of TENS estimated by placebo-controlled trials in people with non-specific acute low back pain. In this review, RCTs using a placebo consisting of what might now be considered to be an active treatment were excluded (see Comment, p 19). The review extracted data on outcome from the first assessment after the end of therapy, because the review considered that this time point was where the largest analgesic effects would be observed. It did not include a description of individual interventions used in each RCT. The review found no significant difference between TENS and placebo in pain (measured by analgesic efficacy [100-point scale]) compared with placebo (2 RCTs, 121 people; RR presented graphically; absolute numbers and figures for point estimate of RR and CI not reported; individual RCTs in analysis not reported).

Harms: **TENS versus placebo:**
The review did not report on harms. [10]

Comment: The distinction between placebo effects and specific treatment effects is often ill-defined in non-pharmaceutical treatment trials. Thus, the selection of a comparison group often requires considerable thought to ensure that the placebo intervention does not share some of the specific therapeutic components of the experimental intervention. This issue is more of a concern when placebos are designed to resemble the experimental intervention. In some placebo-controlled trials, the placebo treatment is actually used in clinical practice as a treatment. [10]

GLOSSARY

Acupuncture Needle puncture of the skin at traditional "meridian" acupuncture points. Modern acupuncturists also use non-meridian points and trigger points (tender sites occurring in the most painful areas). The needles may be stimulated manually or electrically. Placebo acupuncture is needling of traditionally unimportant sites or non-stimulation of the needles once placed.

Back school Traditionally, this is a series of group education sessions on low back pain. Sessions are usually supervised by a clinician or physiotherapist specialising in low back pain treatment and often include information on an exercise programme.

Cesar therapy Exercise programme to improve posture and so reduce back pain caused by poor posture.

Generic back exercise (low back pain) In this review, generic back exercise denotes undifferentiated exercise/movements performed in multiple directions or planes without emphasis on the person's pattern of pain or directional preference for pain control.

Low-quality evidence Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Mechanical diagnosis and therapy (MDT) A method of therapy that involves a comprehensive mechanical assessment and treatment (MDT) to assess the effects of end-range repetitive movements, static positioning, or both on patient symptoms. The mechanical diagnosis enables clinicians to prescribe individual exercises in a specific preferred direction, typically extension or flexion. The emphasis is on patient responsibility and self-treatment. Mobilisation

techniques are used in more difficult mechanical cases until patients can perform the prescribed exercises on their own.

Moderate-quality evidence Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Multidisciplinary treatment Intensive physical and psychosocial training by a team (e.g., a physician, physiotherapist, chiropractor, psychologist, social worker, and/or occupational therapist). Training is usually given in groups and does not involve passive physiotherapy.

Roland Morris Disability Questionnaire A 24-item, self-reported, disability scale specific to back pain recommended for use in primary care and community studies. Measures daily function in completing activities affected by back pain. The scale score ranges from 0 (no disability) to 24 (severe disability).

Sciatica Radicular leg pain emanating from irritation in one of the roots of the sciatic nerve and following the nerve's distribution.

Very low-quality evidence Any estimate of effect is very uncertain.

Visual Analogue Scale (VAS) A commonly used scale in pain assessment. It is a 10-cm horizontal or vertical line with word anchors at each end, such as 'no pain' and 'pain as bad as it could be'. The person is asked to make a mark on the line to represent pain intensity. This mark is converted to distance in either centimetres or millimetres from the 'no pain' anchor to give a pain score that can range from 0–10 cm or 0–100 mm.

SUBSTANTIVE CHANGES

Acupuncture Option restructured. One systematic review added. [13] Categorisation unchanged (unknown effectiveness).

Advice to stay active One systematic review updated. [11] Categorisation unchanged (likely to be beneficial).

Back exercises Two systematic reviews [11] [19] and two RCTs added. [21] [22] Categorisation unchanged (unknown effectiveness).

Multidisciplinary treatment programmes (subacute low back pain) One RCT added to Comment, p 13 section. [32] Categorisation unchanged (unknown effectiveness).

Spinal manipulation One systematic review updated, [33] one systematic review added, [35] and one RCT added. [36] Categorisation unchanged (unknown effectiveness).

Temperature treatments (short-wave diathermy, ultrasound, ice, and heat) Option restructured; evidence re-evaluated. Categorisation unchanged (unknown effectiveness).

rss description: New search performed and critically appraised; no new evidence selected for inclusion.

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Disclaimer

TABLE **GRADE evaluation of interventions for low back pain (acute)**

Important outcomes	Symptom improvement, functional improvement, return to work, adverse effects								
Number of studies (participants)	**Outcome**	**Comparison**	**Type of evidence**	**Quality**	**Consistency**	**Directness**	**Effect size**	**GRADE**	**Comment**
What are the effects of non-drug treatments for acute low back pain?									
Unclear (unclear) [12]	Return to work	Advice to stay active *v* no advice or traditional medical treatment	4	−1	0	−2	0	Very low	Quality point deducted for incomplete reporting of results; directness points deducted for mixed comparison groups, use of co-interventions, and unclear effect sizes limiting generalisability
Unclear (unclear) [12]	Functional improvement	Advice to stay active *v* no advice or traditional medical treatment	4	−1	0	−2	0	Very low	Quality point deducted for incomplete reporting of results; directness points deducted for mixed comparison groups, use of co-interventions, and unclear effect sizes limiting generalisability
2 (400) [11]	Symptom improvement	Advice to stay active *v* bed rest	4	−1	0	0	0	Moderate	Quality point deducted for incomplete reporting of results
2 (400) [11]	Functional status	Advice to stay active *v* bed rest	4	−1	0	0	0	Moderate	Quality point deducted for incomplete reporting of results
2 (400) [11]	Return to work	Advice to stay active *v* bed rest	4	−1	0	0	0	Moderate	Quality point deducted for incomplete reporting of results
1 (92) [28] [29]	Symptom improvement	Multidisciplinary treatment programme (for acute low back pain) *v* usual care	4	−2	0	−1	0	Very low	Quality points deducted for sparse data and incomplete reporting of results; directness point deducted for inclusion of co-interventions
1 (92) [28] [29]	Functional improvement	Multidisciplinary treatment programme (for acute low back pain) *v* usual care	4	−2	0	−1	0	Very low	Quality points deducted for sparse data and incomplete reporting of results; directness point deducted for inclusion of co-interventions
1 (92) [28] [29]	Return to work	Multidisciplinary treatment programme (for acute low back pain) *v* usual care	4	−2	0	−1	0	Very low	Quality points deducted for sparse data and incomplete reporting of results; directness point deducted for inclusion of co-interventions
4 (1179) [30] [31]	Return to work	Multidisciplinary treatment programmes (for subacute low back pain) *v* usual care	4	−3	0	−2	0	Very low	Quality points deducted for incomplete reporting of results, alternate allocation in 1 study, and weak methods (including blinding, co-interventions); directness points deducted for no direct statistical analysis in 1 study and wide variation of interventions between studies
At least 5 (at least 250) [10] [33] [34]	Symptom improvement	Spinal manipulation *v* placebo/sham treatment	4	−1	−1	−1	0	Very low	Quality point deducted for incomplete reporting of results; consistency point deducted for conflicting results (between studies, between short and long term); directness point deducted for unclear interventions used
At least 2 (at least 192) [33] [37]	Functional improvement	Spinal manipulation *v* placebo/sham treatment	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results; directness point deducted for unclear interventions used
2 (149) [35] [36]	Symptom improvement	Spinal manipulation *v* NSAIDs	4	−3	0	0	0	Very low	Quality points deducted for sparse data, incomplete reporting of results, and weak methodologies

Important outcomes	Symptom improvement, functional improvement, return to work, adverse effects								
Number of studies (participants)	**Outcome**	**Comparison**	**Type of evidence**	**Quality**	**Consistency**	**Directness**	**Effect size**	**GRADE**	**Comment**
1 (75) [36]	Functional improvement	Spinal manipulation *v* NSAIDs	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (75) [36]	Return to work	Spinal manipulation *v* NSAIDs	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (103) [37]	Symptom improvement	Spinal manipulation *v* muscle relaxants	4	−3	0	0	0	Very low	Quality points deducted for sparse data, incomplete reporting of results, and weak methodologies
1 (103) [37]	Functional improvement	Spinal manipulation *v* muscle relaxants	4	−3	0	0	0	Very low	Quality points deducted for sparse data, incomplete reporting of results, and weak methodologies
3 (148) [13]	Symptom improvement	Acupuncture *v* no treatment or control	4	−3	0	0	0	Very low	Quality points deducted for sparse data, incomplete reporting of results, and weak methodologies
3 (148) [13]	Functional improvement	Acupuncture *v* no treatment or control	4	−3	0	0	0	Very low	Quality points deducted for sparse data, incomplete reporting of results, and poor-quality RCT
At least 5 (at least 657) [13]	Symptom improvement	Acupuncture *v* NSAIDs	4	−1	0	−1	0	Low	Quality point deducted for weak methods; directness point deducted for uncertainty about benefit (different results for higher quality trials)
1 (40) [14]	Symptom improvement	Acupuncture *v* paracetamol	4	−2	0	0	0	Low	Quality points deducted for sparse data and weak methods
2 (121) [27]	Symptom improvement	Massage *v* placebo massage, sham massage, no massage, or usual care	4	−3	0	−1	0	Very low	Quality points deducted for sparse data, incomplete reporting of results, and weak methods; directness point deducted for heterogeneity among interventions
2 (121) [27]	Functional improvement	Massage *v* placebo massage, sham massage, no massage, or usual care	4	−3	0	−1	0	Very low	Quality points deducted for sparse data, incomplete reporting of results, and weak methods; directness point deducted for heterogeneity among interventions
3 (348) [42]	Symptom improvement	Heat wrap *v* placebo or non-heated wrap	4	−1	0	0	0	Moderate	Quality point deducted for incomplete reporting of results
2 (258) [42]	Functional improvement	Heat wrap *v* placebo or non-heated wrap	4	−1	0	0	0	Moderate	Quality point deducted for incomplete reporting of results
1 (226) [42]	Symptom improvement	Heat wrap *v* paracetamol (acetaminophen)	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results; directness point deducted for narrow range of comparators
1 (226) [42]	Functional improvement	Heat wrap *v* paracetamol (acetaminophen)	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results; directness point deducted for narrow range of comparators
1 (226) [42]	Symptom improvement	Heat wrap *v* NSAIDs	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results; directness point deducted for narrow range of comparators
1 (226) [42]	Functional improvement	Heat wrap *v* NSAIDs	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results; directness point deducted for narrow range of comparators

Important outcomes	Symptom improvement, functional improvement, return to work, adverse effects								
Number of studies (participants)	**Outcome**	**Comparison**	**Type of evidence**	**Quality**	**Consistency**	**Directness**	**Effect size**	**GRADE**	**Comment**
1 (50) [42]	Symptom improvement	Heat wrap *v* MDT	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (50) [42]	Functional improvement	Heat wrap *v* MDT	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (73) [14]	Symptom improvement	Ultrasound *v* analgesics (unspecified)	4	−2	0	−1	0	Very low	Quality points deducted for sparse data and incomplete reporting of results; directness point deducted for uncertainty about drugs in comparison
2 (121) [10]	Symptom improvement	TENS *v* placebo	4	−2	0	−1	0	Very low	Quality points deducted for sparse data and incomplete reporting of results; directness point deducted for unclear interventions
10 (at least 491) [16]	Symptom improvement	Generic back exercise *v* usual care or no treatment (acute back pain < 6 weeks' duration)	4	−2	0	−1	0	Very low	Quality points deducted for incomplete reporting of results, and poor-quality RCTs; directness point deducted for uncertainty about definition of exercises
at least 11 (at least 491) [16] [20]	Functional improvement	Generic back exercise *v* usual care or no treatment (acute and subacute low back pain)	4	−2	0	−1	0	Very low	Quality points deducted for incomplete reporting and for inclusion of poor-quality RCTs; directness point deducted for uncertainty about definition of exercises
7 (at least 134) [16] [20]	Return to work	Generic back exercise *v* usual care or no treatment (subacute back pain of 6–12 weeks' duration)	4	−2	0	−1	0	Very low	Quality points deducted for incomplete reporting and for inclusion of poor-quality RCTs; directness point deducted for uncertainty about definition of exercises
2 (470) [17]	Symptom improvement	Specific back exercise *v* passive treatments	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results; directness point deducted for composite outcome
At least 3 (at least 495) [17]	Functional improvement	Specific back exercise *v* passive treatments	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results; directness point deducted for composite outcome
2 (261) [17]	Symptom improvement	Specific back exercise *v* advice to stay active	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results; directness point deducted for uncertainty about definition of exercise
2 (261) [17]	Functional improvement	Specific back exercise *v* advice to stay active	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results; directness point deducted for uncertainty about definition of exercise
1 (107) [11]	Return to work	Specific back exercise *v* advice to stay active	4	−2	0	−1	0	Very low	Quality points deducted for sparse data and incomplete reporting of results; directness point deducted for uncertainty about definition of exercise
1 (149) [23]	Symptom improvement	Specific back exercise *v* flexion exercises	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (24) [24]	Functional improvement	Specific back exercise *v* flexion exercises	4	−3	0	0	0	Very low	Quality points deducted for sparse data, incomplete reporting of results, and poor-quality RCT

Important outcomes	Symptom improvement, functional improvement, return to work, adverse effects								
Number of studies (participants)	**Outcome**	**Comparison**	**Type of evidence**	**Quality**	**Consistency**	**Directness**	**Effect size**	**GRADE**	**Comment**
1 (24) [25]	Functional improvement	Specific back exercise *v* spinal manipulation	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (50) [19]	Symptom improvement	Specific back exercise *v* heat treatment	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (50) [19]	Functional improvement	Specific back exercise *v* heat treatment	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (260) [18]	Functional improvement	Specific back exercise *v* NSAIDs	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results; directness point deducted for narrow range of comparators

Type of evidence: 4 = RCT Consistency: similarity of results across studies.
Directness: generalisability of population or outcomes.
Effect size: based on relative risk or odds ratio.