Bilaga till rapport

Preventiva insatser vid akut smärta från
rygg och nacke – effekter av fysisk träning,
manuell behandling och beteendepåverkande åtgärder,
nr 245 (2016)

Appendix 1 Included studies/Bilaga 1 Tabellverk, beskrivning av ingående studier

Table 1 Neck pain.

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
Ask et al 2009 Norway [1]	Population n=25, 18–67 years Motor control training group: (n=11), mean age 38.3, female/male 7/6 Endurance and strength training group: (n=14), mean age 35.6, female/male 7/7 Inclusion criteria: Whiplash-associated disorder still having symptoms or disability 6 weeks after injury Setting An outpatient spine clinic in Norway Study period	I: Motor control training Motor relearning programme with initial emphasis on coordination and holding capabilities of specific neck flexorand extensor-, and shoulder girdle muscles. The main focus is on re-education in order to reduce the imbalance between the deep and superficial neck synergists. Each exercise is repeated 10 times. When training the deep neck flexors, an air-filled pressure sensor is placed behind the neck to give feedback of adequate performance Drop-out (n=1) Participants received one-to-one supervision by the	C: Endurance and strength training Higher load to recruit all the muscle synergists. The neck flexor and extensor muscles are exercised by lifting the head up from supine or prone positions. Strength also trained by using elastic rubber band as resistance against flexion, extension and lateral in sitting position. Upper body strengthening exercises include push-ups and dumbbell shoulder exercises. 15–20 repetitions of each exercise in one set. Weight resistance was increased gradually over the treatment period with fewer repetitions Participants received one-to-one supervision by the physiotherapist, 1–2 sessions approx 30 min/week for 6 weeks	Neck Disability Index scale 0–50 1 year I: 11.0 (IQR 12 to 56) C: 13.5 (IQR 7 to 18.5) p= 0.783 Pain morning VAS 0–100 1 year I: 37.0 (IQR 3 to 54) C: 15.5 (IQR -3.3 to 32.0) p= 0.048 Pain evening VAS 0–100 1 year I: 52.0 (IQR 7 to 18) C: 36.5 (IQR 8.3 to 77.3) p= 0.096	Quality Moderate

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	6 weeks Follow-up 6 weeks and 1 year	physiotherapist, 1–2 sessions approx 30 min/week for 6 weeks	Drop-outs (n=3)		
Bunketorp et al 2006 Sweden [2]	Population n=47, mean age 31 years Female/male 30/17 Home training group: n=25, drop-outs n=5 Supervised training group: n=24, drop-outs n=2 Inclusion criteria: Subacute whiplash-associated disorders following a whiplash trauma to the neck Setting An interdisciplinary rehabilitation centre Study period Home group:	I: Supervised training Patients attended the rehabilitation centre for an average of 18 sessions (range 12–42) No negative side effects occurred due to any of the treatments Drop-out n=2	C: Self-administered home training Individual physiotherapy counselling on average 4 times (range 1–9) Drop-out n=5	Self-Efficacy Scale 3 months % improved I: 68% C: 36% I vs C: 32 (95% CI 5.1 to 59.2) p=0.03 Tampa Scale for Kinesiophobia 3 months % improved I: 68% C: 36% I vs C: 32 (95% CI 5.1 to 59.2) p=0.03 Pain Disability Index 3 months % improved I: 73%	Quality Moderate Other comments Co-interventions 56% in home training group, 14% in supervised group Exactly the same data for SES and TSK, appears twice in the paper

Author Year Country Reference	**Population Inclusion criteria Setting Study period Follow-up**	**Intervention**	**Control**	**Outcome Results**	**Quality Comments Study limitations**
	89–128 days Supervised training group: 64–125 days Follow-up 173–198 days			C: 40% I vs C: 33 (95% CI 6.0 to 59.4) p=0.03 Secondary outcome measures were neck pain intensity, sensory and affective dimensions of pain, pain location and duration, muscle tenderness, grip strength, cervical mobility, sick leave and analgesic consumption	
Bring et al 2015 Sweden [3]	Population n=55 Aged 18–65 Experimental group 1: n=18, age 35.3 years, female n=12 Experimental group 2: n=18, age 35.7 years, female n=14	I: Individually tailored behavioural medicine intervention, face-to-face I2: Individually tailored behavioural medicine intervention, web-based Lost to follow-up: 3	C: Standard care only Only written self-care instructions	Pain related disability, mean (IQR) 12 months I1: 9 (9) I2: 11.5 (5) C: 15 (14) Fear of movement, mean (IQR) 12 months I1: 24 (7) I2: 25 (8) C: 31 (8)	Quality Moderate

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Control group: n=19, age 36.0 years, female n=11 Inclusion criteria Whiplash associated disorder Grade I–II duration <2 weeks Setting Face-to-face group and control group in out-patient clinic Study period 5–10 weeks Follow-up Questionnaire at 3, 6 and 12 months postintervention			Pain related disability, mean (IQR) 12 months I1 and I2 vs C: p=0.009 Fear of movement, mean (IQR) 12 months I1 and I2 vs C: p=<0.001	
Gemmell 2010 UK [4]	Population n=47 Activator group: Mean age (SD): 46.8 (11.8)	I1: Activator group Activator IV instrument was applied and the patient received one thrust over the articular pillar in line with		PGIC, OR 3 months I1 vs I2: 1.4 (95% CI 0.13 to 17.56) I1 vs I3: 2.6 (95% CI 0.06 to 112.81)	Quality Moderate Other comments

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Mean BMI (SD): 25.6 (5.4) Mean BQ raw score (SD): 30.2 (10.9) Females: 81% Mean NRS for pain (SD): 6.7 (1.5) Mean SF-36 PCS (SD) 40.6 (6.5) Mean SF-36 MCS (SD) 49.2 (12.0) <u>Manipulation group:</u> Mean age (SD): 46.9 (9.1) Mean BMI (SD): 27.6 (7.0) Mean BQ raw score (SD): 32.2 (9.6) Females: 69% Mean NRS for pain (SD): 6.0 (1.3) Mean SF-36 PCS (SD) 45.3 (8.5) Mean SF-36 MCS (SD) 47.2 (9.6)	the facet joint of the restricted segment <u>I2: Manipulation group</u> One or two dynamic thrusts applied with high velocity low amplitude force <u>I3: Mobilisation group</u> Repetitive low-grade passive movement with variation in amplitude All patients had two treatments per week for three weeks, and were treated until symptom free or had received the maximum of six treatments. The duration of a single treatment session was 10 to 15 minutes		I2 vs I3:5.8 (95% CI 0 to 0) 6 months I1 vs I2: 1.5 (95% CI 0.13 to 17.56) I1 vs I3: 13.8 (95% CI 0.63 to 299.67) I2 vs I3: 2.8 (95% CI 0.06 to 122.80) 12 months I1 vs I2: 3.8 (95% CI 0.39 to 37.18) I1 vs I3: 3.3 (95% CI 0.27 to 40.61) I2 vs I3: 1.2 (95% CI 0.09 to 15.96) <u>Pain (NRS), OR</u> 3 months I1 vs I2: 0.39 (95% CI –1.58 to 2.35) I1 vs I3: 1.33 (95% CI –1.55 to 4.22) I2 vs I3: 0.95 (95% CI –1.69 to 5.38)	Difficulty recruiting participants therefore stopped trial before it´s expected completion

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	<u>Mobilisation group:</u> Mean age (SD): 43.8 (13.0). Mean BMI (SD): 24.7 (3.5). Mean BQ raw score (SD): 25.6 (10.6). Females: 87% Mean NRS for pain (SD): 4.9 (1.3). Mean SF-36 PCS (SD) 44.5 (6.0) Mean SF-36 MCS (SD) 48.0 (10.2) Inclusion criteria: Patients with sub-acute (at least 4 weeks, but no longer than 12 weeks duration) non-specific neck pain Mean age: 18–64 Setting:			6 months I1 vs I2: 1.96 (95% CI –0.34 to 4.26) I1 vs I3: 1.61 (95% CI –1.26 to 4.48) I2 vs I3: –0.35 (95% CI –3.05 to 2.35) 12 months I1 vs I2: 1.72 (95% CI –1.17 to 4.62) I1 vs I3: 1.30 (95% CI –2.05 to 4.65) I2 vs I3: –0.48 (95% CI –3.47 to 2.63) <u>SF -36, Mental Component</u> 3 months I1 vs I2: –1.98 (95% CI –10.57 to 6.61) I1 vs I3: –0.66 (95% CI –13.28 to 11.96) I2 vs I3: 1.32 (95% CI –10.23 to 12.86) 6 months	

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Outpatient clinic of the Anglo-European College of Chiropractic during January–July 2007 and January–March 2008			I1 vs I2: –1.28 (95% CI – 10.47; 7.89) I1 vs I3: 0.89 (95% CI – 10.55; 12.34) I2 vs I3: 2.18 (95% CI –8.59; 12.95) 12 months I1 vs I2: 0.42 (95% CI –7.74; 8.59) I1 vs I3: –1.75 (95% CI – 11.19; 7.69) I2 vs I3: –21.17 (95% CI – 10.78; 6.44)	
Jull et al 2013 Australia [5]	<u>Population</u> n=101, 18–65 years Intervention group: n=49, mean age 36.4 years, female 61.2% Usual care group: n=52, Mean age 35.4 years, female 55.8% <u>Inclusion criteria:</u> Acute neck pain that was classifiable as WAD II for <4 weeks	<u>I: Pragmatic intervention</u> n=49 Pharmaceutical management (ranging from simple medications to opioid analgesia), multimodal physiotherapy and psychology Stratified multiprofessional intervention was prescribed on an individual basis. A participant could receive	<u>C: Usual care</u> n=52 Usual care from health practitioners of their choice or as monitored by the insurer as currently practised in Queensland, Australia, for the 12-mo period of the trial Lost to follow-up n=1	<u>Neck Disability Index OR</u> 6 months I vs C: 0.55 (95% CI 0.23; 1.29), p=0.163) 12 months I vs C: 0.65 (95% CI 0.28;1.47) p=0.297 <u>Neck Disability Index</u> 6 months I: 16.8 (SD 15.2) C: 13.4 (SD 14.4)	<u>Quality</u> Moderate

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	<u>Setting</u> Accident and emergency centres and the community <u>Study period</u> 10 weeks <u>Follow-up</u> 11 weeks, 6 months and 12 months	any combination of medical, physiotherapeutic and psychological care, and this care was received concurrently. At the minimum, they included medical consultation and physiotherapy management for the pain and physical impairment. Medication was monitored by the medical practitioner on a weekly basis or as required during treatment period. Pharmacotherapeutic options included: (1) simple analgesic agents for participants without evidence of central nervous system hypersensitivity and/or nonsteroidal antiinflammatory drugs for those with moderate or severe symptoms, an estimated 60% to 70% of participants; (2) opioid		12 months I: 16.9 (SD 15.3) C: 13.5 (SD 15.4) I vs C: 5.33 (95% CI –0.46; 11.13) <u>Pain VAS</u> 6 months I: 1.8 (SD 2.1) C: 1.4 (SD1.7) 12 months I: 2.3 (SD 2.4) C: 1.6 (SD 2.0) I vs C: 0.64 (95% CI 0.2; 1.31) <u>Pictorial Fear of Activity Scale</u> 6 months I: 1.5 (SD 2.3) C: 2.0 (SD2.5) 12 months	

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
		analgesic agents for moderate to severe symptoms with evidence of CNS hypersensitivity - an estimated 20% to 30% of participants; (3) adjuvant analgesic agents for severe pain with evidence of enhanced nociception - an estimated 10% of participants Lost to follow-up n=3		I: 1.7 (SD 2.6) C: 1.9 (SD 2.7) I vs C: –0.36 (95% CI –1.31; 0.6) There was no improvement in current nonrecovery rates at 6 mo (63.6%, pragmatic care; 48.8%, usual care), indicating no advantage of the early multiprofessional intervention Baseline levels of pain and disability had a significant bearing on recovery both at 6 and 12 mo in both groups, suggesting that future research focus on finding early effective pain management, particularly for the subgroup of patients with initial high levels of pain and disability, towards improving recovery rates	

Author Year Country Reference	**Population Inclusion criteria Setting Study period Follow-up**	**Intervention**	**Control**	**Outcome Results**	**Quality Comments Study limitations**
Kongsted et al 2008 Denmark [6]	<u>Population</u> n=182 Age 18–70 years Average age 35 years, female/male n=85/97 Oral advice group: n=119, median age 33, female 44%. Pamphlet group: n=63, median age 32, female 52% <u>Inclusion</u> Whiplash-associated disorder (WAD). Rear-end or frontal car collision experienced symptoms within 72 hours and could be examined within 10 days of the collision. Mild complaints <u>Setting</u> From emergency units and general practitioners in 4 Danish counties	<u>I: 1 hour-educational session</u> Information and advice from the project nurse at a home visit. The session lasted about 1 hour. To make sure that the substance of the patient education was standardised, it was based on a check-list and individual questions were answered in accordance with this list. The whiplash mechanism was described; it was underlined that whiplash denotes a trauma mechanism rather than a diagnosis. A generally good prognosis and the importance of staying active were emphasised too, and it was explained how fear of pain and focus on pain can lead to a vicious circle that may be self-perpetuating. The participants were told that acute pain because of	<u>C: Educational pamphlet</u> The pamphlet group received the same information as the intervention group in an 8-pages A5 booklet (total word count equals 1503). Drop-out rate n=8	<u>Recovery %, pain 0 or 1 (0–10 point scale)</u> 3 months I: 69 (95% CI 49; 73) C: 56 (95% CI 36; 76) p=0.40 6 months I: 60 (95% CI 49; 70) C: 57 (95% CI 42; 73) p=0.94 12 months I: 70 (95% CI 61; 79) C: 58 (95% CI 45; 72) p=0.29 <u>Neck Pain, median</u> 3 months I: 0 (IQR 0; 1) C: 1 (IQR 0; 2) p=0.53 6 months I: 0 (IQR 0; 2) C: 0 (IQR 0; 3) p=0.37	<u>Quality</u> Moderate

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	<u>Study period</u> <u>Follow-up</u> After 3, 6, and 12 months. Mailed questionnaire	soft tissue injury is expectable and that the severity of additional muscle spasms might be reduced by attempting to move as naturally as possible. Generally it was the aim to reduce fear and uncertainty and to motivate the participants to resume normal activities Drop-out rate n=16		12 months I: 0 (IQR 0; 1) C: 1 (IQR 0; 3) p=0.11 <u>Disability, median</u> 3 months I: 2 (IQR 0; 5) C: 3 (IQR 0; 7) p=0.51 6 months I: 2 (IQR 0; 4) C: 2 (IQR 0; 7) p=0.10 12 months I: 0 (IQR 0; 3) C: 2 (IQR 0; 3.25) p=0.31	
Lamb et al 2013 United Kingdom [7]	<u>Population</u> *Step 1*: n=6 952; <u>Active management:</u> Mean age 37 years, men n=995 *Step 2*: n=949;	Step 1 <u>I: Active management</u> Training slots were used of 30–40 min duration, repeated every 4 months to coincide with medical staff	Step 1 <u>C: Usual care consultations</u> Lost to follow-up n=1 604 (58%) Step 2 <u>C: Single advice session</u>	Step 1 <u>Neck Disability Index (NDI)</u> <u>100</u> 1 year Mean I: 14.4 (SD 15.9)	<u>Quality</u> Moderate

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Advice: n=299, mean age 40 years, men n=115 Physiotherapy package: n=300, mean age 40 years, men n=106 Usual care: n=1 598, mean age 37 years, men n=666 Inclusion criteria Acute whiplash Setting Step 1: 12 NHS Trust Hospitals comprising 15 emergency departments. Pragmatic, cluster randomised trial who treated patients with acute whiplash associated disorder of grades I–III. The hospitals were randomised by clusters Step 2: Self-referred to research clinic	rotations. Training was providied to clinicians assigned to usual care. For both groups of the trial, training included an overview of whiplash injury and study procedures. The active management staff were trained to provide reassurance that prognosis is good after whiplash associated disorder; encourage return to normal activities as soon as possible and to practise neck exercises; inform patients that pain is a normal response, that analgesia should be used consistently, that a neck collar should be avoided Lost to follow-up n=2 644 (62%) Step 2	Lost to follow-up n=61 (20%)	C: 14.4 (SD 16.0) I vs C 0.05 (95% CI –1.5; 2.5) SP12-physical 100 1 year Mean I: 49.8 (SD 9.1) C: 49.9 (SD 9.0) I vs C 0.0 (95% CI –1.5; 1.5) SP12-mental 100 1 year Mean I: 49.3 (SD 10.9) C: 49.6 (SD 10.9) I vs C –0.3 (95% CI –1.4; 0.9) Work days lost 1 year Mean I: 6 (SD 17.4) C: 6 (SD 15.8) I vs C –0.0 (95% CI –2.1; 1.5) Self-rated benefit 1 year I vs C OR 1.28 (95% CI 1.14; 1.45) p=<0.0001	

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	Nested individually randomised trial <u>Study period</u> <u>Follow-up</u> 4 months, 8 months and 12 months	<u>I: Package of up to 6 physiotherapy sessions</u> The package was standardised and based on present clinical guidelines. Therapists were asked to provide up to 6 sessions in 8 weeks, limited to manual therapy, other soft-tissue techniques, exercise, tips on management of pain and on resumption of normal activities, psychological strategies to deal with travel anxiety, and a screen for post-traumatic stress. For the reinforcement of advice group, physiotherapists provided a 30–40 min session where they examined the patient and provided advice Lost to follow-up n=59 (20%)		Step 2 <u>Neck Disability Index (NDI) 100</u> 1 year Mean I: 21.7 (SD 18.4) C: 19.5 (SD 17.0) I vs C –2.0 (95% CI –4.6; 0.6) <u>SP12-physical 100</u> 1 year Mean I: 46.5 (SD 10.2) C: 47.1 (SD 9.9) I vs C 1.1 (95% CI –0.7; 2.9) <u>SP12-mental 100</u> 1 year Mean I: 47.5 (SD 11.8) C: 48.8 (SD 10.6) I vs C –0.0 (95% CI –2.2; –0.02) <u>Work days lost</u> 1 year Mean I: 9 (SD 18.9) C: 11 (SD 26.2)	

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
				I vs C –4 (95% CI –7.5; 1.5) p=0.026 Self-rated benefit 1 year I vs C OR 0.98 (95% CI 0.73; 1.32) p=<0.0001 Economic evaluation Active management consultations and the physiotherapy package were more expensive than usual care and single advice session No treatment-related serious adverse events or deaths were noted	
Rosenfeld et al 2003 Sweden [8]	Population n=102 Active intervention initiated within 96 hours: n=25, mean age 39 years Active intervention initiated with a delay:	I1: Active intervention initiated within 96 hours after collision The active intervention consisted of 2 phases: (1) an initial phase given to all patients including information, postural control, and cervical	C1: Standard intervention initiated within 96 hours Written information on injury mechanisms, advice on suitable activities, and postural correction. The advice provided in the leaflet was to rest the neck during the first weeks after trauma and that a soft collar could provide comfort	Pain intensity Differences in outcome active vs standard intervention 6 months ANOVA 0.0004 Friedmann 0.0009 3 years ANOVA 0.02	Quality Moderate

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	n=26, mean age 33 years <u>Standard intervention within 96 hours:</u> n=26, mean age 32 years Group 4: n=25, mean age 38 years <u>Inclusion criteria</u> Whiplash trauma in motor vehicle collisions <u>Setting</u> The southern half of Elfsborg County in the southwestern part of Sweden. A mixture of urban, village, and rural populations. Physicians in 29 primary care units, 3 emergency wards, and several private clinics selected patients consecutively <u>Study period</u>	rotation exercises; and (2) a second phase, if symptoms were unresolved, of evaluation and treatment according to McKenzie principles. No additional interventions. Treatment by the physiotherapist was terminated 6 weeks after the initiation of active intervention or earlier if symptoms resolved Lost to follow-up n=4 I2: <u>Active intervention initiated with a delay of 14 days after collision</u> Lost to follow-up n=6	as well as prevent the neck from excessive movements.Patients were instructed to perform active movements 2 or 3 times daily “a few weeks” after trauma. The recommended movements were elevation of shoulders, retraction of shoulder blades, rotation of torso, lateral flexion of the head, rotation of the head, and combined flexion-rotation of the head Lost to follow-up n=5 C2: <u>Standard intervention initiated with a delay of 14 days</u> Lost to follow-up n=6	Friedmann 0.026 Delaying intervention 2 weeks did not affect outcome variables. However, at 3 years, only patients receiving early active intervention had a total cervical range of motion similar to that of matched unexposed individuals	

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	March 1995 to March 1996? <u>Follow-up</u> 6 months and 3 years				
Rosenfeld et al 2006 Sweden [9]	<u>Population</u> n=102 Group 1: n=25, mean age 39 years Group 2: n=26, mean age 33 years Group 3: n=26, mean age 32 years Group 4: n=25, mean age 38 years <u>Inclusion criteria</u> Whiplash trauma in motor vehicle collisions <u>Setting</u> The southern half of Elfsborg County in the southwestern part of Sweden. A mixture of urban, village, and rural populations.	Group 1: Active intervention initiated within 96 hours after collision Group 3: Active intervention initiated with a delay of 14 days after collision The active intervention is an active exercise protocol incorporating the idea of early and repeated movement based on Salter's work on continuous passive motion and components consistent with McKenzie principles. The active intervention consisted of 2 phases: (1) an initial phase given to all patients	Group 2: Standard intervention initiated within 96 hours Lost to follow-up n=5 Group 4: standard intervention initiated with a delay of 14 days Lost to follow-up n=6 A standard intervention of initial rest, recommended soft collar, and gradual self-mobilization. Standard intervention consisted of written information on injury mechanisms, advice on suitable	Primary outcomes <u>Results</u> Pain intensity and sick leave were significantly ($p<0.05$) reduced if patients received active intervention compared with standard intervention. Delaying intervention 2 weeks did not affect outcome variables. However, at 3 years, only patients receiving early active intervention had a total cervical range of motion similar to that of matched unexposed individuals	<u>Quality</u> Moderate

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Physicians in 29 primary care units, 3 emergency wards, and several private clinics selected patients consecutively <u>Study period</u> March 1995 to March 1996? <u>Follow-up</u> 6 months and 3 years	including information, postural control, and cervical rotation exercises; and (2) a second phase, if symptoms were unresolved, of evaluation and treatment according to McKenzie principles. The same physiotherapist treated all patients receiving the active intervention, ensuring strict adherence to the protocol with no additional interventions. Treatment by the physiotherapist was terminated 6 weeks after the initiation of active intervention or earlier if symptoms resolved (Briefly: an intervention using frequent active cervical rotation complemented by assessment and treatment according to McKenzie's principles)	activities, and postural correction. This leaflet was used by the Neck Injury Unit, Orthopedic Clinic, Sahlgrenska University Hospital. The advice provided in this leaflet was to rest the neck during the first weeks after trauma and that a soft collar could provide comfort as well as prevent the neck from excessive movements. However, no data were collected on the use of a collar. Furthermore, patients were instructed to perform active movements 2 or 3 times daily "a few weeks" after trauma. The recommended movements were elevation of shoulders, retraction of shoulder blades, rotation of torso, lateral flexion of the head, rotation of the head, and combined flexion-rotation of the head Lost to follow-up Group 2 n=5 Lost to follow-up Group 4		

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		To test the time factor, interventions were either made within 96 hours or delayed 14 days from collision. The effects of the 2 interventions and the time factor on pain intensity, cervical range of motion, and sick leave were analyzed at 6 months and 3 years. Cervical range of motion at 3 years was also compared with that in matched, unexposed individuals Lost to follow-up Group 1 n=4 Lost to follow-up Group 3 n=6	n=6		
Scholten-Peeters et al 2006 The Netherlands	<u>Population</u> n=80 18–55 years	<u>I: GP care</u> GPs treated patients according to a dynamic multimodal treatment protocol primarily aimed to	<u>C: Physiotherapy</u> PTs treated patients according to a dynamic multimodal treatment protocol primarily aimed to increase activities and influence	<u>Neck pain intensity VAS 0–100</u> Mean improvment from baseline and differences between groups	<u>Quality</u> Moderate <u>Other comments</u>

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
[10]	GP care group: n=42, mean age 33.8 years, female n=26 Lost to follow-up n=2 Physiotherapy group: n=38, mean age 31.9 years, female n=27 Lost to follow-up n=1 Inclusion criteria Acute WAD grade 1 or 2 as the result of a road-traffic accident, with symptoms like neck pain, headache, or dizziness within 48 hours after trauma; living in The Netherlands Setting Departments of hospitals in the middle and south of The Netherlands recruited patients	increase activities and influence unfavorable psychosocial factors for recovery The content of the information provided to patients during treatment depended on the treatment goals set by the GPs	unfavorable psychosocial factors for recovery The content of the information provided to patients during treatment depended on the treatment goals set by the PTs. Also, the type of exercises chosen by the PTs depended on the treatment goals, and it was not explicitly necessary that exercise therapy was provided in all patients	26 weeks I: 22.5 (SD 24.5) C: 18.7 (SD 30.8) Δ 3.8 (95 % CI –8.5; 16.1) 52 weeks I: 25.0 (SD 24.7) C: 2.2 (SD 29.5) Δ –0.2 (95 % CI –12.2; 11.9) Headache intensity VAS 0–100 26 weeks I: 27.0 (SD 29.8) C: 18.0 (SD 40.0) Δ 9.0 (95 % CI –6.6; 24.6) 52 weeks I: 32.70 (SD 28.6) C: 21.2 (SD 40.1) Δ 11.5 (95 % CI –4.0; 26.9) Work activities VAS 0–100 26 weeks I: 33.0 (SD 42.5) C: 1.1 (SD 34.7) Δ 15.9 (95 % CI –1.5; 33.3) 52 weeks I: 46.30 (SD 34.6)	Follow-up from accident so only follow up at 26 and 52 weeks in table

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Follow-up 8, 12, 26, and 52 weeks after trauma. At 52-week follow-up, patients received only postal questionnaires			C: 22.8 (SD 40.1) Δ 23.5 (95 % CI 7.6; 39.3) p=0.01 Functional recovery 52 weeks I: 25 (59.5%) C: 11 (28.9%) RR 2.1 (95 % CI 1.0; 4.2) p=0.05	
Söderlund et al 2000 Sweden [11]	Population n=66, mean age 34 years Female/male 35/24 Additional treatment group: n=34 Regular treatment group: n=32 Inclusion criteria Acute whiplash-associated disorders (WAD) Setting	I: Additional-exercise treatment Patients were given an exercise programme that included instructions of alternating rest with activities, keeping the neck from getting cold, walking a fair distance every day, and keeping the upright body posture intact while sitting, standing or walking. Patients were instructed not to lift or carry heavy items, and not to remain seated with their head bent forward	C: Regular treatment Patients were given an exercise programme that included instructions of alternating rest with activities, keeping the neck from getting cold, walking a fair distance every day, and keeping the upright body posture intact while sitting, standing or walking. Patients were instructed not to lift or carry heavy items, and not to remain seated with their head bent forward during the first weeks after the injury Lost to follow-up: n=6	Pain Disability Index 0–70 Mean 3 months I: 19.6 (SD 16.5) C: 15.6 (SD 14.8) 6 months I: 15.8 (SD 16.5) C: 15.1 (SD 13.8) Self-Efficacy Scale 0–200 Mean 3 months I: 157.8 (SD 35.7) C: 161.5 (SD 34.2) 6 months	Quality Moderate

Author Year Country Reference	Population Inclusion criteria Setting Study period Follow-up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	The orthopaedic clinic at the university hospital, Uppsala <u>Study period</u> 2.5-year period. On average, patients were included 20 days after the accident <u>Follow-up</u> 3 months and 6 months	during the first weeks after the injury The additional-exercise included exercises to improve kinaesthtetic sensibility and co-ordinating of the neck muscles at least 3 times a day. Lost to follow-up: n=7		I: 160.1 (SD 40.6) C: 163.6 (SD 31.3) <u>Pain VAS 0–10</u> Mean 3 months I: 2.6 (SD 2.4) C: 2.2 (SD 2.0) 6 months I: 1.8 (SD 1.9) C: 2.0 (SD 1.7) Nonsymptomatic patients complied better with the treatment regime	

Table 2 Low back pain.

First author Year Country Reference	Population Inclusion criteria Setting Study period Follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
Bronfort et al 2012 USA [12]	Population: n=272 Spinal manipulation therapy (SMT): n=91, mean age 48.3, women 58.2% Medication group: n=90, mean age 46.8, women 72.2% Home exercise with advice (HEA): n=91, mean age 48.6, women 65.9% Inclusion 18 to 65 years, nonspecific neck pain for 2 to 12 weeks duration Setting	SMT-group (I): Manipulations of areas of the spine with segmental hypomobility by using diversified techniques. Advice to stay active Received therapy: n=91 Postintervention phase Lost to follow-up n=21	Medication group (C1): NSAID, acetaminophen, muscle relaxants. Non-responders recieved narcotic medication. Advice to stay active Received therapy: n=84 Postintervention phase Lost to follow-up n=31 HEA-group (C2): Individualised instruction and advice for two 1-hour sessions. 5–10 repetitions/6–8 times/day at home Treatment period 12 weeks Received therapy: n=91 Postintervention phase Lost to follow-up n=22	Pain free 52 weeks; I. 27.3%, C1: 16.9%, C2: 36.7% I vs C1: 10.4 (–2.9; 23.6) I vs C2: –9.4 (–24.0; 5.1) C1 vs C2: 19.8 (6.1; 33.6) Secondary measures were self-reported disability, global improvement, medication use, satisfaction, general health status (Short Form-36 Health Survey physical and mental health scales), and adverse events	Quality Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period Follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	1 university research center and 1 pain management clinic <u>Study period</u> 12 weeks <u>Follow-up</u> At 26 and 52 weeks after randomisation (14 and 40 weeks after treatment)				
Kongsted et al 2007 Denmark [13]	<u>Population</u> n=458 Age 18–70 years Neck collar group: n=156, mean age 33, male 29% Act as usual group: n=153, mean age 34, male 27%	<u>Neck collar group (I1):</u> Immobilization in a rigid collar all waking hours during a 2-week period followed by active mobilization program similar to that done in the last 4 weeks in the active mobilization group. A maximum of 2 treatment sessions per week during a 4-week period were given Lost to follow-up n=8	<u>Advice to act-as-usual</u> (C): Checklist-based information about whiplash injuries and the rationale for staying active in spite of symptoms aimed at reducing fear and motivating participants to resume normal activities Lost to follow-up n=25	<u>Median neck pain intensity the preceding week (box scale 0 to 10).</u> 12 months: I1: 3 (IQR 1–7), I2: 3 (IQR 0–6), C: 4.5 (IQR 0–8) <u>Neck disability (15-item Copenhagen Neck Functional Disability Scale)</u> 12 months: I1: 9 (IQR 2–18), I2: 7 (IQR 2–14), C: 6 (IQR 2–18)	<u>Quality</u> Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period Follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Active mobilization group: n=149, mean age 33, male 29% <u>Inclusion</u> Whiplash-associated disorder (WAD). Rear-end or frontal car collision experienced symptoms within 72 hours and could be examined within 10 days of the collision <u>Setting</u> Emergency units and general practitioners at 2 university research centers <u>Study period</u> 4 weeks, 6 weeks <u>Follow-up</u> after 3, 6, and 12 months postinjury.	<u>Active mobilization program</u> (I2): 1 physiotherapist at each center using the principles of Mechanical Diagnosis and Therapy (MDT) maximum of twice weekly for 6 weeks. For 3 weeks after the accident, pain-free range of motion performed in series of 10 every waking hour + move the neck in end range of motion once in each movement direction every day. Guidance regarding posture. Participants who still had symptoms after 3 weeks were examined according to the MDT protocol. According to this, exercises and advice about posture and physical activities were prescribed. During the 3-week program, exercises were adjusted according to symptom response. Participants were advised to gradually increase range of motion as pain declined. If insufficient response to the active intervention, passive		<u>Affected working ability (%)</u> 12 months: I1:28 (95% CI 20; 36), I2: 22 (95% CI 15; 36), C: 25 (95% CI 17; 33) <u>General health status (SF-36)</u> 12 months: I1: 46 (IQR 34–56), I2: 46 (IQR 40–55), C: 46 (IQR 35–54) <u>Mental health status (SF-36)</u> 12 months: I1: 55 (IQR 47–58), I2: 54 (IQR 43–58), C: 54 (IQR 41–58) <u>Results</u> At the 1-year follow-up, 48% of participants reported considerable neck pain, 53% disability, and 14% were still sick listed at 1 year follow-up. No significant differences were observed between the 3 interventions group	

First author Year Country Reference	Population Inclusion criteria Setting Study period Follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
		mobilization and soft tissue techniques to the cervical spine and upper back were added Lost to follow-up n=5			
Kuijper et al 2009 The Netherlands [14]	<u>Population</u> n=205 Age 18–75 years Collar group: n=69, mean age 47, male 38% Physiotherapy group: n=70, mean age 46.7, male 34% Control group: n=66, mean age 47.7, male 32% <u>Inclusion</u> Patients with symptoms and signs of cervical radiculopathy of less	<u>Collar group (I1):</u> Patients were advised to wear semi-hard collar during the day for three weeks and rest as much as possible. The next three weeks patients were weaned from the collar, after six weeks they were advised to take it off completely. Patients were asked to record the time they wore the collar Lost to follow-up n=6 <u>Physiotherapy group (I2):</u> Focus on mobilising and stabilising the cervical spine twice a week for six weeks. The standardised physiotherapists sessions were “hands off” and	<u>Control group (C):</u> Continuation of daily activities as much as possible without specific treatment Lost to follow-up n=5	<u>Neck pain (VAS)</u> 6 months: I1: 10.0 (IQR 0–40.0), I2: 20.0 (IQR 0–43.8), C: 10 (IQR 0–50.0) NS <u>Neck Disability Index</u> 6 months: I1: 8.0 (IQR 0–26.0), I2: 10.0 (IQR 2–29.2), C: 8 (IQR 0–26.0) NS	<u>Quality</u> Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period Follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	than one month's duration <u>Setting</u> Neurology outpatient clinics in 3 Dutch hospitals in The Hague, Gouda, and Amersfoort <u>Study period</u> <u>Follow-up</u> 3 weeks, 6 weeks, 6 months	consisted of graded activity exercises to strengthen the superficial and deep neck muscles. Encouraged the patients to do home exercises Lost to follow-up n=2			
Puentedura 2011 USA [15]	<u>Population:</u> n=24 Thoracic group (I1): Mean age: 33.1±5.8 Female 6 (60 %) Cervical group (I2): Mean age: 34.1±7.0 Female 10 (71 %)	<u>Cervical group (I1):</u> n=14 Patients who received cervical TJM and an exercise program Drop-out: n=4 <u>Thoratic group (I2):</u> n=10 Patients who received thoratic TJM and an exercise program		<u>Baseline to 6 months:</u> <u>Overall success:</u> I1: 10/14 I2: 1/10 <u>Neck Disability Index</u> 6 months: I1: 3.7 SD±5.7 (95% CI 0.9; 6.5)	<u>Quality</u> Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period Follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Inclusion criteria: 18–60 years. Primary report of neck pain with or without unilateral upper extremity symptoms, and have a baseline Neck Disability Index (NDI) score of 10/50 points or greater Patients had to satisfy at least 4 out of the following 6 criteria: 1. Symptom duration less than 30 days 2. No symptoms distal to the shoulder 3. No aggravation of symptoms by looking up 4. Fear-Avoidance Beliefs Questionnaire Physical Activity	Drop-out: n=0 Both groups attended physical therapy sessions 3 times during the first week and 2 times during the second week, for a total of 5 sessions over a 2-week period. The exercise program were standardized		I2: 9.9 SD±3.9 (95% CI 6.6; 13.2) <u>Fear Avoidance Beliefs Questionnaire</u> 6 months: I1: 2.1 SD±3.5 (95% CI 0.3; 4.0) I2: 5.2 SD±3.0 (95% CI 3.0; 7.4) ITT analysis	

First author Year Country Reference	Population Inclusion criteria Setting Study period Follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	(FABQ-PA) subscale score less than 12 5. Decreased upper thoratic spine kyphosis (T3-T5) 6. Cervical extension range of motion (ROM) less than 30° Patients were randomly allocated to 1 of the 2 treatment groups by drawing index cards showing the group assignment from sealed, opaque envelopes				
Gemmell 2010 UK [4]	<u>Population</u> n=47 <u>Activator group (I1):</u> Mean age (SD): 46.8 (11.8) Mean BMI (SD): 25.6 (5.4)	<u>Activator group (I1):</u> Activator IV instrument was applied and the patient received one thrust over the articular pillar in line with the facet joint of the restricted segment <u>Manipulation group (I2):</u>		<u>PGIC, OR</u> 3 months I1 vs I2: 1.4 (95% CI 0.13; 17.56) I1 vs I3: 2.6 (95% CI 0.06; 112.81) I2 vs I3:5.8 (95% CI 0; 0) 6 months	<u>Quality</u> Moderate <u>Comments</u> Difficulty recruiting participants therefore stopped

First author Year Country Reference	Population Inclusion criteria Setting Study period Follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Mean BQ raw score (SD): 30.2 (10.9) Females: 81% Mean NRS for pain (SD): 6.7 (1.5) Mean SF-36 PCS (SD) 40.6 (6.5) Mean SF-36 MCS (SD) 49.2 (12.0) <u>Manipulation group (I2):</u> Mean age (SD): 46.9 (9.1) Mean BMI (SD): 27.6 (7.0) Mean BQ raw score (SD): 32.2 (9.6) Females: 69% Mean NRS for pain (SD): 6.0 (1.3) Mean SF-36 PCS (SD) 45.3 (8.5) Mean SF-36 MCS (SD) 47.2 (9.6)	One or two dynamic thrusts applied with high velocity low amplitude force <u>Mobilisation group (I3)</u> Repetitive low-grade passive movement with variation in amplitude All patients had two treatments per week for three weeks, and were treated until symptom free or had received the maximum of six treatments. The duration of a single treatment session was 10 to 15 minutes		I1 vs I2: 1.5 (95% CI 0.13; 17.56) I1 vs I3: 13.8 (95% CI 0.63; 299.67) I2 vs I3: 2.8 (95% CI 0.06; 122.80) 12 months I1 vs I2: 3.8 (95% CI 0.39; 37.18) I1 vs I3: 3.3 (95% CI 0.27; 40.61) I2 vs I3: 1.2 (95% CI 0.09; 15.96) <u>Pain (NRS), OR</u> 3 months I1 vs I2: 0.39 (95% CI –1.58; 2.35) I1 vs I3: 1.33 (95% CI –1.55; 4.22) I2 vs I3: 0.95 (95% CI –1.69; 5.38) 6 months I1 vs I2: 1.96 (95% CI –0.34; 4.26) I1 vs I3: 1.61 (95% CI –1.26; 4.48)	trial before it´s expected completion

First author Year Country Reference	Population Inclusion criteria Setting Study period Follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Mobilisation group (I3): Mean age (SD): 43.8 (13.0) Mean BMI (SD): 24.7 (3.5) Mean BQ raw score (SD): 25.6 (10.6) Females: 87% Mean NRS for pain (SD): 4.9 (1.3) Mean SF-36 PCS (SD) 44.5 (6.0) Mean SF-36 MCS (SD) 48.0 (10.2) Inclusion criteria: Patients with sub-acute (at least 4 weeks, but no longer than 12 weeks duration) non-specific neck pain Mean age: 18–64			I2 vs I3: –0.35 (95% CI – 3.05; 2.35) 12 months I1 vs I2: 1.72 (95% CI –1.17; 4.62) I1 vs I3: 1.30 (95% CI –2.05; 4.65) I2 vs I3: –0.48 (95% CI – 3.47; 2.63) SF -36, Mental Component 3 months I1 vs I2: –1.98 (95% CI – 10.57; 6.61) I1 vs I3: –0.66 (95% CI – 13.28; 11.96) I2 vs I3: 1.32 (95% CI – 10.23; 12.86) 6 months I1 vs I2: –1.28 (95% CI – 10.47; 7.89) I1 vs I3: 0.89 (95% CI – 10.55; 12.34) I2 vs I3: 2.18 (95% CI –8.59; 12.95) 12 months	

First author Year Country Reference	Population Inclusion criteria Setting Study period Follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Setting: Outpatient clinic of the Anglo-European College of Chiropractic during January–July 2007 and January–March 2008			I1 vs I2: 0.42 (95% CI –7.74; 8.59) I1 vs I3: –1.75 (95% CI – 11.19; 7.69) I2 vs I3: –21.17 (95% CI – 10.78; 6.44)	

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
Bishop 2010 Canada [16]	Population n=88 Chiropractic treatment (I): Female/male: 61/39 % Mean age: 38 (8.9) years, range 19 to 59 Mean duration pain: 20.0 (3.7) days Usual care (C): Female/male: 59/41 % Mean age: 37 (11.3) years, range 19 to 59 Mean duration pain: 18.0 (3.7) days Inclusion criteria: LBP 2–4 weeks duration Quebec Task Force Classification of Spinal Disorders criteria Categories 1 and 2 Setting	Chiropractic treatment (I): Conducted at a frequency of two to three times per week, for a maximum period of 4 weeks. Spinal therapy was specifically limited to the lumbar spine Patients were advised to avoid guideline-discordant treatments, including muscle relaxant and opioid-class medication, passive physiotherapy modalities, bed rest and special back exercise programs n=45 Drop-out rate 9/45 (20%)	Usual care (C): Patients were advised of their diagnosis and referred back to their referring family physician. Family physicians were not offered specific treatment recommendations but were simply advised to treat at their own discretion n= 43 Drop-out rate 8/43 (18.6%)	RDQ change, mean (SE) 16 weeks; C: –0.14 (0.56), I: –2.66 (0.60) Mean difference (95% CI): 2.52 (0.88; 4.16), p=0.003 24 weeks; C: –0.12 (0.35), I: –2.68 (0.77) Mean difference (95% CI): 2.56 (0.82; 4.30), p= 0.004 SF-36 BP change, mean (SE) 16 weeks; C: 10.05 (1.52), I: 11.33 (1.40) Mean difference (95% CI): – 1.29 (–5.38; 2.80), p=0.53 24 weeks; C: 8.21 (1.32), I: 11.04 (1.43) Mean difference (95% CI): –2.84 (–6.71; 1.04) SF-36 PF change, mean (SE) 16 weeks; C: 9.72 (2.22), I:14.13 (1.66)	Quality Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	(I): Combined Neurosurgical and Orthopedic spine Program (CNOSP) outpatient clinic at Vancouver General Hospital (C): A variety of professionals including family physicians, massage therapists, kinesiologists, and/or physiotherapists at their private offices <u>Follow-up</u> The patients were followed up at 8, 16 and 24 weeks after their initial consultation			Mean difference (95% CI): – 4.41 (–9.90; 1.07), p=0.11 24 weeks; C: 10.98 (2.04), I: 13.62 (1.66) Mean difference (95% CI): – 2.64 (–7.86; 2.57), p=0.32	
Burton et al 1999 United Kingdom [17]	<u>Population</u> n=162 Aged 17–70 <u>Experimental group</u>: n=83, age 42.6 years, female n=41	<u>I: Experimental booklet</u> A novel patient educational booklet, The Back Book, developed to provide evidence-based information and advice consistent with current clinical guidelines	<u>C: Traditional booklet</u> The control intervention was *Handy Hints*, a booklet published by a patient-support group. In view of a previous RCT showing that a similar booklet had no	<u>Fear-avoidance beliefs</u> >4 points reduction 3 months I: 38/61 C: 22/54 RR 1.53 (95% CI 1.05; 2.23)	<u>Quality</u> Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Control group: n=79, age 44.7 years, female n=48 Inclusion criteria Non-specific low back pain Setting Patients seeking treatment in primary care for a new episode of acute or recurrent nonspecific low back pain, with or without referred leg pain. Duration of pain was less than 3 months, and patients had not received any health care, nor lost any time from work as a result of back pain, during the 3 months preceding this episode Study period 12 months Follow-up		effect, *Handy Hints* was considered to be a neutral control	12 months I: 39/63 C: 24/57 RR 1.47 (95% CI 1.02; 2.11) Roland Disability Questionnaire Data only in figure. NS Visual analogue pain scale 0–100 3 months pain at worst I: 49.2 (SD 29.7) C: 50.1 (SD28.5) NS 12 months pain at worst I: 50.9 (SD 29.6) C: 50.8 (SD 27.8) NS	

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Postal follow-up response at 1 year after initial treatment was 78%. Postal follow-up assessment was done at 2 weeks, at 3 months, and at 1 year after baseline				
Cleland et al 2009 USA [18]	<u>Population:</u> n=112 Female: 52 % Mean age: 40.3 (SD=11.5) Inclusion criteria: Patients with a modified Oswestry Disability Questionnaire (ODQ) score of >25%, age 18–60 years, and to be positive for the spinal manipulation CPR, with requires the presence of at least 4 of the 5 findings listed below: 1. Duration of current episode of low back pain <16 days	<u>Supine Thrust Manipulation group (I1):</u> n=37 <u>Side-Lying Thrust Manipulation group (I2):</u> n = 38	<u>Non-thrust Manipulation group (C):</u> n=37	<u>Oswestry Score</u> 6 months: I1 vs I2: -0.85 (95% CI –5.52; 3.83) p=0.72 I2 group vs C: 6.81 (95% CI 2.28; 11.35) P=0.004 I1 vs C: 5.97 (95% CI 0.69; 11.25) p=0.027 <u>Numeric pain rating</u> 6 months: I1 vs I2: 0.19 (95% CI –0.57; 0.96) p=0.62 I2 vs C: 0.39 (95% CI –0.33; 1.10)	<u>Quality</u> Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	2. Extent of distal symptoms: No symptoms distal to the knee 3. FABQW subscale score <19 points 4. Segmental mobility testing ≥1 hypomobile segment in the lumbar spine 5. Hip internal rotation range of motion ≥ At least 1 hip with >35° of internal rotation range motion <u>Setting:</u> United States Military Health System and outpatient physical therapy clinics affiliated with Concord Hospital, Concord NH, Intermountain Healthcare, Salt Lake City, UT and the University of Southern California, Los Angeles, CA			p=0.29 I1 vs C: 0.58 (95% CI –0.27; 1.43) p=0.18 <u>Number of subjects reporting side effects (%):</u> I1: 9 (24.3%) I2: 9 (23.7 %) C: 10 (27.0 %)	
Del Pozo-Cruz et al	<u>Population</u> 18–64 years, n=100	<u>I: Web-based program</u>	<u>C: Standard care</u>	<u>Roland-Morris Disability Questionnaire</u> I: improvement	<u>Quality</u> Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
2012 Spain [19] (intervention)	Control group: n=50, mean age 45.50 ±7.02, male %=11.4 Lost to follow-up: n=6 Intervention group: n=50, mean age 46.83 ±9.13, male %=15.2 Lost to follow-up: n=4 Inclusion criteria Subacute low back pain Setting University´s Preventive Medicine Service, office workers Study period 9-month period Follow-up 9 months	The intervention group had access to both the study intervention and standard care The web-based program was offered via the Preventive Medicine Service website. The participants in the intervention group were asked to engage in the web-based program at their work site for 11 minutes each day, 5 days a week, personal e-mail interventions plus standard care (patient visits at least once per year, and self-care web-based information. 1 e-mail was sent per day, always with the same information	The control group had access to standard care only. Standard care was defined as all existing non-web-based interventions offered by the University of Extremadura's Preventive Medicine Service	mean –7.36 points (95% CI – 8.41; –6.31) C: worsening of mean 1.89 points (95% CI: 0.71; 2.65) I vs C: mean –9.25 points (95% CI: –10.57; –7.89) Quality of Life I vs C: mean 0.24 points (95% CI 0.20; 0.29)	
Del Pozo-Cruz et al 2012 Spain	Population 18–64 years, n=100	I: Reminder group The intervention group subjects were educated daily about sitting correctly and	C: Standard occupational care	Oswestry Disability Index Clinical positive change: I vs C OR 5.42 (95% CI 1.707; 17.216)	Quality Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
[19] (effects)	Reminder group intervention: n=50, age 46.83, female/male %=84.80/15.20 Lost to follow-up: n=4 Control group intervention: n=50, age 45.50, female/male %=88.60/11.40 Lost to follow-up: n=6 <u>Inclusion criteria:</u> Non-specific subacute lower back pain <u>Setting</u> Occupational preventive service <u>Study period</u> <u>Follow-up</u> 9 months	asked to perform exercises shown by video demonstrations on the university website. The exercise routines included strengthening, mobility and stretching exercises focused on the postural stability muscles		<u>Health Related Quality of Life</u> EQ-5D points improvment: I vs C OR 3.587 (95% CI 2.210; 5.823) <u>Pain</u> VAS from EQ-5D: I vs C OR 7.652 (95% CI 2.480; 23.613)	<u>Other comments</u> No explanation for cut off for "clinical positive change"
Faas et al 1995	<u>Population</u> n=363 Age 16–65 years	<u>I1: Exercise group</u>	<u>C: Placebo group</u> Placebo ultrasound therapy by a physiotherapist	<u>Sickness absence</u> 4–12 months % ≥1 day	<u>Quality</u> Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
The Netherlands [20]	Exercise group: n=156, mean age 36 years, female 47% Usual care group: n=155, age 36, female 41% Placebo group: n=162, age 38, female 42% Total drop-out n=60 Inclusion criteria: Acute nonspecific low back pain and a paid job Setting From 40 general practices 363 patients who were gainfully employed Study period Sickness absence (number of days) was checked monthly during the 1-year follow-up Follow-up	Exercise instruction with advice for daily life by a physiotherapist Drop-out n=20 I2: Usual care Information and analgesics by a general practitioner Drop-out n=23 All patients received analgesic agents and information on low back pain before randomisation	Drop-out n=17	I1: 33 I2: 36.0 C: 30.7	

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	1 year				
Faas et al 1993 The Netherlands [21]	Population n=473 Age 16–65 years Exercise group: n=156, mean age 36 years, female 47% Usual care group: n=155, age 36, female 41% Placebo group: n=162, age 38, female 42% Total drop-out n=60 Inclusion criteria: Acute low back pain between T12 and the gluteal folds with or without radiation into the upper leg, pain for 3 weeks or less Setting	I: Exercise Exercise instruction with advice for daily life by a physiotherapist Drop-out n=20 I2: Usual care Usual care by the general practitioner Drop-out n=23 All patients received analgesic agents and information on low back pain before randomisation	C. Placebo Placebo ultrasound therapy by a physiotherapist Drop-out n=17	No recurrence 12 months I1: 47% I2: 47% C: 55% I1 vs !2: (95% CI –10.1; 10.5) I1 vs C: (–13.7; 6.9) Pain VAS 0–100 4–12 months Mean decrease I1: –26 (SD 23) I2: –27 (SD 26) C: –26 (SD 26)	Quality Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	40 Dutch general practices <u>Study period</u> 11 months <u>Follow-up</u> 2 weeks, 4 weeks, 12 months after visit to the doctor's practice				
Fritz et al 2003 USA [22]	<u>Population</u> n=78, mean age 37.4 ±10.4 years Female/male 38%/62% Classification group: n=41, age 35.9, female n=19 Guideline group: n=37, age 39.1, female n=11 Drop-outs? <u>Inclusion criteria:</u> Work-related low back pain of less than 3 weeks duration <u>Setting</u>	Patients were randomised to receive therapy based on a classification system that attempts to match patients to specific interventions or therapy based on the Agency for Health Care Policy and Research guidelines Drop-out: no data available		Impairment Index, Oswestry scale, SF-36 component scores, satisfaction, medical costs and return to work status <u>Results</u> Subjects receiving classification-based therapy showed greater change on the Oswestry (P=0.023) and the SF-36 physical component (p=0.029) after 4 weeks. Patient satisfaction was greater (p=0.006) and return to full-duty work status more likely (p=0.017) after 4 weeks	<u>Quality</u> <u>Moderate</u>

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	5 Employee Health Services outpatient clinics at the University of Pittsburgh Medical Center Study period 4 weeks Follow-up 1 year			in the classification-based group. After 1 year there was a trend toward reduced Oswestry scores in the classification-based group (p=0.063)	
Hides et al 2001 Australia [23]	Population 18–45 years, n=39 Specific exercise group: n=20, mean age 31, female/male n=13/7 Control group: n=19, mean age 31, female/male n=10/9 Lost to follow-up: n=3 Inclusion criteria Acute, first-episode low back pain (LBP) Setting	I: Specific exercise The exercises were designed specifically to activate and train the isometric holding function of the multifidus muscle at the affected vertebral segment. Contraction of the multifidus was confirmed by realtime ultrasound imaging Medical management included advice and use of medications. Patients from the specific exercise group were seen twice per week in 4 weeks	C: Control Patients received medical management, including advice on bedrest, absence from work, prescription of medication, and advice to resume normal activity as tolerated Lost to follow up: n=3	Recurrenct episodes 1 year Mean number of episodes I: 2.8 (SD 2) C: 4.2 (SD 3.4) One year after treatment, specific exercise group recurrence was 30%, and control group recurrence was 84% (P <0.001). 2 to 3 years after treatment, specific exercise group recurrence was 35%, and control group recurrence was 75% (p<0.01)	Quality Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Hospital accident and emergency department Study period 4 weeks Follow-up 1 year and 3 years Questionnaire				
Hurley 2004 Ireland [24]	Population n=240 Age: 18–65 years Female: 144 (60 %) Consenting subjects recruited following referral by physicians to physiotherapy randomly assigned to receive a copy of the Back Book and were randomized to either of 3 groups Manipulative therapy (I1): n=80 Interferential therapy (I2):	Manipulative therapy (I1): Received MT: n=78 Drop-out: 2 Interferential therapy (I2): Received IFT: n=78 Drop-out: 2 Combined Therapy group (I3): Received MT + IFT: n=78 Drop-out: 2		Roland Morris scale: 6 months: I1: –4.66 (95% CI –6.1; –3.3) I2: –3.94 (95% CI –5.3; –2.6) I3: –0.62 (95% CI –.0; –3.2) 12 months: I1: –4.71 (95% CI –6.1; – 3.3) I2: –4.90 (95% CI –6.2; –3.6) I3: –6.50 (95% CI –7.8; –5.1) McGill questionnaire: 6 months: I1: –4.93 (95% CI –7.8; – 2.0) I2: –6.89 (95% CI –9.7; –4.1) I3: –6.38 (95% CI –9.3; – 3.4)	Quality Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	n=80 <u>Combined Therapy group (I3):</u> n= 80 Study period: All subjects in all groups should receive a minimum of four and a maximum of 10 treatments over a period of 8 weeks. Recruitment to the study was from May 1999 to May 2000 Follow-up: At 6 months, 12, months and at discharge			12 months: I1: –6.38 (95% CI –9.4; – 3.3) I2: –8.32 (95% CI –11.3; – 5.3) I3: –9.22 (95% CI –12.3; – 6.1) <u>VAS</u> 6 months I1: –16.95 (95% CI –24.0; – 9.9) I2: –24.55 (95% CI –31.5; – 17.7) I3: –19.9 (95% CI –27.2; – 12.7) 12 months I1: –18.2 (95% CI –26.6; – 10.7) I2: –26.50 (95% CI –33.8; – 19.2) I3: –25.7 (95% CI –33.1; – 18.1) <u>SF-36 Mental Health:</u> 6 months I1: 6.53 (95% CI 1.8; 11.2) I2: 3.17 (95% CI –1.4; 7.8)	

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
				I3: 7.16 (95% CI 2.3; 12.0) 12 months I1: 4.72 (95% CI –0.3; 9.7) I2: 0.84 (95% CI –3.9; 5.6) I3: 10.3 (95% CI 5.3; 15.4) No significant differences between groups for low back pain recurrence, work absenteeism, medication, exercise participation, healthcare use at 12 months (p>0.05)	
Jellema et al 2005 The Netherlands [25]	Population n=314 Minimal intervention strategy: n=143, mean age 43.4 years, female n=68 Dropped out after 6 weeks: n=0, after 13 weeks: n=1, after 26 weeks: n=4, after 52 weeks: n=11 Usual care: n=171, mean age 42.0 years, female n=81 Dropped out after	I: Minimal intervention strategy Aimed at assessment and modification of psychosocial prognostic factors The general practitioner explored the presence of psychosocial prognostic factors, discussed these factors, set specific goals for reactivation, and provided an educational booklet. The consultation took about 20	C: Usual care Usual care was not standardised The guideline for low back pain of the Dutch College of General Practitioners advises a wait and see policy for acute low back pain, with analgesics and gradual uptake of activities, and provides general recommendations on reactivation and home	Roland-Morris disability questionnaire 0–24 52 weeks I: median 1 (IQR 0 to 4) C: median 1 (IQR 0 to 4) Mean difference 0.25 (95% CI –0.77; 1.28) No recovery 52 weeks I: 32% C: 28% OR 1.16 (95% CI 0.63; 2.17)	Quality Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	6 weeks: n=2, after 13 weeks: n=6, after 26 weeks: n=7, after 52 weeks: n=15 <u>Inclusion criteria</u> Non-specific low back pain of less than 12 weeks' duration, recruited by their general practitioner <u>Setting</u> 60 general practitioners in 41 general practices <u>Study period</u> <u>Follow-up</u> 6, 13, 26, and 52 weeks	minutes and consisted of three phases: exploration, information, and self care	exercises. For subacute low back pain (>6 weeks), the guideline advises referral for exercise therapy, physiotherapy, or manual therapy in the case of persistent functional disability. Explicit guidance on psychosocial factors is lacking	<u>Sick leave</u> Proportion of patients 52 weeks I: 8% C: 7% OR 0.69 (95% CI 0.43; 1.13) <u>Pain severity 0–10</u> 52 weeks I: median 0 (IQR 0; 3) C: median 0 (IQR 0; 2) Mean difference 0.015 (95% CI –0.41; 0.44) <u>Severity of main complaint 0–10</u> 52 weeks I: median 1 (IQR 0; 3) C: median 1 (IQR 0; 3) Mean difference 0.021 (95% CI –0.45; 0.49) <u>Percieved general health SF-36 1–5</u> 52 weeks I: mean 2.7 (SD 0.9)	

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
				C:mean 2.7 (SD 0.8) Mean difference 0.056 (95% CI –0.07; 0.17)	
Jüni et al 2008 Switzerland [26]	<u>Population</u> n=104 I: Female/male: 35/65 % Mean age: 34.3 (9.4) years Duration pain: <4 weeks C: Female/male: 37/63% Mean age: 36.5 (8.2) years Duration pain: <4 weeks <u>Inclusion criteria:</u> Age 20–55 years. Low back pain, duration of current episode <4 weeks <u>Setting</u> C: Treating physicians. I: SMT was performed by a specialist in manual medicine, chiropractice and rheumatology, a specialist in physical medicine or an osteopath, all proficient in SMT	<u>Spinal manipulative therapy in addition to standard care (I)</u> n=52 <u>Drop-out rate</u> 2/52 (3.8%)	<u>Standard care alone (C):</u> General advice and paracetamol, diclofenac or dihydrocodeine as required. n=52 <u>Drop-out rate</u> 1/52 (1.9%)	<u>Pain intensity</u> 6 months; I vs C: 0.6, 95% CI –40.4; 1.6, p=0.22) <u>Pain Free</u> 6 months; I: 22 patients (44%), C: 39 (59%) Difference –15%, (95% CI – 34% to 4%, p=0.17) <u>No analgesics</u> 6 months; I: 7 patients (14%), 4 patients (8%) Difference 6%, (95% CI – 6%; 18%, p=0.36)	<u>Quality</u> Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Follow-up 1, 3, 7 and 14 days after their initial consultation. An extended follow-up was performed after 6 months				
Kittang et al 2001 Norway [27]	Population n=60 Age 18–67 years Standardised acupuncture treatment group: n=28, mean age 41.1, female/male n=19/19 Naproxen group: n=29, mean age 41.1, female/male n=19/20 Inclusion Acute low back pain of less than 10 days Setting General practices in Norway	Standardised acupuncture treatment group (I): 30 patients were randomised to standardised acupuncture treatment (4 treatments) for 2 weeks Mobilisation at first treatment after acupuncture. Patients were encoraged to stay physically active Drop-out rate n=1	Naproxen group (C): 30 patients recieved entero-soluble naproxen 500 mg twice daily for ten days. Patients were encoraged to stay physically active Drop-out rate n=1	There were no differences between groups in the reduction of pain or stiffness over a 6 month evaluation Patients receiving acupuncture reported fewer new episodes of low back pain (11/28 versus 30/29, $p<0.05$) during the 6+12 month follow-up Side effects were frequent in the naproxen group, especially gastro-enteric side effects (0/28 versus 15/29, $p<0.01$)	Quality Moderate Study limitations

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Study period 6 months Follow-up 3 months and 12 months				
Hay et al 2005 [28] United Kingdom	Population 18–64 years, n=402, mean age 40.6 years Brief pain management group: n=201, age 40.4, female n=100 Manual physiotherapy: n=201, age 40.9, female n=110 Inclusion criteria: Non-specific low back pain of less than 12 weeks' duration Setting 28 general practices in UK Study period	Manual physiotherapy (I): Oriented towards spinal manual-therapy techniques specific exercises for the back. The manual therapy included articulatory mobilisation, articulatory manipulation, or other softtissue treatment approaches. Individualised home programme of specific spinal stabilisation and muscle strengthening back exercises, education about the anatomy of the spine, and ergonomic advice Drop-out n=39	Brief pain management(C): Programme designed to identify and address psychosocial risk factors for persistent or recurrent disability related to back pain. The emphasis was on return to normal activity through functional goal setting, with educational strategies to overcome psychosocial barriers to recovery. A management plan that included general fitness and exercise, explanation about pain mechanisms, distress, encouragement of positive coping strategies, overcoming fear of "hurt=harm", and	Roland Morris disability questionnaire absolute score 3 months: I: 5.1 (5.8), C: 6.0 (5.9) (95% CI –0.5; 2.1) (p=0.203) 12 months: I: 4.4 (5.5), C: 5.2 (5.7) (95% CI 0.8 –0.5; 2.0) (p=0.222) Roland Morris disability questionnaire change score 3 months: I:8.1 (6.0), C: 7.8 (6.6) difference –0.2 (95% CI –1.6; 1.2) (p=0.755) 12 months: I: 8.8 (6.4) C: 8.8 (6.1) difference 0 (95% CI – 1.3; 1.4), (p=0.99) Patients overall assessment 12 months: I: 84%, C: 84% (95% CI –7.9; 8.2) (p=0.954)	Quality Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	One 40 minutes assessment and treatment session and up to 6 subsequent 20 minutes treatment session <u>Follow-up</u> 3 months and 12 months		implementation of a graded return to usual. Exercises, done both in clinic and at home, focused on increasing overall physical activity and spinal mobility and were tailored to individual functional needs and capabilities Drop-out n=44	One adverse reaction (an exacerbation of pain after the initial assessment) was recorded Analysis was by intention to treat	
Leclaire et al 1996 [29] Canada	<u>Population</u> n=363 Age 18–50 years Back school group: n=82, mean age 31.9 years, male 57% Standard therapy group: n=88, mean age 32.2, male 32.2% Total drop-out n=	<u>I: Back school</u> Standard back care program and daily physiotherapy, with the addition of a back school program. Specific aims were to educate patients about aspects of low back pain, including the causes of low back problems and resultant pain, the role of exercise in improving the subjects current status and ways to prevent a recurrence of pain. Lifestyle changes and coping mechanisms. The	<u>C: Control program</u> Standard back care program that consisted of rest, analgesics, nonsteroidal anti-inflammatory drugs as appropiate, and daily physiotherapy. The treatment included hot or cold packs, massage, ultrasound and/or transcutaneous nerve stimulation of pain relief and low back exercises. The exercises based on an	<u>Number of recurrences in the year following the study onset</u> I: 19.9 episodes/100 patients C: 13.3 episodes/100 patients z=1.4, p=0.16 <u>Duration of recurrences in the year following the study onset</u> I: 25 days (IQR 14; 58) C: 70 days (IQR 55; 89) p=0.21	<u>Quality</u> Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Inclusion criteria: Patients with low back pain of less than 3 months duration Setting A private physiatric outpatient clinic Study period 8 weeks Follow-up 6 months and 12 months	objectives were to increase self-care behaviors in patients and an active attitude for return to health. The back school program consisted of three 90-minute sessions given by a single trained instructor at 0, 1, and 8 weeks	adapted form of flexion strenghtening of abdominal muscles included pelvic tilt, unilateral and bilateral knee flexion tretching the low back and isometric abdominal strengthening and psoas stretching all performed in a supine position. Patients were instructed to repeat the 5 exercises, 10 times each day for the rest of their lives	Pain VAS (0–10) 6 months I: 1.5 (SD 2.1) C: 1.2 (SD 1.7) 12 months I: 1.4 (SD 2.2) C: 1.2 (SD 1.8) p=0.284 Oswestry (0-100) 6 months I: 9.5 (SD 17.1) C: 6.9 (SD 13.5) 12 months I: 8.0 (SD 12.1) C: 6.1 (SD 9.6) p=0.075 Roland-Morris (0–100) 6 months I: 11.3 (SD 17.1) C: 7.9 (SD 13.5) 12 months	

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
				I: 8.9 (SD 15.2) C: 6.9 (SD 12.9) p=0.095 Those randomised to the back school group gained significantly more knowledge, based on the multiple choice examination (p=.0001) and performed the exercise program significantly better *(*p=.0001) than the standard care group	
Luijsterburg et al 2008 [30] The Netherlands	Population n=135 Physical therapy (PT) added to the general practitioners' care: n=67, mean age 42 years, female n=38 General practitioners' care only: n=68, mean age 43 years, female n=27 Inclusion criteria Acute sciatica	I: Physical therapy (PT) added to the general practitioners' care. Physical therapy treatment consists of exercise therapy as well as giving information and advice about LRS. Passive modalities such as massage and manipulation techniques, or applications such as ultrasound therapy or electrotherapy were not allowed. The treatment protocol was developed in a	C: General practitioners' care only All patients were treated by the GP according to their clinical guideline. GPs gave information and advice about LRS and, if necessary, prescribed (pain) medication	Global perceived effect (GPE) 52 weeks I: 79% C: 56% RR 1.4 (95% CI 1.1; 1.8) Back pain NRS 0–10 52 weeks Mean I: –3.0 (SD 3.1) C: –2.3 (SD 2.9) Δ –0.7 (95% CI –1.7; 0.4)	Quality Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Setting Participating general practitioners in Rotterdam and the surrounding area invited patients Study period May 2003 to November 2004? At 3, 6, 12 and 52 weeks? Follow-up 12 months	consensus meeting with participating physical therapists. They acted as coaches and guided the patient in order to stimulate return to activity, despite the pain experience Both GP and PT interventions were restricted to a maximum of 9 treatments/consultations in the first 6 weeks after randomisation		RDQ score 0–24 52 weeks Mean I: –10.0 (SD 6.5) C: –8.1 (SD 6.1) Δ –0.9 (95% CI –3.0; 1.3) TSK score 17–68 52 weeks Mean I: –3.3 (SD 7.3) C: –4.5 (SD 6.6) Δ 1.2 (95% CI –1.2; 3.6) General health SF-36 0–100 52 weeks Mean I: –3.1 (SD 15.7) C: –4.1 (SD 16.7) Δ 1.0 (95% CI –4.5; 6.5)	
Nordeman et al 2006 [31] Sweden	Population 18–65 years n=60	I: Early Access group Within 2 days for physical examination and individualised physical therapy treatment. Patients were given a same-day	C: Waiting list A control group with a 4-week waiting list. Received the same treatment as the	Pain intensity, Borg category scale 6 months Median I: –3.0 (IQR –2.0; –4.0)	Quality Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Early access group: n=32, mean age 39.2 years, male/female n=12/20 Control group: n=28, mean age 40.8 years, male/female n=14/14 <u>Inclusion criteria:</u> Subacute low back pain. Symptoms 3 to 12 weeks from onset <u>Setting</u> Primary health care <u>Study period</u> <u>Follow-up</u> 6 months Self-administrated questionnaires were used for assessment	appointment to a physical therapist in an open access system on the day of trial entry or were given an appointment within 2 days if they consulted the physical therapy department by telephone. Treatment was indiviudalised Drop-out n=2	Early Access group but initiated after 4 weeks Drop-out n=0	C: –1.5 (IQR –1.0; –46.0) Mean I: –3.0 (SD 1.7) C: –2.0 (SD 2.2) p=0.06 (t-test), 0.025 (M&W), 0.003 (MWT) <u>Orebro musculoskeletal pain screening questionnaire</u> 6 months Median I: –25.0 (IQR –1.0; –46.0) C: –21.0 (IQR –5.0; –39.0) Mean I: –26.5 (SD 31.1) C: –20.2 (SD 23.4) p=0.41 (t-test), 0.55 (M&W), 0.42 (MWT) <u>Roland and Morris disability questionnaire</u> 6 months Median I: –7.0 (IQR –2.0; –10.0)	

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
				C: –3.5 (IQR 0.5; –9.0) Mean I: –6.3 (SD 5.3) C: –5.3 (SD 5.6) p=0.48 (t-test), 0.40 (M&W), 0.31 (MWT) <u>Sick-leave change 12 months</u> 6 months Median I: 0.0 (IQR 2.0; 0.0) C: 0.0 (IQR 0.0; 0.0) Mean I: 0.7 (SD 1.8) C: 0.0 (SD 2.2) p=0.13 (t-test), 0.20 (M&W), 0.25 (MWT)	
Pengel et al 2007 [32] Australia and New Zealand	<u>Population</u> 18–80 years n=259 <u>Exercise and advice group:</u> n=63, mean age 50.1 years, female n=46	<u>I: Exercise and advice</u> *Exercise* Individualised, progressive, submaximal program designed to improve the abilities of participants to complete functional activities that they	<u>C1: Sham exercise and advice</u> Participants received 12 physiotherapist-directed sham exercise sessions and 3 physiotherapist-directed	Exercise and advise vs no exercise and no advice <u>Average pain past week (scale 0 to 10)</u> 3 months Δ –1.1 (95% CI –2.0; –0.3)	<u>Quality</u> Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Sham exercise and advice group: n=63, mean age 51.2 years, female n=44 Exercise and sham advice group: n=65, mean age 48.0 years, female n=46 Sham exercise and sham advice group: n=68, mean age 50.0 years, female n=54 Inclusion criteria Subacute low back pain (>6 weeks and <3 months in duration) Setting 7 university hospitals and primary care clinics in Australia and New Zealand Study period January 2001–June 2003	specified as being difficult to perform because of low back pain. Aerobic exercise, stretches, functional activities, activities to build speed, endurance and coordinatiom; and trunk and limb-strengthening exercises. Participants received 12 physiotherapist-directed exercise sessions over 6 weeks *Advice* Encourage a graded return to normal activities. The physiotherapist explained the benign nature of low back pain, addressed any unhelpful beliefs about back pain, and emphasised that being overly careful and avoiding light activity would delay recovery. Participants received 3 physiotherapist-directed advice sessions over 6 weeks	advice advice sessions over 6 weeks Drop-out n=4 C2: Exercise and sham advice Participants received 12 physiotherapist-directed exercise sessions and 3 physiotherapist-directed sham advice sessions over 6 weeks Drop-out n=6 C3: Sham exercise and sham advice *Sham exercise* Control for the exercise intervention consisted of sham pulsed ultrasonography and sham pulsed short-wave diathermy *Sham advice*	12 months Δ –0.8 (95% CI –1.7; 0.1) Patient-Specific Functional Scale 3 months Δ 1.3 (95% CI 0.6; 2.1) 12 months Δ 1.1 (95% CI 0.3; 1.8) Global perceived effect 11-point scale 3 months Δ 0.9 (95% CI 0.2; 1.5) 12 months Δ 0.8 (95% CI 0.0; 1.6) Roland-Morris Disability Questionnaire 3 months Δ 2.0 (95% CI –2.4; 2.7) 12 months Δ -0.4 (95% CI –3.1; 2.3) Depression Anxiety Stress Scales-21	

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Follow-up 6 weeks, 3 months, 12 months		Opportunity to talk about their low back pain and any other problems. The physiotherapists responded in a warm and empathic manner, displaying genuine interest in the participant, but did not give advice about the low back pain Participants received 12 physiotherapist-directed sham exercise sessions and 3 physiotherapist-directed sham advice sessions over 6 weeks Drop-out n=10	3 months Δ 0.2 (95% CI –2.4; 2.1) 12 months Δ 1.1 (95% CI 0.3; 1.8)	
Santilli et al 2005 [33] Italy	Population n=102 Active manipulations (I): Female/male 30.2/69.8% Age <40, 45.3% 40–49, 26.4% 50+, 28.3%	Active manipulations (I): A pre-planned 30-days protocol with a number of sessions that depended on pain relief or up to a maximum of 20. Mean 12.8 sessions	Simulated manipulations (C): Soft muscle pressing apparently similar to manipulations but not following any specific patterns and not involving	VAS reduction local pain (% patients) 180 days; I: 98%, C: 94% (NS) VAS reduction radiating pain (% patients)	Quality Moderate Study limitations

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Duration pain: <10 days <u>Simulated manipulations (C):</u> Female/male 44.9/55.1% Age <40, 32.7% 40–49, 32.7% 50+, 34.7% Duration pain: <10 days <u>Inclusion criteria:</u> Age 18 to 65 Pain for less than 10 days, pain-free previous 3 months Moderate to severe radiating pain to one leg Magnetic resonance imaging (MRI) evidence of disc protrusion with or without disc degeneration in the spinal segments involved in pain	Active manipulation consisted of examining the range of motion in the back, followed by soft tissue manipulations and brisk rotational thrusting away from the greatest restriction n=53 <u>Drop-out rate</u> 5/53 (9.4%)	rapid thrust. Mean 13.0 sessions n=49 <u>Drop-out rate</u> 1/49 (2.1%)	180 days; I:100%, C: 83% (p<0.01) <u>Pain free local pain (% patients)</u> 180 days; I:28%, C: 6% (p<0.005) <u>Pain free radiating pain (% patients)</u> 180 days; I: 55%, C: 20% (p<0.001) <u>Quality of Life (SF-36)</u> No follow-up time given (NS)	

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	<u>Setting</u> 2 rehabilitation medical centers. Treatment were performed by experienced chiropractors <u>Follow-up</u> Scheduled visits at 15, 30, 45, 90 and 180 days after their initial consultation to follow-up how the pain is evolving After admission, each patient received an ad hoc diary in which to record the days of pain during the 30-day treatment periods, number and type of nonsteriodal anti-inflammatory drugs, and number of drug prescriptions				

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
Schneider et al 2015 [34] USA	Population n=112 Manual care (I1): n=37, mean age 41.4, women 67.6% Mechanical care (I2): n=35, mean age 40.4, women 60.0% Usual medical care (C): n=35, mean age 41.3, women 60.0% Inclusion At least 18 years, Low back pain for up til 12 weeks duration Setting Center for Integrative Medicine, Pittsburgh, USA. Study period 4 weeks	Manual care (I1): High velocity, low amplitude thrust manipulation, 8 visits during 4 weeks. Educational booklet Mechanical care (I2): Mechanical assisted manipulation using an activator instrument, 8 visits during 4 weeks. Educational booklet	Usual medical care (C): Information, over the counter analgesics and NSAID, advice to stay active. 3 office visits during 4 weeks. Educational booklet	Disability (Oswestry) change from baseline, mean (SD) 6 months I1: –12.7 (14.1) I2: –11.0 (15.7) C: –10.9 (17.4) Pain (self reported pain intensity scale 0–10) change from baseline mean (SD) 6 months I1: –2.9 (2.0) I2: –1.8 (–2.2) C: –2.2 (2.6) Adjusted group differences, Disability (Oswestry) mean (95% CI) 6 months I1 vs I2: 0.4 (–10.2; 11.0) I1 vs C: 1.4 (–9.1; 12.0) I2 vs C: 1.0 (–9.6; 11.6) Adjusted group differences, Pain (self reported pain intensity scale 0–10) mean (95% CI) 6 months	Quality Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Follow-up At 3 and 6 months after randomisation Received therapy: n=107 Lost to follow-up n=3			I1 vs I2: –1.2 (–3.2; 0.7) I1 vs C: –0.9 (–2.9; 1.1) I2 vs C: 0.3 (–1.6; 2.3)	
Sharpe et al 2012 [35] Australia	Population n=88 Study 1 (acute pain): 18–75 years ABM group: n=27, mean age 41.4±14.1 Placebo group: n=27, mean age 40.64±15.80 Lost to follow-up n=8 Inclusion criteria Participants must have a new back or neck pain injury Setting The participants were recruited from 11 physiotherapy clinics in	I: Attention bias modification 1 session of ABM and physiotherapy	C: Placebo 1 session placebo ABM and physiotherapy	Average pain VAS 0–100 3 months I: 16.93 (SD 23.7) C: 40.26 (SD 26.6) p=0.001 Roland Morris Disability Questionnaire 3 months I: mean 1.56 (SD 2.9) C: mean 2.48 (SD 4.9) NS	Quality Moderate

First author Year Country Reference	Population Inclusion criteria Setting Study period follow up	Intervention	Control	Outcome Results	Quality Comments Study limitations
	Sydney, Australia <u>Follow-up</u> 3 months				

Table 3 Economic evaluations comparing different interventions.

Author Year Reference Country	Study design Population Setting Perspective	Intervention vs control	Incremental cost	Incremental effect	ICER	Study quality and relevance* Further information Comments
Jellema et al 2007 [36] The Netherlands	RCT, CUA, 12 months Non-specific LBP <12 weeks, n=314, mean age I (C): 43.0 (45.7), Male I (C): 79% (63%) GP setting Societal	I: MIS (minimal intervention strategy) C: UC (Usual care)	Costs reported in EUR year 2002 Total (95% CI) –490 (–987; 92) Indirect: –495 (–921;158)	–0.004 QALY	Saves 47,348/QALY	High study quality Moderate relevance to Sweden due to old data from a non-Swedish context
Whitehurst et al 2007 [37] UK	RCT, CUA, 12 months LBP <12 weeks, n=402 General practice Public and private sector	I: BPM (Brief Pain Management program) C: Physical therapy	Costs reported in GBP in year 2001–2002 Total health care costs (95% CI): – 53.56 (–145.92; 38.80)	QALYs (controlled for baseline EQ-5D): –0.020 (– 0.06; 0.02)	PT vs BPM: 2,362/QALY The higher the WTP threshold, the less likely BPM is to be considered cost effective. If the cost per QALY threshold was a conservative 10,000 per QALY gained,	High study quality Moderate relevance to Sweden due to old data and lack of data concerning absence of work

Author Year Reference Country	Study design Population Setting Perspective	Intervention vs control	Incremental cost	Incremental effect	ICER	Study quality and relevance* Further information Comments
					the chance that BPM is cost effective is 17%	
Luijsterburg et al 2007 [38] The Netherlands	RCT, CUA and CEA, 12 months Sciatica pain <6 weeks, n=135, mean age I (C): 42 (43), Male I (C): 43% (60%) GP setting Societal	I: Physical therapy + GP care C: GP care	Costs reported in EUR probably in year 2005 Total (indirect) costs: 1,444.0 (1,249.8)	QALYs: –0,03 NS GPE (Global perceived effect): RR (95% CI): 1.4 (1.1; 1.8)	QALY: more expensive and worse effect GPE total (direct): 6,224 (837) GPE total costs: the intervention has a 68% (37%) probability of being cost-effective against the control at a WTP of 12,000 (4,000) per patient improved gained	Moderate study quality, however this is deemed not to influence the conclusion that the PT arm is more expensive at no QALY improvement Moderate relevance to Sweden due to Dutch prices and that the friction cost method was employed
Lamb et al 2013	Two step RCT, CUA, 12 months	Step 1 (step 2)	Costs reported in GBP year 2009	Step 1 (step 2)	Step 1:	Moderate study quality

Author Year Reference Country	Study design Population Setting Perspective	Intervention vs control	Incremental cost	Incremental effect	ICER	Study quality and relevance* Further information Comments
[7] UK	Patients with acute whiplash, n=3,851 (599) for step 1(step 2), mean age I (C): 37 (37) and 40 (40) for step 1 and 2 respectively, Male I (C): 44% (42%) and 35% (38%) for step 1 and 2 respectively Emergency department UK NHS perspective	I: active management (physiotherapy) C: UC consultations (Single advice session)	Step 1 (step 2): 27.95 (58.36)	–0.003 (–0.011)	–9,317/QALY (dominated) Step 2: –5,305/QALY (dominated)	due to drop-out and lack of sensitivity analysis Moderate relevance to Sweden

CEA = Cost-effectiveness analysis; CI = Confidence interval; CUA = Cost-utility analysis; EUR = Euro; GBP = British pound; GP = General practitioner; ICER = Incremental cost-effectiveness ratio; MCS = mental component summary of the SF-36_{v2} ; Mean = mean improvement; NS = Not significant; NRS = numerical rating scale for pain; PCS = physical component summary of the SF-36_{v2} ;PGIC= Patient global impression of change; QALY = Quality adjusted life years; RCT = Randomised controlled trial; SD = standard deviation; US = Usual care; WTP = Willingness to pay

* Study quality is a combined assessment of the quality of the study from a clinical as well as an economic perspective

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