

## Supplementary Online Content

Paige NM, Miake-Lye IM, Booth MS, et al. Association of spinal manipulative therapy with clinical benefit and harm for acute low back pain: systematic review and meta-analysis. *JAMA*. doi:10.1001/jama.2017.3086

**eAppendix.** Systematic Review Search Strategies

**eTable 1.** Evidence Table of 26 Randomized Clinical Trials of Spinal Manipulative Therapy for Acute Low Back Pain

**eTable 2.** Quality Scores of 26 Randomized Clinical Trials of Spinal Manipulation Therapy for Acute Low Back Pain

**eReferences**

This supplementary material has been provided by the authors to give readers additional information about their work.

## **eAppendix. Systematic review search strategies**

### SEARCH STRATEGY FOR “CHIROPRACTIC” SYSTEMATIC REVIEWS

#### DATABASE SEARCHED:

Cochrane Database of Systematic Reviews and Other Reviews

NO DATE OR LANGUAGE LIMITATIONS

#### SEARCH STRATEGY:

'chiroprac\* in Title, Abstract, Keywords  
Cochrane Reviews (17)  
Other Reviews (44)

#### SEARCH STRATEGY:

"Manipulation, Spinal"

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Cochrane Databased Search Strategy #2:

spine or spinal or neck or back or cervi\*  
and  
(smt or manipul\* or chiropract\*):ti,ab,kw

Dates:

2011-present,

Limit to the Cochrane Systematic Reviews, Other Reviews (DARE), Technology Assessments,  
and Economic Evaluations databases.

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Forward search on:

Hurwitz EL, Aker PD, Adams AH, Meeker WC, Shekelle PG. Manipulation and mobilization of the cervical spine. A systematic review of the literature. Spine (Phila Pa 1976). Aug 1 1996;21(15):1746-1759; discussion 1759-1760.

## **2. Update Search Strategies**

### SPINAL MANIPULATION THERAPY – 2015 UPDATE SEARCH METHODOLOGY

#### DATABASE SEARCHED & TIME PERIOD COVERED:

COCHRANE CENTRAL – 1/1/2011-2/06/2017

#### SEARCH STRATEGY:

#1 MeSH descriptor: [Back] explode all trees

#2 MeSH descriptor: [Buttocks] this term only

#3 MeSH descriptor: [Leg] this term only

#4 MeSH descriptor: [Back Pain] explode all trees

#5 MeSH descriptor: [Back Pain] 1 tree(s) exploded

#6 MeSH descriptor: [Back Injuries] explode all trees

#7 MeSH descriptor: [Low Back Pain] this term only

#8 MeSH descriptor: [Sciatica] this term only

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#9 low next back next pain

#10 lbp

#11 #1 or #2 or #3 or #5 or #6 or #7 or #8 or #9 or #10

#12 MeSH descriptor: [Musculoskeletal Manipulations] explode all trees

#13 MeSH descriptor: [Chiropractic] explode all trees

#14 manip\*

#15 MeSH descriptor: [Osteopathic Medicine] explode all trees

#16 osteopath\*

#17 chiropract\*

#18 #12 or #13 or #14 or #15 or #16 or #17

#19 #11 and #18

=====  
DATABASE SEARCHED & TIME PERIOD COVERED:  
MEDLINE ON OVID – 1/1/2011-2/06/2017

SEARCH STRATEGY:

1 Clinical Trial.pt.

2 randomized.ab,ti.

3 placebo.ab,ti.

4 dt.fs.

5 randomly.ab,ti.

6 trial.ab,ti.

7 groups.ab,ti.

8

1 or 2 or 3 or 4 or 5 or 6 or 7

9 Animals/

10 Humans/

11

9 not (9 and 10) Including Related Terms

12

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8 not 11

13 dorsalgia.ti,ab.

14 exp Back Pain/

15 backache.ti,ab.

16 (lumbar adj pain).ti,ab.

17 coccyx.ti,ab.

18 coccydynia.ti,ab.

19 sciatica.ti,ab.

20 sciatica/

21 spondylosis.ti,ab.

22 lumbago.ti,ab.

23 exp low back pain/

24

13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23

25 exp Manipulation, Chiropractic/

26 exp Manipulation, Orthopedic/

27 exp Manipulation, Osteopathic/

28 exp Manipulation, Spinal/

29 exp Musculoskeletal Manipulations/

30 exp Chiropractic/

31 manipulation.mp.

32 manipulate.mp.

33 exp Orthopedics/

34 exp Osteopathic Medicine/

35

25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34

36

12 and 24 and 35

37

36 and 2011:2015.(sa\_year).

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DATABASE SEARCHED & TIME PERIOD COVERED:  
EMBASE – 1/1/2011-2/06/2017

SEARCH STRATEGY:

#2 'clinical article'/exp OR 'clinical study'/exp OR 'clinical trial'/de OR 'controlled study'/de OR 'randomized controlled trial'/de OR 'major clinical study'/de OR 'double blind procedure'/de OR 'multicenter study'/de OR 'single blind procedure'/de OR 'phase 3 clinical trial'/de OR 'phase 4 clinical trial'/de OR 'crossover procedure'/de OR 'placebo'/de

#6 allocat\*

#7 assign\*

#8 blind\*

#12 clinical NEAR/25 (study OR trial\*)

#13 compar\*

#14 control\*

#17 'cross over'

#18 'cross-over'

#19 'crossover'

#20 factorial

#21 'follow up'

#22 follow\* NEAR/3 up

#23 'follow up'

#24 placebo\*

#25 prospectiv\*

#26 random\*

#27 (singl\* OR doubl\* OR trebl\* OR tripl\*) NEAR/25 (blind\* OR mask\*)

#28 trial

#29 versus OR vs

#30

#6 OR #7 OR #8 OR #12 OR #13 OR #14 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23

OR #24 OR #25 OR #26 OR #27 OR #28 OR #29

#31

#2 OR #30

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#34 dorsalgia

#35 'back pain'

#36 lumbar NEAR/2 pain

#37 coccyx

#38 coccydynia

#39 sciatica

#40 spondylosis

#41 lumbago

#42 'backache'/exp OR 'ischialgia'/exp OR 'low back pain'/exp

#43

#34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42

#44 'chiropractic'/exp OR 'orthopedic manipulation'/exp OR 'manipulative medicine'/exp OR 'osteopathic medicine'/exp OR 'orthopedics'/exp

#45 manipulation

#46 manipulate

#47 osteopathy

#48

#44 OR #45 OR #46 OR #47

#49

#31 AND #43 AND #48

#50

#31 AND #43 AND #48 AND [humans]/lim

#51

#31 AND #43 AND #48 AND [humans]/lim AND [2011-2015]/py

=====  
DATABASE SEARCHED & TIME PERIOD COVERED:  
CINAHL – 1/1/2011-2/06/2017

SEARCH STRATEGY:

Search modes - Find all search terms (For all search statements)

S1 randomized controlled trials

S2 randomized controlled trials

S3 PT clinical trial

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S4 (MH "Clinical Trials+")

S5 clin\* n25 trial\*

S6 (singl\* or doubl\* or trebl\* or tripl\*) n25 (blind\* or mask\*)

S7 (MH "Placebos")

S8 (MH "Study Design+")

S9 (MH "Comparative Studies")

S10 (MH "Evaluation Research+")

S11 (MH "Prospective Studies+")

S12 "follow up studies" OR "follow-up studies" OR "followup studies" OR "follow-up study" OR "follow up study" OR "followup study"

S13 control\* or prospectiv\* or volunteer\*

S14 placebo\* OR random\* OR (latin n2 square\*)

S15

S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14

S18 TI dorsalgia OR AB dorsalgia

S19 (MH "Back Pain+")

S20 TI backache OR AB backache

S21 TI lumbar n2 pain OR AB lumbar n2 pain

S22 TI coccyx pain OR AB lumbar n2 pain

S23 TI coccyx OR AB coccyx

S24 TI coccydynia OR AB coccydynia

S25 TI sciatica OR AB sciatica

S26 (MH "Sciatica")

S27 TI spondylosis OR AB spondylosis

S28 TI lumbago cronico OR AB spondylosis

S29 TI lumbago OR AB lumbago

S30 (MH "Low Back Pain")

S31

S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR  
S29  
OR S30

S32 (MH "Chiropractic+")

S33 (MH "Manipulation, Chiropractic")

S34 (MH "Manipulation, Orthopedic")

S35 (MH "Manipulation, Osteopathic")

S36 (MH "Manual Therapy+")

S37 (MH "Orthopedics")

S38 (MH "Osteopathy+")

S39 manipulation

S40 manipulate

S41

S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40

S42

s15 AND S31 AND S41

S43

S15 AND S31 AND S41

DATABASE SEARCHED & TIME PERIOD COVERED:

PubMed – 1/1/2015-2/06/2017

SEARCH STRATEGY:

Manipulation, Chiropractic[mh] OR Manipulation, Orthopedic[mh] OR Manipulation,  
Osteopathic[mh] OR Manipulation, Spinal[mh] OR Musculoskeletal Manipulations[mh] OR  
Chiropractic[mh] OR Orthopedics OR Osteopathic Medicine

AND

"Low Back Pain"[Mesh] OR low back pain\*[tiab] OR "Back"[Mesh] OR dorsalgia[tiab] OR Back  
Pain[mh] OR backache[tiab] OR "lumbar pain"[tiab] OR coccyx[tiab] OR coccydynia[tiab] OR  
sciatica[tiab] OR sciatica[mh] OR spondylosis[tiab] OR lumbago[tiab]

AND

Randomized Controlled Trial" [Publication Type] OR "Randomized Controlled Trials as  
Topic"[Mesh] OR random\*[tiab] OR rct\* OR systematic[tiab] OR systematic[sb] OR Clinical  
Trial[pt] OR randomized[tiab] OR placebo[tiab] OR randomly[tiab] OR trial[tiab] OR groups[tiab]



**eTable 1. Evidence table of 26 randomized clinical trials of spinal manipulative therapy for acute low back pain**

Author, Year	Setting	% Male	Mean Age	Presence of Leg Pain or Sciatica	Outcome	Baseline value	Treatment arms	Sample Size	Follow-up
Bergquist-Ullman, et al., 1977 <sup>1</sup>	Industry	87% male	34 years	14% of patients had a straight leg raise test positive at less than 60 degrees	Pain index	43	back school (instruction and exercise)	N=44	10 day median: 20 3 week median: 19 6 week median: 22
						42	non-thrust manipulation	N=50	10 day median: 22 3 week median: 18 6 week median: 21
						42	diathermy according to Cyriax, Kaltenborn, Lewit, and Janda	N=56	10 day median: 28 3 week median: 25 6 week median: 17
Blomberg, et al., 1994 <sup>2,6</sup>	Primary care	52% male	37 years	10% with "true radicular pain"	Disability Rating Score (function)	No baseline data	usual medical care	N=48	3 days mean: 4.6 1 week mean: 3.9 2 week mean: 3.2 3 week mean: 3
							mix of thrust and non-thrust manipulation, some patients also got steroid injections of the parasacroccygeal structures as described by Cyriax	N=53	3 days mean: 3.5 1 week mean: 2.6 2 week mean: 1.8 3 week mean: 1.4
					Pain score		usual medical care	N=48	3 days mean: 4.8 1 week mean: 4.2 2 week mean: 3.4 3 week mean: 3.4
							mix of thrust and non-thrust manipulation, some patients also got steroid injections of the parasacroccygeal structures as described by Cyriax	N=53	3 days mean: 3.8 1 week mean: 3.1 2 week mean: 2 3 week mean: 1.7

eTable 1. Evidence table of 26 randomized clinical trials of spinal manipulative therapy for acute low back pain (continued)

Author, Year	Setting	% Male	Mean Age	Presence of Leg Pain or Sciatica	Outcome	Baseline value	Treatment arms	Sample Size	Follow-up
Cherkin, et al., 1998 <sup>7</sup>	Primary care patients from health maintenance organization	52% male	41 years	Sciatica excluded	Roland Morris Disability questionnaire (function)	12.1 (CI: 11.2-13.1)	thrust manipulation	N=122	4 week mean: 3.7 (2.9 SD)
						11.7 (CI: 10.4-13.0)	physical therapy according to McKenzie	N=136	4 week mean: 4.1 (3.3 SD)
						11.7 (CI: 10.4-13.0)	educational booklet	N=66	4 week mean: 4.9 (3.8 SD)
					Bothersomeness of symptoms (pain)	5.5 (CI: 5.1-5.8)	thrust manipulation	N=122	4 week mean: 1.9 (1.5 SD)
						6 (CI: 5.6-6.5)	physical therapy according to McKenzie	N=136	4 week mean: 2.3 (1.9 SD)
						5.3 (CI: 4.9-5.7)	educational booklet	N=66	4 week mean: 3.1 (2.4 SD)
Childs, et al., 2004 <sup>8</sup>	8 physical therapy clinics in the United States	58% male	34 years	24% had "symptoms distal to knee"	Oswestry disability questionnaire (function)	41.4 (10.1 SD)	thrust manipulation	N=70	1 week mean: 14.6 4 week mean: 8.4
						40.9 (10.8 SD)	low stress aerobic exercise and lumbar spine strengthening program according to Agency for Health Care Policy and Research guidelines	N=61	1 week mean: 35 4 week mean: 23
Cramer, et al., 1993 <sup>9</sup>	Clinical chiropractic college	57% male	Not reported	Patients with "compressive neuropathy" we excluded	Visual Analogue Scale (pain)	71.8 (14.8 SD)	non-thrust manipulation and electrical stimulation and cold pack	N=17	10 day mean: 38.6 (25.2 SD)
						72 (19.2 SD)	detuned ultrasound and cold pack	N=18	10 day mean: 42 (28.8 SD)
					Oswestry disability questionnaire (function)	17.6 (11.9 SD)	non-thrust manipulation and electrical stimulation and cold pack	N=17	10 day mean: 7.3 (6.8 SD)
						14.9 (5.0 SD)	detuned ultrasound and cold pack	N=18	10 day mean: 8.0 (7.6 SD)

eTable 1. Evidence table of 26 randomized clinical trials of spinal manipulative therapy for acute low back pain (continued)

Author, Year	Setting	% Male	Mean Age	Presence of Leg Pain or Sciatica	Outcome	Baseline value	Treatment arms	Sample Size	Follow-up
Cruser, et al., 2012 <sup>10</sup>	United States military facility	55% male	27 years	Not reported	Visual Analogue Scale (pain)	5.2 (2.1 SD)	mix of thrust and non-thrust manipulation, soft tissue stretching, myofascial release, counterstrain muscle energy, sacroiliac articulation	N=30	4 week mean: 2.0 (1.5 SD)
						5.5 (2.2 SD)	usual medical care	N=30	4 week mean: 3.7 (2.4 SD)
					Roland Morris Disability questionnaire (function)	12.4 (5.3 SD)	mix of thrust and non-thrust manipulation, soft tissue stretching, myofascial release, counterstrain muscle energy, sacroiliac articulation	N=30	4 week mean: 4.4 (5.9 SD)
						12.5 (6.0 SD)	usual medical care	N=30	4 week mean: 7.31 (6.3 SD)
Delitto, et al., 1993 <sup>11</sup>	Physiotherapy department	58% male	33 years	21% had "leg symptoms"	Oswestry disability questionnaire (function)	33 (5 SD)	thrust manipulation and extension exercises according to McKenzie and hand-heel rock exercise	N=14	3 day mean: 20 (5 SD) 5 day mean: 10 (5 SD)
						41 (5 SD)	flexion exercises according to Williams	N=10	3 day mean: 36 (5 SD) 5 day mean: 32 (4 SD)
Erhard, et al., 1994 <sup>12</sup>	Physiotherapy department	62% male	44 years	8% had "leg symptoms"	Oswestry disability questionnaire (function)	45 (12 SD)	thrust manipulation and extension exercises according to McKenzie	N=12	3 day mean: 20 (8 SD) 5 day mean: 8 (8 SD)
						40 (12 SD)	extension exercises according to McKenzie	N=12	3 day mean: 35 (8 SD) 5 day mean: 25 (14 SD)
Farrell, et al., 1982 <sup>13</sup>	Setting unclear	62% male	42 years	Not reported	Subjective pain rating	4.95	non-thrust manipulation according to Stoddart and Maitland	N=24	3 week mean: 0.3
						5.3	physical therapy and diathermy, isometric abdominal exercises and ergonomic instructions	N=24	3 week mean: 0.3

eTable 1. Evidence table of 26 randomized clinical trials of spinal manipulative therapy for acute low back pain (continued)

Author, Year	Setting	% Male	Mean Age	Presence of Leg Pain or Sciatica	Outcome	Baseline value	Treatment arms	Sample Size	Follow-up
Fritz, et al., 2015 <sup>14</sup>	Primary care	48% male	37 years	Patients with presence of pain or numbness distal to the knee were excluded	Numeric pain rating of low back pain severity	no baseline data	thrust manipulation and exercises	N=108	4 week mean: 1.7 (1.9 SD)
						no baseline data	standard medical care and self-help booklet	N=112	4 week mean: 2.1 (1.9 SD)
					Oswestry disability questionnaire (function)	no baseline data	thrust manipulation and exercises	N=108	4 week mean: 11.1 (12.5 SD)
						no baseline data	standard medical care and self-help booklet	N=112	4 week mean: 14.5 (13.2 SD)
Glover, et al., 1974 <sup>15</sup>	Work medical center	89% male	39 years	Not reported	Percent pain relief	no baseline data	diathermy	N=41	3 day mean: 56 1 week mean: 80
						no baseline data	non-thrust manipulation	N=43	3 day mean: 50 1 week mean: 75
Godfrey, et al., 1984 <sup>16</sup>	Patients referred from primary care	Not reported	42 years	Not reported	General symptomatology (number of patients with marked improvement) (pain)	no baseline data	thrust manipulation according to Maigne		2-3 week: 14/39 (35.9%)
						no baseline data	light effleurage and minimal electrostimulation		2-3 week: 7/33 (21.2%)
					Activities of Daily Living (number of patients with moderate improvement) (function)	no baseline data	thrust manipulation according to Maigne		2-3 week: 7/24 (29.2%)
						no baseline data	light effleurage and minimal electrostimulation		2-3 week: 5/17 (29.4%)

eTable 1. Evidence table of 26 randomized clinical trials of spinal manipulative therapy for acute low back pain (continued)

Author, Year	Setting	% Male	Mean Age	Presence of Leg Pain or Sciatica	Outcome	Baseline value	Treatment arms	Sample Size	Follow-up
Goertz, et al., 2013 <sup>17</sup>	United States army medical center	86% male	26 years	43% had "radicular signs"	Numerical pain rating scale	5.8 (2.1 SD)	standard medical care and brief massage, ice or heat, McKenzie exercises, stretching exercises	N=46	2 week mean: 6.1 4 week mean: 5.2
						5.8 (1.5 SD)	thrust manipulation	N=45	2 week mean: 3.9 4 week mean: 3.9
					Roland Morris Disability questionnaire (function)	12.7 (5.1 SD)	standard medical care and brief massage, ice or heat, McKenzie exercises, strengthening exercises	N=46	2 week mean: 12.9 4 week mean: 12
						11 (4.2 SD)	thrust manipulation	N=45	2 week mean: 8.9 4 week mean: 8
Grunnesjo, et al., 2004 <sup>18-20</sup>	Nine primary health care and one outpatient orthopedic hospital department	56% male	41 years	8% had "verified herniations"	Pain last 24 hours	52.2 (CI: 46.7-57.8)	stay active	N=71	5 week mean: 29.7 (25.8 SD)
						54.7 (CI: 49.8-59.6)	mix of thrust and non-thrust manipulation and stay active and in some patients a steroid injection in the parasacroccygeal region	N=89	5 week mean: 20.8 (23.3 SD)
					All disability rating variables	52 (CI: 47.4-56.6)	stay active	N=71	5 week mean: 31.9 (21.9 SD)
						57.8 (CI: 53.7-61.8)	mix of thrust and non-thrust manipulation and stay active and in some patients a steroid injection in the parasacroccygeal region	N=89	5 week mean: 25.8 (22.1 SD)
Hadler, et al., 1987 <sup>21</sup>	Primary care	57% male	Not reported	Not reported	Roland Morris Disability questionnaire (function)	no baseline data	mobilization	N=28	9 day mean: 4.5 12 day mean: 3.7
						no baseline data	thrust manipulation	N=26	9 day mean: 3.7 12 day mean: 3.4

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eTable 1. Evidence table of 26 randomized clinical trials of spinal manipulative therapy for acute low back pain (continued)

Author, Year	Setting	% Male	Mean Age	Presence of Leg Pain or Sciatica	Outcome	Baseline value	Treatment arms	Sample Size	Follow-up					
Hallegraeff, et al., 2009 <sup>22</sup>	Three physical therapy and manual therapy centers	55% male	39 years	Patients with symptoms distal to the knee were excluded	Oswestry disability questionnaire (function)	0.24 (0.18 SD)	thrust manipulation	N=31	2.5 week mean: 0.14 (0.17 SD)					
						0.26 (0.12 SD)	physical therapy	N=33	2.5 week mean: 0.14 (0.12 SD)					
					Visual Analogue Scale (pain)	42.7 (18.4 SD)	thrust manipulation	N=31	2.5 week mean: 19 (16.9 SD)					
						54 (17.5 SD)	physical therapy	N=33	2.5 week mean: 24.8 (20.1 SD)					
Hancock, et al., 2007 <sup>23</sup>	Patients referred from primary care	56% male	41 years	Patients with "nerve root compromise" were excluded	Numerical pain rating scale negative effect size favors manipulation	no baseline data	non-thrust manipulation	N=59	1 week effect size: 0.2 (CI: -0.3-0.7) 2 week effect size: -0.4 (CI: -1.0, 0.1) 4 week effect size: -0.2 (CI: -0.7, 0.3)					
						no baseline data	detuned pulsed ultrasound (sham)	N=60						
					Roland Morris Disability questionnaire (function) negative effect size favors manipulation	no baseline data	non-thrust manipulation	N=59	1 week effect size: -0.7 (CI: -2.1, 0.6) 2 week effect size: -1.4 (CI: -2.7, -0.1) 4 week effect size: -1 (CI: -2.1, 0.1)					
						no baseline data	detuned pulsed ultrasound (sham)	N=60						
					Heymann, et al., 2013 <sup>24</sup>	5 orthopedic or general practices	60% male	37 years	Not reported	Roland Morris Disability questionnaire (function)	13.5 (5.6 SD)	thrust manipulation	N=38	1 week mean: 5.8
											14.4 (4.8 SD)	analgesic (diclofenac)	N=37	1 week mean: 9.7
15 (3.8 SD)	sham	N=25	no data provided											
Visual Analogue Scale (pain)	no baseline data	thrust manipulation	N=38	1 week mean: 10										
	no baseline data	analgesic	N=37	1 week mean: 30										
	no baseline data	sham	N=25	1 week mean: no data provided										

eTable 1. Evidence table of 26 randomized clinical trials of spinal manipulative therapy for acute low back pain (continued)

Author, Year	Setting	% Male	Mean Age	Presence of Leg Pain or Sciatica	Outcome	Baseline value	Treatment arms	Sample Size	Follow-up
Hoiriis, et al., 2004 <sup>25</sup>	Patients recruited via advertisement	57% male	42 years	Patients with "known or suspected disk herniation" were excluded	Visual Analogue Scale (pain)	4.52 (1.82 SD)	thrust manipulation	N=34	2 week mean: 2.4 (2.2 SD) 4 week mean: 1.7 (1.9 SD)
						3.9 (2.0 SD)	muscle relaxants (cyclobenzaprine or carisoprodol or methocarbamol)	N=36	2 week mean: 2.7 (2.2 SD) 4 week mean: 2.2 (2.2 SD)
						3.8 (1.6 SD)	sham	N=40	2 week mean: 3.2 (2.4 SD) 4 week mean: 2.2 (2.0 SD)
					Oswestry disability questionnaire (function)	24.8 (11.5 SD)	thrust manipulation	N=46	2 week mean: 17.0 (13.8 SD) 4 week mean: 11.9 (11.9 SD)
						22.8 (12.9 SD)	muscle relaxants (cyclobenzaprine or carisoprodol or methocarbamol)	N=47	2 week mean: 17.0 (12.2 SD) 4 week mean: 16.0 (16.1 SD)
						24.8 (11.7 SD)	sham	N=48	2 week mean: 19.3 (13.7 SD) 4 week mean: 16.3 (12.6 SD)
Juni, et al., 2009 <sup>26</sup>	Patients referred from emergency department or a general practice	64% male	35 years	Patients with "signs of nerve root irritation or compression" were excluded	Roland Morris Disability questionnaire (function)	12.8 (5.1 SD)	Mix of thrust and non-thrust manipulation	N=52 12.8 (5.1 SD)	2 week mean: 5.8 (5.7 SD)
						14.3 (4.9 SD)	analgesic (paracetamol, diclofenac, or dihydrocodeine)	N=52	2 week mean: 5.2 (7.0 SD)
					Pain intensity, BS-11 score positive favors manipulation	6.3 (2.2 SD)	mix of thrust and non-thrust manipulation	N=52	Difference of 0.5 (2.6 SD)
						6.8 (2.2 SD)	Analgesic (paracetamol, diclofenac, or dihydrocodeine)	N=52	

eTable 1. Evidence table of 26 randomized clinical trials of spinal manipulative therapy for acute low back pain (continued)

Author, Year	Setting	% Male	Mean Age	Presence of Leg Pain or Sciatica	Outcome	Baseline value	Treatment arms	Sample Size	Follow-up
MacDonald, et al., 1990 <sup>27</sup>	General practice	41% male	Not reported	Patients with "neurologic deficits" were excluded	Improvement in the disability index	6.4 (3 SD)	thrust manipulation and advice on posture, exercises and avoidance of occupational stress	N=36	2 week mean: 4.1 (3.5 SD)
						6.1 (2.5 SD)	advice on posture, exercise, and avoidance of occupational stress	N=30	2 week mean: 4.4 (3.5 SD)
Morton, 1999 <sup>28</sup>	Patients referred from primary care	34% male	44 years	Patients with "abnormalities on neurologic exam" were excluded	Roland Morris Disability questionnaire (function)	10.6 (5.2 SD)	thrust manipulation	N=15	1 week mean: 6.9 (4.1 SD) 2 week mean: 6.0 (2.3 SD) 3 week mean: 3.7 (3.7 SD) 4 week mean: 1.9 (2.5 SD)
						10.1 (6.4 SD)	spinal stabilizing exercises	N=14	1 week mean: 9.1 (5.9 SD) 2 week mean: 7.9 (6.3 SD) 3 week mean: 7 (6.1 SD) 4 week mean: 6 (5.2 SD)
					Visual Analogue Scale (pain)	49.7 (23.6 SD)	thrust manipulation	N=15	1 week mean: 27.6 (15.2 SD) 2 week mean: 17.4 (13.9 SD) 3 week mean: 7.5 (6.4 SD) 4 week mean: 2.4 (3 SD)
						46.6 (25.1 SD)	spinal stabilizing exercises	N=14	1 week mean: 46.4 (23.3 SD) 2 week mean: 36.6 (24.6 SD) 3 week mean: 34.5 (23 SD) 4 week mean: 25.4 (17.3 SD)



eTable 1. Evidence table of 26 randomized clinical trials of spinal manipulative therapy for acute low back pain (continued)

Author, Year	Setting	% Male	Mean Age	Presence of Leg Pain or Sciatica	Outcome	Baseline value	Treatment arms	Sample Size	Follow-up	
Postacchini, et al., 1988 <sup>29</sup>	Hospital outpatient department	51% male	38 years	Not reported	Improvement in low back pain from pre-treatment	no baseline data	thrust manipulation	N=53	3 week mean: 8.5	
						no baseline data	back school	N=17	3 week mean: 10.4	
						no baseline data	analgesics (diclofenac)	N=49	3 week mean: 9.4	
						no baseline data	physiotherapy of light massage, analgesic currents, and diathermy	N=47	3 week mean: 8.1	
						no baseline data	bed rest	N=29	3 week mean: 6.6	
						no baseline data	topical gel	N=46	3 week mean: 5.8	
Rasmussen, 1979 <sup>30</sup>	Hospital department of physical medicine and rheumatology	Not reported	35 years	Patients with "signs of root pressure" were excluded	Number of patients with total restoration of all symptoms	no baseline data	non-thrust manipulation	N=12	11/12 (91.7%)	
						no baseline data	diathermy	N=12	3/12 (25%)	
Skargren, et al., 1998 <sup>31</sup>	Primary care centers	38% male	41 years	Not reported	Visual Analogue Scale (pain) negative favors manipulation	56 (22 SD)	thrust manipulation	N=172	4-5 week difference: -0.16 (CI: -6.47, 6.15)	
						61 (21 SD)	physiotherapy	N=144		
						Oswestry disability questionnaire (function) negative favors manipulation	35 (17 SD)	thrust manipulation	N=172	4-5 week difference: -1.49 (CI: -5.51, 2.54)
							37 (16 SD)	physiotherapy	N=144	

eTable 1. Evidence table of 26 randomized clinical trials of spinal manipulative therapy for acute low back pain (continued)

Author, Year	Setting	% Male	Mean Age	Presence of Leg Pain or Sciatica	Outcome	Baseline value	Treatment arms	Sample Size	Follow-up
Waterworth, et al., 1985 <sup>32</sup>	General practice	62% male	36 years	Not reported	Score of lower back pain	2.1	non-thrust manipulation	N=38	12 day mean: 0.42
						2.1	analgesic (diflunisal)	N=36	12 day mean: 0.44
						2	physiotherapy including local heat, ultrasound, and flexion and extension exercises	N=34	12 day mean: 0.38
					Patient has overall improvement score of excellent	no baseline data	non-thrust manipulation	N=38	23/38 (60.5%)
						no baseline data	analgesic (diflunisal)	N=36	15/36 (41.7%)
						no baseline data	physiotherapy including local heat, ultrasound, and flexion and extension exercises	N=34	13/34 (38.2%)

**eTable 2. Quality scores of 26 randomized clinical trials of spinal manipulative therapy for acute low back pain**

Article	Randomization	Concealment	Blinding, provider	Blinding, patient	Blinding, outcome	Dropouts	Timing	Intention to Treat	Baseline Differences	Co-interventions	Compliance	Total
Bergquist-Ullman, M., 1977 <sup>1</sup>	+	?	-	-	-	-	+	-	?	?	-	2
Blomberg, S., 1994 <sup>2</sup>	+	+	-	-	-	+	-	+	-	+	+	6
Cherkin, D. C., 1998 <sup>7</sup>	+	+	-	-	-	+	+	+	+	-	?	6
Childs, J. D., 2004 <sup>8</sup>	+	+	-	-	-	+	+	+	+	?	+	7
Cramer, G. D., 1993 <sup>9</sup>	?	?	-	-	-	+	+	+	?	?	?	3
Cruser, A., 2012 <sup>10</sup>	?	+	-	-	-	+	+	+	+	+	+	7
Delitto, A., 1993 <sup>11</sup>	+	-	-	-	?	?	+	+	+	?	?	4
Erhard, R. E., 1994 <sup>12</sup>	+	?	-	-	?	-	+	-	+	?	?	3
Farrell, J. P., 1982 <sup>13</sup>	?	?	-	-	-	+	+	?	+	?	?	3
Fritz, J. M., 2015 <sup>14</sup>	+	+	-	-	-	+	+	+	+	-	+	7
Glover, J. R., 1974 <sup>15</sup>	+	?	-	-	-	?	+	?	?	?	?	2
Godfrey, C. M., 1984 <sup>16</sup>	+	?	-	+	+	-	+	-	?	+	+	6
Goertz, C. M., 2013 <sup>17</sup>	+	+	-	-	-	-	+	+	+	+	+	7
Grunnesjö, M. I., 2004 <sup>18-20</sup>	+	+	-	-	-	+	+	+	+	?	+	7
Hadler, N. M., 1987 <sup>21</sup>	?	?	-	+	-	+	+	-	-	?	?	3
Hallegraeff, J. M., 2009 <sup>22</sup>	+	+	-	-	-	+	+	+	-	?	+	6
Hancock, M. J., 2007 <sup>23</sup>	+	+	-	+	-	+	+	+	+	+	+	9
Heymann, W. J., 2013 <sup>24</sup>	?	+	-	+	+	-	+	+	+	?	?	6
Hoiriis, K. T., 2004 <sup>25</sup>	+	?	-	-	-	-	+	+	?	?	?	3
Juni, P., 2009 <sup>26</sup>	+	+	-	-	-	+	+	+	?	+	+	7
MacDonald, R. S., 1990 <sup>27</sup>	?	?	-	-	-	+	+	-	+	?	+	4
Morton, J. E., 1999 <sup>28</sup>	+	-	-	-	-	?	+	+	?	?	?	3
Postacchini, F., 1988 <sup>29</sup>	?	?	-	-	-	+	+	-	?	-	?	2
Rasmussen, G., 1979 <sup>30</sup>	?	?	-	-	-	+	+	-	?	?	?	2
Skargren, E. I., 1998 <sup>31</sup>	?	?	-	-	-	-	+	-	+	-	?	2
Waterworth, R. F., 1985 <sup>32</sup>	+	?	-	-	-	+	+	-	?	?	?	3

\* +=yes, -=no, ?=unsure/don't know; full criteria specified in Cochrane Back Group Risk of Bias Tool.<sup>33</sup>

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