Supplemental Online Content

Huygen FPM, Soulanis K, Rtveladze K, Kamra S, Schlueter M. Spinal cord stimulation vs medical management for chronic back and leg pain: a systematic review and network meta-analysis. JAMA Netw Open. 2024;7(11):e2444608. doi:10.1001/jamanetworkopen.2024.44608

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

eTable 1. Population, Intervention, Comparator, Outcomes, Study design (PICOS) search strategy

PICOS	Inclusion	Exclusion
Population	SCS-naïve adults (≥18 years old) with chronic back/leg pain (FBSS or PSPS, NSRBP, CRPS) and diabetic peripheral neuropathy*	• Paediatrics <18 years old • Patients with cancer-related pain, ischaemic pain (PVD, angina) • Patients without chronic back/leg pain (FBSS or PSPS, NSRBP, CRPS) and diabetic peripheral neuropathy
Intervention	• SCS alone or in combination • DRGS alone or in combination	Interventions not listed in the inclusion criteria
Comparator	No restrictions**	Not applicable
Outcomes	No restrictions but can include the following: • ≥50% reduction in pain • ≥30% reduction in pain • Pain relief (NRS, VAS) • QoL • Functional capacity • Functional disability (ODI) • Analgesic medication use • Treatment satisfaction • Safety (AEs and mortality) • Sleep quality (PSQ-D) • Fall under morbidity	None
Study design(s)	• RCTs • Long-term safety/observational studies that originated from RCTs • SLRs***	Study designs not listed in inclusion criteria
Limits	• Language: English and German • Year limit: No restriction • Study duration: No restriction • Limitations by study sample size: No restriction	Other languages

Abbreviations: AE, Adverse event; CRPS, Complex Regional Pain Syndrome; DRGS, Dorsal Root Ganglion Stimulation; FBSS, Failed Back Surgery Syndrome; NRS, Numeric rating scale; ODI, Oswestry Disability Index; PSPS, Persistent Spinal Pain Syndrome; PSQ, Pain and sleep questionnaire; PVD, Peripheral vascular disease; QoL, Quality of life; RCT, Randomized control trial; SCS, Spinal cord stimulation; SLR, Systematic literature review; VAS, Visual analogue scale.

*Subject to clinical rationale, should group studies by underlying conditions prior to evidence synthesis.

**Active comparators strongly preferred.

*** Systematic literature reviews will be included at abstract review stage in order to search their reference lists for any missed studies and subsequently excluded during full text review stage

eTable 2. Embase search strategy (1974 to 2022 September 02)

#	Searches	Results
1	exp backache/ or exp leg pain/	176551
2	exp diabetic neuropathy/	27191
3	exp peripheral neuropathy/	79927
4	(((back or musculoskel* or intractabl* or leg or neuropath* or phantom limb or fantom limb or complex or regional or spinal cord) adj4 pain) or CRPS).mp.	217074
5	(sciatica or back-ache or back*ache or lumbago or FBSS or PSPS or (diabet* adj3 neuropath*) or (peripheral adj3 neuropath*) or (reflex adj4 dystroph*) or (sudeck* adj2 atroph*) or causalg* or (failed back adj4 surg*) or (failed back adj4 syndrome*) or (persistent spinal adj4 syndrome*)).mp.	171374
6	or/1-5	373614
7	exp spinal cord stimulation/	8598
8	((spinal cord adj3 (stimulat* or electrostimulat*)) or (dorsal root adj3 (stimulat* or electrostimulat*)) or SCS or Dorsal root ganglion stimulation or DRGS).mp.	30049
9	((epidural adj3 (stimulat* or electrostimulat*)) or SENZA or neuromodul*).mp.	69413
10	or/7-9	95416
11	6 and 10	9768
12	exp randomized controlled trial/	728326
13	Clinical Trial/	1045890
14	controlled clinical trial/	468225
15	multicenter study/	335670

#	Searches	Results
16	Phase 2 clinical trial/	99073
17	Phase 3 clinical trial/	62516
18	Phase 4 clinical trial/	4912
19	exp randomization/	95285
20	Single Blind Procedure/	47426
21	Double Blind Procedure/	198771
22	Crossover Procedure/	71364
23	Placebo/	385558
24	(randomi?ed controlled trial$ or rct).tw.	317081
25	(random$ adj2 allocat$).tw.	51092
26	((singl$ or doubl$ or treb$ or tripl$) adj (blind$3 or dumm$3 or mask$3)).tw.	267990
27	(crossover or cross over).tw.	117949
28	placebo$.tw.	348438
29	Prospective Study/	791679
30	Clinical study/	160263
31	exp case control study/	210559
32	longitudinal study/	177581
33	retrospective study/	1300185
34	cross-sectional study/	501921
35	cohort analysis/	889366
36	case control.ti,ab.	191802

#	Searches	Results
37	(cohort adj (study or studies or analys$)).ti,ab.	425230
38	((follow up or observational) adj (study or studies)).ti,ab.	294611
39	((longitudinal or retrospective or prospective or cross sectional) adj (study or studies or review or analys$ or cohort$)).ti,ab.	1597410
40	exp post hoc analysis/	41582
41	(post adj2 hoc).mp.	81625
42	systematic review/	367083
43	meta analysis/	255753
44	(meta analy$ or metanaly$ or metaanaly$).mp.	400954
45	((systematic or evidence) adj3 (review$ or overview$)).mp.	532819
46	or/12-45	6112187
47	11 and 46	3136
48	(animal$ not human$).mp.	4448337
49	animal/ or animal experimentation/	4428446
50	(animal/ not (animal/ and human/)) or (animal$ not human$).mp.	4503960
51	animal/ or animal experiment/ or animal model/ or animal tissue/ or nonhuman/	8980614
52	(news or comment or editorial or note or case report or books or chapter or erratum).pt.	1957504
53	case report/ or editorial/	3479859
54	or/48-53	13476801
55	47 not 54	2448
56	limit 55 to conference abstracts	919
57	limit 56 to yr="1974 - 2019"	683

#	Searches	Results
58	55 not 57	1765
59	limit 58 to (english or german)	1738

#	Searches	Results
1	exp backache/ or exp leg pain/	175720
2	exp diabetic neuropathy/	27085
3	exp peripheral neuropathy/	79580
4	(((back or musculoskel* or intractabl* or leg or neuropath* or phantom limb or fantom limb or complex or regional or spinal cord) adj4 pain) or CRPS).mp.	216131
5	(sciatica or back-ache or back*ache or lumbago or FBSS or PSPS or (diabet* adj3 neuropath*) or (peripheral adj3 neuropath*) or (reflex adj4 dystroph*) or (sudeck* adj2 atroph*) or causalg* or (failed back adj4 surg*) or (failed back adj4 syndrome*) or (persistent spinal adj4 syndrome*)).mp.	170644
6	or/1-5	372015
7	exp spinal cord stimulation/	8561
8	((spinal cord adj3 (stimulat* or electrostimulat*)) or (dorsal root adj3 (stimulat* or electrostimulat*)) or SCS or Dorsal root ganglion stimulation or DRGS).mp.	29926
9	((epidural adj3 (stimulat* or electrostimulat*)) or SENZA or neuromodul*).mp.	69207
10	or/7-9	95108
11	6 and 10	9733
12	exp randomized controlled trial/	723637
13	Clinical Trial/	1040784
14	controlled clinical trial/	466733

#	Searches	Results
15	multicenter study/	332373
16	Phase 2 clinical trial/	97999
17	Phase 3 clinical trial/	61879
18	Phase 4 clinical trial/	4881
19	exp randomization/	94909
20	Single Blind Procedure/	47181
21	Double Blind Procedure/	197583
22	Crossover Procedure/	71172
23	Placebo/	383817
24	(randomi?ed controlled trial$ or rct).tw.	314362
25	(random$ adj2 allocat$).tw.	50858
26	((singl$ or doubl$ or treb$ or tripl$) adj (blind$3 or dumm$3 or mask$3)).tw.	266733
27	(crossover or cross over).tw.	117585
28	placebo$.tw.	346823
29	Prospective Study/	786059
30	Clinical study/	160007
31	exp case control study/	209691
32	longitudinal study/	176636
33	retrospective study/	1289057
34	prospective study/	786059

#	Searches	Results
35	cross-sectional study/	498476
36	cohort analysis/	879801
37	case control.ti,ab.	190891
38	(cohort adj (study or studies or analys$)).ti,ab.	421167
39	((follow up or observational) adj (study or studies)).ti,ab.	292654
40	((longitudinal or retrospective or prospective or cross sectional) adj (study or studies or review or analys$ or cohort$)).ti,ab.	1586996
41	exp post hoc analysis/	41252
42	(post adj2 hoc).mp.	81075
43	systematic review/	363671
44	meta analysis/	253493
45	(meta analy$ or metanaly$ or metaanaly$).mp.	397751
46	((systematic or evidence) adj3 (review$ or overview$)).mp.	528326
47	or/12-46	6074235
48	11 and 47	3122
49	(animal$ not human$).mp.	4441386
50	animal/ or animal experimentation/	4418349
51	(animal/ not (animal/ and human/)) or (animal$ not human$).mp.	4497019
52	animal/ or animal experiment/ or animal model/ or animal tissue/ or nonhuman/	8957815
53	(news or comment or editorial or note or case report or books or chapter or erratum).pt.	1945917
54	case report/ or editorial/	3468889

#	Searches	Results
55	or/49-54	13436497
56	48 not 55	2434
57	limit 56 to conference abstracts	912
58	limit 57 to yr="1974 - 2019"	683
59	56 not 58	1751
60	limit 59 to (english or german)	1724

eTable 3. MEDLINE search strategy (1946 to September 02, 2022)

#	Searches	Results
1	exp Back Pain/	43555
2	exp Diabetic Neuropathies/	25597
3	(((back or musculoskel* or intractabl* or neuropath* or phantom limb or leg or fantom limb or complex or regional or spinal cord) adj4 pain) or CRPS).mp.	130542
4	(sciatica or back-ache or back*ache or lumbago or FBSS or PSPS or (diabet* adj3 neuropath*) or (reflex adj4 dystroph*) or (sudeck* adj2 atroph*) or causalg* or (failed back adj4 surg*) or (failed back adj4 syndrome*) or (persistent spinal adj4 syndrome*)).mp.	41300
5	or/1-4	169954
6	exp Spinal Cord Stimulation/	1601
7	((spinal cord adj3 (stimulat* or electrostimulat*)) or (dorsal root adj3 (stimulat* or electrostimulat*)) or SCS or Dorsal root ganglion stimulation or DRGS).mp.	19322
8	((epidural adj3 (stimulat* or electrostimulat*)) or SENZA or neuromodul*).mp.	23965

#	Searches	Results
9	or/6-8	41929
10	5 and 9	3472
11	exp Randomized Controlled Trial/	577753
12	exp Random Allocation/	106876
13	Clinical Trial/	536037
14	controlled clinical trial/	95017
15	multicenter study/	325200
16	Single blind method/	32166
17	Double blind method/	172937
18	Placebo$.tw.	238824
19	(randomi?ed controlled trial$ or rct).tw.	238414
20	(random$ adj2 allocat$).tw.	41375
21	((singl$ or doubl$ or treb$ or tripl$) adj (blind$3 or dumm$3 or mask$3)).tw.	191174
22	(crossover or cross over).tw.	94811
23	prospective studies/	637627
24	Clinical study/	5253
25	exp Case-Control Studies/	1350259
26	longitudinal studies/	160223
27	retrospective studies/	1055535
28	cross-sectional studies/	438802
29	cohort studies/	318262

#	Searches	Results
30	case control.ti,ab.	146191
31	(cohort adj (study or studies or analys$)).ti,ab.	292829
32	((follow up or observational) adj (study or studies)).ti,ab.	199104
33	((longitudinal or retrospective or prospective or cross sectional) adj (study or studies or review or analys$ or cohort$)).ti,ab.	1061586
34	(post adj2 hoc).mp.	42468
35	systematic review/	206003
36	meta analysis/	166784
37	(meta analy$ or metanaly$ or metaanaly$).mp.	279280
38	((systematic or evidence) adj3 (review$ or overview$)).mp.	343294
39	or/11-38	4484767
40	10 and 39	1039
41	(animal$ not human$).mp.	4801419
42	animal/ or animal experimentation/	7162521
43	(animal/ not (animal/ and human/)) or (animal$ not human$).mp.	5112604
44	animal/ or animal experiment/ or animal model/ or animal tissue/ or nonhuman/	7162860
45	(news or comment or editorial or note or case reports or books or chapter or erratum).pt.	3870035
46	historical article/ or case reports/ or editorial/	3259704
47	or/41-46	11242121
48	40 not 47	946
49	limit 48 to (english or german)	933

eTable 4. Cochrane search strategy (2005 to August 31, 2022)

#	Searches	Results
1	exp Back Pain/	5706
2	exp Diabetic Neuropathies/	2325
3	(((back or musculoskel* or intractabl* or leg or neuropath* or phantom limb or leg or fantom limb or complex or regional or spinal cord) adj4 pain) or CRPS).mp.	28652
4	(sciatica or back-ache or back*ache or lumbago or FBSS or PSPS or (diabet* adj3 neuropath*) or (reflex adj4 dystroph*) or (sudeck* adj2 atroph*) or causalg* or (failed back adj4 surg*) or (failed back adj4 syndrome*) or (persistent spinal adj4 syndrome*)).mp.	10792
5	or/1-4	36033
6	exp Spinal Cord Stimulation/	92
7	((spinal cord adj3 (stimulat* or electrostimulat*)) or (dorsal root adj3 (stimulat* or electrostimulat*)) or SCS or Dorsal root ganglion stimulation or DRGS).mp.	1726
8	((epidural adj3 (stimulat* or electrostimulat*)) or SENZA or neuromodul*).mp.	3215
9	or/6-8	4655
10	5 and 9	926
11	(animal$ not human$).mp.	5075
12	animal/ or animal experimentation/	11236
13	(animal/ not (animal/ and human/)) or (animal$ not human$).mp.	16261
14	animal/ or animal experiment/ or animal model/ or animal tissue/ or nonhuman/	11243
15	(news or comment or editorial or note or case reports or books or chapter or erratum).pt.	5155
16	or/11-15	21410
17	10 not 16	921
18	limit 17 to (english or german) [Limit not valid in CDSR; records were retained]	918

eTable 5. Summary of available patient characteristics across included studies

N	Study name (NCT/trial registration number)	Population for baseline characteristics	Clinical condition	Site of pain	Mean age, years (range)	Male, n (%)	Mean time since FBSS/surgery onset, years (range)
1	PROCESS (ISRCTN77527324)	SCS+CMM, N=52	Neuropathic pain, FBSS	Leg and back	48.90 (SD=10.00)	30 (58.00)	4.7 (SD=5.10)
		CMM, N=48	Neuropathic pain, FBSS	Leg and back	48.90 (SD=10.00)	30 (58.00)	4.7 (SD=5.10)
2	SENZA-PDN (NCT03228420)	10 kHz SCS + CMM, N=113	Neuropathic pain, PDN	Leg	60.70 (55-70, SD=11.40)	70 (61.90)	NR
		CMM, N= 103	Neuropathic pain, PDN	Leg	60.80 (55-67.5, SD=9.90)	66 (64.10)	NR
3	de Vos 2014 (ISRCTN03269533)	SCS + CMP, N=40	Neuropathic pain, PDN	Leg	58.00 (SD=11.00)	25 (62.50)	NR
		CMP, N=20	Neuropathic pain, PDN	Leg	61.00 (SD=12.00)	13 (65.00)	NR
4	PROMISE (NCT01697358)	SCS + OMM, N=110	Neuropathic pain, FBSS	Back and leg	52.80 (SD=12.50)	42 (38.20)	5.30 (SD=6.2)
		OMM, N=108	Neuropathic pain, FBSS	Back and leg	55.10 (SD=10.20)	44 (40.70)	5.60 (SD=5.5)
5	Slangen 2014 (NCT01162993)	SCS + BMT, N=22	Neuropathic pain, PDPN	Lower limb	57.10 (SD=12.40)	15 (68.00)	NR
		BMT, N=14	Neuropathic pain, PDPN	Lower limb	56.50 (SD=8.00)	9 (64.00)	NR
6	Kapural 2022 (NCT03680846)	10 kHz SCS + CMM, N=83	Neuropathic pain, NSRBP	Back and leg	Median=53.00 (29-87)	36 (47.40)	NR
		CMM, N=76	Neuropathic pain, NSRBP	Back and leg	Median=58.50 (26-77)	23 (46.00)	NR
7	De Andres 2017 (NR)	High- Frequency SCS, N=26	Neuropathic pain, FBSS	Mainly axial low back pain or radiating leg pain	51.62 (SD=9.31)	15 (57.70)	NR
		Conventional SCS, N=29	Neuropathic pain, FBSS	Mainly axial low back pain or radiating leg pain	53.79 (SD=11.46)	11 (37.90)	NR

N	Study name (NCT/trial registration number)	Population for baseline characteristics	Clinical condition	Site of pain	Mean age, years (range)	Male, n (%)	Mean time since FBSS/surgery onset, years (range)
8	SURF (NR)	High-frequency (10-kHz stimulation) WSCS, N=50	Neuropathic pain, FBSS	Chronic back or back and leg pain	59.40 (SD=12.00)	23 (46.00)	NR
		Low frequency (10-1500-Hz) WSCS, N=49	Neuropathic pain, FBSS	Chronic back or back and leg pain	59.00 (SD=11.00)	27 (55.00)	NR
9	Al-kaisy 2021 (NR)	SCS 10 kHz + CMM, N=NR	Non-neuropathic pain, chronic NSRBP	Back and leg	NR	NR	NR
		CMM, N=NR	Non-neuropathic pain, chronic NSRBP	Back and leg	NR	NR	NR
10	Evoke (NCT02924129)	Closed-loop SCS (ECAP-controlled), N=67	Mixed population, Chronic, intractable pain of the back and legs	Leg and back	54.60 (SD=9.70)	34 (51.00)	NR
		Open-loop SCS (manual stimulation), N=67	Mixed population, Chronic, intractable pain of the back and legs	Leg and back	55.90 (SD=11.60)	35 (52.00)	NR
11	SENZA-RCT (NCT01609972)	High-frequency Therapy SCS, N=101	Mixed population, Chronic, intractable pain of the trunk and/or limbs	Limbs and trunk	54.60 (SD=12.40)	35 (38.00)	NR
		Low-frequency Therapy SCS, N=97	Mixed population, Chronic, intractable pain of the trunk and/or limbs	Limbs and trunk	55.20 (SD=13.40)	36 (41.40)	NR

N	Study name (NCT/trial registration number)	Population for baseline characteristics	Clinical condition	Site of pain	Mean age, years (range)	Male, n (%)	Mean time since FBSS/surgery onset, years (range)
12	SGX-SCS-RCT (NCT03606187)	DTM SCS, N=67	Mixed population, Chronic LBP, and leg pain	Back and leg	61.28 (SD=12.16)	33 (49.30)	NR
		Traditional SCS, N=61	Mixed population, Chronic LBP, and leg pain	Back and leg	60.66 (SD=11.77)	27 (44.30)	NR
13	SUNBURST (NCT02011893)	Burst stimulation SCS, N=55	Mixed population, Chronic intractable pain in the limbs and trunk	Limbs and trunk	60.40 (SD=13.40)	24 (43.60)	NR
		Tonic stimulation SCS, N=45	Mixed population, Chronic intractable pain in the limbs and trunk	Limbs and trunk	58.80 (SD=13.60)	19 (42.20)	NR

Abbreviations: µS, Microseconds; BMT, Best medical treatment; CMM, Conventional medical management; CMP, Conventional medical practice; CRPS, Complex regional pain syndrome; CRPS I, Complex regional pain syndrome type I; DRGS, Dorsal root ganglion stimulation; DTM SCS, Differential Target Multiplexed spinal cord stimulation; ECAP, Evoked compound action potential; FBSS, Failed Back Surgery Syndrome; kHz, Kilohertz; LBP, Low back pain; NR, Not reported; NRS, Numeric Rating Scale; NSRBP, Non-surgical refractory back pain; OMM, Optimal Medical Management; PDN, Painful diabetic neuropathy; PDPN, Painful diabetic peripheral neuropathy; PNFS, Peripheral nerve field stimulation; SCS, Spinal cord stimulation; SCS CME, Conventional spinal cord stimulation method; SCS EME, Experimental spinal cord stimulation method; SD, Standard deviation; SLR, Systematic literature review; WSCS, Wireless extracorporeal SCS

eTable 6. Study results for evidence synthesis of the included studies

N	Study name (NCT/trial registration number)	Treatments, sample size, N	Timepoints	Pain site	Sample size, n	Pain reduction/relief ≥50%, n (%)	Pain intensity/scores, mean (SD)	EQ-5D index score, mean (SD)	Disability (ODI), mean (SD)
1	PROCESS (ISRCTN77527324)	SCS+CMM	3 months	Back	50	VAS: 28 (56.0)	VAS: 41.02 (NR)	0.49 (0.32)	43.03 (15.65)
				Leg		VAS: 28 (56.0)	VAS: 35.1 (NR)		
			6 months	Back		VAS: 14 (28.0)	VAS: 40.6 (24.9)	0.47 (0.32)	44.9 (18.8)
				Leg		VAS: 24 (48.0)	VAS: 39.9 (26.3)		
			12 months	Back	NR	NR	NR	NR	NR
				Leg	47	VAS: 16 (34.0)	NR	NR	NR
			24 months	Back	NR	NR	NR	NR	NR
				Leg	52	VAS: 17 (32.7)	NR	NR	NR
		CMM	3 months	Back	44	VAS: 4 (9.1)	VAS: 51.07 (NR)	0.22 (0.32)	55.76 (46.65)
				Leg		VAS: 4 (9.1)	VAS: 68.66 (NR)		
			6 months	Back		VAS: 5 (11.4)	VAS: 51.6 (26.7)	0.25 (0.32)	56.1 (17.9)
				Leg		VAS: 4 (9.1)	VAS: 66.6 (24)		
			12 months	Back	NR	NR	NR	NR	NR
				Leg	41	VAS: 3 (7.1)	NR	NR	NR
			24 months	Back	NR	NR	NR	NR	NR
				Leg	48	VAS: 8 (16.7)	NR	NR	NR
2			3 months	Back	NR	NR	NR		NR

N	Study name (NCT/trial registration number)	Treatments, sample size, N	Timepoints	Pain site	Sample size, n	Pain reduction/relief ≥50%, n (%)	Pain intensity/scores, mean (SD)	EQ-5D index score, mean (SD)	Disability (ODI), mean (SD)
	SENZA-PDN (NCT03228420)	10 kHz SCS + CMM		Leg	88	VAS: 78 (88.6)	NR	0.77 (0.14)	
			6 months	Back	NR	NR	NR	0.77 (0.12)	NR
				Leg	87	VAS: 74 (85.1)	VAS: 1.7 (1.9)		
		CMM	3 months	Back	NR	NR	NR	0.62 (0.15)	NR
				Leg	96	VAS: 7 (72.9)	NR		
			6 months	Back	NR	NR	NR	0.60 (0.15)	NR
				Leg	93	VAS: 5 (5.4)	VAS: 6.9 (2.1)		
3	de Vos 2014 (ISRCTN03269533)	SCS + CMP	3 months	Back	NR	NR	NR	NR	NR
				Leg	NR	NR	VAS: 28.8 (95.2)		
			6 months	Back	NR	NR	NR	0.65 (0.28)	NR
				Leg	40	VAS: 25 (62.5)	VAS: 31 (28)		
		CMP	3 months	Back	NR	NR	NR	NR	NR
				Leg	NR	NR	VAS: 70.5 (65.3)		
			6 months	Back	NR	NR	NR	0.44(0.33)	NR
				Leg	20	VAS: 1 (5.0)	VAS: 67 (21)		
4	PROMISE (NCT01697358)	SCS + OMM	3 months	Back	NR	NR	NR	NR	NR
				Leg	NR	NR	NR		

N	Study name (NCT/trial registration number)	Treatments, sample size, N	Timepoints	Pain site	Sample size, n	Pain reduction/relief ≥50%, n (%)	Pain intensity/scores, mean (SD)	EQ-5D index score, mean (SD)	Disability (ODI), mean (SD)
			6 months	Back	110	VAS: 15 (13.6)	VAS: 6.0 (2.1)	0.49 (0.27)	46.9 (17.1)
				Leg	110	VAS: 33 (30.0)	VAS: 4.2 (2.4)		
		OMM	3 months	Back	NR	NR	NR	NR	NR
				Leg	NR	NR	NR		
			6 months	Back	108	VAS: 5 (4.6)	7.2 (1.9)	0.38 (0.27)	53.1 (17.9)
				Leg	108	VAS: 9 (8.3)	VAS: 5.4 (2.4)		
5	Slangen 2014 (NCT01162993)	SCS + BMT	3 months	Back	NR	NR	NR	0.54 (0.37)	NR
				Leg	22	VAS: 16 (72.7)	VAS: 3.4 (2.6)		
			6 months	Back	NR	NR	NR	0.50 (0.38)	NR
				Leg	22	VAS: 13 (59.1)	VAS: 3.95 (3.0)		
		BMT	3 months	Back	NR	NR	NR	0.41 (0.34)	NR
				Leg	14	VAS: 0 (0)	6.8 (1.9)		
			6 months	Back	NR	NR	NR	0.33 (0.34)	NR
				Leg	14	VAS: 1 (7.1)	6.45 (2.0)		
6	Kapural 2022 (NCT03680846)	10 kHz SCS + CMM, N=83	3 months	NR	NR	NR	NR	0.79 (0.55)	NR
				NR	NR	NR	NR		
			6 months	NR	NR	NR	NR	0.78 (0.45)	NR
				NR	NR	NR	NR		

N	Study name (NCT/trial registration number)	Treatments, sample size, N	Timepoints	Pain site	Sample size, n	Pain reduction/relief ≥50%, n (%)	Pain intensity/scores, mean (SD)	EQ-5D index score, mean (SD)	Disability (ODI), mean (SD)
		CMM, N=76	3 months	NR	NR	NR	NR	0.56 (0.64)	NR
				NR	NR	NR	NR		
			6 months	NR	NR	NR	NR	0.52 (0.71)	NR
				NR	NR	NR	NR		
7	De Andres 2017 (NR)	High-Frequency SCS, N=26	3 months	Back	NR	NR	NRS: 5.98 (2.6)	NR	21.85 (8.59)
				Leg	NR	NR	NRS: 5.98 (2.6)		
			6 months	Back	NR	NR	NRS: 5.83 (2.2)	NR	22.9 (6.7)
				Leg	NR	NR	NRS: 5.83 (2.2)		
		Conventional SCS, N=29	3 months	Back	NR	NR	NRS: 5.71 (1.7)	NR	20.55 (8.32)
				Leg	NR	NR	NRS: 5.71 (1.7)		
			6 months	Back	NR	NR	NRS: 5.78 (1.9)	NR	21.1 (9.9)
				Leg	NR	NR	NRS: 5.78 (1.9)		
8	SURF (NR)	High-frequency (10-kHz stimulation) WSCS, N=50	3 months	Back	NR	NR	VAS: 22.6 (13.6)	NR	NR
				Leg	NR	NR	VAS: 21.7 (20.6)		
			6 months	Back	38	VAS: 35 (92.1)	VAS: 17.8 (14.1)	NR	NR
				Leg	NR	NR	VAS: 13.3 (14.1)		
		Low frequency (10-1500-	3 months	Back	NR	NR	VAS: 29.6 (16.6)	NR	NR
				Leg	NR	NR	VAS: 26.5 (24.3)		

N	Study name (NCT/trial registration number)	Treatments, sample size, N	Timepoints	Pain site	Sample size, n	Pain reduction/relief ≥50%, n (%)	Pain intensity/scores, mean (SD)	EQ-5D index score, mean (SD)	Disability (ODI), mean (SD)
		Hz) WSCS, N=49	6 months	Back	34	VAS: 28 (82.4)	VAS: 27.8 (23.2)	NR	NR
				Leg	NR	NR	VAS: 22.3 (24.4)		
9	Al-kaisy 2021 (NR)	SCS 10 kHz + CMM, N=NR	3 months	Back	NR	NR	NR	NR	NR
				Leg	NR	NR	1.3 (NR)		
			6 months	Back	NR	NR	NR	NR	NR
				Leg	NR	NR	1.8 (NR)		
		CMM, N=NR	3 months	Back	NR	NR	NR	NR	NR
				Leg	NR	NR	6.5 (NR)		
			6 months	Back	NR	NR	NR	NR	NR
				Leg	NR	NR	6.5 (NR)		
10	Evoke (NCT02924129)	Closed-loop SCS (ECAP-controlled), N=67	3 months	Back	62	VAS: 50 (80.6)	VAS: 22.7 (10.2)	0.67 (0.15)	NR
				Leg	62	VAS: 50 (80.6)	VAS: 82.2 (10.8)		
			6 months	Back	NR	NR	NR	NR	NR
				Leg	NR	NR	NR		
			12 months	Back	NR	NR	NR	NR	NR
				Leg	59	VAS: 49 (83.1)	NR		
			24 months	Back	NR	NR	NR	NR	NR

N	Study name (NCT/trial registration number)	Treatments, sample size, N	Timepoints	Pain site	Sample size, n	Pain reduction/relief ≥50%, n (%)	Pain intensity/scores, mean (SD)	EQ-5D index score, mean (SD)	Disability (ODI), mean (SD)
				Leg	59	VAS: 49 (83.1)	NR		
		Open-loop SCS (manual stimulation), N=67	3 months	Back	63	VAS: 36 (57.1)	VAS: 34.1 (11.2)	0.66 (0.12)	NR
				Leg	63	VAS: 43 (81.1)	VAS: 80.0 (9.9)		
			6 months	Back	NR	NR	NR	NR	NR
				Leg	NR	NR	NR		
			12 months	Back	NR	NR	NR	NR	NR
				Leg	59	VAS: 36 (61.0)	NR		
			24 months	Back	NR	NR	NR	NR	NR
				Leg	54	VAS: 34 (63.0)	NR		
11	SENZA-RCT (NCT01609972)	High-frequency Therapy SCS, N=101	3 months	Back	90	VAS: 76 (84.4)	VAS: 2.22 (1.75)	NR	NR
				Leg	90	VAS: 75 (83.3)	VAS: 1.87 (2.0)		
			6 months	Back	90	VAS: 69 (76.7)	VAS: 2.62 (1.75)	NR	NR
				Leg	90	VAS: 73 (81.1)	VAS: 2.3 (2.0)		
			12 months	Back	NR	NR	NR	NR	NR
				Leg	90	VAS: 71 (78.9)	NR		
			24 months	Back	NR	NR	NR	NR	NR
				Leg	85	VAS: 62 (72.9)	NR		

N	Study name (NCT/trial registration number)	Treatments, sample size, N	Timepoints	Pain site	Sample size, n	Pain reduction/relief ≥50%, n (%)	Pain intensity/scores, mean (SD)	EQ-5D index score, mean (SD)	Disability (ODI), mean (SD)
		Low-frequency Therapy SCS, N=97	3 months	Back	81	VAS: 35 (43.2)	VAS: 4.23 (2.05)	NR	NR
				Leg	81	VAS: 45 (55.6)	VAS: 3.43 (2.1)		
			6 months	Back	81	VAS: 42 (51.9)	VAS: 4.2 (2.05)	NR	NR
				Leg	81	VAS: 44 (54.3)	VAS: 3.52 (2.1)		
			12 months	Back	NR	NR	NR	NR	NR
				Leg	81	VAS: 42 (51.9)	NR		
			24 months	Back	NR	NR	NR	NR	NR
				Leg	71	VAS: 35 (49.3)	NR		
12	SGX-SCS-RCT (NCT03606187)	DTM SCS, N=67	3 months	Back	67	VAS: 54 (80.6)	VAS: 1.91 (1.04)	NR	NR
				Leg	67	VAS: 52 (77.6)	VAS: 2.07 (1.9)		
			6 months	Back	67	VAS: 50 (74.6)	VAS: 2.39 (3.8)	NR	NR
				Leg	33	VAS: 25 (75.8)	VAS: 2.08 (1.5)		
			12 months	Back	NR	NR	NR	NR	NR
				Leg	67	VAS: 53 (79.1)	NR		
		Traditional SCS, N=61	3 months	Back	61	VAS: 31 (50.8)	VAS: 3.95 (1.2)	NR	NR
				Leg	61	VAS: 44 (72.1)	VAS: 2.58 (1.8)		
			6 months	Back	61	VAS: 31 (50.8)	VAS: 3.86 (1.4)	NR	NR

N	Study name (NCT/trial registration number)	Treatments, sample size, N	Timepoints	Pain site	Sample size, n	Pain reduction/relief ≥50%, n (%)	Pain intensity/scores, mean (SD)	EQ-5D index score, mean (SD)	Disability (ODI), mean (SD)
				Leg	39	VAS: 24 (61.5)	VAS: 2.58 (1.8)		
			12 months	Back	NR	NR	NR	NR	NR
				Leg	61	VAS: 46 (75.4)	NR		
13	SUNBURST (NCT02011893)	Burst stimulation SCS, N=55	3 months	Back	NR	NR	VAS: 40.6 (25.5)	NR	NR
				Leg	NR	NR	VAS: 33.71 (3.73)		
			6 months	Back	NR	NR	NR	NR	NR
				Leg	NR	NR	NR		
		Tonic stimulation SCS, N=45	3 months	Back	NR	NR	VAS: 42.62 (20.7)	NR	NR
				Leg	NR	NR	VAS: 35.76 (3.52)		
			6 months	Back	NR	NR	NR	NR	NR
				Leg	NR	NR	NR		

Abbreviations: µS, Microseconds; BMT, Best medical treatment; CMM, Conventional medical management; CMP, Conventional medical practice; CRPS, Complex regional pain syndrome; CRPS I, Complex regional pain syndrome type I; DRGS, Dorsal root ganglion stimulation; DTM SCS, Differential Target Multiplexed spinal cord stimulation; ECAP, Evoked compound action potential; FBSS, Failed Back Surgery Syndrome; kHz, Kilohertz; LBP, Low back pain; NR, Not reported; NRS, Numeric Rating Scale; NSRBP, Non-surgical refractory back pain; OMM, Optimal Medical Management; PDN, Painful diabetic neuropathy; PDPN, Painful diabetic peripheral neuropathy; PNFS, Peripheral nerve field stimulation; SCS, Spinal cord stimulation; SCS CME, Conventional spinal cord stimulation method; SCS EME, Experimental spinal cord stimulation method; SD, Standard deviation; SLR, Systematic literature review; WSCS, Wireless extracorporeal SCS

eTable 7. Prior distributions used in the Bayesian NMAs for all outcomes.

Outcome	Timepoint	Intercept	Treatment	Tau (only for RE)
Proportion of patients achieving ≥50% pain reduction in back	3 months	Normal (0, 4)	Normal (0, 4)	Half-Normal (0, 4)
	6 months	Normal (0, 4)	Normal (0, 4)	Half-Normal (0, 4)
Proportion of patients achieving ≥50% pain reduction in leg	3 months	Normal (0, 4)	Normal (0, 4)	Half-Normal (0, 4)
	6 months	Normal (0, 4)	Normal (0, 4)	Half-Normal (0, 4)
	12 months	Normal (0, 4)	Normal (0, 4)	Half-Normal (0, 4)
	24 months	Normal (0, 4)	Normal (0, 4)	Half-Normal (0, 4)
Pain intensity in back	3 months	Normal (0, 100)	Normal (0, 10)	Half-Normal (0, 5)
	6 months	Normal (0, 100)	Normal (0, 10)	Half-Normal (0, 5)
Pain intensity in leg	3 months	Normal (0, 100)	Normal (0, 10)	Half-Normal (0, 5)
	6 months	Normal (0, 100)	Normal (0, 10)	Half-Normal (0, 5)
EQ-5D index score	3 months	Normal (0, 100)	Normal (0, 10)	Half-Normal (0, 5)
	6 months	Normal (0, 100)	Normal (0, 10)	Half-Normal (0, 5)
Functional disability (ODI)	3 months	Normal (0, 100)	Normal (0, 10)	Half-Normal (0, 5)
	6 months	Normal (0, 100)	Normal (0, 10)	Half-Normal (0, 5)

Abbreviations: EQ-5D: Euroqol 5-Dimensions; NMA: network meta-analysis; RE: random effects; ODI: Oswestry Disability Index

Note: all distributions parameters are presented as follows: Normal (μ, σ^2)

eTable 9. Matrix of Bayesian NMA results for all follow-up assessment timepoints

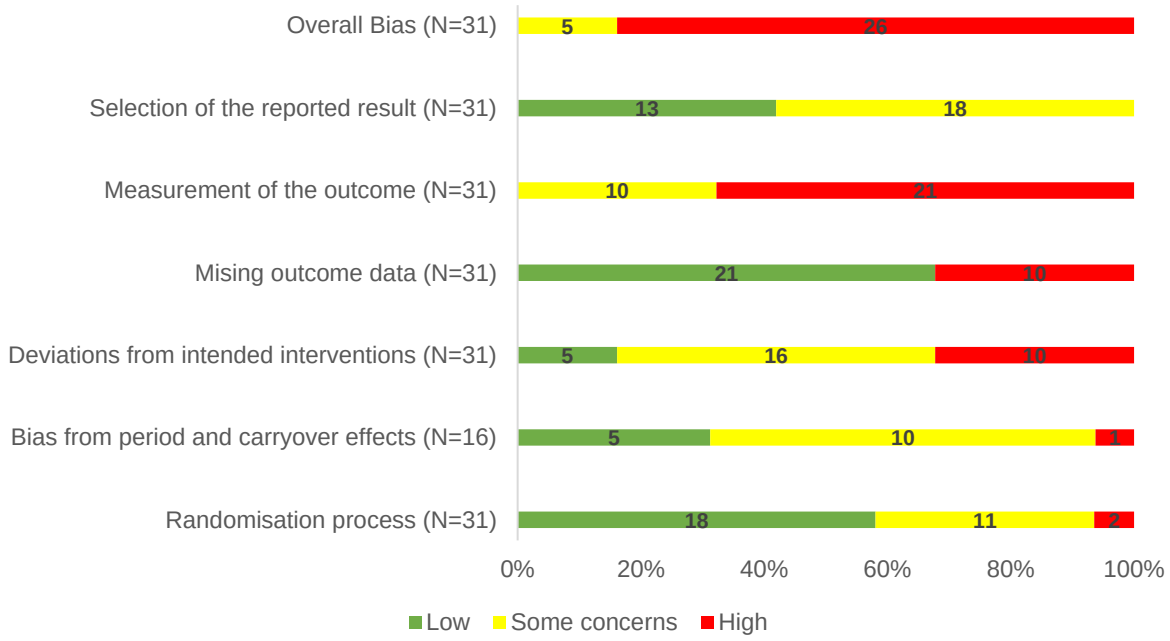
Proportion of patients achieving ≥50% pain reduction in back (OR, 95%CrI) 3 months assessment timepoint		
Conventional SCS	0.21 (0.13, 0.33)	10.03 (3.60, 31.43)
4.68 (3.03, 7.46)	**Novel SCS**	47.05 (15.58, 160.09)
0.10 (0.03, 0.28)	0.02 (0.01, 0.06)	**CMM**
Model	Fixed effects	
DIC	14.53	
Proportion of patients achieving ≥50% pain reduction in back (OR, 95%CrI) 6 months assessment timepoint		
Conventional SCS	0.34 (0.21, 0.55)	3.00 (1.49, 6.72)
2.92 (1.83, 4.71)	**Novel SCS**	8.76 (3.84, 22.31)
0.33 (0.15, 0.67)	0.11 (0.04, 0.26)	**CMM**
Model	Fixed effects	
DIC	14.07	
Proportion of patients achieving ≥50% pain reduction in leg (OR, 95%CrI) 3 months assessment timepoint		
Conventional SCS	0.40 (0.26, 0.60)	26.97 (13.05, 59.88)
2.53 (1.65, 3.89)	**Novel SCS**	68.43 (33.92,149.88)
0.04 (0.02, 0.08)	0.01 (0.01, 0.03)	**CMM**
Model	Fixed effects	
DIC	24.41	
Proportion of patients achieving ≥50% pain reduction in leg (OR, 95%CrI) 6 months assessment timepoint		
Conventional SCS	0.67 (0.05, 12.99)	6.93 (0.67, 49.35)
1.50 (0.08, 21.49)	**Novel SCS**	10.13 (0.45, 129.31)
0.14 (0.02, 1.50)	0.10 (0.01, 2.24)	**CMM**
Model	Random effects	
DIC	26.15	
Proportion of patients achieving ≥50% pain reduction in leg (OR, 95%CrI) 12 months assessment timepoint		
Conventional SCS	0.40 (0.25, 0.61)	5.32 (1.83,18.53)
2.52 (1.64, 3.96)	**Novel SCS**	13.45 (4.24,50.43)
0.19 (0.05, 0.55)	0.07 (0.02, 0.24)	**CMM**
Model	Fixed effects	
DIC	15.61	
Proportion of patients achieving ≥50% pain reduction in leg (OR, 95%CrI) 24 months assessment timepoint		
Conventional SCS	0.35 (0.20, 0.60)	2.32 (0.93, 6.05)
2.82 (1.65, 4.90)	**Novel SCS**	6.58 (2.28,19.54)
0.43 (0.17, 1.08)	0.15 (0.05, 0.44)	**CMM**
Model	Fixed effects	
DIC	10.02	
Pain intensity in back (MD, 95%CrI) 3 months assessment timepoint		
Conventional SCS	1.07 (-0.15,2.14)	-0.99 (-3.77,1.81)
-1.07 (-2.14,0.15)	**Novel SCS**	-2.05 (-4.96,1.06)
0.99 (-1.81,3.77)	2.05 (-1.06,4.96)	**CMM**
Model	Random effects	

DIC	27.97	
Pain intensity in back (MD, 95%CrI) 6 months assessment timepoint		
Conventional SCS	1.17 (0.77, 1.58)	-1.17 (-1.64, -0.70)
-1.17 (-1.58,-0.77)	**Novel SCS**	-2.34 (-2.96, -1.73)
1.17 (0.70, 1.64)	2.34 (1.73, 2.96)	**CMM**
Model	Fixed effects	
DIC	23.87	
Pain intensity in leg (MD, 95%CrI) 3 months assessment timepoint		
Conventional SCS	0.47 (-0.18, 1.18)	-3.78 (-4.92,-2.68)
-0.47 (-1.18, 0.18)	**Novel SCS**	-4.25 (-5.51,-3.09)
3.78 (2.68, 4.92)	4.25 (3.09, 5.51)	**CMM**
Model	Random effects	
DIC	36.46	
Pain intensity in leg (MD, 95%CrI) 6 months assessment timepoint		
Conventional SCS	1.12 (0.03, 2.19)	-2.89 (-4.03, -1.81)
-1.12 (-2.19,-0.03)	**Novel SCS**	-4.01 (-5.31, -2.75)
2.89 (1.81, 4.03)	4.01 (2.75, 5.31)	**CMM**
Model	Random effects	
DIC	37.98	
EQ-5D index score (MD, 95%CrI) 3 months assessment timepoint		
Conventional SCS	0.00 (-0.05, 0.04)	0.16 (0.11, 0.22)
0.00 (-0.04, 0.05)	**Novel SCS**	0.16 (0.12, 0.20)
-0.16 (-0.22, -0.11)	-0.16 (-0.20, -0.12)	**CMM**
Model	Fixed effects	
DIC	18.01	
EQ-5D index score (MD, 95%CrI) 6 months assessment timepoint		
Conventional SCS	-0.02 (-0.09, 0.05)	0.15 (0.09, 0.21)
0.02 (-0.05, 0.09)	**Novel SCS**	0.17 (0.13, 0.21)
-0.15 (-0.21, -0.09)	-0.17 (-0.21, -0.13)	**CMM**
Model	Fixed effects	
DIC	19.49	
Functional disability (ODI) (MD, 95%CrI) 3 months assessment timepoint		
Conventional SCS	-1.75 (-6.01, 2.61)	-10.52 (-16.42, -4.75)
1.75 (-2.61, 6.01)	**Novel SCS**	-8.75 (-15.96, -1.77)
10.52 (4.75,16.42)	8.75 (1.77, 15.96)	**CMM**
Model	Fixed effects	
DIC	7.98	
Functional disability (ODI) (MD, 95%CrI) 6 months assessment timepoint		
Conventional SCS	-2.15 (-6.51, 2.24)	-7.10 (-10.91, -3.36)
2.15 (-2.24, 6.51)	**Novel SCS**	-4.98 (-10.78, 0.62)
-2.15 (-6.51, 2.24)	-7.10 (-10.91, -3.36)	**CMM**
Model	Fixed effects	

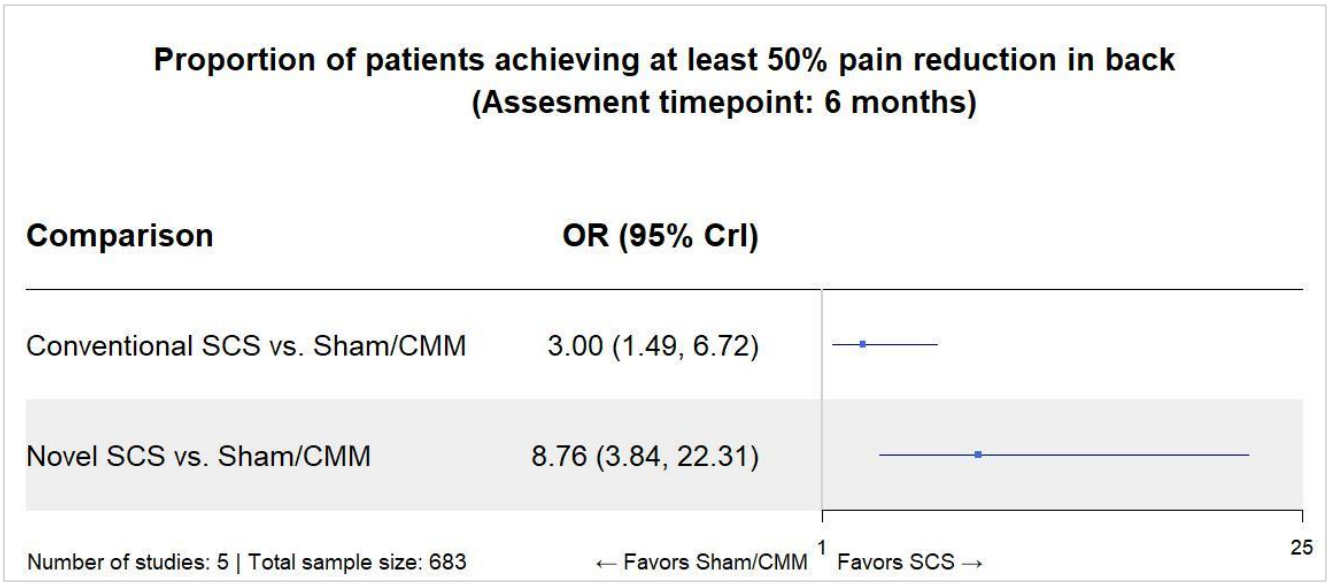
DIC	11.13

Abbreviations: CMM: conventional medical management; CrI: credible intervals; DIC: Deviance Information Criterion; EQ-5D: EuroQol 5 Dimensions; MD: median difference; ODI: Oswestry Disability Index; OR: odds ratio; SCS: spinal cord stimulation.
Table results to be read horizontally and top-to-bottom. Rows represent the intervention and column the comparator.
Categorical measures (proportion achieving ≥50% pain reduction) are summarized with odds ratios while continuous measures (pain intensity, EQ-5D, ODI) are summarized with mean differences.
GREEN cells represent favourability of SCS vs. Sham/CMM and achieved statistical superiority.
YELLOW cells represent favourability of SCS vs. Sham/CMM but did not achieve statistical superiority.

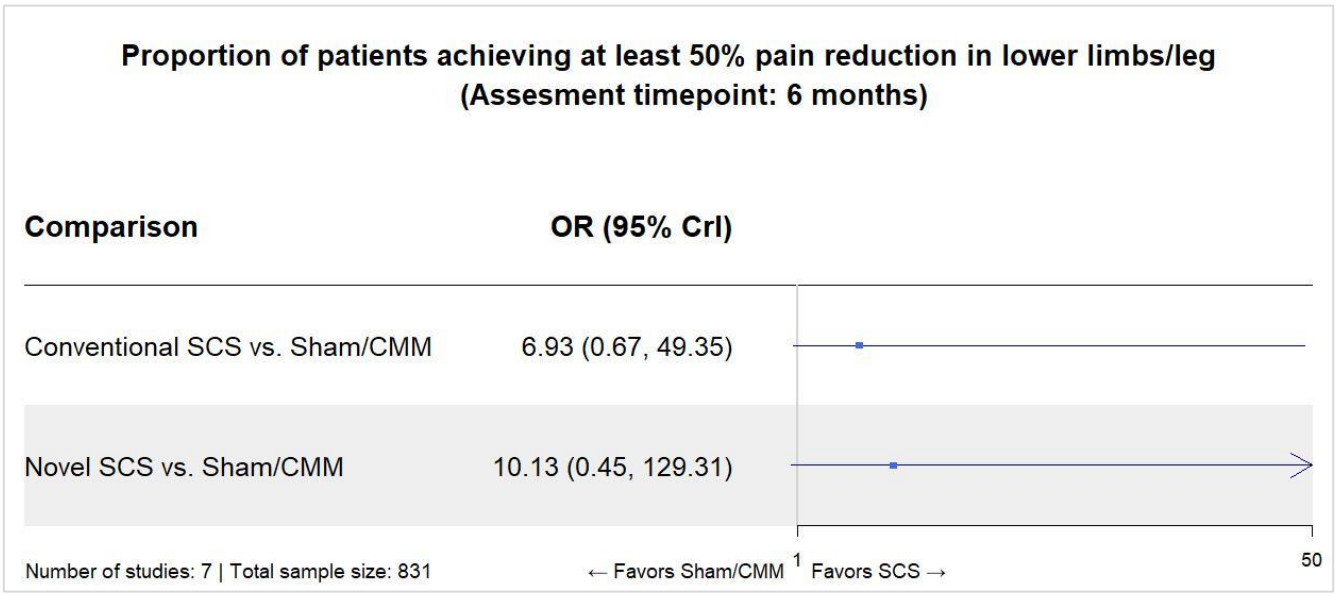
eFigure 1. Overall risk of bias across the identified studies



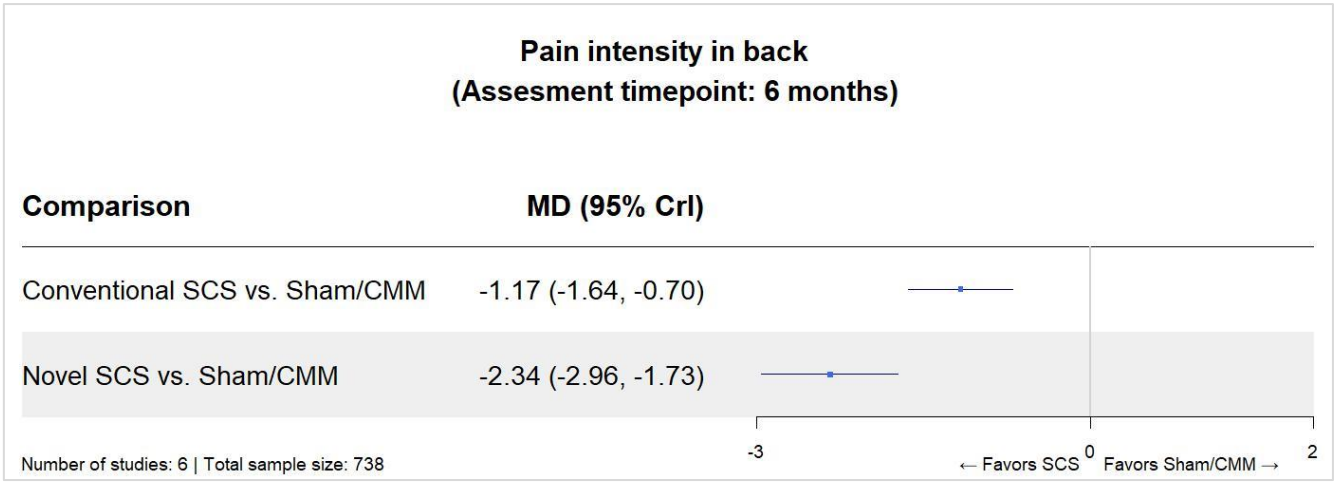
eFigure 2. Forest plot for "proportion of patients achieving at least 50% pain reduction in back", FE model (assessment timepoint: 6 months)



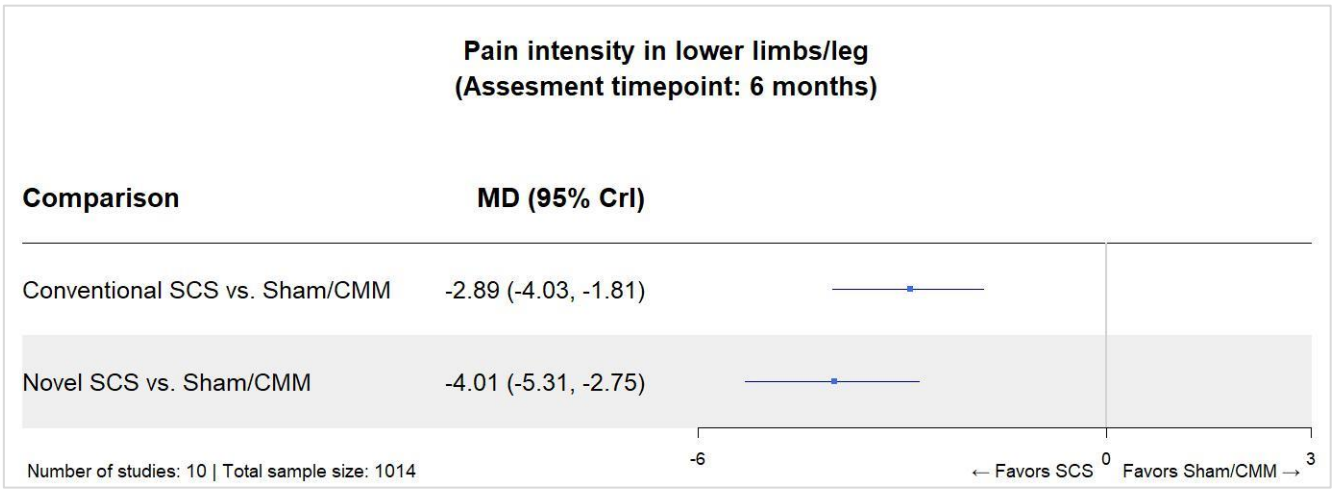
eFigure 3. Forest plot for “proportion of patients achieving at least 50% pain reduction in lower limbs/leg”, RE model (assessment timepoint: 6 months)



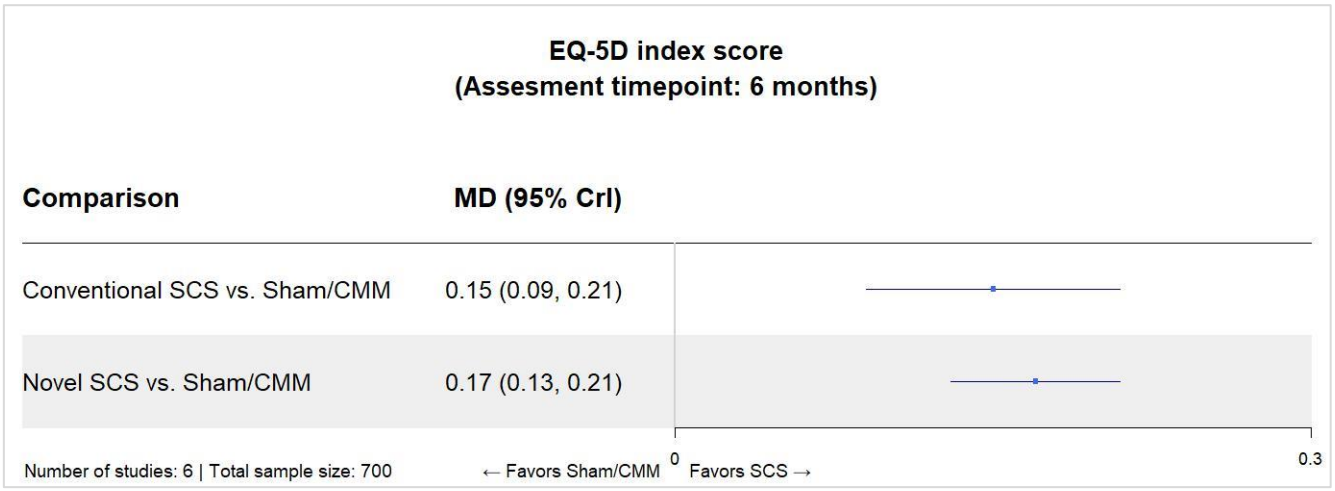
eFigure 4. Forest plot for “pain intensity score in back”, FE model (assessment timepoint: 6 months)



eFigure 5. Forest plot for “pain intensity score in lower limbs/leg”, RE model (assessment timepoint: 6 months)



eFigure 6. Forest plot for “EQ-5D index score”, FE model (assessment timepoint: 6 months)



eFigure 7. Forest plot for “functional disability: ODI score”, FE model (assessment timepoint: 6 months)