

Supplemental Table 2. Non operative interventions for neurogenic claudication due to lumbar spinal stenosis: A summary of GRADE assessment and outcomes (60 comparisons)

						Walking ability/pain/function/quality of life measures				GRADE
Studies	Risk of Bias	Consistency	Directness	Precision	Selective Reporting	Immediate up to 1w	Short-term >1w - 3m	Intermediate 3m – 1yr	Long term >1yr	
Calcitonin										
Calcitonin injection vs. placebo injection										
Eskola 1992	High	No No	Yes Yes	No No	Yes		= TWT = VAS	= TWT = VAS	= TWT = VAS	+000 +000
Porter 1983	High	No	Yes	No	Yes		? Distance walked	? Distance walked		+000
Porter 1988	High	No No	Yes Yes	No No	Yes		= Distance walked = VAS			+000 +000
Calcitonin nasal spray vs. placebo injection										
Podichetty 2004	High	No No No No	Yes Yes Yes Yes	No No No No	Yes		= Distance walked = Time walked = SF-36 = VAS			+000 +000 +000 +000
Tafazal 2007	High	No No No No No	Yes Yes Yes Yes Yes	No No No No No	No		= Shuttle walk = VAS leg = VAS back = ODI = Global			+000 +000 +000 +000 +000
Calcitonin nasal spray plus physical therapy vs. paracetamol plus physical therapy										
Sahin 2009	High	No No No	Yes Yes Yes	No No No	No		= Distance walked = VAS = RMDI			+000 +000 +000
Oral Medication										
Oral prostaglandin vs. Etodlac (NSAID)										
Matsudaira 2009	Low	No No No No No	Yes Yes Yes Yes Yes	No No No No No	Yes		> Distance walked # ? SF-36 = LBP > Leg pain > Global #			++00 +000 ++00 ++00 ++00
Methylcobalamin (vit B12) plus conservative care vs. conservative care										
Waikakul 2000	High	No	Yes	No	No			> Distance walked #	> Distance walked #	+000

Gabapentin plus physical therapy, corset & NSAIDS vs. placebo plus physical therapy, corset & NSAIDS										
Yaksi 2007	High	No	Yes	No	No		= VAS	> Distance walked > VAS	> Distance walked # > VAS #	+000 +000
Pregabalin vs. active placebo										
Markman 2015	High	No	Yes	No	No		= NPS rest/final = Distance walked = Recovery time = Global < RMDQ			+000 +000 +000 +000 +000
Gabapentin plus conservative vs. conservative plus botulinum										
Park 2017	High	No	Yes	No	No		= NPS (Back/leg) = ODI = Global			0000 0000 0000
Oxymorphone hydrochloride vs. placebo										
Markman 2015 - 2	High	No	Yes	No	No		= NPS rest/final = Distance walked = Recovery Time = ZCQ (s) = ZCQ (f) = Global			0000 0000 0000 0000 0000 0000
Propoxyphene/acetaminophen vs. placebo										
Markham 2015 - 2	High	No	Yes	No	No		= NPS rest/final = Distance walked = Recovery Time = ZCQ (s) < ZCQ (f) # = Global			0000 0000 0000 0000 0000 0000
Oxymorphone hydrochloride vs. propoxyphene/acetaminophen										
Markham 2015 - 2	High	No	Yes	No	No		= NPS rest/final = Distance walked = Recovery Time = ZCQ (s) > ZCQ (f) # = Global			0000 0000 0000 0000 0000 0000
Oral corticoid vs. placebo										

Rodrigues 2014	High	No No No No	Yes Yes Yes Yes	No No No No	No		= SF-36 = RMDQ = 6 min walk < VAS #			0000 0000 0000 0000
Rehabilitation Therapy and Multimodal Care										
Exercise plus ultrasound vs. exercise plus sham ultrasound										
Goren 2010	low	No No No No	Yes Yes Yes Yes	No No No No	No		= TWT = VAS back = VAS leg = ODI			++00 ++00 ++00 ++00
Exercise plus ultrasound vs. no treatment										
Goren 2010	Low	No No No No	Yes Yes Yes Yes	No No No No	No		= TWT = VAS back > VAS leg # > ODI			++00 ++00 ++00 ++00
Exercise plus sham ultrasound vs. no treatment										
Goren 2010	Low	No No No No	Yes Yes Yes Yes	No No No No	No		= TWT = VAS back > VAS leg # > ODI #			++00 ++00 ++00 ++00
In-patient physical therapy vs. home exercise program plus oral diclofenac										
Koc 2009	High	No No No No	Yes Yes Yes Yes	No No No No	Yes		= TWT = VAS = RMDI = NHP	= TWT = VAS = RMDI = HNP		+000 +000 +000 +000
Unweighted treadmill walking plus exercise vs. cycling plus exercise										
Pua 2007	Low	No No No No No	Yes Yes Yes Yes Yes	No No No No No	No		= Distance walked = ODI = RMDI = VAS = Global			++00 ++00 ++00 ++00 ++00
Manual therapy, exercise and unweighted treadmill vs. flexion exercise, walking and sham ultrasound										
Whitman 2006	High	No No No No	Yes Yes Yes Yes	No No No No	No		= TWT > Global # = ODI = NPRS			+000 +000 +000 +000
Supervised physical therapy vs home exercises										

Minetama 2019	High	No	Yes	No	No		> ZCQ (F) #			+000
		No	Yes	No			>ZCQ (S) #			+000
		No	Yes	No			> Distance walked #			+000
		No	Yes	No			> NPS (leg)			
		No	Yes	No			> SF-36 PF			+000
		No	Yes	No			> SF-36 BP			+000
		No	Yes	No			= Daily Steps			+000
		No	Yes	No						+000
Manual therapy & exercise vs medical care										
Schneider 2019	Low	No	Yes	Yes	No		> ZCQ #	= ZCQ		+++0
		No	Yes	Yes			= SPWT	= SPWT		+++0
		No	Yes	Yes			= PA	= PA		+++0
Manual therapy & exercise vs. community exercise										
Schneider 2019	Low	No	Yes	Yes	No		> ZCQ #	= ZCQ		+++0
		No	Yes	Yes			= SPWT	= SPWT		+++0
		No	Yes	Yes			= PA	= PA		+++0
Community exercise vs. medical care										
Schneider 2019	Low	No	Yes	Yes	No		= ZCQ	= ZCQ		+++0
		No	Yes	Yes			= SPWT	= SPWT		+++0
		No	Yes	Yes			> PA	= PA		+++0
Comprehensive therapy and exercise vs. self-directed exercise										
Ammendolia 2018	Low	No	Yes	Yes	No	> SPWT #	> SPWT #	> SPWT #	> SPWT #	+++0
		No	Yes	Yes		> 30% SPWT	> 30% SPWT	> 30% SPWT	>30% SPWT	+++0
		No	Yes	Yes		> 50% SPWT	= 50% SPWT	= 50% SPWT	> 50% SPWT	+++0
		No	Yes	Yes		> ZCQ (s)	= ZCQ (s)	= ZCQ (s)	> ZCQ (f) #	+++0
		No	Yes	Yes		= ZCQ (f)	= ZCQ (f)	= ZCQ (f)	> ZCQ (s) +	+++0
		No	Yes	Yes		= ODI	= ODI	> ODI (walk)	ZCQ (f)	+++0
		No	Yes	Yes		> NPS (back) #	= NPS (back)	= NPS (back)	= ODI	+++0
		No		Yes		= NPS (leg)	= NPS (leg)	= NPS (leg)	= NPS (back)	+++0
		No				= SF-36 BP	= SF-36 BP	= SF-36 BP	> SF-36 BP #	+++0
		No				= SF-36 PF	> SF-36 PF #	= SF-36 PF	>SF-36 PF #	+++0
Standard exercise vs. isokinetic exercises										
Oğuz 2013	High	No	Yes	No	Yes	= VAS	= VAS	= VAS		0000
		No	Yes	No		= ODI	= ODI	= ODI		0000
		No	Yes	No		= TWT	= TWT	= TWT		0000
Standard exercise vs. unloaded exercise										
Oğuz 2013	High	No	Yes	No	Yes	< VAS	< VAS	= VAS		0000
		No	Yes	No		< ODI	= ODI	= ODI		0000
		No	Yes	No		= TWT	= TWT	= TWT		0000

Isokinetic exercises vs. unloaded exercises										
Oğuz 2013	High	No	Yes	No	Yes	< VAS	= VAS	= VAS		0000
		No	Yes	No		< ODI	< ODI	= ODI		0000
		No	Yes	No		< TWT #	< TWT	= TWT		0000
Aquatic physical therapy exercise vs. physical therapy										
Homayouni 2015	High	No	Yes	No	Yes	> VAS #	= VAS			0000
		No	Yes	No		> Distance walked	= Distance walked			0000
Pre-surgical exercise program vs. routine preoperative hospital management										
Marchand 2019	High	No	Yes	No	Yes	> NPS (leg) #	= NPS (leg)	= NPS (leg)		0000
		No	Yes	No		> Duration walked #	= Duration walked	= Duration walked		0000
Gang-Chuk Tang (herbal concoction), daily Mokuri Chuna therapy, daily acupuncture, physician consultation vs. oral aceclofenac, epidural steroid injection, physical therapy										
Kim 2019	Low	No	Yes	No	Yes		= VAS (leg)	= VAS (leg)		+000
		No	Yes	No			= VAS (back)	> VAS (back) #		+000
		No	Yes	No			> OCS	= OCS		+000
		No	Yes	No			> Distance walked	> Distance walked		+000
Mokhuri Chuna, acupuncture, and physician consultation vs. oral aceclofenac, epidural steroid injection, physical therapy										
Kim 2019	Low	No	Yes	No	Yes	>VAS (low back)#	= VAS (leg)	> VAS (leg) #		+000
		No	Yes	No			= VAS (back)	> VAS (back) #		+000
		No	Yes	No			= OCS	= OCS		+000
		No	Yes	No			= Distance walked	= Distance walked		+000
Spinal Manipulation										
Lumbar spinal manipulation vs. waiting										
Passmore 2017	High	No	Yes	No	No	= NPS (Back)				0000
		No	Yes	No		= NPS (Leg)				0000
Acupuncture										
Acupuncture with usual care vs. usual care										

Kim 2016	High	No	Yes	No	No		6 weeks:				0000
		No	Yes	No	No		= ODI				0000
		No	Yes	No	No		= SF-36 BP				0000
		No	Yes	No	No		= SF-36 PF				0000
		No	Yes	No	No		= LBP				0000
		No	Yes	No	No		= Leg pain				0000
		No	Yes	No	No		= Distance walked				0000
		No	Yes	No	No		3 months:				
		No	Yes	No	No		= ODI				0000
		No	Yes	No	No		= SF-36 BP				0000
		No	Yes	No	No		= SF-36 PF				0000
		No	Yes	No	No		= LBP				0000
		No	Yes	No	No		= Leg pain				0000
		No	Yes	No	No		= Distance walked				0000
Acupuncture vs. sham acupuncture											
Qin 2020	Low	No	Yes	No	No	> RMDQ	> RMDQ	> RMDQ			++00
		No	Yes	No	No	> NRS (back) #	> NRS (back) #	> NRS (back)			++00
		No	Yes	No	No	> NRS (leg) #	> NRS (leg) #	> NRS (leg) #			++00
		No	Yes	No	No	> SSS-S #	> SSS-S #	> SSS-S #			++00
		No	Yes	No	No	> SSS-F #	> SSS-F #	> SSS-F #			++00
		No	Yes	No	No	= SPWT	= SPWT	= SPWT			++00
Epidural Injection											
Translaminar epidural steroid injections vs. placebo injections											
Cuckler 1985	High	No	Yes	No	No	= Global			=global		+000
Translaminar epidural steroids plus epidural block vs. placebo injections											
Fukusaki 1988	High	No	Yes	No	No	> Distance walked #	= Distance walked				+000
Translaminar epidural steroids plus epidural block vs. epidural block injections											
Fukusaki 1988	High	No	Yes	No	No	= Distance walked	= Distance walked				+000
Translaminar epidural block vs. placebo											
Fukusaki 1988	High	No	Yes	No	No	> Distance walked #	= Distance walked				+000
Intralaminar epidural steroid plus epidural block vs. home exercise program plus oral diclofenac											
Koc 2009	High	No	Yes	No	Yes		= TWT	= TWT			+000
		No	Yes	No	Yes		> VAS #	= VAS			+000
		No	Yes	No	Yes		> RMDI #	= RMDI			+000

		No	Yes	No	Yes		> NHP	= HNP		+000	
Intralaminar epidural steroid plus epidural block vs. in-patient physical therapy											
Koc 2009	High	No	Yes	No	Yes		= TWT	= TWT		+000	
		No	Yes	No	Yes		= VAS	= VAS		+000	
		No	Yes	No	Yes		= RMDI	= RMDI		+000	
		No	Yes	No	Yes		= NHP	= HNP		+000	
Caudal epidural steroids vs. placebo injections											
Zahaar 1991	High	No	Yes	No	No	= Global			= Global	+000	
Mild lumbar decompression vs. epidural steroid injection											
Brown 2012	High	No	Yes	No	No		= VAS			0000	
		No	Yes	No	No		= ODI			0000	
		No	Yes	No	No		= ZCQ			0000	
		No	Yes	No	No		12 weeks:				
		No	Yes	No	No		= VAS				0000
		No	Yes	No	No		= ODI				0000
Lidocaine vs. glucocorticoid–lidocaine											
Friedly 2014, 2017	Low	No	Yes	Yes	No		3 weeks:	12 weeks:	12 months:		
		No	Yes	Yes	No		< RMDQ	= RMDQ	= RMDQ	+++0	
		No	Yes	Yes	No		< NPS (leg)	= NPS (leg)	= NPS (leg)	+++0	
		No	Yes	Yes	No		6 weeks:	6 months:			
Makris 2016	Low	No	Yes	No	Yes		= RMDQ			+++0	
		No	Yes	Yes	No		= NPS (leg)			+++0	
		No	Yes	No	Yes		Makris 2016				
		No	Yes	No	Yes		3 weeks:				
		No	Yes	No	Yes		< RMDQ using SIP			0000	
		No	Yes	No	Yes		Weights				
		No	Yes	No	Yes		< RMDQ Patient-			0000	
		No	Yes	No	Yes		Prioritized				
		No	Yes	No	Yes		(LESSER)				
		No	Yes	No	Yes		6 weeks:				
		No	Yes	No	Yes		< RMDQ using SIP			0000	
		No	Yes	No	Yes		Weights				
		No	Yes	No	Yes		= RMDQ Patient-			0000	
		No	Yes	No	Yes		Prioritized				
		No	Yes	No	Yes		(LESSER)			0000	

Lidocaine spinal injection vs. saline spinal injection										
Song 2016	High	No No	Yes Yes	No No	No		1 month: = VAS = FRI			0000 0000
		No No	Yes Yes	No No			3 months: = VAS = FRI			0000 0000
Fluoroscopically guided lumbar ILESIS at the level of maximal stenosis vs. two intervertebral levels cephalad										
Milburn 2014	High	No No No	Yes Yes Yes	No No No	No	1 week: > NPS (walking) # > RMDQ #	4 weeks: > NPS (walking) # > RMDQ			0000 0000
		No No	Yes Yes	No No			12 weeks: = NPS (walking) > RMDQ			0000 0000
Epidural steroid injection (ESI) Vs. ESI & physiotherapy										
Hammerich 2019	High	No No No No No	Yes Yes Yes Yes Yes	No No No No No	No		= ODI = NPS > SF-36 ER # > SF-36 EWB > SF-36 GH	= ODI > NPS # = SF-36 ER = SF-36 EWB = SF-36 GH	= ODI > NPS # = SF-36 ER = SF-36 EWB = SF-36 GH	0000 0000 0000 0000 0000
Interlaminar vs. transforaminal epidural steroid injection										
Sencan 2020	High	No No No No	Yes Yes Yes Yes	No No No No	Yes	= NPS	3 weeks: = NPS = ODI > BDS = Distance walked	3 months: > NPS = ODI > BDS > Distance walked #		0000 0000 0000 0000
		No No No No No No	Yes Yes Yes Yes Yes Yes	No No No No No No						0000 0000 0000 0000 0000 0000
TNF alpha inhibitor (Etanercept) vs. steroid injection										
Wei 2020	Low	No No No	Yes Yes Yes	No No No		> VAS #	1, 3 months: > VAS # > ODI #	6 months: > VAS # > ODI #		++00 ++00 ++00
TNF alpha inhibitor (Etanercept) vs. lidocaine										

Wei 2020	Low	No No No	Yes Yes Yes	No No No		> VAS #	1, 3 months: > VAS # > ODI #	6 months: > VAS # > ODI #		++00 ++00 ++00
Steroid vs. lidocaine injection										
Wei 2020	Low	No No No	Yes Yes Yes	No No No		= VAS	1, 3 months: = VAS = ODI	6 months: = VAS = ODI		++00 ++00 ++00
Percutaneous Epidural Adhesiolysis										
Balloon-less catheter (Racz) vs. inflatable balloon catheter (ZiNeu)										
Karm 2018	High	No No No No No No	Yes Yes Yes Yes Yes Yes	No No No No No No	No		1 month: = NPS (back) = NPS (leg) = ODI 3 months: = NPS (back) = NPS (leg) = ODI	6 months: < NPS (back) # < NPS (leg) # < ODI		0000 0000 0000 0000 0000 0000
Surgery vs. Physical Therapy										
Interspinous spacer (X Stop) vs. non operative care										
Zucherman 2004, 2005, Hsu 2006	High	No No	Yes Yes	No No	No		> ZCQ(S)# > ZCQ(F)# > SF-36 PF > SF-36 BP > SF-36 GH > SF-36 ER	> ZCQ(S)# > ZCQ(F)# > SF-36 PF > SF-36 BP > SF-36 GH > SF-36 ER	> ZCQ(S)# > ZCQ(F)# > SF-36 PF# > SF-36 BP# > SF-36 GH > SF-36 ER#	+000 +000 +000 +000 +000 +000
Laminectomy +/- fusion vs. non operative care for degenerative spondylolisthesis										

Weinstein 2007, 2009 Abdu 2018	High	No No No No No No No No No No No No	Yes Yes Yes Yes Yes Yes Yes Yes	No No No No No No No No	No		= SF-36 BP, PF = ODI = LBPBS = LPBI = SBS	= SF-36 BP, PF = ODI = LBPBS = LPBI = SBS	2 years: = SF-36 BP, PF = ODI = LBPBS = LPBI = SBS 4 years: = SF-36 BP, PF = ODI = LBPBS = LPBI = SBS 8 years: = SF-36 BP, PF = ODI = LBPBS = LPBI = SBS	+000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000
Laminectomy +/- fusion vs. non operative care										
Amundsen 2000	High	No No	Yes Yes	No No	No		?* Pain severity	?* Global	?* Pain severity ? Global	+000 +000
Malmivaara 2007 N= 94	Low	No No No No	Yes Yes Yes Yes	No No No No	No			= TWT = SW > VAS leg walk # > VAS LB walk # > ODI	= TWT = SW > VAS leg walk # > VAS LB walk # > ODI	++00 ++00 ++00 ++00
Weinstein 2008, 2010, Lurie 2015	High	No No No No No	Yes Yes Yes Yes Yes	No No No No No	No		= SF-36 BP = SF-36 PF = LBPBS = LPBI = SBS = ODI	= SF-36 BP = SF-36 PF = LBPBS = LPBI = SBS = ODI	2 years: > SF-36 BP ** # = SF-36 PF = LBPBS = LPBI = SBS = ODI 4 years: =SF-36 BP ** = SF-36 PF = LBPBS = LPBI	+000 +000 +000 +000 +000 +000 +000 +000 +000 +000

									= SBS 8 years: = SF-36 BP = SF-36 PF = ODI = Stenosis Index	+000 +000 +000 +000
Laminectomy, facet resection, neuroforaminotomy vs. physical therapy										
Delitto 2015	High	No No	Yes Yes	No No	No				2 years: = SF-36 = ODI	+000 +000

> favours intervention (first comparison), < favours control (second comparison), = no difference between intervention and control groups, TWT= Treadmill Walking Test, VAS= Visual Analog Scale for Pain Intensity, RMDI= Roland-Morris Back Disability Index, NHP= Nottingham Health Profile, Global= Patient Perceived Improvement, SR= Selective Reporting, ODI= Oswestry Back Disability Index, ?= insufficient data, LBP= Low back Pain Severity Scale, Leg pain= Leg Pain Severity Scale, ? SF-36=No data on overall score, improvement in some subscales, NPRS= Numeric Pain Rating Scale, SF-36 BP= SF-36 Bodily Pain Subscale, SF-36- PF= SF-36 Physical Function Subscale, SF-36 ER= SF-36 emotional role subscale, SF-36 EWB= SF-36 emotional well-being subscale, SF-36 GH= SF-36 General health subscale, LBPBS= Low Back Pain Bothersome Scale, LPBI= Leg Pain Bothersome Index, SBS= Stenosis Bothersome Scale, SW= Subjective Walking, VAS leg= Visual Analog Scale for Leg Pain, VAS LB= Visual Analog Scale for Low Back Pain, VAS leg walking= Visual Analog Scale for Leg pain while walking, SIP= sickness index profile, BDS= Beck Depression Score, LESSER= Lumbar Epidural Steroid Injection for Spinal Stenosis Extended Research, PA= Physical Activity, FRI= Functional Rating Index, TWT= Total Walking Time, SSS= Spinal Stenosis Questionnaire, ?*= no between group statistical comparisons, **= SF-36 BP significantly better at 2 years but not 4 years.
GRADE evidence; +000= Very low GRADE evidence, ++00= Low GRADE, +++0= Moderate GRADE evidence, ++++= High GRADE evidence
between group difference meeting the MCID. The MCID used were: ≥ 1.25 points for back pain and ≥ 1.5 points for leg pain on 0 to 100-point Visual Analogue Scale (VAS) and 0 to 10-point Numerical Rating Scale (NRS) for back pain (58), ≥ 5 points on 0- to 24-point Roland-Morris Disability Questionnaire (RMDQ) (59), ≥ 8 points for conservative treatment and ≥ 12 points for surgery on 0- to 100-points for Oswestry Disability Index (ODI) (60), ≥ 0.1 points for the functional component and 0.36 points for symptom component of the Zurich Claudication Questionnaire (ZCQ) (58), ≥ 0.38 points for combined symptoms and functional scores of the ZCQ (92), $\geq 30\%$ between-group difference for walking distance, global improvement and SF36 subscales (61).