Supplemental Table 1. Characteristics of included studies

Study	Participants and Settings	Interventions	Outcomes/Follow-up	Results (Group 1 is reference group)
Calcitonin				
Eskola 1992	39 subjects with an average of 6 years of pain, average age of 56.6 years of age, 20 males and 19 females. **Setting:** Orthopaedic hospital in Finland.	1) 100IU Calcitonin injection every other day for 4 weeks (n=20) 2) Placebo treatment (Miacalcic Sandoz 100IU) every other day for 4 weeks (n=19)	1) VAS 2) Treadmill test 3) Coping with ADLs 4) Digitest Ergojump 5) Blood tests **Follow-up:** 1, 3, 4, 6 and 12 months	**Between group WMD and 95% CI** **Pain (VAS) (mm):** -0.050 (-0.053 to -0.047) **Walking distance (meters):** -18.5 (-240.37 to 203.37) **Adverse events:** The calcitonin injection group reported minor nausea and rash in 89% of the subjects.
Podichetty 2004	55 subjects with an average age of 68.5 years and an average of 36.2 weeks of the condition in the intervention group and 29.8 weeks in the placebo group, 33 males and 22 females. **Setting:** Spinal center in the United States	1) 400 IU intranasal calcitonin daily for 6 weeks followed by open label 6-week extension (n=36) 2) Placebo nasal spray daily for 6 weeks, followed by open label 6-week extension, during which all patients received 400IU calcitonin (n=19)	1) VAS 2) Walking capacity 3) ODI 4) Stenosis specific questionnaire 5) Satisfaction with pain levels, functional status, and treatment received 6) SF-36 7) Symptom diary **Follow-up:** 12 weeks	**Between group MD, 95% CI, p values** **12 weeks:** **Pain VAS (mm):** 0.5 (-0.85 to 1.93): p=0.44, **Walking time (seconds)**: 42.2 (-86.9 to 170.4): p=0.51 **Walking distance (feet)**: 163.3 (-311.16 to637.84); p=0. 0.49 **SF-36 MCS:** -4.22 (-10.41 to1.97) ; p=0.18 **SF-36 PCS:** 0.43 (-3.73 to 4.59); p= 0.84
Porter	41 subjects with	1) 100 IU salmon calcitonin injection	1) Walking chart	Insufficient data provided to calculate mean difference in

1983	10 in a double blind RCT crossover, 37 males and 4 females with mean age of 55.4 years. **Setting:** Infirmary in England	four times per week, sometimes with Maxalon for nausea (n=5) 2) Matching placebo (n=5) Only responders randomized	and ability to walk more than 1 mile 2) ODI **Follow-up:** 10 weeks	walking distance or ODI among the 10 patients enrolled in RCT. **Adverse events:** The calcitonin injection group reported minor nausea and rash in 40% of the subjects.
Porter 1988	42 subjects, 35 male, 7 female, average age of 53.6 years in 20 subjects and 56.7 years in 22 subjects, median duration of back pain reported was 11 years for 19 subjects, and 14 years for 22 subjects. Median duration of claudication was 1.25 years for 20 subjects and 4.5 years for 22 subjects. **Setting:** Infirmary in England	1) 100 IU of salmon calcitonin injected subcutaneously 4 times per week for 8 weeks (n=20) 2) 1 ml of saline injected 4 times per week for 8 weeks (n=22)	1) VAS 2) Claudication threshold 3) 3 level mobility assessment 4) Analgesic requirements 5) 3 level sleep disturbance 6) Treatment success defined as 100% improvement in walking distance and able to walk 800 m. **Follow-up**: 4 and 8 weeks	**Difference in median score from baseline between groups** **Pain score (VAS) (mm):** 4 weeks: -9 8 weeks: -5.5 **Walking distance until symptoms onset (meters):** 4 weeks: -14 8 weeks: 42 **Walking distance until pain prevents walking (meters):** 4 weeks: -41 8 weeks: -99 No significant between group differences. No p values or 95% CI provided.
Sahin 2009	45 subjects 31 males and 14 females, average	1) 200 IU intranasal calcitonin daily for 8 weeks (n=23)	1) VAS 2) Walking capacity	**Percent change between groups:** **8 weeks:** **VAS at rest:** 4.7%, p>0.05

	ages of 57.65 years in calcitonin group and 54.45 years in paracetamol group. **Setting:** Physical and Rehabilitation Medicine Department in Turkey	2) Up to 1500mg of paracetamol daily for 8 weeks (n=22) Both groups took part in a physical therapy and exercise program 5 times per week for 15 sessions.	3) RMDI 4) Ranges of motion **Follow-up:** 8 weeks	**VAS with motion:** -7.9%, P>0.05 **Roland Morris**: 8.2%, p>0.05 **Walking distance**: -15.4%, p>0.05
Tafazal 2007	40 subjects, 30 males, 10 females, average of 67 years in the intervention group and 70.2 years in the placebo group, average of 38.7 months with symptoms in the calcitonin group and 30.9 months in the placebo group. **Setting:** University hospital in England	1) Placebo nasal spray NaCl for 4 weeks (n=20) 2) 200 IU nasal salmon calcitonin for 4 weeks (n=20)	1) VAS 2) Shuttle walking test 3) 4-point subjective outcome of overall assessment (excellent, good, fair, poor) 4) ODI 5) Modified Somatic Perception Questionnaire 6) Modified Zung Depression Score **Follow-up:** Baseline, 4, 10, 16 weeks	**4 weeks: Between group MD 95% CI** **ODI:** -0.7 (1.7 to -3.5) **LBOS**: -3.0 (-0.6 to -4.7) **VAS leg (mm):** -10 (-4.0 to -13) **VAS back (mm)**: -6.0 (-6 to -12) **Shuttle walk distance (m):** -13 (-7 to -35) **16 weeks: between group MD, p values** **ODI**: 0.1, p=0.44; **LBOS**: 0.7, p=0.93; **VAS leg (mm):** -4, p=0.66; **VAS back (mm):** 16, p=0.03; **Shuttle walking distance (m):** -11, p=0.39

Oral Medication				
Matsudaira 2009	79 subjects, 24 males and 24 females, with an average age of 69.6 years in the Limaprost group and 72.2 in the Etodolac group. **Setting:** Orthopaedic surgery in a medical faculty in Japan	1) Oral prostaglandin E1 derivative (15 g Limaprost) 3 times daily for 8 weeks (n=39) 2) 400 mg of etodolac (NSAID) twice daily for 8 weeks (n=40)	1) SF-36 2) Verbal pain rating scales 3) Walking distance 4) LBP severity 5) Leg pain severity 6) Leg numbness severity 7) Treatment satisfaction **Follow-up:** 8 weeks	**SF-36 subscales MD, p values** 8 weeks: **physical function:** 9.4, p=0.01, **role physical:** 13.7, p=0.03, **bodily pain**: 15.5, p<0.01: **General health**: 6.6, p=0.08; **vitality**: 11.3, p=0.02; **social functioning**: 8.0, p=0.17; **role emotional:** 10.2, p=0.07; **mental health:** 12.2, p<0.01. **Secondary outcomes** not provided in a way that MD can be extracted: 8 weeks: **low back pain:** p=0.77; leg pain p=0.08; **Leg numbness:** p<0.01; **walking distance** p<0.01; **patient subjective improvement** p<0.01; **patient satisfaction** p<0.01 all in favor of limaprost **Adverse events:** 5% of subjects in both groups reported gastrointestinal upset.
Waikakul 2000	152 subjects, 68 males and 84 females with an average age of 66.8 years. 44 of the subjects had symptoms for less than one month, 98 had symptoms for more than one month. **Setting:** Hospital in Thailand	1) Conservative treatment consisting of education, activity modification, exercise and physical therapy. NSAIDs, muscle relaxants, and analgesics as necessary. Vitamin B1, B6, and B12 3 times per day (n=82) 2) Conservative treatment plus Methlcobalin ESAI, 1.5mg per day in 3 divided doses after meals for 6 months (n=70)	1) Presence of pain on spinal motion 2) Claudication distance 3) Medication intake (NSAIDs, muscle relaxants, and steroids) **Follow-up:** every month for two years	**Walking distance** **Percent able to walk > 1000 meters** 6 mo: 71.3% vs. 88.6%, p< 0.05 12 mo: 81.3% vs. 97.1%, p < 0.05 18mo: 83.8% vs. 97.1% p < 0.05 **Adverse events:** There were no reported adverse effects in subjects in methylocabalin group
Yaksi 2007	55 subjects, 22 males, 33 females, average age of 50.8 years. **Setting:** Hospital	1) 900 mg of gabapentin per day increased weekly by 300 mg to a maximum of 2400 mg (n=28) 2) Placebo (n=27)	1) VAS – low back and leg pain during movement 2) Walking distance	**Between group difference, p values** **Pain (VAS) (mm) no raw data** 3rd mo 3.4 vs. 1.9, p =0.039 4th mo 4.1 vs.2.0, p =0.006 **Walking Ability, no raw data**

	department of physical medicine and rehabilitation in Turkey	Both groups received physical therapy exercises, a lumbosacral corset with steel bracing and NSAID treatments	3) Presence or absence of motor and/or sensory deficits **Follow-up:** 15 days, 1, 2, 3, 4 months	Grp 1: longer walking distance at end of 2nd mo ($p < 0.05$), 3rd mo ($p < 0.05$) and 4th mo ($p < 0.005$) **Adverse events:** some subjects randomized to the gabapentin group (no data specified) experienced mild to moderate drowsiness and/or dizziness.
Markman 2015	29 participants, 20 males, 9 females, Eligible subjects were older than 50 years (mean 70 .1 years) with at least one level of radiographically confirmed lumbar spinal stenosis and symptoms of neurogenic claudication for at least 3 months. **Setting:** Hospital in Rochester, New York	1) Pregabalin group (n=14) 2) Active placebo (Diphenhydramine) (n=15) Cross over study after 7 day wash out period. Pregabalin was started at 75 mg PO twice daily or diphenhydramine, 6.25 mg) and increased on day 4 to 150 mg PO twice daily (12.5 mg diphenhydramine) for 7 days. Pregabalin was decreased to 75 mg PO twice daily (6.25 mg diphenhydramine) on day 11 for 3 days of tapering.	1) NRS - time to first moderate pain symptom during a 15-minute treadmill test (Tfirst) (NRS - greater than 4) **Follow-up:** day 10 of intervention period	**Between group MD, 95% CI, p values** **Treadmill testing pain at rest (NRS)** 0.29 (0.41 to 0.98): p=0.40 **Treadmill testing final pain (NRS)** 0.25 (-0.44 to 0.94): p=0.46 **Treadmill testing distance walked (m)** -24.06 (-75.63 to 27.52): p=0.35 **Treadmill testing recovery time (min)** -0.79 (-1.86 to 0.28): p=0.14 **Treadmill testing patient global assessment of pain** -0.08 (-0.45 to 0.29): p=0.67 **Treadmill testing RMDQ** 1.50 (0.38 to 2.62): p=0.01 **Adverse events:** Complications were reported in 64% of subjects in group 1, the most common being dizziness, compared to 35% in group 2.
Park 2017	45 subjects, 21 in GPN Group (17 female, 4 males, mean age 66.1± 10.5), and 24 in BTX group (15 female and 9 males, mean age	1) Conservative treatments plus gabapentin (group GPN): Gabapentin 300 to 1200mg/d - titrated to patient characteristics, comorbidities, and reported side effects (n=21) 2) Conservative treatments plus BTX	3) NRS - back/leg pain intensity 4) Cramp frequency (no./wk) 5) Cramp severity (0-4	No statistically significant difference between groups and lack of reporting of quantitative data **Adverse events:** Five patients (20.8%) in group 2 reported mild to moderate pain at injection sites for a few days.

	66.2±8.2) **Setting:** Outpatient department for interventional pain management in Korea	injection (group BTX): The BTX (botulinum toxin type A [Nabota]) dose was 100U in 5mL of 0.9% saline injected into the gastrocnemius medialis and lateralis. (n=24) Conservative treatments: education, exercise, analgesic medication, injection therapy including epidural injections, and physical therapy	criteria) 6) Insomnia severity – (ISI 0-28) 7) ODI 8) Patient global impression of change **Follow-up:** 2 weeks, 1 and 3 months.	
Markman 2015 - 2	24 participants, 12 males and 12 females, (mean age 72 years) LSS by imaging with symptoms of neurogenic claudication **Setting:** Translational Pain Research Center at a University in Rochester, New York	1) Oxymorphone hydrochloride (Opana IR, 5 mg) (n=8) 2) Propoxyphene/acetaminophen (Darvocet, 100 mg/650 mg) (n=8) 3) Placebo: 3 separate visits (random order with at least 3 day washout periods) (n=8)	1) NRS (at rest) 2) NRS (final pain rating) 3) AUC 4) 4) Distance walked (m) 5) Recovery time (min) 6) ZCQ 7) Patient global assessment of pain 8) RMDQ 9) ODI **Follow-up:** Study was prematurely terminated	**Between group MD, 95% CI, p values** **Treadmill testing pain at rest (NRS)** Grp 1 vs Grp 3: -0.04 (-0.72 to 0.65): p-0.89 Grp 2 vs Grp 3: -0.27 (-0.95 to 0.41): p=0.32 Grp 1 vs Grp 2: 0.23 (-0.45 to 0.92): p=0.40 **Treadmill testing final pain (NRS)** Grp 1 vs Grp 3: 0.2 (-0.74 to 1.14): p=0.60 Grp 2 vs Grp 3: 0.53 (-0.40 to 1.46): p=0.16 Grp 1 vs Grp 2: -0.33 (-1.26 to 0.61): p=0.39 **Treadmill testing distance walked (m)** Grp 1 vs Grp 3: -12.41 (-63.01 to 38.20): p=0.54 Grp 2 vs Grp 3: -23.41 (-73.60 to 26.79): p=0.25 Grp 1 vs Grp 2: 11 (-39.53 to 61.54): p=0.59 **SSSQ symptom severity score** Grp 1 vs Grp 3: -0.03 (-0.19 to 0.13): p=0.61 Grp 2 vs Grp 3: 0.01 (-0.15 to 0.17): p=0.85 Grp 1 vs Grp 2: -0.04 (-0.20 to 0.11): p=0.49 **SSSQ physical function score** Grp 1 vs Grp 3: 0.04 (-0.16 to 0.09): p=0.47 Grp 2 vs Grp 3: 0.11 (-0.01 to 0.23): p=0.03 Grp 1 vs Grp 2: -0.15 (-0.27 to -0.02): p=0.01 **Patient global assessment of pain** Grp 1 vs Grp 3: -0.03 (-0.52 to 0.47): p=0.90 Grp 2 vs Grp 3: 0.13 (-0.36 to 0.61): p=0.52

				Grp 1 vs Grp 2: -0.15 (-0.64 to 0.34): p=0.44 **The study was prematurely terminated because of the removal of propoxyphene/acetaminophen from the US market.**
Rodrigues 2014	61 patients with lumbar canal stenosis (50–75 years; canal area < 100 mm^2 at L3/L4, L4/L5, and/or L5/S1on MRI; and claudication within 100 m). 31 in the corticoid group (mean age 58.23 (6.38), and 30 in the placebo group (mean age 58.33 (6.19)) **Setting:** Hospital in São Paulo, Brazil	1) Oral corticoid group received 1 mg/kg of oral corticoids daily, with a dose reduction of one-third per week for 3 weeks (n=31) 2) Control group was administered placebo for the same period (n=30)	1) SF-36 2) RMDQ 3) 6-min walk test 4) VAS 5) Likert scale **Follow-up:** 3, 6 and 12 weeks	**Between group comparison** **VAS (6 weeks)** Corticoid vs Placebo: 1.53 p=0.02 (in favour of placebo)
Rehabilitation Therapy and Multimodal Care				
Goren 2010	45 subjects, 13 males, 32 females, average ages in groups of 57.4, 49.13, and 53.06. 7 subjects with pain duration of 3-6 months, 7 with pain duration of 6-12 months, and	1) Stretching and strengthening exercises for lumbar, abdominal, leg muscles as well as low intensity cycling exercises were given as therapeutic exercises. Ultrasound was applied with 1mHz, 1.5W/cm2 intensity, in continuous mode on the back muscle for 10 minutes (n=17) 2) Same as group 1 with Ultrasound on off- mode (n=17)	1) VAS (out of 10) 2) Treadmill test at 3 km/h for maximum of 15 minutes or 750m. 3) ODI 4) Analgesic consumption 5) Physiatrist	**Pain (VAS) (mm) within group MD** 3 weeks: Grp 1: -2.2 for **back pain;** -1.47 for **leg pain** Grp 2: -1.94 for **back pain;** -2.47 for **leg pain** Grp 3: 0.40 for **back pain;** 0.54 for **leg pain** Between groups differences Leg pain: Grp 1> Grp 3 (p<0.01), Grp 2> Grp 3 (p<0.01) **Walking Ability (within group MD)** 3 weeks: Grp 1: 94.30 seconds

	31 with pain duration of greater than 12 months. **Setting:** Rehabilitation center in Turkey	3) No exercise-no treatment (n=16)	assessment **Follow-up:** End of 3-week treatment period only	Grp 2: 114.94 seconds Grp 3: -66.10 seconds No significant change between groups **Disability (ODI) (within group MD)** 3 weeks: Grp 1: -3.94 Grp 2: -7.8 Grp 3: -3.6 ODI between groups differences Grp 1> Grp 3 ($p<0.05$), Grp 2> Grp 3 ($p<0.05$)
Koc 2009	29 subjects, 21 male, 8 female, average ages of 62.6, 61.1, and 53.1 years in the three groups, average pain duration of 5.7 years, 5.0 years, and 5.7 years in the three groups. **Setting**: Medical school department of physical medicine and rehabilitation in Turkey	1) Conservative inpatient physical therapy program 5 days a week for 2 weeks. PT included applications of ultrasound 1.5 W/cm2 for 10min, hot pack for 20min, and TENS for 20min to the lumbar region (n=13) 2) Lumbar epidural steroid injections, 10 ml of solution containing 60mg of triamcinolon acetonide (1.5 mL), 15 mg of 0.5% bupivacain hydrochloride (3 mL), and 5.5 mL of physiologic saline (0.9%NaCl) was injected in 3.5minutes. (n=10) 3) Control group (n=10) All patients included were trained to pursue a home-based therapeutic exercise program performed twice daily for a period of 6 months, and oral diclofenac sodium 75mg was administered to all patients twice daily for 2 weeks	1) VAS 2) Treadmill walk test 3) Nottingham Health Profile 4) RMDI 5) Functional testing including finger to floor distance, sit-to-stand, and a weight carrying test **Follow-up:** 2 weeks, 1, 3 and 6 months	No raw data provided. No significant between group differences for all outcomes and follow-ups except: **Pain (VAS)** 2 weeks: Grp 2 less pain than Grp 3 p= 0.008 **Disability (RMDI)** 2 weeks: Grp 2 less disability than Grp 3 p= 0.007 **Quality of Life (Nottingham Health Profile) (no data provided)** Grp 2 had significantly higher improvement than Grp 3 at 2 weeks in mobility subgroup scores. **Adverse events:** 1 subject reported angina pectoralis and 1 reported gastric complaints (group not specified).
Pua 2007	68 subjects, 35 males, 33	1) Unweighted treadmill training: Weeks 1 and 2, participants walked	1) VAS for pain over past	**Pain (VAS) (mm) MD and 95% CI** 6 weeks: 2 (-5 to 10)

	females, average age of 58 years, 12 week median pain duration **Setting:** Hospital in Singapore	with a relatively pain-free gait which translated to 30–40% of body weight. In weeks 3 to 6, participants were encouraged to walk at a moderate intensity. The duration of each treadmill session was limited by participant tolerance or to a maximum of 30 minutes. 2x per week for 6 weeks = 12 sessions (n=33) 2) Cycling on upright bicycle: During weeks 1 and 2, participants cycled at their comfortable pace at 50 to 60 rpm. Participants were instructed to assume a flexed posture. In weeks 3 to 6, participants were encouraged to exercise at a moderate intensity and the duration of each cycling session was limited by participant tolerance or to a maximum of 30 minutes. 2x per week for 6 weeks for 12 sessions (n=35)	week 2) Patient perceived benefit on a 6-point scale 3) ODI 4) RMDI 5) Walking ability **Follow-up:** 3 and 6 weeks	**Disability (ODI), OR, 95% CI** 6 weeks: OR 1.10 (0.41 to 2.98) **Patient perceived benefit, OR, 95% CI** 6 weeks: OR 0.50 (0.17 to 1.48) **Walking ability** (≥800 m), **OR, 95% CI** 6 weeks: OR 1.14 (0.44 to 2.94) **Adverse events:** 1 subject in treadmill group reported increase in pain.
Whitman 2006	58 subjects, 31 males, 27 female, 29 (group 1) with an average age of 70 years, 29 (group 2) with an average age of 68.9, median low back pain duration of 108 months in Group 1's 29 subjects and 60 months in Group 2's 29	1) Flexion Exercise and Walking Group: 45-60 minutes twice per week for 6 weeks. Lumbar flexion exercises along with self-pace treadmill walking program, and sub-therapeutic ultrasound. The duration of each treadmill session was based on that patient's tolerance on that specific day and could extend up to 45 minutes. (n=29) 2) Manual Therapy, Exercise and Walking Group: 45-60 minutes twice per week for 6 weeks - Manual	1) Global Rating of Change (15-point scale) 2) NPRS for lower limb 3) Walking Tolerance test 4) ODI 5) Medication consumption 6) Satisfaction subscale of the Spinal	**Patient Global Assessment (somewhat better or greater)** 6 weeks: 41% vs. 79% p<0.01 1 year: 21% vs. 38% p>0.05 **Number needed to treat for benefit for perceived recovery and 95% CI** 6 weeks: 2.6 (1.8 to 7.8) 1 year: 4.8 (-2.3 to 21.3) long term: 4.4 (- 2.1 to 22.7) **Pain (NPRS lower extremity)** **Within group MD, 95% CI** 6 weeks: 1.1 (0.2 to 2.0) vs. 1.5 (0.5 to 2.5) 1 year: 1.2 (0.4 to 1.9 vs.1.0 (-0.2 to 2.2);

	subjects, lower extremity median pain duration of 48 months in Group 1's 29 subjects and 24 months in Group 2's 29 subjects. **Setting:** University in the United States	physical therapy (thrust and non thrust) to the thoracic and lumbar spine, pelvis, and lower extremities and specific exercises at discretion based on the underlying impairments. Patients received specific exercises to address impairments in mobility, strength, and/or coordination. Exercises were performed in the clinic and as part of a home exercise program. Patients also underwent a bodyweight supported treadmill ambulation program using a cable and trunk harness system to unload a specific amount of weight from the patient while the patient walks as comfortably as possible on a treadmill (n=29).	Stenosis Scale 7) Additional use of health care resources **Follow-up:** 6 weeks, 1 year, long term mail survey (averaging 29 months)	Long term: 1.8 (0.6 to 3.0) vs. 2.0 (0.7 to 3.4) Between group MD not statistically significant at any follow-up period **Walking Ability (improvement in meters) within group MD, 95% CI** 6 weeks: 176.5 (-9.5 to 362.4) vs. 339.7 (218.4 to 461) 1 year: 130.4 (-55.3 to 316.2) vs. 209.8 (67.5 to 352.1) Between group improvement not statistically significant at any follow-up **Disability (ODI) within group MD** 6 weeks: 6.55 (1.87 to 11.23) vs. 10.48 (6.5 to 14.4) 1 year: 5.03 (1.71 to 8.35) vs. 7.14 (1.5 to 12.8) Between group differences not statistically significant at any follow-up
Minetama 2019	86 patients, 39 men and 47 women, average age 72.7 years 43 patients (20 men and 23 women, average age 72.3 years to the PT group 43 patients (19 men and 24 women, average age 73.2 years) to the HE group. Duration symptoms 20 months	1) Physical therapy + home exercise program (n=43) 2) Home exercise (HE) program alone (n=43) Supervised physical therapy twice a week for 6 weeks, including manual therapy, individually tailored stretching and strengthening exercises, cycling, and body weight-supported treadmill walking. The manual therapy included manipulation, stretching, and massaging of the thoracic and lumbar spine, pelvis, and lower extremities. The individually tailored muscle exercises included those for the trunk (eg, abdominal planks, side bridge, and/or back extension) and lower	1) ZCQ 2) Satisfaction 3) SPWT (m) 4) NRS 5) JOABPEQ-acquired points 6) SF-36 7) HADS 8) PCS 9) PASS-20 10) TSK-11 11) Daily steps **Follow-up:** 6 weeks	**Between group MD, 95% CI** **ZCQ - Symptom severity** −0.4 (−0.6 to −0.2): statistically significant **ZCQ - Physical function** −0.4 (−0.6 to −0.2): statistically significant **SPWT (m)** 455.9 (308.5 to 603.2): statistically significant **NRS - Leg pain** −1.4 (−2.5 to −0.3): statistically significant **SF-36 - Physical functioning** 9.2 (2.1 to 16.3): statistically significant **SF-36 - Bodily pain** 10.4 (3.3 to 17.5): statistically significant **Daily steps** 723.4 (199.1 to 1,283.5): statistically significant

	Setting: Spine care center at a university hospital in Japan	extremities (eg, unloading hip and/or knee exercise with ankle weight and/or standing squats). The typical dosage for strengthening exercises was a total of 2 to 3 sets with 10 repetitions, each of 6-second contraction. The typical duration of stretching was three repetitions of 30 seconds. All patients in both groups were asked to take a daily walk that did not exacerbate their lower extremity symptoms using a pedometer and walking diary and to perform a HE program consisting of lumbar flexion exercises including three 30-second bouts of both single and double knee-to-chest exercises, ten 6-second bouts of trunk raises and bridging in the supine position, and a 4-point kneeling exercise at least twice daily.		
Schneider 2019	259 subjects, 122 males and 137 women with an average age of 72.4, 68 patients had symptoms for less than 6 months, 191 had symptoms for greater than 6 months **Setting:** Outpatient research clinic in Pittsburgh	1) Medical care (MC) (n=88) 2) Group exercise (GE) (n=84) 3) Manual therapy + exercise (MTE) (n=87) **Medical Care:** 3 visits to a physical medicine physician over 6 weeks. Primarily prescription of oral medications in any combination of nonnarcotic analgesics, anticonvulsants, antidepressants. Optional referral for epidural steroid injections if inadequate pain relief by oral medication, severe neurogenic claudication, and/or patient preference.	1) SSS 2) SPWT 3) Physical Activity **Follow-up:** 2 and 6 months	**Between group MD, 95% CI** **SSS (2 months)** GE vs MC: 0.4 (-1.3 to 2.1) MTE vs MC: -2.0 (-3.6 to -0.4) MTE vs GE: -2.4 (-4.1 to -0.8) **SPWT (2 months)** GE vs MC: 79.9 (-74.5 to 234.5) MTE vs MC: 122.9 (-25.7 to 271.6) MTE vs GE: 43.0 (-111.8 to 197.9) **Physical activity (2 months)** GE vs MC: 28.7 (2.7 to 54.7) MTE vs MC: 20.4 (-4.5 to 45.3) MTE vs GE: -8.3 (-34.5 to 17.6) **SSS (6 months)** GE vs MC: -0.5 (-2.3 to 1.3) MTE vs MC: -1.1 (-2.8 to 0.6) MTE vs GE: -0.6 (-2.4 to 1.2)

		Physician rendered general guide and on gentle stretching and advice to stay active. **Group Exercise:** Supervised exercise classes at 2 local senior community centers. 2x 45-min classes/week, 6 weeks. Taught by senior fitness instructors. Participants self-select level of exercise based on fitness level (easy to medium) **Manual Therapy + Exercise:** 2x 45minute sessions per week, 6 weeks by either 2 chiropractors or 2 physiotherapists. Sessions included 3 interventions: 1. Warm-up procedure on stationary bicycle 2. Manual therapy procedures (lumbar distraction, hip, lumbar/sacroiliac joint and neural mobilizations 3. Individualized instruction in spinal stabilization exercises and home stretching Practitioner determined what muscles required stretch/strengthening and appropriate exercises added to program.		**SPWT (6 months)** GE vs MC: 86.5 (-75.7 to 248.8) MTE vs MC: 73.8 (-84.1 to 231.7) MTE vs GE: -12.7 (-175.6 to 150.1) **Physical activity (6 months)** GE vs MC: 21.3 (-6.9 to 49.4) MTE vs MC: -2.9 (-30.1 to 24.3) MTE vs GE: -24.2 (-52.5 to 4.0) **Adverse events:** There were no reported serious adverse events in any group. There was a significantly greater rate of transient joint soreness associated with group 3 (49%) compared with group 2 (31%) and group 1 (6%).
Ammendolia 2018	104 patients, 45 males and 59 females, 48 in comprehensive group and 51 in self-directed group, with an average age of 69.4	1) Comprehensive (n=48) 2) Self-directed (n=51) **Comprehensive:** Chiropractor providing 2x/week of 15-20-minute treatment sessions over a 6-week period followed by a single (booster) session, 4 weeks later.	1) SPWT Distance 2) Clinical Significance - 30% improvement in SPWT no. (%) 3) Clinical	**Between group MD, 95% CI, p values** **SPWT** 8 wks: 345.4 (150.0 to 540.7): p=0.00 3 mo: 304.1 (77.9 to 530.3): p=0.01 6 mo: 421.0 (181.4 to 660.6): p=0.00 12 mo: 473.2 (203.9 to 742.4): p=0.00 **30% improvement in SPWT** 8 wks: 24 (6-40): p=0.01 3 mo: 21 (4-38): p=0.02

	(comprehensive) and 71.7 (self-directed) neurogenic claudication >3 months, imaging-confirmed canal narrowing, walk >20m and not surgical candidates in next 12 months **Setting:** Academic hospital outpatient clinic in Toronto	Education: Self-management strategies via cognitive behavioral approach. Body repositioning (pelvic tilt) when standing and walking. Exercises: Standardized set of exercises demonstrated gradually over 6 weeks and was a part of structured home exercise program. Cycling, muscle stretching, strengthening, conditioning for back and lower extremity fitness and to facilitate lumbar flexion Manual therapy: Spinal manipulation; joint, soft tissue and neural mobilization; lumbar flexion-distraction; and manual muscle stretching applied each visit. Participants received an instructional video and workbook and pedometer. **Self-directed:** Instructional Video, workbook, pedometer and a single 15-to 30-minute training session with an experienced independent licensed chiropractor, independent of the comprehensive program, Training session: Describe 6-week program, review workbook, explain pedometer use and recording of weekly walking steps. Video and workbook: Educational information and the same exercise instruction and self-management strategies received by the comprehensive group	Significance - 50% improvement in SPWT no. (%) 4) ZCQ-S 5) ZCQ-F 6) ZCQ-S + ZCQ-F 7) ODI 8) ODI walk 9) NRS Back 10) NRS Leg **Follow-up:** 8 weeks, 3, 6, and 12 months	6 mo: 19 (2-35): p=0.02 12 mo: 22 (4-39): p=0.02 **50% improvement in SPWT** 8 wks: 26 (8-42): p=0.01 3 mo: 19 (-1.0 to 36): p=0.06 6 mo: 17 (-2 to 35): p=0.09 12 mo: 24 (5-40): p=0.01 **ZCQS** 8 wks: -0.19 (-0.37 to -0.02): p=0.03 3 mo: -0.15 (-0.37 to 0.08): p=0.19 6 mo: -0.02 (-0.22 to 0.19): p=0.87 12 mo: -0.22 (-0.47 to 0.02): p=0.07 **ZCQF** 8 wks: -0.02 (-0.22 to 0.17): p=0.81 3 mo: -0.18 (-0.39 to 0.03): p=0.09 6 mo: -0.11 (-0.33 to 0.11): p=0.34 12 mo: -0.27 (-0.49 to 0.04): p=0.02 **ZCQS+ZCQF** 8 wks: -0.24 (-0.56 to 0.07): p=0.13 3 mo: -0.36 (-0.75 to 0.03): p=0.07 6 mo: -0.23 (-0.58 to 0.12): p=0.20 12 mo: -0.48 (-0.90 to -0.06): p=0.03 **ODI** 8 wks: -0.02 (-0.07 to 0.02): p=0.30 3 mo: -0.04 (-0.09 to 0.01): p=0.13 6 mo: -0.02 (-0.07 to 0.02): p=0.34 12 mo: -0.03 (-0.08 to 0.02): p=0.30 **ODI Walk** 8 wks: -0.2 (-0.6 to 0.1): p=0.14 3 mo: -0.4 (-0.9 to 0.03): p=0.07 6 mo: -0.9 (-1.3 to -0.4): p<0.001 12 mo: -0.2 (-0.7 to 0.2): p=0.32 **NRS Back** 8 wks: -1.4 (-2.2 to -0.5): p=0.002 3 mo:-0.6 (-1.4 to 0.3): p=0.23 6 mo: -0.7 (-1.7 to 0.3): p=0.16 12 mo: -0.4 (-1.3 to 0.4): p=0.32

				NRS Leg 8 wks: -0.7 (-1.5 to 0.1): p=0.09 3 mo: 0.05 (-0.85 to 0.96): p=0.91 6 mo: -0.9 (-1.9 to 0.003): p=0.58 12 mo: -0.5 (-1.6 to 0.6): p=0.37 **SF-36 Bodily Pain** 8 wks: 2.0 (-4.9 to 8.9: p=0.57 3 mo: -4.5 (-12.4 to 3.5): p=0.27 6 mo: -3.3 (-10.2 to 3.6): p=0.35 12 mo: 10 (2.1 to 17.9): p=0.013 **SF-36 Physical Function** 8 wks: 4.2 (-3.9 to 12.4): p=0.31 3 mo: 9.2 (1.1 to 17.3): p=0.027 6 mo: 5.8 (-2.1 to 13.6): p=0.15 12 mo: 8.2 (0.2 to 16.2): p=0.045 **Adverse events:** At 12 months, 0 participants out of 43 in group 1 and 2 out of 46 participants in group 2 experienced adverse events that were mostly attributed to a temporary increase in low back and/or leg pain.
Oğuz 2013	120 patients, 30 in group 1 with an average age of 57.1 years old, 30 in group 2 with an average age of 55.8 years old and group 3 with an average age of 57.4 years old, LSS symptoms, narrowing by MRI **Setting:** University	1) Standard exercise group (n=30) 2) Isokinetic exercise program (n=30) 3) Unloading exercise group (n=60) All groups physician-guided (5x/week for 3 weeks) then at-home (3x/week) **Standard Exercise:** 15 sessions of TENS, hot packs with home exercise instruction. **Isokinetic exercise:** 20 minutes/day, 5 sessions/week for a total of 15 sessions with a physician. Isokinetic exercises:	1) VAS 2) ODI 3) Beck Depression Inventory **Follow-up:** 4, 12 and 24 weeks	**Between group MD, p value** **VAS** After treatment: Grp 1 vs Grp 2:0.37, p>0.05 Grp 1 vs Grp 3: 1.36, p<0.05 Grp 2 vs Grp 3: 0.99, p<0.05 4th week: Grp 1 vs Grp 2: 1.43, p>0.05 Grp 1 vs Grp 3: 1.17, p<0.05 Grp 2 vs Grp 3: -0.26, p>0.05 12th week: Grp 1 vs Grp 2: 0.93, p>0.05 Grp 1 vs Grp 3: 0.71, p>0.05 Grp 2 vs Grp 3: -0.22, p>0.05 24th week: Grp 1 vs Grp 2: 1.08, p>0.05

	department of physical medicine and rehabilitation in Turkey	rates of 60°/sec, 120°/sec, 180°/sec with 70° of body movement (50° flexion to 20° extension) Each session had 3 sets, each set had 5 repetitions at described velocity, with 20s rest between each set. **Unloaded exercise:** 5 sessions of unloading exercise per week, for a total of 15 sessions with a physician. Walking with unloading exercise devise: session 1-5 = 45% body weight, session 6-15 = 30% body weight. Treadmill walking at 1.2 km/hr for 20 minutes, or until pain due to neurogenic claudication was felt. Subjects advised to follow exercise program s at home at least 3x/week after discharge.		Grp 1 vs Grp 3: 0.46, p>0.05 Grp 2 vs Grp 3: -0.62, p>0.05 **ODI** After treatment: Grp 1 vs Grp 2: -0.8, p>0.05 Grp 1 vs Grp 3: 1.8, p<0.05 Grp 2 vs Grp 3: 2.6, p<0.05 4th week: Grp 1 vs Grp 2: 1.5, p>0.05 Grp 1 vs Grp 3: 2.6, p>0.05 Grp 2 vs Grp 3: 1.1, p<0.05 12th week: Grp 1 vs Grp 2: 1, p>0.05 Grp 1 vs Grp 3: 1.3, p>0.05 Grp 2 vs Grp 3: 0.3, p>0.05 24th week: Grp 1 vs Grp 2: 0.4, p>0.05 Grp 1 vs Grp 3: 0.5, p>0.05 Grp 2 vs Grp 3: 0.1, p>0.05 **Total Gait Duration** After treatment: Grp 1 vs Grp 2: 64.6, p>0.05 Grp 1 vs Grp 3: -50.5, p>0.05 Grp 2 vs Grp 3: -115.1, P<0.05 4th week: Grp 1 vs Grp 2: 45.9, p>0.05 Grp 1 vs Grp 3: -18.4, p>0.05 Grp 2 vs Grp 3: -64.3, p<0.05 12th week: Grp 1 vs Grp 2: 52.23 p>0.05 Grp 1 vs Grp 3: -0.67 p>0.05 Grp 2 vs Grp 3: -52.9 p>0.05 24th week: Grp 1 vs Grp 2: 35.2, p>0.05 Grp 1 vs Grp 3: 1.9, p>0.05 Grp 2 vs Grp 3: -33.3, p>0.05

Homayouni 2015	47 subjects, 23 male, 24 female, 24 in group one, mean age 55.56, 12 male, 12 female, 23 in group two, mean age 55.68, 11 male, 12 female **Setting:** University-based pain clinics in Iran	1) Treatment in therapeutic pools with water temperature of 29–30 degrees Celsius. Every aquatic session started with warm up and ended with cool down, with duration of 10–15 min for each of them. Participants should have attended aquatic physical therapy sessions every other day for a total duration of 24 sessions. Each session included ambulation, side walking, chain walking, forward walking with kickboard, stretching of each muscle group including adductors, abductors, flexors and extensors of the hip, knee flexors and ankle plantar flexors and dorsiflexors. Other interventions were mini-squat, pelvic curl, pelvic tilt, and knee to chest, double knee lift, and deep-water exercise. (n=25) 2) Passive modalities by physical therapists including continuous mode ultrasound (US) 1.5W/ cm2 for 10 min and hot pack and trans-electrical nerve stimulation (TENS) for 20 min to the lumbar region. Also, the therapists instructed the patients in this group to perform trunk muscle endurance, William's and stretching exercises. The patients were treated using these passive modalities and were given exercises under supervision of physiotherapists for 10 sessions. They were instructed to perform the learned exercises 30 min	1) VAS 2) Walking ability **Follow-up:** Immediately after therapy, 3 months	**All between group comparisons** **Walking ability** Grp 1 > Grp 2: p=0.02 **VAS** Grp 1 > Grp 2 p=0.001

		a day at home in the following weeks until the end of the eighth week. (n=25)		
Marchand 2019	40 participants, 17 females and 23 males, 20 in the intervention group with an average age of 66.7 years old and 20 in the control group with an average age of 71.5 years old, with history and diagnostic imaging of LSS **Setting:** Regional hospital in Quebec	1) Exercise 3x week / 6 weeks prior to surgery (n=20) 2) Regular hospital preoperative management with back posture education (n=20)	1) NRS (Pain Intensity) 2) ROM (Active) 3) Muscle strength (N-m) 4) Walking capacity (seconds) **Follow-up:** 3 and 6 months	**Between group MD** **NRS (leg)** Preoperative: -2.1, p<0.05 Postoperative: 1.1, p>0.05 3 months: 1.1, p>0.05 6 months: 0.3, p>0.05 **ROM (active)** Preoperative: 5, p<0.05 Postoperative: -6, p>0.05 **Muscle Strength** Preoperative: 45.7, p<0.001 Postoperative: 5.1, p>0.05 **Walking Duration** Preoperative: 90, p<0.05 Postoperative: -14.5, p>0.05
Kim 2019	34 subjects, mean age 64 (5.3), women 24 (66.7) **Setting:** Hospital in Seoul, South Korea	1) MT1 group: 110 g of Gang-Chuk Tang was administered 3 times a day (Gang-Chuk Tang is an herbal concoction consisting of Eucommiae Cortex, Achyranthis Radix, Rhizoma Cibotii, Sorbus commixta, G. thunbergii, Saposhnikovia Radix, and Acanthopanacis Cortex in equal portions) Daily Mokhuri Chuna therapy (relaxation and mobilization of lumbar joint and back muscle) Daily acupuncture treatment on LI4, ST36, LV3, BL22, BL23, BL24, BL25, and Ashi points. Consultation on precautions related to daily	1) VAS for leg pain 2) VAS for low back pain 3) Oxford Claudication Scoring 4) Walking distance **Follow-up:** 3 and 6 months	**All between group comparisons** **VAS leg pain (post treatment)** MT2 (28.82±27.46) vs CMT (51.82±25.34) groups: P=0.04 **VAS leg pain (6 months)** MT1 (48.91±23.08) vs CMT (72.27±16.72) groups: P=0.01 MT2 (42.36±21.29) vs CMT groups: P=0.003 **VAS low back pain (6 months):** MT2 (30.00±13.48) vs CMT (60.82±18.62) groups: P=0.001 **Oxford Claudication Scoring (3 months)** MT1 (18.75±6.52) vs CMT (25.82±6.24) groups: p=0.02 **Walking distance (3 months)** MT1 vs CMT: p=0.03 **Walking distance (6 months)** MT1 vs CMT: p=0.01

		activity and stepwise walking training for the entire 4 weeks of therapy. (n=12) 2) MT2 group: Mokhuri Chuna, acupuncture, and physician consultation were offered in the same manner and dosage as the MT1 group with the exception that all herbal medications were withheld. (n=11) 3) CMT group: Oral analgesic therapy (aceclofenac 100 mg twice daily and eperisione hydrochloride 50 mg three times daily for 28 days) and three interlaminar epidural steroid injections (5 mg of dexamethasone per injection) at the level of the affected spinal region over a 4-week period were administered. Physiotherapy including heating pad, and transcutaneous electrical nerve simulator, and deep tissue heating therapy five times per week for 4 weeks. (n=11)		The primary outcome of this pilot study was safety as measured by the type and incidence of adverse events (AEs).
Spinal Manipulation				
Passmore 2017	14 patients with degenerative LSS (n=14); Swiss Spinal Stenosis score of M=63.2, standard deviation [SD] = 15.9) (mean age 59.0 (10.6)), 7 in the SM group (4	1) Spinal manipulation group: received bilateral high-velocity; low-amplitude spinal manipulation directed toward the lumbar region (by a licensed chiropractor with more than 10 years of clinical experience) (n=7) 2) Non Intervention Group: Waited 5 minutes if they were assigned to the	1) Movement time 2) NPS (Back) 3) NPS (leg) 4) ROM **Follow-up:** Immediately after intervention	There was no significant difference between groups for all outcomes. 1. Grp 1 vs. Grp 2, p=0.739 2. Grp 1 vs. Grp 2, p> 0.05 3. Grp 1 vs. Grp 2, p> 0.05 4. Grp 1 vs. Grp 2, p> 0.05

	female, 3 male) (mean age 59.1 (9.3)), 7 in the NI group (3 female, 4 male) (mean age 58.9 (12.6)) **Setting:** rehabilitation hospital in Winnipeg, Manitoba	no intervention group (n=7)		
Acupuncture				
Kim 2016	50 participants mean age of 62.0±9.8 years, acupuncture (n=26), age 65.0±8.7, male / female 12/14, control (n=24), age 58.9±10.2, male / female 10/14. Mean duration of symptoms 33m **Setting:** Hospital in Yangsan, South Korea	1) Acupuncture: 269 acupuncture sessions were administered during the study. 81% (n=21) of patients received at least 10 acupuncture sessions. Electrical acupuncture was applied at least once and bilaterally at back shu points (BL23, BL24, BL25 or BL26) or Jiaji points at L2–L5 spinal levels. Other frequently used points were BL57, BL60, GB39, GB34 and tender points located in the lower extremities (n=26) 2) Control: In total, 255 physical therapy sessions were provided to patients in the control group at their request. 92% (n=22) of patients received at least 10 physical therapy sessions (median 11, range 1–13). (n=24)	1) ODI 2) SF-36 bodily pain 3) SF-36 physical function 4) LBP bothersomeness 5) LBP intensity 6) Leg pain bothersomeness 7) Leg pain intensity 8) Self-reported pain-free walking distance (m) **Follow-up:** 6 weeks, 3 months	**Between group MD, 95% CI** **ODI** 6 wk: -2.2 (-7.0 to 2.6) 3 mo: -2.5 (-8.9 to 3.8) **SF-36 BP** 6 wk: -8.6 (-18.6 to 1.3) 3 mo: 3.2 (-8.3 to 14.7) **SF-36 PF** 6 wk: 0.1 (-7.6 to 7.9) 3 mo: 1.3 (-8.3 to 10.9) **LBP bothersomeness** 6 wk: -0.6 (-11.4 to 10.1) 3 mo: -7.4 (-19.6 to 4.8) **LBP intensity** 6 wk: -5.1 (-15.5 to 5.3) 3 mo: -13.5 (-26.2 to -0.7) **Leg pain bothersomeness** 6 wk: -7.4 (-18.4 to 3.7) 3 mo: -9.2 (-21.6 to 3.2) **Leg pain intensity** 6 wk: -11.5 (-0.9 to -22.0) 3 mo: -12.6 (-24.6 to -0.6)

				None statistically significant
Qin 2020	80 participants assigned with 70 completing the 8-week treatment course (38 in acu group and 32 in sham acu group). Mean age of 61.5±7.9 years with 34 males and 46 females. Duration of symptoms <3mo =14 (17.5%), 3-12 mo = 1(1.3%), 1 to 5 y = 24 (30%), >5 y =41 (51.3%) **Setting:** 2 Clinical Sites - Department of Acupuncture and Neurology, Guang'anmen Hospital Department of Acupuncture and Neurology, Beijing Fengtai Hospital of Integrated Traditional and Western Medicine.	1) Acupuncture: Applied by acupuncturists with 5 years of Chinese medical university program and at least 2 year of clinical experience. Sterile disposable steel needles (Hwato Acupuncture, Suzhou, China; 0.30 £ 40 mm/0.30 £ 75 mm) were inserted through adhesive pads. Participants underwent 3 treatments weekly over 8 weeks, and each session persisted for 30 minutes. To maintain "De qi," a sensation of numbness and soreness, acupuncture manipulation (twirling, lifting, and thrusting on needles) was performed every 10 minutes during the treatment. 2) Sham acupuncture: Chosen acupoints, treatment duration, and frequency of sessions were the same as in the acupuncture group. Participants in the sham cohort were treated using a pragmatic placebo needle on the same acupoints, which is similar to the Streitberger needle design (Supplementary Materials). Acupuncturists pretended to manipulate the needle every 10 minutes, but "De qi" was not sought.	1) RMDQ 2) NRS back 3) NRS Leg 4) SSS Symptoms subscale 5) SSS physical function subscale 6) SSS satisfaction subscale 7) Self-paced walk test **Follow-up:** 4 weeks, 8 weeks (end of treatment), 3 months, 6 months	**RMDQ** 4 wk: -3.6 (-5.2 to -1.9): p<0.001 8 wk: -2.6 (-3.7 to -1.4): p<0.001 3 mo: -2.3 (-3.9 to -0.7): p=0.005 6 mo: -1.8 (-3.6 to -0.3): p=0.086 **NRS Back** 4 wk: -1.7 (-2.4 to -0.9): p<0.001 8 wk: -2.3 (-3.0 to -1.5): p<0.001 3 mo: -1.7 (-2.6 to -0.8): p<0.001 6 mo: -1.2 (-2.1 to -0.3): p=0.007 **NRS Leg** 4 wk: -2.0 (-2.6 to -1.3): p<0.001 8 wk: -2.9 (-2.6 to -1.3): p<0.001 3 mo: -2.4 (-3.3 to -1.4): p<0.001 6 mo: -2.1 (-3.0 to -1.2): p<0.001 **SSS Symptoms Subscale** 4 wk: -0.6 (-0.8 to -0.4): p<0.001 8 wk: -0.9 (-1.2 to -0.6): p<0.001 3 mo: -0.9 (-1.2 to -0.6): p<0.001 6 mo: -1.0 (-1.3 to 0.6): p<0.001 **SSS Physical Function Subscale** 4 wk: -0.5 (-0.8 to -0.3): p<0.001 8 wk: -0.8 (-1.1 to -0.5): p<0.001 3 mo: -0.7 (-1.0 to -0.4): p<0.001 6 mo: -0.7 (-1.1 to -0.4): p<0.001 **Self-Paced Walk Test** 4 wk: p=0.648 8 wk: p=0.29 3 mo: p=030 6 mo: p=0.133 **Adverse events:** 3 participants in group 1 reported pain after needle insertion and 1 had a hematoma. 3 participants in group 2 reported back pain and 2 reported fatigue. All adverse events were reported as mild or moderate, and none required medical intervention.

Epidural injections				
Cuckler 1985	73 subjects in total, 37 with spinal stenosis, 36 with acute herniated nucleus pulposus, 37 males, 36 female, average age of 48.5 years in the experimental group and 49.5 years in the placebo group. Experimental group average 36.6 months in symptom duration, placebo group averaged 29.4 months. **Setting:** Orthopaedic surgery department in the United States	1) Steroid group: 2ml of sterile water containing 80mg of methylprednisolone acetate combined with 5ml of 1% procaine was injected into the epidural space in the region between the 3rd and 4th lumbar vertebrae with the patient in the lateral decubitus position lying on the side of the painful limb (n=42), 20 with stenosis). 2) Placebo group: 2ml of saline combined with 5ml of 1% procaine was injected into the epidural space in the region between the 3rd and 4th lumbar vertebrae with the patient in the lateral decubitus position lying on the side of the painful limb. (n=31, 17 with stenosis) All patients were advised to take mild analgesics (aspirin or acetaminophen) during the post-injection period. Second injection given if less than 50% improvement after 24 hours - considered treatment failure	1) Subjective percentage of improvement with 75% required to be considered a treatment improvement, if less than 50% after 24 hours was considered a treatment failure 2) Re-injection rates 3) Surgery rates **Follow-up:** 24 hours, every 3 months up to 30 months, averaging 20.2 months in the steroid group and 21.5 months in the control group.	**Patient Global Assessment (improved by at least 75%)** 24 hours: 33% (steroid) vs. 21% (saline) p>0.05 Long term: 33% (saline) vs. 14% (saline) p>0.05
Fukusaki 1988	53 subjects, 38 males and 15 female. Group 1 averaged 70 years of age and 79 days of symptoms on average, group 2 averaged 69 years of age and	1) Epidural injection with 8 ml of saline, repeated twice in the first week (n=16) 2) Epidural injection with 8 ml of 1% mepivacaine, repeated twice in the first week. (n=18) 3) Epidural injection with a mixture of 8 ml of 1% mepivacaine and 40 mg	1) Walking distance which was graded according to distance (excellent, good, or poor) **Follow-up:** 1 week, 1 month, 3	**Walking distance** Percent excellent effect = mean of > 100m in walking distance 1 week: 12.5 % (saline) vs. 55% (block) vs. 63.2% (block + steroid); block or block + steroid > saline, p< 0.05; 1 mo: 6.3% (saline) vs. 16.7% (block) vs. 15.8% (block + steroid) p > 0.05 3 mo: 6.3 (saline) vs. 5.6% (block) vs. 5.3% (block +steroid) p> 0.05 No significant difference between block vs. block + steroid at

	an average of 82 days of symptoms, group 3 averaged 72 years of age and 94 days of symptoms on average **Setting:** Anaesthesia department in Japan	of methylprednisone, repeated twice in the first week. (n=19)	months	all follow-up periods, p>0.05 **Adverse events:** no reported complications
Zahaar 1991	30 subjects, 37 male and 26 female. Steroid group averaged 46.5 years of age and 36.6 months of symptoms, control group averaged 49 years of age and 29.4 months of symptoms **Setting**: Medical facility in Egypt	1) Steroid injection: 5ml of hydrocortisone acetate suspension, 2x2ml carbocaine, 4% Volume completed with sterile saline to 30ml (n=18) 2) Control: 2x2ml of carbocaine, 4% injected into epidural space. Volume completed with sterile saline to 30ml. (n=12)	1) Subjective percentage of improvement where 75% or more was deemed successful and surgery after injection was considered a failure. **Follow-up:** 24 hours, then every three months up to 36 mo averaging 20.2 mo in the steroid group and 21.5 mo control group.	**Patient Global Assessment** (improved by at least 75%) 24 hours: 55% (steroid injection) vs. 50% (control) p> 0.05 Up to 36 mo: 38% (steroid injection) group vs. 33.3% (control) p>0.05 **Failures (%)** (required surgery) Up to 36 mo: 61% (steroid injection) vs. 66.6% (control) p>0.05
Friedly 2014, 2017 Makris 2016	400 patients, 221 females and 179 males, 200 in the lidocaine group	1) Lidocaine + glucocorticoid (1-3 mL of 0.25-1% lidocaine followed by 1-3 mL triamcinolone (60-120mg), betamethasone (6-12mg),	1) RMDQ 2) NRS (Leg Pain)	**Between group MD, 95% CI, p values** **RMDQ** 3 weeks: -1.8 (-2.8 to -0.9): p<0.001 6 weeks: -1.0 (-2.1 to 0.1): p=0.07

	with an average age of 68.1 years old and 200 gluocorticoid-lidocaine group with an average age of 68 years old, LSS by CT or MRI. 26% patients symptoms greater than 5 years. **Setting:** 16 medical centers across the United States	dexamethasone (8-10mg) or methylprednisone (60-120mg)) (n=200) 2) Lidocaine group (0.25-1% lidocaine alone) (n=200) Physician option for intralaminar and/or transformaminal techniques	**Follow-up:** 3, 6, and 12 weeks, 6 and 12 months Makris 2016 subgroup 1) RMDQ using SIP Weights 2) RMDQ patient-prioritized (LESSER) **Follow-up:** 3 and 6 weeks	12 wk: 0.1 (-1.0 to 1.3): p=0.84 6 mo -0.00 (-1.1 to 1.1): p=0.99 12 mo: -0.4 (-1.6 to 0.9): p=0.55 **NRS (Leg pain)** 3 weeks: -0.6 (-1.2 to -0.1): p=0.02 6 weeks: -0. (=0.8 to 0.4): p=0.48 12 wk: 0.1 (-0.5 to 0.7): p=0.70 6 mo: -0.2 (-0.8 to 0.4): p=0.47 12 mo: 0.1 (-0.5 to 0.7): P=0.75 Subgroup Analysis **RMDQ using SIP weight** 3 wks: -1.9 (-2.9 to -0.7): p<0.001 6 wks: -1.1 (-2.2 to -0.1): p=0.04 **RMDQ patient prioritized (LESSER)** 3 wks: -1.8 (-2.8 to -0.8): p<0.001 6 wks: -1.0 (-2.0 to 0.1): p=0.08 **Adverse events:** A total 21.5% of patients in group 1 and 15.5% in group 2 reported one or more adverse events (p=0.08) that included headaches, fever, infection, dizziness, cardiovascular/lung problems, leg swelling and dural puncture.
Song 2016	29 subjects, 14 males and 15 women with an average age of 58.3 and 61.7 between groups, history of intermittent claudication and lower limb radicular pain or paresthesia	1) Lidocaine spinal injection, 40 mg triamcinolone mixed with 10 mL 0.5% lidocaine was used under the guide of fluoroscopy (n=15) 2) Saline spinal injection using same volume (n=14)	1) VAS 2) FRI **Follow-up:** 1 and 3 months	No significant difference between groups. **VAS** 1-month p= 0.696, 3 months p= 0.891 **FRI** 1-month p=0.983, 3 months p=0.743

	Setting: Rehabilitation clinic in Korea			
Milburn 2014	57 patients met inclusion criteria, agreed to participate, and were enrolled. 20 patients were male; 37 were female. Mean patient age was 65.3 years (range, 32-88 years). Average duration of symptomatology (pain and/or disability) was 42 months. The mean degree of canal narrowing at the most stenotic level was 6.1 mm (range, 2.5-9.1 mm). The most common maximally stenotic intervertebral level was L4-L5	Fluoroscopically guided lumbar ILESI performed either at: 1) The level of maximal stenosis (n=30) 2) Two intervertebral levels cephalad, corresponding to a less stenotic level (n=27) Injection was performed with a 20-gauge Tuohy needle using a loss of resistance technique. The injectate consisted of 2 mL of 40 mg/mL methylprednisolone (Pfizer), 2 mL of bupivacaine 0.25% (Hospira), and 2 mL of normal saline for a total injectate volume of 6 mL.	1) NRS - Pain with Ambulation 2) RMDQ **Follow-up:** 1, 4 and 12 weeks	**All between group comparisons** **NRS (pain with ambulation)** 1 wk: Grp 1 lower pain compared to Grp 2, p=0.045 4 wk: Grp 1 lower pain compared to Grp 2, p=0.049 12 wk: Grp 1 lower pain compared to Grp 2, p=0.08 **RMDQ** 1 wk: Grp 1 lower compared to Grp 2, p=0.001 4 wk: Grp 1 lower compared to Grp 2, p=0.009 12 wk: Grp 1 lower compared to Grp 2, p=0.003

	(n¼42) followed by L3-L4 (n¼11) and L5-S1 (n¼4). **Setting:** Clinic in New Orleans, Louisiana			
Brown 2012	38 patients, 21 males and 17 females, 21 in mild group with an average age of 74.2 years and 17 in ESI group with an average age of 78.7 years, symptomatic LSS patients with painful lower limb neurogenic claudication, able to walk at least 10 feet unaided, (ODI) score > 20 **Setting:** Pain management clinic in Florida	1) Epidural steroid (80 mg triamcinolone acetate) (n=17) 2) Mild lumbar decompression (n=21)	1) VAS 2) ODI 3) ZCQ 4) Patient Satisfaction (0-10) **Follow-up:** 6 and 12 weeks	**VAS** 6 and 12 weeks P=0.54 **ODI** p=0.86 **ZCQ** p>0.05 **Patient satisfaction** p>0.05
Hammerich 2019	54 patients total, age 67.2 ± 9.7, 27 male, 27 female, 31 in ESI group, 23 in ESI plus PT. Mean duration of	1) ESI (n=31) 2) ESI + PT (n=23) ESI: 1.5 mL of steroid at each site injected with maximal involvement using transforaminal approach.	1) ODI 2) NRS current 3) SF-36 emotional role 4) SF-36 emotional well-being	**Between group MD, 95% CI, p values** **ODI** 10 wks: -1.08 (-8.10 to 5.94) p=0.80 6 mo: -4.70 (-11.72 to 2.32) p=0.27 12 mo: -2.72 (-9.74 to 4.30) p=0.52 **NRS** 10 wks: -1.68 (-3.08 to -0.29) p=0.07

	symptoms 14 m **Setting:** Clinics in Colorado, Texas, South Carolina and New Hampshire	PT: 8-10 sessions PT manual therapy and exercise. Walking program and/or stationary bike, stretching and strengthening exercises.	5) SF-36 general health perception **Follow-up**: 10 weeks, 6 and 12 months	6 mo: -1.99 (-3.38 to -0.60) p=0.04 12 mo:-2.44 (-3.80 to -1.08) p=0.00 **SF-36 Emotional role** 10 wks: -28.53 (-49.05 to -8.01) p=0.03 6 mo: -11.25 (-31.77 to 9.27) p=0.39 12 mo: -10.67 (-31.19 to 9.85) p-0.41 **SF-36 Emotional well-being** 10 wks: -11.26 (-19.52 to -2.99) p=0.02 6 mo: 2.69 (-5.57 to 10.95) p=0.59 12 mo: -5.76 (-14.02 to 2.50) p=0.24 **SF-36 General Health Perception** 10 wks: -8.99 (-17.20 to -0.78) p=0.05 6 mo: -5.56 (-13.77 to 2.65) p=0.23 12 mo: -5.10 (-13.31 to 3.11) p=0.27
Sencan 2020	67 patients. The median age 62.5 years with 18 males and 49 females. Median duration of symptoms was 29 and 24 months in the ILESI and bilateral TFESI groups, respectively **Setting:** University department Pain Medicine, Istanbul Turkey	1) Interlaminar: ILESI, fluoroscopy guided with 1 to 2 mL contrast dye with mixture of 80 mg methylprednisolone acetate, 2 mL saline solution, and 2 mL (0.5%) bupivacaine solution 2) Transforaminal: TFESI, fluoroscopy guided with 1 to 2 mL contrast dye with mixture of 80 mg methylprednisolone acetate, 2 mL saline solution, and 2 mL (0.5%) bupivacaine solution	1) NPS 2) ODI 3) Beck depression scale 4) Walk distance **Follow-up:** after treatment, 3 weeks and 3 months	**Between Group Median Differences (data not provided), p values** **NPS** after treatment: p=0.14 3 wks: p=0.28 3 mo: p=0.047 **ODI** 3 wks: p=0.93 3 mo: p=0.65 **Beck Depression Scale** 3wks: p=0.048 3 mo: p=0.03 Walking Distance 3 wks: p=0.23 3 mo: p= 0.048
Wei 2020	90 patients. Mean age about 65 years, 45 females, 45	1) Epidural injection with 2.0mL of lidocaine and 10 mg of TNF-a inhibitor (etanercept) on the affected spinal nerves.	1) VAS (leg) 2) ODI **Follow-up:** after	**Between Group Mean Differences (data not provided), p values** **Grp 1 vs Grp 2** **VAS**

	males, mean duration of symptoms about 2.8 months **Setting:** University Hospital Jiangsu China	2) Epidural administration with 2mL of lidocaine mixed with 2mL of steroid (diprospan) 3) Epidural injection 4.0mL of lidocaine only.	treatment, 1,3, 6 months	after treatment, 1, 3 and 6 mo, Grp 1 greater reduction, p<0.05 **ODI** 1, 3 and 6 mo, Grp 1 greater reduction, p<0.05 **Grp 1 vs Grp 3** **VAS** after treatment, 1, 3 and 6 mo, Grp 1 greater reduction, p<0.05 **ODI** 1, 3 and 6 mo, Grp 1 greater reduction, p<0.05 **Grp 2 vs Grp 3** **VAS** after treatment, 1, 3 and 6 mo, no significant difference, p>0.05 **ODI** 1, 3 and 6 mo, no significant difference, p>0.05
Karm 2018	44 patients total, 20 in the RACZ group (age 66.1 +-12.2, male 9 (45.0%), and 24 in the ZiNeu group (Age 65.5 +-6.4 18 females, 26 males. **Setting:** Single-center, academic, outpatient interventional pain management clinic in Korea	1) PEA Using a Balloon-less Catheter (Racz) (n = 20) 2) Percutaneous Epidural Decompression and Adhesiolysis Using an Inflatable Balloon Catheter (ZiNeu) (n = 24)	1) NRS (back pain) 2) NRS (leg pain) 3) ODI **Follow-up:** 1, 3 and 6 months	**Between group MD, 95% CI, p values** **NRS-11 (Back pain)** 1 mo:-0.38 (-1.81 to 1.06): p=0.61 3 mo: -1.13 (-2.63 to 0.38): p=0.14 6 mo: -2.02 (-3.58 to 0.45): p=0.01 **NRS-11 (Leg pain)** 1 mo: 0.73 (-0.40 to 1.85): p=0.21 3 mo: -0.69 (-1.89 to 0.52): p=0.26 6 mo: -1.88 (-3.15 to 0.61): p=0.00 **ODI (%)** 1 mo: -6.13 (-13.88 to 1.61): p=0.12 3 mo: -6.63 (-14.75 to 1.48): p=0.11 6 mo: -13.74 (-22.18 to 5.30): p=0.00 **Adverse events:** Minor and transient adverse events were reported equally in both groups (no data provided), mostly pain and paresthesia at the injection site.
Surgery				
Zucherman 2004, 2005, 2006	191 subjects, 57% male and 43% female in the X STOP group. 52% male	1) X STOP Interspinous Process Decompression System (n=100) 2) Non-operative treatment: Subjects received an epidural steroid injection	1) SF-36 2) ZCQ 3) Worker's compensation claims	**Patient global assessment** **(Good result)** 2 yrs: 73.1% (surgery) vs. 35.9% (control) (P< 0.001) **Symptoms Severity score**

	and 48% female in the non-operative group. Average age of 70 years in the X STOP group and 69.1 years in the non-operative group. Average of 3.5 year symptom duration in the X STOP group and 4.7 years in the non-operative group. **Setting:** Spine center in the United States	on enrolment and were eligible for additional injections as needed, as well as NSAIDS, analgesic agents, and physical therapy. Physical therapy consisted of education on back care and modalities such as ice packs, heat packs, massage, stabilization exercises, and pool therapy. Braces such as abdominal binders and corsets were permitted, but body jackets and chair back braces were not. (n=91)	4) ODI 5) Radiographic changes **Follow-up:** Surgery: 7 (2 yr) Control: 19 (2 yr)	Surgery better at 6 w, 6 mo, 1 and 2 yr (graphs) (P<0.001) 2 yrs: MPC 45.4% (surgery) vs. 7.4% (control) (P < 0.001) **"Clinically relevant improvement (patients)":** 2 yrs: 60.2% (surgery) vs. 18.5% (control) (P< 0.001) **Symptoms Severity score††** Surgery better at 6 w, 6 mo, 1 and 2 yr (graphs) (P<0.001) 2 yrs: MPC 44.3% (surgery) vs. -0.4% (control) (P < 0.001) **"Clinically relevant improvement (as measured by patients)":** 2 yrs: 57% (surgery) vs. 14.8% (control) (P < 0.001) **ZCQ (global success)** 6 mo: 52% (surgery) vs. 9% (control) (P value not reported) 1 yr: 59% vs 12% (P value not reported) 2 yrs: 48.4% (surgery) vs. 4.9% (control) (P < 0.001) **Quality of life (SF-36)** At all post treatment time points (6 w, 6 mo, 1 yr, 2 yr), the mean domain scores documented in the X STOP group were significantly greater than those in the non operative group, with the exception of the mean General Health, Role Emotional, and Mental Component *Summary scores at 2 years* **Adverse events:** No complications were reported in group 2. In group 1, complications were reported in 11% of subjects including spinous process fracture, coronary ischemia, respiratory distress, hematoma, and 1 death (pulmonary edema)
Weinstein 2007, 2009, Abdu 2018	Subjects with image-confirmed degenerative spondylolisthesis: 304 subjects in the RCT, 303 in the observational cohort, 31% male in the surgical group, 33% male in the surgical group. Average	1) Assigned to surgery (standard laminectomy with or without fusion) (n=159) 2) Assigned to non-surgical treatment: Usual non-operative care (n=145)	1) SF-36 bodily pain 2) SF-36 bodily function 3) low back pain bothersomeness scale 4) Leg pain bothersomeness scale 5) ODI 6) Subjective self-	**All between group comparisons using Intention-to-Treat analysis** **SF-36 Bodily Pain, DMC, 95% CI** 2 yrs: 1.5 (-4.2 to 7.3) 4 yrs: -2 (-8.6 to 4.6) 8 yrs: p=0.85 **SF-36 Bodily Function, DMC, 95% CI** 2 yrs: 1.9 (-3.7 to 7.5) 4 yrs: -3.1 (-9.2 to 3.0) 8 yrs: p=0.31 **Disability (ODI), DMC, 95% CI** 2 yrs: 2.2 (-2.3 to 6.8)

	age of 64.7 years in the surgical group and 68.2 years in the non-surgical group. Subjects had symptoms for at least 12 weeks **Setting:** multi-centred orthopaedic departments in the United States		reported improvement, satisfaction with current symptoms and care 7) Stenosis bothersomeness index **Follow-up**: 6 weeks, 3 and 6 months, 1, 2, 4 and 8 years	4 yrs: 4.1 (-0.8 to 9.1) 8 yrs: p=0.039 Other outcomes (patient's satisfaction; Stenosis Bothersomeness Index, Leg Pain Bothersomeness Scale; and Low Back Pain Bothersomeness Scale) were not provided separately for the randomized cohort. **Adverse events:** group 1 reported 14% intraoperative complication mostly and dural tears and 19% postsurgical complications including 1 death, 11% required additional surgeries at 2 years,
Amundsen 2000	100 subjects, 54 male, 46 female, median age of 59 (males were 1.5 years higher than females). Median back pain duration was 14 years, median duration of sciatica was 2 years. **Setting:** Neurology department in a hospital in Norway	1) Surgery: Partial or total laminectomy, medial facetectomy, discectomy, and/or removal of osteophytes from the vertebral margins or facet joints. No fusions. (n=13) 2) Conservative therapy: Lumbar orthosis use for 1 month worn during the day for all activities plus instruction and back school." (n=18)	1) VAS 2) Verbal Rating Scale 3) Subjective change (better, worse, or unchanged) 4) Work status 5) Subjective rating from evaluating physician and study team (Excellent, Fair, Unchanged, Worse) **Follow-up:** 6 months, 1, 4 and 10 years	**Patient global assessment (Good result)** 1 yr: RR 2.07 (0.98 to 4.38) 4 yrs*: RR 1.94 (1.14 to 3.31)* 10 yrs: RR 3.18 (0.97 to 10.41) **Pain (none or mild)** 1 yr: NR 4 yrs: RR 3.33 (0.77 to 14.33) 10 yrs: RR 1.59 (0.55 to 4.55) Other outcomes (claudication or walking distance; level of daily activity; and neurologic deficits) were not reported separately for the randomized cohort.
Malmivaara 2007	94 subjects, 22% of surgical	1) Segmental decompressive surgery with facetectomy (n=50)	1) 11 point numerical pain	**All between group comparisons** **Leg pain, MD, 95% CI**

	subjects were male, 45% of non-operative subjects were male. Nonoperative group had average age of 62.9 years, surgical group had average age of 63.9 years. Surgical group averaged 14 years since onset of symptoms, nonsurgical group average 16 years since onset of symptoms. Minimum of 6 months of symptoms for study inclusion. **Setting:** Research Center in Finland	2) Non-operative treatment: NSAIDS when indicated and seen one to three times by a physiotherapist, in addition to the standard visit at each follow-up. The physiotherapist gave all patients educational brochure. The patients were encouraged to use their back in a normal way. Pain-relieving body postures were taught as well as basic ergonomics related to lifting and carrying. Individually structured programs included trunk muscle endurance and stretching-type exercises. Additional individual physiotherapy consisting of passive treatment methods (such as ultrasound and transcutaneous nerve stimulation). (n=44) The patients in the surgical group also received the brochure and the instructions described above.	rating scale for back and leg pain 2) Walking ability (distance without a break) also via treadmill test 3) General health status on a 5 point scale (very good, quite good, average, quite poor or very poor. 4) ODI 5) Ability to complete certain activities of daily 6) living without difficulty, some difficulty, marked difficulties or not at all 7) Radiographic examination **Follow-up:** 6 months, 1 and 2 years	1 yr: 1.69 (0.41 to 2.96) 2 yr: 1.51(0.25 to 2.77) **Back pain, MD, 95% CI** 1 yr: 2.33 (1.12 to 3.55) 2 yrs: 2.13(0.98 to 3.28) **Disability (ODI), MD, 95% CI** 1yr: 11.3 (4.3to 18.8) 2 yrs: 7.8 (0.8 to14.9) **> 10 points reduction (ODI): RR, 95% CI** 1 yr: 2.16 (1.31to 3.57) 2 yrs: 1.36 (0.88 to 2.10) **Walking disability (walking distance <1.250 m), RR, 95% CI** 1 yr: 0.93 (0.61 to 2.03) 2 yrs: 1.08 (0.70 to 2.42) **Walking disability (walking distance <400 m), RR, 95% CI** 1 yr: 0.91 (0.51 to 4.24) 2 yrs: 1.18 (0.67 to 4.72)

Weinstein 2008, 2010, Lurie 2015	289 in the RCT, 365 in the observational cohort. 62% male in the surgical groups, 59% male in the non-surgical groups. Average age of 63.8 in the surgical group, 66.1 in the non-surgical group. 60% in the surgical group and 55% in the non-surgical group had symptoms for over 6 months. **Setting:** multi-centred-orthopaedic departments in the United States.	1) Assigned to surgery: Standard laminectomy with or without fusion (n=138) 2) Assigned to non-surgical treatment: Usual non-operative care - recommended to include at least active physical therapy, education or counseling with home exercise instruction, and the administration of NSAIDs, if tolerated (n=151)	1) SF-36 bodily pain 2) SF-36 bodily function 3) Low back pain bothersomeness scale 4) Leg pain bothersomeness scale 5) ODI 6) Subjective self-reported improvement, satisfaction with current symptoms and care, 7) Stenosis bothersomeness index **Follow-up**: 6 weeks, 3 and 6 months, 1, 2, 4, 8 years	**All between group comparisons using Intention-to-Treat Analysis** **SF-36 Bodily Pain, DMC, 95% CI** 2 yrs: 7.8 (1.5to 14.1) 4 yrs: 0.3 (-6.4 to 7) 8 yrs: p=0.25 **SF-36 Bodily Function, DMC, 95% CI** 2 yrs: 0.1 (-6.4 to 6.5) 4 yrs: -3.2 (-9.9 to 3.6) 8 yrs: p=0.89 **Disability (ODI), DMC, 95% CI** 2 yrs: -3.5 (-8.7 to 1.7) 4 yrs: 0.2 (-5.2 to 5.7) 8 yrs: p=0.87 Other outcomes (patient's satisfaction; Stenosis Bothersomeness Index, Leg Pain Bothersomeness Scale; and Low Back Pain Bothersomeness Scale) were not provided separately for the randomized cohort. **Adverse events:** In group 1, 10% of patients required transfusions intraoperatively and 5% postoperatively. The most common surgical complication was dural tear, in 9% of patients. At 2 years, reoperation had occurred in 8% of subjects.
Delitto 2015	169 patients, 88 males and 81 females, 87 surgical group with an average age of 66.6 years old and 82 PT group with an average age of 69.8 years old, LSS by computed	1) Surgical decompressive laminectomies, partial facet resection, and neuroforaminotomies (n=87) 2) PT program: lumbar flexion exercises, exercises and education (n=82)	1) SF-36 physical function **Follow-up:** 2 years	**2 years -SF-36 Physical Function, MD and 95% CI** 0.9 (7.9 to 9.6) **Adverse events:** 9 out of 82 participants in group 2 reported adverse events consisting of worsening of symptoms whereas 33 out 87 participants in group 1 reported surgery related complications, mainly attributable to reoperation, delay in wound healing and surgical site infection.

	tomography - criteria of Wiesel and colleagues (18) or magnetic resonance imaging - criteria of Boden and colleagues (2) **Setting:** Neurologic and orthopedic surgery departments and physical therapy clinics in western Pennsylvania			

ADLs = Activities of Daily Living, AUC = Area under the pain-intensity curve, BTX = Botox, CI = Confidence Interval, DMC = Difference in mean change from baseline, ESI = Epidural Steroid Injection, FRI = Functional Rate Index, GRP = Group, HADS =Hospital Anxiety and Depression Scle, IU = International Units, JOABPEQ = Japanese orthopaedic association back pain evaluation questionnaire, LBOS = Low Back Outcome Score, LBP = Low Back Pain, m = Meters, MCS = Mental Component Score, MD = Mean Difference, mm = Millimeters, Mo = Months, MPC = Mean Percent Change, NRS = Numerical Pain Rating Scale, NR = Not Reported, ODI = Oswestry Disability Index, OR = Odds Ratio, PASS-20 = Pain Anxiety Symptoms Scale, PCS = Physical Component Score, RCT = Randomized Controlled Trial, RMDI = Roland Morris Disability Index, ROM = Range of Motion, RR = Relative Risk, SBI = Stenosis Bothersomeness Index, SPWT = Self-Paced Walking Test, SSS = Spinal Stenosis Questionnaire, TSK-11 = Tampa Scale-11, VAS = Visual Analogue Scale, WMD = Weighted Mean Difference, ZCQ = Zurich Claudication Questionnaire