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Lumbar Spondylosis: Treatment

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Learning Objectives

- Understand common presentations of lumbar degenerative disease
- Develop a multimodal nonoperative treatment approach
- Identify patients who would benefit from surgical intervention

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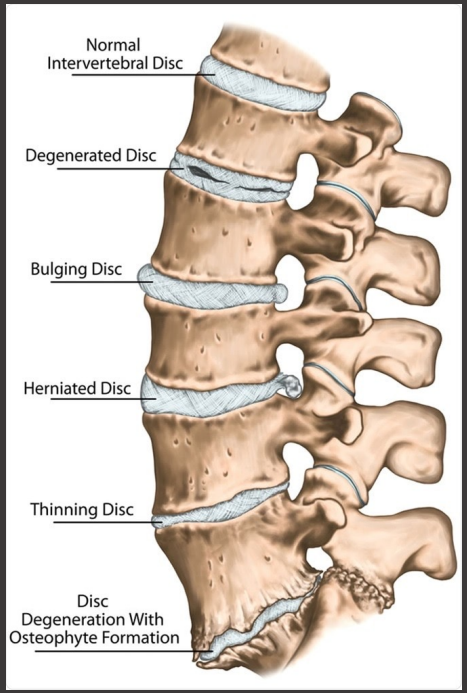
Etiology: Lumbar Spondylosis

- Lumbar spondylosis: Age related degeneration of the joints of the lumbar spine.

- Degeneration likely starts with disc and progresses with involvement of facet joints and ligamentum flavum



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Etiology: Lumbar Spondylosis

- Incidence increases with age even in asymptomatic patients
  - Ages 20-35: 20%
  - Ages 60-80: 57%

- Presence or severity on imaging does not correlate with symptoms

J Bone Joint Surg Am. 1990 Mar;72(3):403-8.

Abnormal magnetic-resonance scans of the lumbar spine in asymptomatic subjects. A prospective investigation

S D Boden [1], D O Davis, T S Dina, N J Patronas, S W Wiesel

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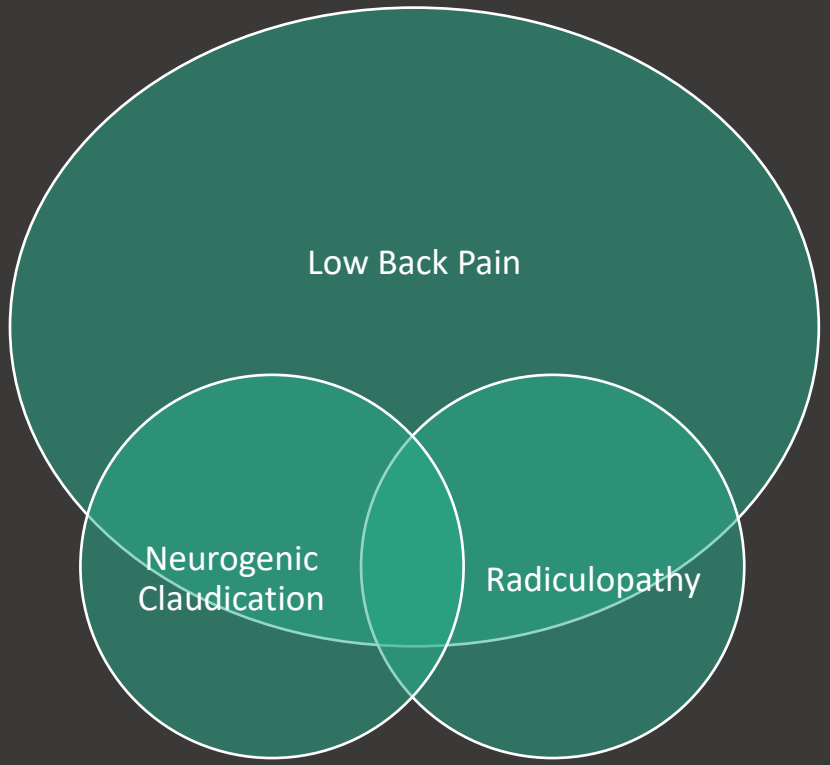
Etiology: Lumbar Spondylosis

- Symptoms can occur in some combination of:
  - Back pain
  - Radiculopathy
  - Neurogenic claudication



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Lumbar Spondylosis: Evaluation

- All patients need:
  - Complete history
  - Review of systems
  - Physical examination
- In the absence of red flags patients with acute low back pain may not initially need:
  - Radiographs
  - Advanced Imaging

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Lumbar Spondylosis: Red Flags

- Fracture:
  - Trauma
  - Osteoporosis/hx of compression fracture
- Infection:
  - Fevers/chills
  - Immunocompromise
  - IV drug abuse
- Cancer:
  - History of malignancy
  - Weight loss
  - Night Sweats/Cough
- Cauda Equina/Neurologic Progression
  - Severe weakness
  - Saddle Anesthesia
  - Less than 3/5 strength
- Nonskeletal Causes of Pain
  - AAA
  - Pyelonephritis

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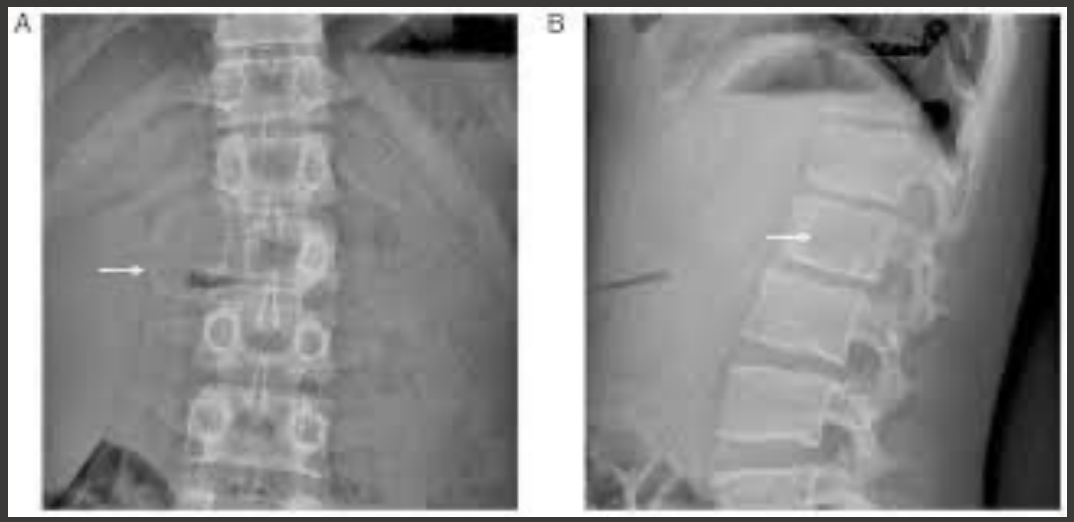
Lumbar Spondylosis: Red Flags



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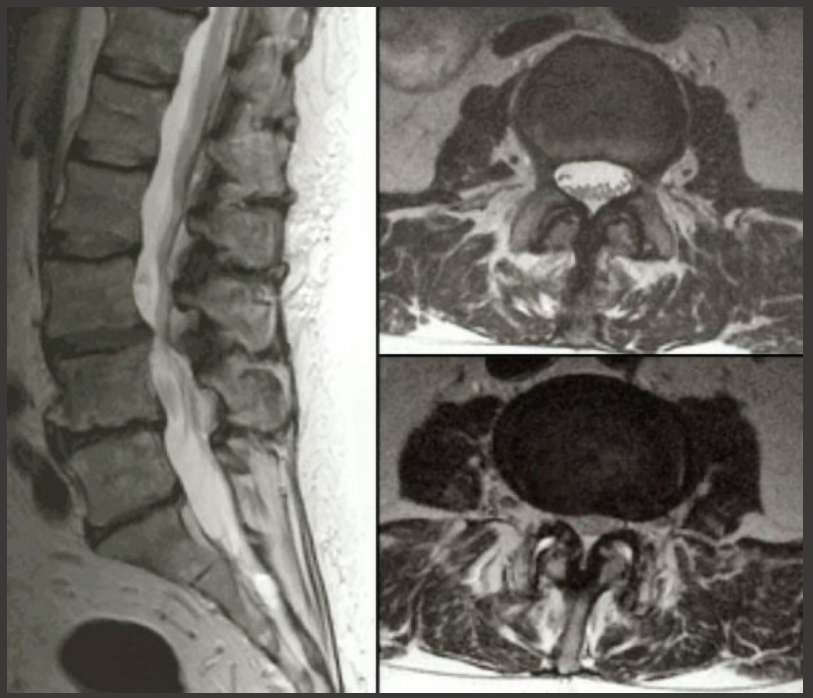
Lumbar Spondylosis: Specific Conditions

- As disc and facet degeneration progress three conditions can develop:
  - Lumbar disc herniation
  - Lumbar stenosis
  - Lumbar spondylolisthesis



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Lumbar Disc Herniation With Radiculopathy

- Trends to younger patients (peak 4th-5th decade of life)
- Pain is typically unilateral with some combination of dermatomal paraesthesias, myotomal weakness or reflex changes
- Nerve tension signs present
  - Femoral Stretch (upper lumbar)
  - Straight leg raise (lower lumbar)

Lumbar Disc Herniation With Radiculopathy

- Majority (95%) occur in paracentral region
- Other 5% occur in far lateral position
- Far lateral disc herniations can be harder to detect
  - Parasagittal views on T1 sequence can be helpful

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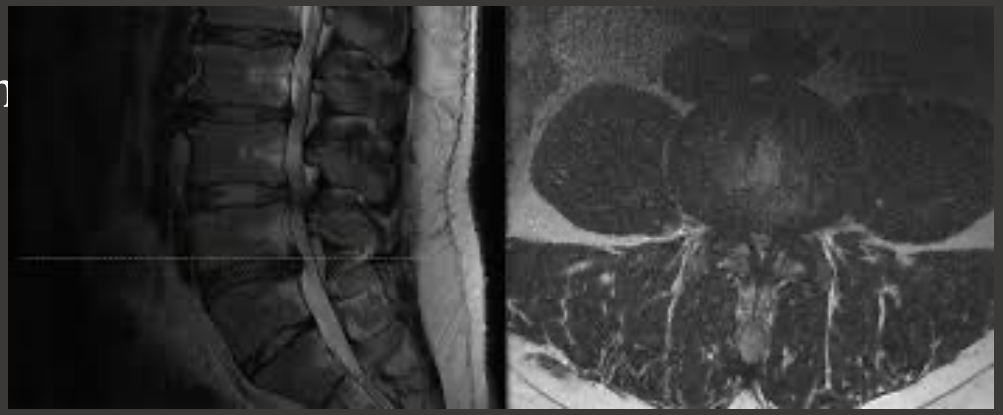
Lumbar Spinal Stenosis

- Can lead to radiculopathy, claudication or both
- Patients describe crampiness in back, buttocks and legs with walking
  - Improved leaning forward
- May not have focal neurologic findings



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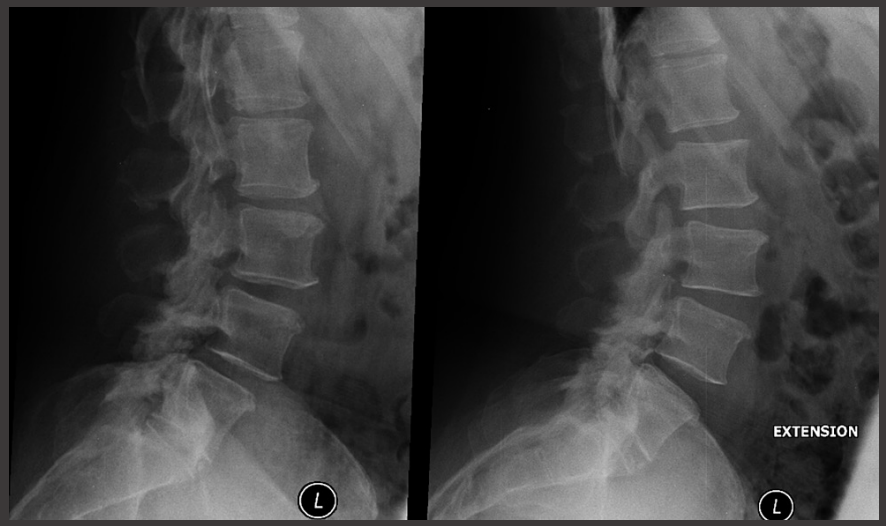
Lumbar Degenerative Spondylolisthesis

- Can cause low back pain, radiculopathy and/or claudication type symptoms
- Most commonly at L4/5
- Can be dynamic (consider flexion/extension views)



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Lumbar Degenerative Spondylolisthesis

Lumbar Spondylosis: Nonoperative Treatment

- In the absence of red flags or severe neurologic dysfunction everyone should attempt nonoperative care
- Care should be tailored to the patient's specific set of symptoms
- Developing a treatment plan represents a good opportunity to involve the patient

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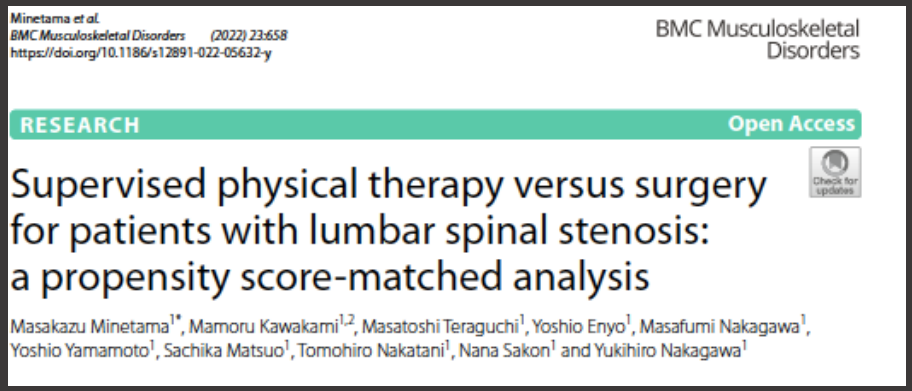
Limitations In Current Literature

- Spondylosis is a broad set of diseases
  - Significant overlap
  - Severity varies
- Randomization is difficult
  - Crossover is extremely high
- In nonrandomized studies
  - Surgical patients have worse baseline stenosis, worse symptoms



Minetama et al.
BMC Musculoskeletal Disorders (2022) 23:658
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BMC Musculoskeletal Disorders

RESEARCH Open Access

Supervised physical therapy versus surgery for patients with lumbar spinal stenosis: a propensity score-matched analysis

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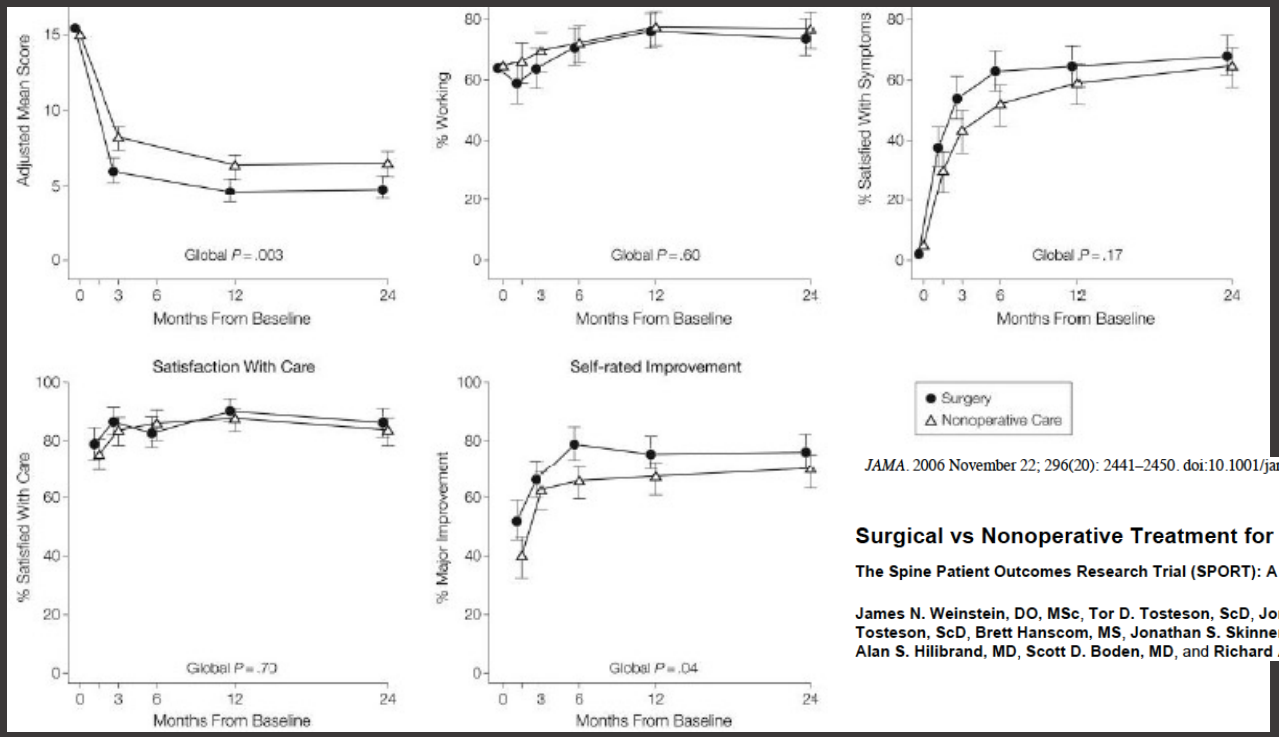
Lumbar Spondylosis: Nonoperative Treatment



JAMA. 2006 November 22; 296(20): 2441–2450. doi:10.1001/jama.296.20.2441.

Surgical vs Nonoperative Treatment for Lumbar Disk Herniation:

The Spine Patient Outcomes Research Trial (SPORT): A Randomized Trial

James N. Weinstein, DO, MSc, Tor D. Tosteson, ScD, Jon D. Lurie, MD, MS, Anna N. A. Tosteson, ScD, Brett Hanscom, MS, Jonathan S. Skinner, PhD, William A. Abdu, MD, MS, Alan S. Hilibrand, MD, Scott D. Boden, MD, and **Richard A. Deyo, MD, MPH**

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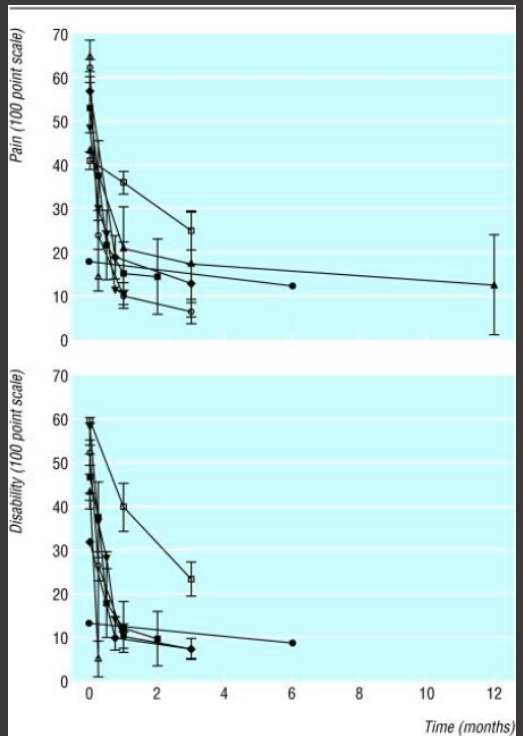
Lumbar Spondylosis: Nonoperative Treatment

- All patients without severe neurologic deficit should have a dedicated trial of nonoperative treatment.
- Decision on what is shared with the patient.
  - NSAIDs/Tylenol
  - Gabapentin
  - Physical therapy
  - Injections (try to limit expectations of pain management)
- Those who continue to have severe pain or limitation are offered surgery.
  - If they are a medical candidate

Nonoperative Treatment Modalities: Natural History

- Time is on the patient's side for acute pain
  - Most patients with acute low back pain see significant improvement in 1 month
  - 80% of patients with radiculopathy from disc herniation resolve in 10-12 weeks
  - About 1/3 of patients with LSS improve with time, 50% don't progress
- Use this in counseling
  - Self care
  - Helps with patient understanding

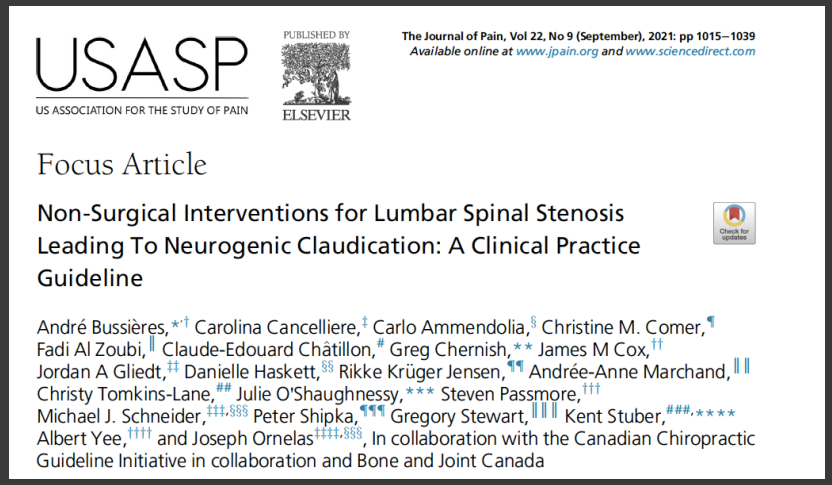


Acute low back pain: systematic review of its prognosis

Liset H M Pengel, Robert D Herbert, Chris G Maher, Kathryn M Refshauge

Nonoperative Treatment Modalities: Oral Medications

- Recommended Against:
  - Tylenol
  - NSAIDs
  - Muscle relaxants
  - Gabapentin/Lyrica
  - Narcotics
  - ESI's
- Weak recommendations:
  - Acupuncture
  - SSNRI's, Tricyclics



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Focus Article

Non-Surgical Interventions for Lumbar Spinal Stenosis Leading To Neurogenic Claudication: A Clinical Practice Guideline

André Bussières,[*,†] Carolina Cancelliere,[‡] Carlo Ammendolia,[§] Christine M. Comer,[¶] Fadi Al Zoubi,[‖] Claude-Edouard Châtillon,[#] Greg Chernish,[**] James M Cox,[††] Jordan A Gliedt,[‡‡] Danielle Haskett,[§§] Rikke Krüger Jensen,[¶¶] Andrée-Anne Marchand,[‖‖] Christy Tomkins-Lane,[##] Julie O'Shaughnessy,[***] Steven Passmore,[†††] Michael J. Schneider,[‡‡‡,§§§] Peter Shipka,[¶¶¶] Gregory Stewart,[‖‖‖] Kent Stuber,[###,****] Albert Yee,[††††] and Joseph Ornelas[‡‡‡‡,§§§], In collaboration with the Canadian Chiropractic Guideline Initiative in collaboration and Bone and Joint Canada

Nonoperative Treatment Modalities: NSAIDs/Tylenol

- Acute Radiculopathy:
  - No great evidence suggesting superiority over placebo
  - Safe
  - Intuitive

- Chronic Low Back Pain:
  - Small improvement in pain (7/100)
  - Small improvement in disability (0.9/24)
  - No difference between types
  - Low risk

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Nonoperative Treatment Modalities: Gabapentin/Lyrica

- Work by blocking presynaptic calcium channels to inhibit release of neurotransmitters
- Anecdotally, many patients note benefit
- Rigorous trials have not consistently shown population benefit over placebo in:
  - Neurogenic claudication
  - Lumbar radiculopathy

Gabapentin and Pregabalin Not Effective for Low Back Pain with or Without Radiculopathy

Clinical Question

Are anticonvulsants an effective treatment for low back pain?

Bottom Line

The use of anticonvulsants like gabapentin (Neurontin) for painful conditions has increased greatly in recent years. This review finds good evidence that these drugs are not an effective treatment for low back pain with or without radiculopathy, and are associated with an increased risk of adverse events. (Level of Evidence = 1a)

Reference: *Enke O, New HA, New CH, et al. Anticonvulsants in the treatment of low back pain and lumbar radicular pain: a systematic review and meta-analysis. CMAJ. 2018;190(26):E786-E793.*

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Nonoperative Treatment Modalities: Gabapentin/Lyrica

- Dosing and tolerance can be an issue

- I typically avoid in:
  - Seizure disorders
  - Patients who operate heavy machinery

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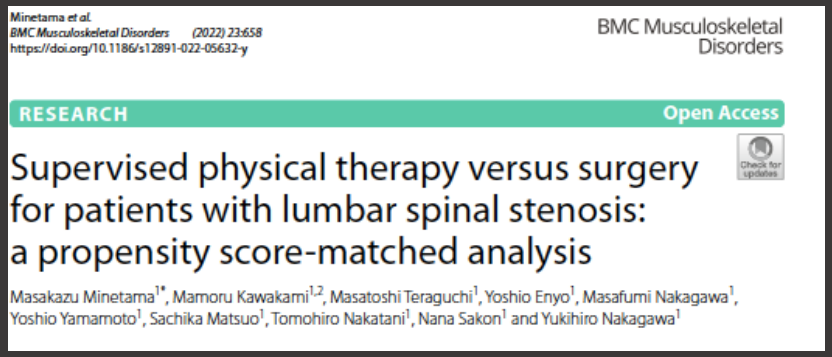
Nonoperative Treatment Modalities: PT

- Can provide similar benefits to surgery especially in mild to moderate cases
- Broad field with little agreement on:
  - Modalities
  - Duration
- Cost
  - Copays
  - Time



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Conclusions: When baseline characteristics were considered, supervised physical therapy yielded similar effects to lumbar surgery. These results suggest that supervised physical therapy is preferred over surgery as first-choice treatment, to prevent complications and to minimize health care costs, especially in mild to moderate cases of LSS.

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Nonoperative Treatment Modalities: PT

- Versus group exercise or medical treatment in stenosis:
  - Short term improvements in walking and disability
  - All groups improved
  - No difference at 6 months

JAMA Netw Open. 2019 Jan; 2(1): e186828. PMCID: PMC6324321
Published online 2019 Jan 4. doi: 10.1001/jamanetworkopen.2018.6828 PMID: 30646197

Comparative Clinical Effectiveness of Nonsurgical Treatment Methods in Patients With Lumbar Spinal Stenosis

A Randomized Clinical Trial

Michael J. Schneider, DC, PhD,[2][1,2] Carlo Ammendolia, DC, PhD,[3] Donald R. Murphy, DC,[4] Ronald M. Glick, MD,[5,6] Elizabeth Hile, PhD, PT,[7] Dana L. Tudorascu, PhD,[8] Sally C. Morton, PhD,[9] Clair Smith, MS,[10] Charity G. Patterson, PhD, MSPH,[1] and Sara R. Piva, PhD, PT[1]

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Nonoperative Treatment Modalities: Epidural Steroid Injection

- No long term improvements
- Helpful for:
  - Diagnostic challenges
  - Medically frail
  - Patients with strong preference
- Sometimes patient come back with poorly validated treatment solutions.
  - Interspinous device
  - MILD procedure
  - Hypertonic Saline
  - Spinal Cord Stimulator

The NEW ENGLAND JOURNAL of MEDICINE

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A Randomized Trial of Epidural Glucocorticoid Injections for Spinal Stenosis

Janna L. Friedly, M.D., Bryan A. Comstock, M.S., Judith A. Turner, Ph.D., Patrick J. Heagerty, Ph.D., Richard A. Deyo, M.D., M.P.H., Sean D. Sullivan, Ph.D., Zoya Bauer, M.D., Ph.D., Brian W. Bresnahan, Ph.D., Andrew L. Avins, M.D., M.P.H., Srdjan S. Nedeljkovic, M.D., David R. Nerenz, Ph.D., Christopher Standaert, M.D., Larry Kessler, Ph.D., Venu Akuthota, M.D., Thiru Annaswamy, M.D., Allen Chen, M.D., M.P.H., Felix Diehn, M.D., William Firtch, M.D., Frederic J. Gerges, M.D., Christopher Gilligan, M.D., Harley Goldberg, M.D., David J. Kennedy, M.D., Shlomo Mandel, M.D., Mark Tyburski, M.D., William Sanders, M.D., David Sibell, M.D., Matthew Smuck, M.D., Ajay Wasan, M.D., Lawrence Won, M.D., and Jeffrey G. Jarvik, M.D., M.P.H.

RESULTS

At 6 weeks, there were no significant between-group differences in the RMDQ score (adjusted difference in the average treatment effect between the glucocorticoid–lidocaine group and the lidocaine-alone group, −1.0 points; 95% confidence interval [CI], −2.1 to 0.1; P=0.07) or the intensity of leg pain (adjusted difference in the average treatment effect, −0.2 points; 95% CI, −0.8 to 0.4; P=0.48). A prespecified secondary subgroup analysis with stratification according to type of injection (interlaminar vs. transforaminal) likewise showed no significant differences at 6 weeks.

CONCLUSIONS

In the treatment of lumbar spinal stenosis, epidural injection of glucocorticoids plus lidocaine offered minimal or no short-term benefit as compared with epidural injection of lidocaine alone. (Funded by the Agency for Healthcare Research and Quality; ClinicalTrials.gov number, NCT01238536.)

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Nonoperative Treatment Modalities: Chiropractic Care and Acupuncture

- Frequently asked
- Out of pocket expense (many times)
- Literature suggests efficacy in subacute or chronic (>4weeks) LBP

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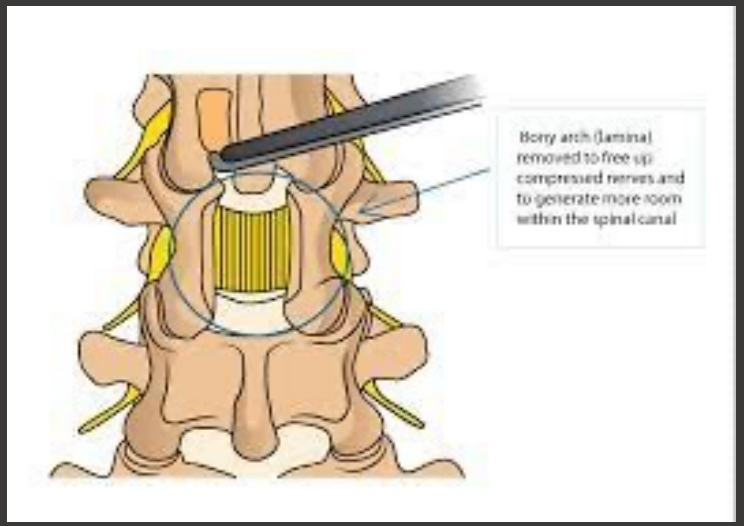
Surgical Treatment: SPORT Trial

- Multicenter randomized control trial evaluating the results of surgery vs nonoperative care in:
  - Lumbar disc herniation
  - Lumbar stenosis
  - Lumbar spondylolisthesis
- Limitations:
  - Individualized nonop regimens
  - High crossover



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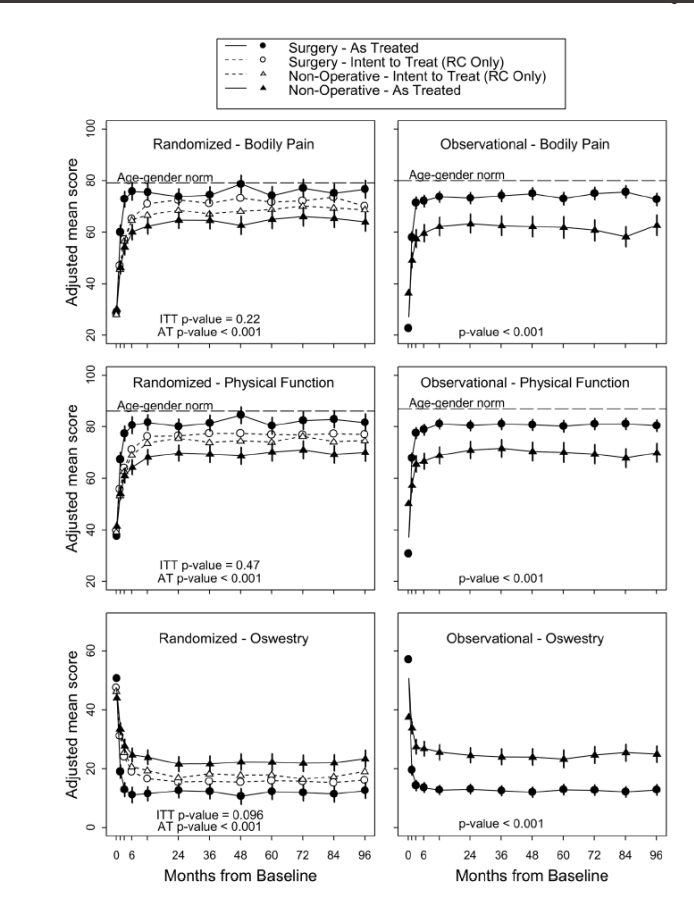
Operative Care: Lumbar Disc Herniation



Spine (Phila Pa 1976). 2014 January 1; 39(1): 3–16. doi:10.1097/BRS.0000000000000088.

Surgical versus Non-Operative Treatment for Lumbar Disc Herniation: Eight-Year Results for the Spine Patient Outcomes Research Trial (SPORT)

Jon D. Lurie[1], **Tor D. Tosteson**[1], **Anna N. A. Tosteson**[1], **Wenyan Zhao**[1], **Tamara S. Morgan**[1], **William A. Abdu**[1], **Harry Herkowitz**[2], and **James N. Weinstein**[1]

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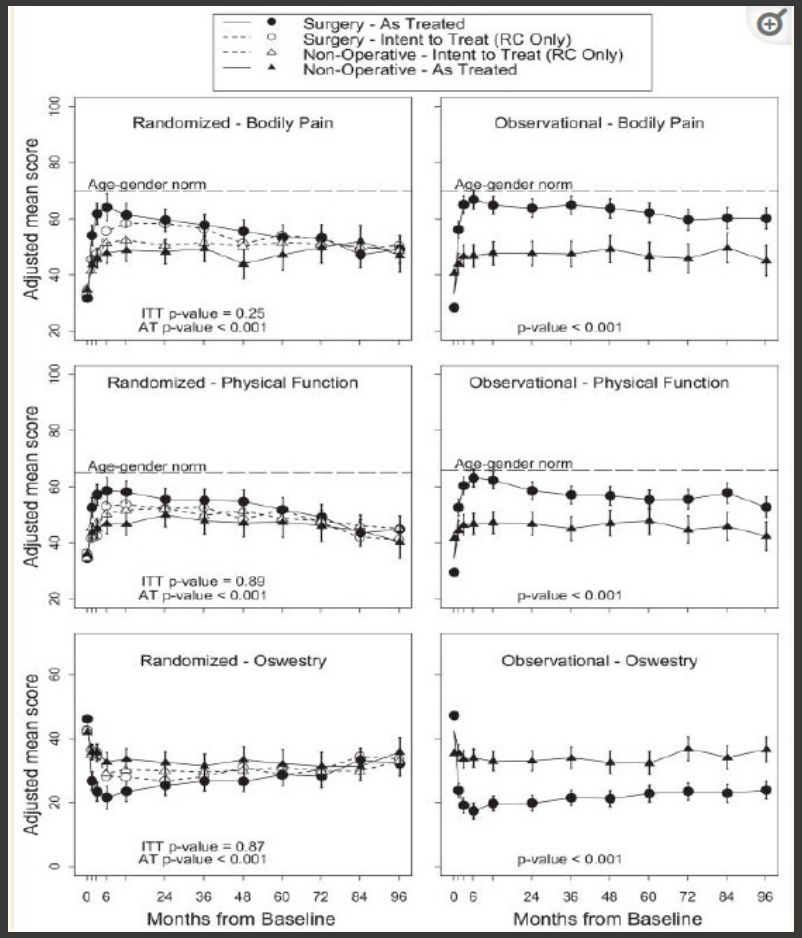
Operative Care: Lumbar Stenosis



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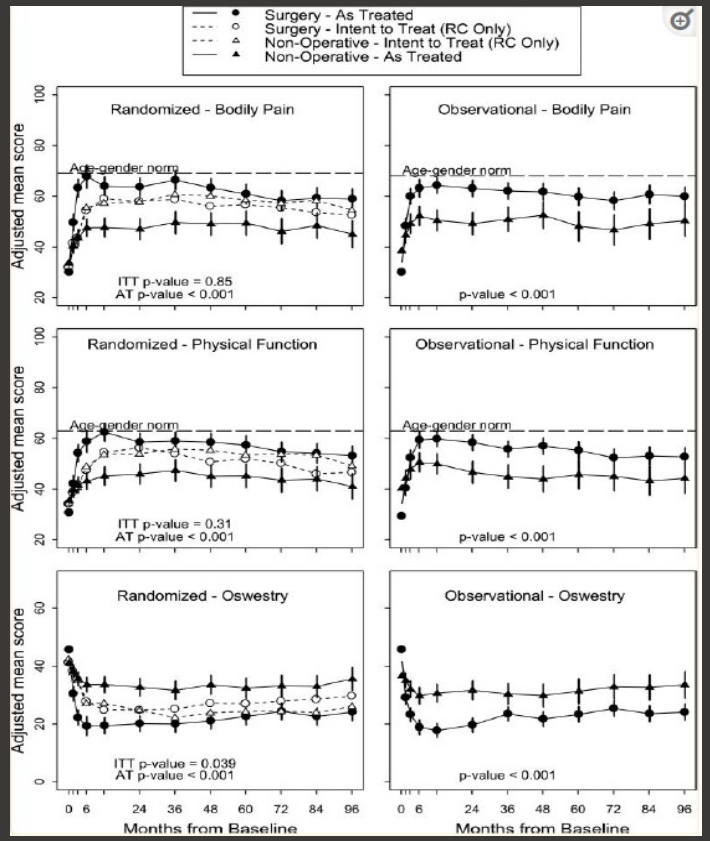
Spine (Phila Pa 1976). 2015 Jan 15; 40(2): 63–76. PMID: 25569524
doi: 10.1097/BRS.0000000000000731

Long-Term Outcomes of Lumbar Spinal Stenosis: Eight-Year Results of the Spine Patient Outcomes Research Trial (SPORT)

Jon D. Lurie, MD, MS,[1,2] Tor D. Tosteson, ScD,[1,2] Anna Tosteson, ScD,[1,2] William A. Abdu, MD, MS,[1,3] Wenyan Zhao, PhD,[1,2] Tamara S. Morgan, MA,[2] and James N. Weinstein, DO, MS[2,3]

Operative Care: Lumbar Degenerative Spondylolisthesis



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Spine (Phila Pa 1976). 2018 Dec 1; 43(23): 1619–1630.
PMID: 29652786
doi: 10.1097/BRS.0000000000002682

Long-Term Results of Surgery Compared with Nonoperative Treatment for Lumbar Degenerative Spondylolisthesis in the Spine Patient Outcomes Research Trial (SPORT)

William A. Abdu, MD, MS,[1,2] Olivia A. Sacks, BA,[1] Anna N.A. Tosteson, ScD,[1,3,4] Wenyan Zhao, PhD, MS,[1,2] Tor D. Tosteson, ScD,[1,4] Tamara S. Morgan, MA,[1,4] Adam Pearson, MD, MS,[1,2] James N. Weinstein, DO, MS,[2,4] and Jon D. Lurie, MD, MS[1,3,4]

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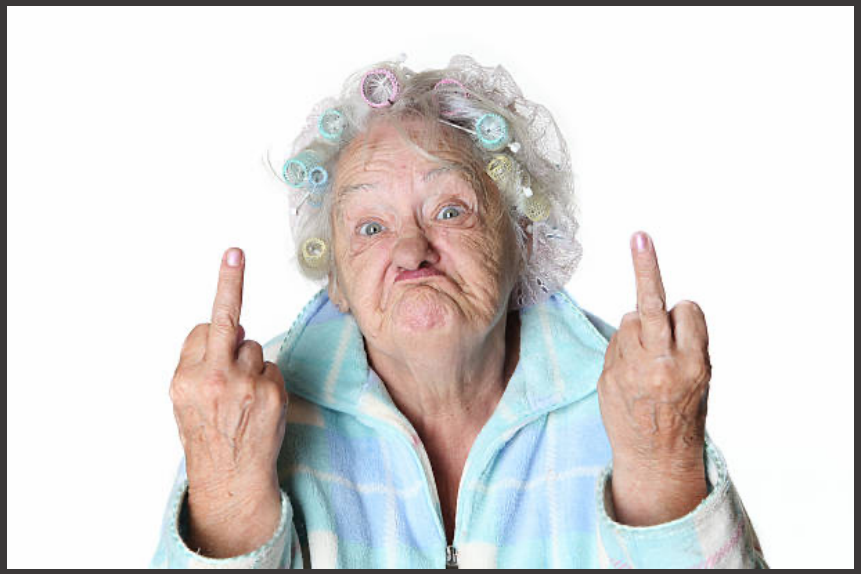
Operative Care: Selecting The Right Patient



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Operative Care: Comorbidity Management

- Parameters for preoperative values vary:
  - Hct: >35-38
  - HgbA1C: <7
  - T-score: >2-2.5 SD's
- Surgical Optimization is a multidisciplinary task

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Conclusions:

- Lumbar Spondylosis is a broad disorder with numerous potential presenting features.
- There is a strong role for nonoperative care but providers should understand each modalities' benefits and limitations.
- For patients who fail nonoperative care, surgery can produce superior results that are durable.

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Questions?