

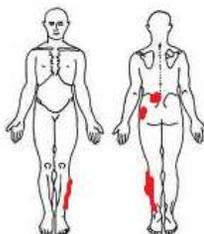


LUMBAR SPINE CASE 3

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Aaron Hartstein, PT, DPT, OCS, FAAOMPT

Orthopaedic Manual Physical Therapy Series
Richmond 2018-2019

VOMPTI_CLINICAL REASONING FORM



Body Chart – Initial Hypothesis:
L4-5, 5-S1 disc, facet (somatic)
L5/S1 Radiculopathy
SIJ pain
Glute Min referral

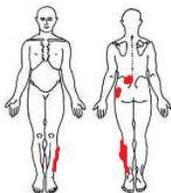
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SUBJECTIVE EXAM

Subjective: **Alert/Asks**, Signs/Symptoms, Aggravating/Alleviating factors, Description/location of symptoms, Behavior, Mechanism of injury

- 70 yo male insidious onset of left posterior- lateral calf pain/pins/burning 3 weeks ago
- Hx of LBP and buttock pain for years which has continued and exacerbated
- Unsure of relationship
- LBP and buttock is an ache which is continuous
- Lateral calf pain is intermittent, but becoming more frequent
 - Aggs: standing & walking (especially fast), lying supine with leg flat
 - Eases: sitting relieves pain immediately
 - LB is stiff in morning < 30 minutes, no pain in calf until mid to late morning



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Rate your assessment of Severity & Irritability

Justify your assessment with examples from the Subjective Exam &/or Objective Exam

Severity: None, Mild, **Mod**, Max

Continuous back pain, intermittent LE symptoms

Irritability: None, **Mild**, Mod, Max

LE come on after a while of being upright, but immediately abate upon sitting

Stage & Stability?

Acute: Subacute, Chronic, **Acute on chronic**

Stable: Improving, **Worsening**, Fluctuating, Red Flags

Identify any potential risk factors (Yellow, Red flags, non MSK involvement, biopsychosocial)

The patient has had an X-Ray showing DJD/DDD in the lower lumbar spine. His GCP told him to “give therapy a try” but likely he will be headed for surgery

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STRUCTURE at Fault:

Joints inferior to the painful region	Myofascial tissue superior to the painful region	Non-Contractile tissue inferior to the painful region	Neural tissue inferior to the painful region	Other structures that must be examined – non-MSK
L4-S1 facets SIJ Knee or hip Superior Tib-fib	Lumbar multifidus Glute med/min Piriformis Peroneals	L4-S1 disc Iliolumbar ligament Trochanter bursa	L5 or S1 nerve roots	Fracture? Visceral? Spondyloarthropathy? Mass?

Primary HYPOTHESIS after Subjective Examination: L5 Radiculopathy 2 to Stenosis

Differential List (Rank? list in order to rule out)

- Glute min referral
- L4-S1 somatic

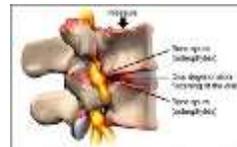


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Lumbar Spinal Stenosis

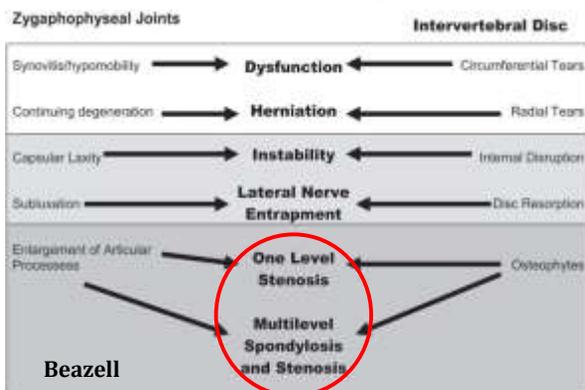
- Developmental Spinal Stenosis
 - Structural changes that effect the size of the vertebral canal or IVF
 - Decreased disc height or z-joint facet hypertrophy (ostephytes)
 - Disc prolapse or herniation
 - Ligamentum flavum hypertrophy
 - Spondylolisthesis



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Cascade of Spinal Degeneration



Physical Exam: *Asterisks* Signs/Symptoms (Special tests, Movement/Joint Dysfunction, Posture, Palpation, etc)

- Observation: Forward flexed posture with hip and knees flexed
- Lumbar ROM: (+) ext (LBP), (+) left SB (LBP & buttock pain)
 - Back left quadrant (LB, buttock and calf pain when sustained)
- Weakness L5 myotome, Reflex and dermatome (-)
- (-) Torsion
- (+) SLR and slump
- Hip stiffness in all directions L>R
- (-) SI clearing
- (+) PA right L4-5 and L5-S1 P!
- (+) PPIVMs/PAIVMs lower t-spine and upper lumbar all directions
- Oswestry Disability Index = 30% perceived disability

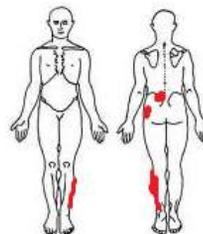


- Lumbar spine examined by Myelogram
 - Flexion exam (top 2)
 - Extension exam (bottom 2)



Are the relationships between the signs on the body chart, the interview, and physical exam consistent? Do the features fit a recognizable clinical pattern? **Yes** No

L5 radiculopathy secondary to stenosis



Diagnosis of Lumbar Spinal Stenosis

An Updated Systematic Review of the Accuracy of Diagnostic Tests

SPINE Volume 35, Number 5, pp 4465-4481
©2011, Lippincott Williams & Wilkins

- MRI most sensitive diagnostic test
- Clinical Reports
 - Most sensitive
 - Radiating leg pain, thigh pain
 - Pain exacerbated with standing
 - Most specific
 - B buttock or thigh pain
 - Decreased pain bending forward
 - Wide BOS while walking

The Clinical Value of a Cluster of Patient History and Observational Findings as a Diagnostic Support Tool for Lumbar Spine Stenosis

Chad Cook¹, Christopher Brown¹, Keith Michael², Robert Isaacs³, Cameron Howen², William Richardson², Matthew Roman² & Eric Hegedus^{2*}

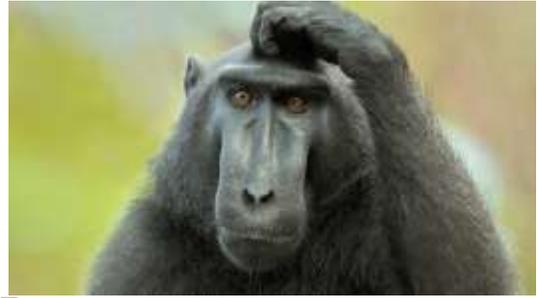
Physical. 04. 14. 19.00111-15-118

- Cluster Variables
 - Bilateral leg symptoms
 - Leg pain more than back pain
 - Pain during walking and standing
 - Pain relief on sitting
 - > 48yo
- 0 out of 5 variables: LR(-) 0.19
- 4 out of 5 variables: LR (+) 4.6
 - Post test probability 76%

➤ What is your primary treatment Objective after initial evaluation?

- **Education:**
Educate pt on condition and positions of comfort. Discuss prognosis and his thoughts regarding imaging and surgery
- **Manual Therapy: (Specific Technique)**
Joint mobilization to improve mobility of the upper lumbar and lower thoracic spine, IV opening techniques, inferior and lateral mobilization to the hips
- **Exercise Prescription: (Specific)**
Lower extremity stretching (hip flexors), flexion biased exercises
Core stabilization, balance
- **Other:**
Traction, neural mobilization

What Do You Treat Now?



Lumbar Treatment – SB PPIVM/PAIVM



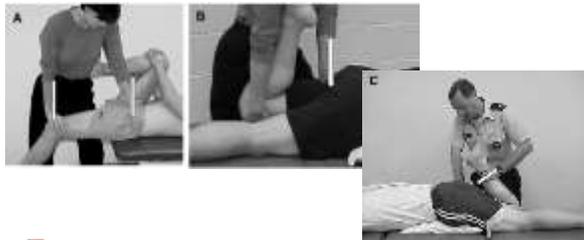
Lower Thoracic and Thoracolumbar Junction Treatment Techniques



Nonsurgical management of patients with lumbar spinal stenosis: a literature review and a case series of three patients managed with physical therapy

Julie M. Whittam, PT, DSc,^{1,2,3,4,5,6}
 Timothy W. Flynn, PT, PhD^{2,4,5,6}
 Julie M. Fritz, PT, PhD²

Phys Med Rehabil Clin N Am
 14 (2003) 77–101



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TABLE 1	Risks and Benefits (Generalized) Potential of the Central Nervous System to Reduce Pain & Functional Limitations and Improve Quality of Life in Patients with Lumbar Spinal Stenosis	
Question	Significance/Utility	Significance/Utility
Background	<ul style="list-style-type: none"> • Significant pain relief (50% or more) within 6 weeks • Patient satisfaction with the treatment • Significant long-term (6 months) improvement in functional status • No significant adverse effects, pain, or other complications 	<ul style="list-style-type: none"> • No adverse effects on the spine • No need for anesthesia (ASA) • Low PDRG (category 1B) • Responding to the lumbar spine • No other serious (1-5) or life-threatening (6-7) risks
Interventions	<ul style="list-style-type: none"> • Manual manipulation of the lumbar spine • Physical therapy (core strengthening, walking, and other exercises) • Patient education and self-management • Patient education and self-management • Patient education and self-management 	<ul style="list-style-type: none"> • Surgery (1-5) • General anesthesia (ASA 2-4) • "Failure" rate of approximately 50% (50% of patients who do not improve) • Physical therapy for the spine (1-5) • No serious adverse effects • No need for anesthesia (ASA 2-4) • No need for anesthesia (ASA 2-4) • No need for anesthesia (ASA 2-4)
Specific benefits	<ul style="list-style-type: none"> • Significant reduction in pain • Significant improvement in functional status 	<ul style="list-style-type: none"> • Significant reduction in pain • Significant improvement in functional status
Risks	<ul style="list-style-type: none"> • Significant reduction in pain • Significant improvement in functional status 	<ul style="list-style-type: none"> • Significant reduction in pain • Significant improvement in functional status

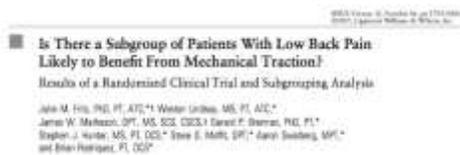
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A. INTERVENTIONS – MANUAL THERAPY
 Clinicians should consider utilizing manual therapy procedures to reduce pain and disability in patients with mobility deficits and acute low back and back-related buttock or thigh pain. Manual manipulation and manual mobilization procedures can also be used to improve spine and hip mobility and reduce pain and disability in patients with subacute and chronic low back and back-related lower extremity pain.

B. INTERVENTIONS – CORE STRENGTHENING EXERCISES AND PROCEDURES
 Clinicians should consider utilizing core strengthening exercises to reduce pain and disability in patients with low back pain and back-related buttock or thigh pain. Core strengthening exercises can also be used to improve spine and hip mobility and reduce pain and disability in patients with subacute and chronic low back and back-related lower extremity pain.

C. INTERVENTIONS – WALKING EXERCISES AND PROCEDURES
 Clinicians should consider utilizing walking exercises to reduce pain and disability in patients with low back pain and back-related buttock or thigh pain. Walking exercises can also be used to improve spine and hip mobility and reduce pain and disability in patients with subacute and chronic low back and back-related lower extremity pain.

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- Predictor Variables
 - Presence of leg pain
 - Signs of nerve root compression
 - Peripheralization with repeated lumbar extension
 - Positive crossed SLR
- 84% with recovery using traction vs. only 45% with recovery without traction



- Predictor Variables
 - FABQ – Work subscale < 21
 - No neurological deficits
 - > 30 years old
 - Non-manual work job status



Number of predictors present	Sensitivity	Specificity	Positive likelihood ratio	Probability of successful traction (%)
≥1	0.98 (0.80–1.00)	0.09 (0.04–0.16)	1.07 (0.99–1.35)	38.4
≥2	0.96 (0.78–1.00)	0.48 (0.36–0.59)	1.78 (1.47–2.17)	50.0
≥3	0.70 (0.55–0.90)	0.75 (0.65–0.83)	3.04 (2.04–4.53)	42.2
All 4	0.36 (0.19–0.57)	0.96 (0.90–0.99)	9.36 (5.13–28.00)	69.2

Pattern Recognition

Identify the key subjective and physical features (i.e. clinical pattern) that would help you recognize this disorder in the future.

Subjective	Physical
Neurogenic pain in the L5 dermatome	Extension motion of the lumbar spine increases lumbar spine pain and LE symptoms
Back pain with referred pain into the buttock	Stiffness in the lumbar spine at most levels, and stiffness in the hips specifically limited extension
Back and peripheral pain with extension postures	Weakness in the L5 myotome
Pain relieved with flexion postures	+ neurodynamic testing reproducing their peripheral symptoms

➤ What is your primary treatment Objective after initial evaluation?

- **Education:**
Educate pt on condition and positions of comfort. Discuss prognosis and his thoughts regarding imaging and surgery
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Systematic Literature Review of Imaging Features of Spinal Degeneration in Asymptomatic Populations

AJNR Am J Neuroradiol 36:811-16 Apr 2015

Table 2: Age-specific prevalence estimates of degenerative spine imaging findings in asymptomatic patients*

Imaging Finding	Age (yr)						
	20	30	40	50	60	70	80
Disk degeneration	37%	52%	68%	80%	88%	93%	96%
Disk signal loss	17%	33%	54%	73%	86%	94%	97%
Disk height loss	24%	34%	45%	56%	67%	76%	84%
Disk bulge	30%	40%	50%	60%	69%	77%	84%
Disk protrusion	29%	31%	33%	36%	38%	40%	43%
Annular fissure	19%	20%	22%	23%	25%	27%	29%
Facet degeneration	4%	9%	18%	32%	50%	69%	83%
Spondylolisthesis	3%	5%	8%	14%	23%	35%	50%

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Annals of Internal Medicine

ORIGINAL RESEARCH

Surgery Versus Nonsurgical Treatment of Lumbar Spinal Stenosis: A Randomized Trial

Anthony DeVito, PT, PhD; Sara J. Pina, PT, PhD; Charity G. Moore, PhD, MSPT; Julie M. Fritz, PT, PhD; Stephen R. Winkler, PhD; Deborah A. Johnson, PT, PhD; Mark Fye, MD; and William C. Welch, MD

Jama Intern Med 2016; 136(10):1141-1149

- 179 patients
 - 1/2 were assigned to surgical group, 1/2 assigned to PT
 - PT focus on flexion exercises, general exercises and education
 - 1/2 PT subjects crossed over to have surgery before trial finished
- Primary outcome was the SF-36
- 24 week follow-up show no significant difference between groups
- Most improvements in both groups occurred around the 10 week mark
- Realistic expectations for the patient and shared decision making
 - Importance of providing prognosis to patient

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Cochrane Database of Systematic Reviews

Surgical versus non-surgical treatment for lumbar spinal stenosis (Review)

Authors' conclusions

We have very little confidence to conclude whether surgical treatment or a conservative approach is better for lumbar spinal stenosis, and we can provide no new recommendations to guide clinical practice. However, it should be noted that the size of side effects ranged from 10% to 20% in surgical cases, and no side effects were reported for any conservative treatment. No clear benefits were observed with surgery versus non-surgical treatment. These findings suggest that clinicians should be very careful in informing patients about possible treatment options, especially given that conservative treatment options have resulted in no reported side effects. High-quality research is needed to compare surgical versus conservative care for individuals with lumbar spinal stenosis.

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Commentary

Consensus at last! Long-term results of all randomized controlled trials show that fusion is no better than non-operative care in improving pain and disability in chronic low back pain

The Spinal Journal 16 (2016) 940-943

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