

LBP & PREVENTION: METHODOLOGY

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LOW BACK PAIN; PREVENTION; METHODOLOGY



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High-quality controlled trials on preventing episodes of back problems: systematic literature review in working-age adults

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BIGOS REVIEW

Treatment

of Studies

Exercise

8

Education

5

Lumbar supports

4

Reduced lifting load
(ergonomic)

4

Shoe orthoses

2



DRUGS!!!



PREVENTION

- “Several levels or categories of prevention are defined, but in some situations the distinction is more artificial than real.”
 - 1) Primordial – disease vectors (drain swamp)
 - 2) Primary - vaccination
 - 3) Secondary – Pap smear (early Dx)
 - 4) Tertiary – Limit severity



PREVENTION

Treat (T1)

Measure (T2)

1) XXX

pain; functional status

2) XX*

* - Measure Complication – Tertiary Prevention

1) HTN – Myocardial infarction

2) LBP – work disability??



METHODOLOGIC ISSUES

- **Rationale - What pathology is being treated?**
- When to intervene
- When to measure outcome
- Outcome measures
- Compliance



LBP - CATEGORIES

- “Mechanical” - Degeneration +/- Injury



LBP - CATEGORIES

- Something different –
 - 1) Non-spine – pancreatic Ca; endometriosis
 - 2) Spine – Infection; Ca; spondyloarthropathy

- Degeneration +/- Injury
 - 1) Widespread pain – “Myofascial”
 - 2) Radiculopathy; neurogenic claudation
 - 3) AXIAL SPINAL PAIN



PATHOPHYSIOLOGY


- “LBP is any back pain between the ribs and top of the leg, from any cause. In practice, more than 95% of cases in the working-age population are thought to result from “soft tissue” (i.e., muscle, tendon, and ligament) strain or sprain.” (p. 2908)

Frank JW et al. Disability resulting from occupational low back pain. *Spine* 1996; 21: 2908-17.



PATHOPHYSIOLOGY

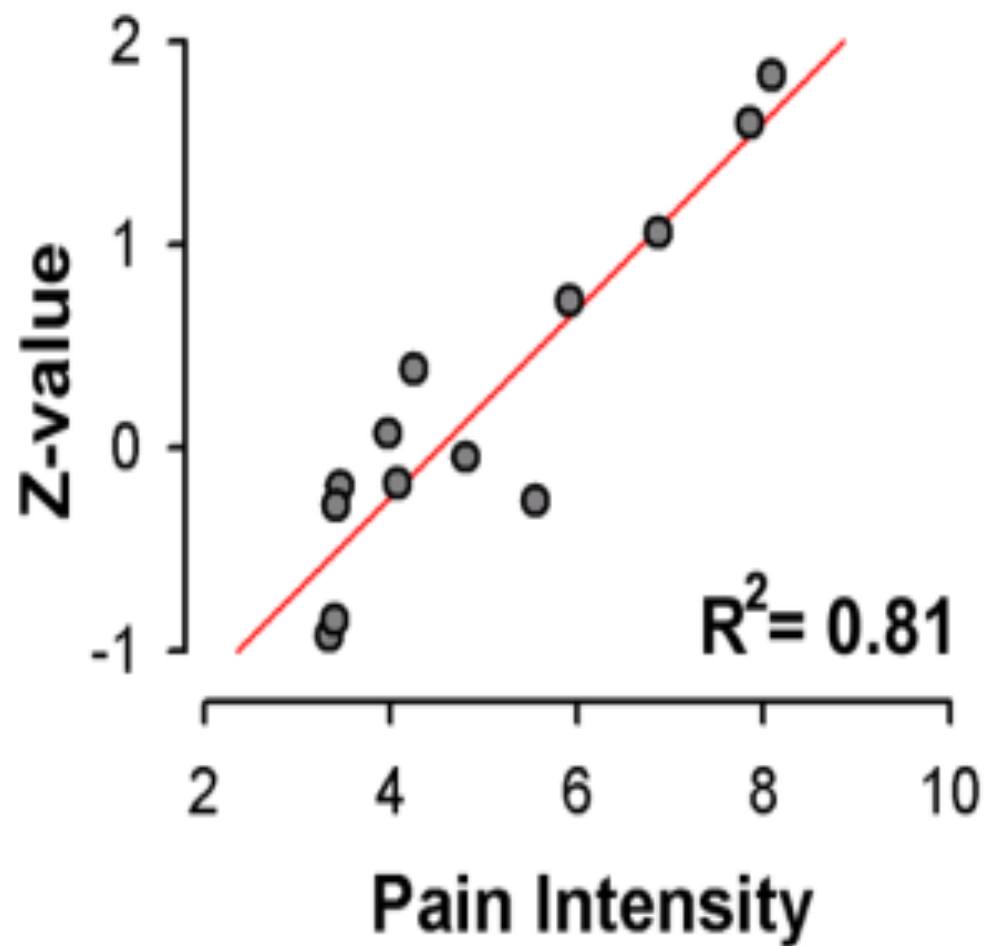
- Joint – disk; facet
- Unknown – nonspecific LBP



“In summary, attempts to identify pain generators in patients with NSLBP via anatomic studies or pain provocation/palliation have met with some success. Some observers emphasize the difficulty of achieving specific diagnoses in these patients, but in doing so they typically either give no substantiating evidence (29) or hearken back to opinions stated in a publication from 1982 (30) as evidence of the difficulty of achieving specific diagnoses in NSLBP (31). We are not aware of any serious attempt to estimate the percentage of NSLBP patients for whom specific structural diagnoses can be achieved on the basis of currently available imaging and pain provocation/palliation procedures. “

Robinson JP, Apkarian V. Low back pain. In Mayer E, Bushnell MC (Ed.) Functional pain syndromes: presentation and pathophysiology. Seattle: IASP Press, 2009.

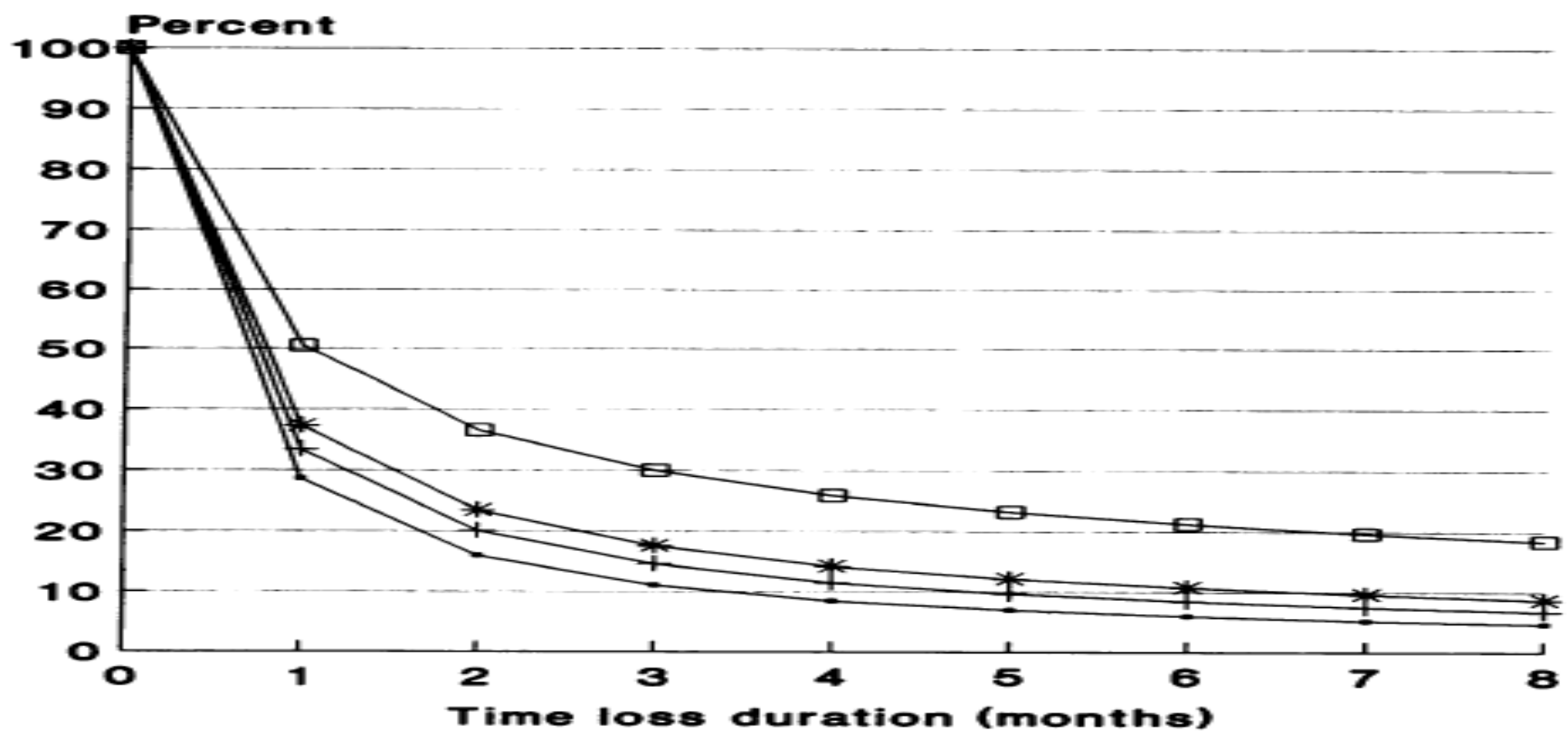
A





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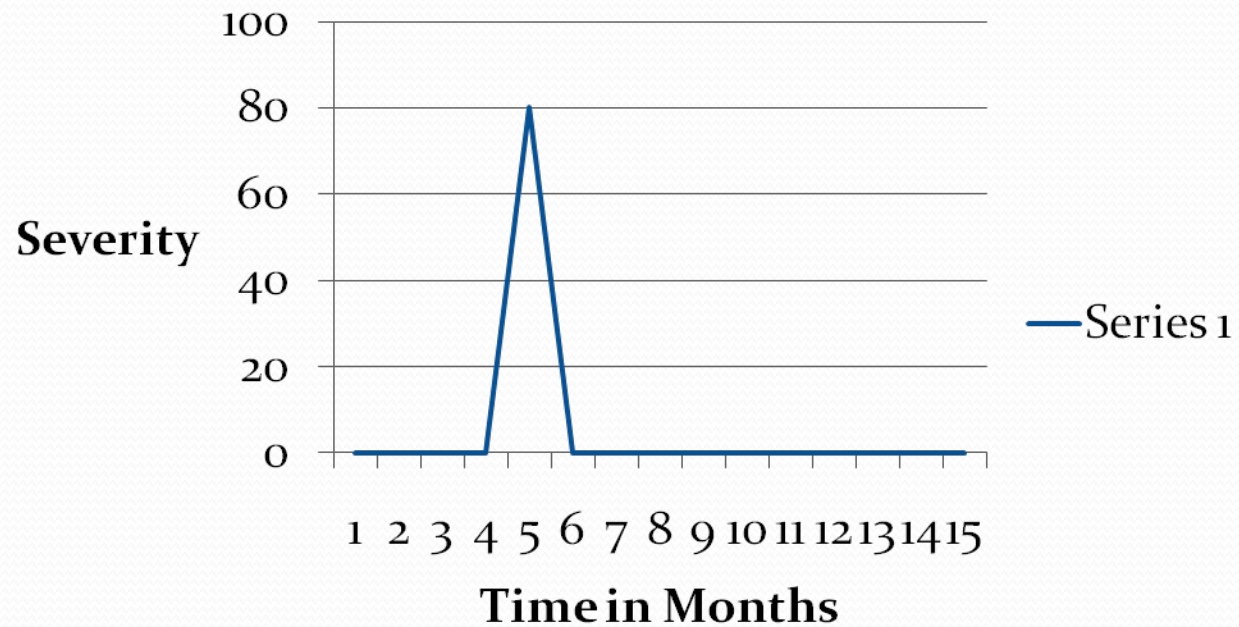



—●— All other injuries —+— Fracture
 —*— Back/neck sprain —□— Carpal tunnel

Note. Values were derived from "reference case" model (male, <30 years old, unmarried, not hospitalized).

FIGURE 4—Percentage of workers receiving disability payments after the indicated number of months since injury, by injury.

WORKERS' COMPENSATION MODEL

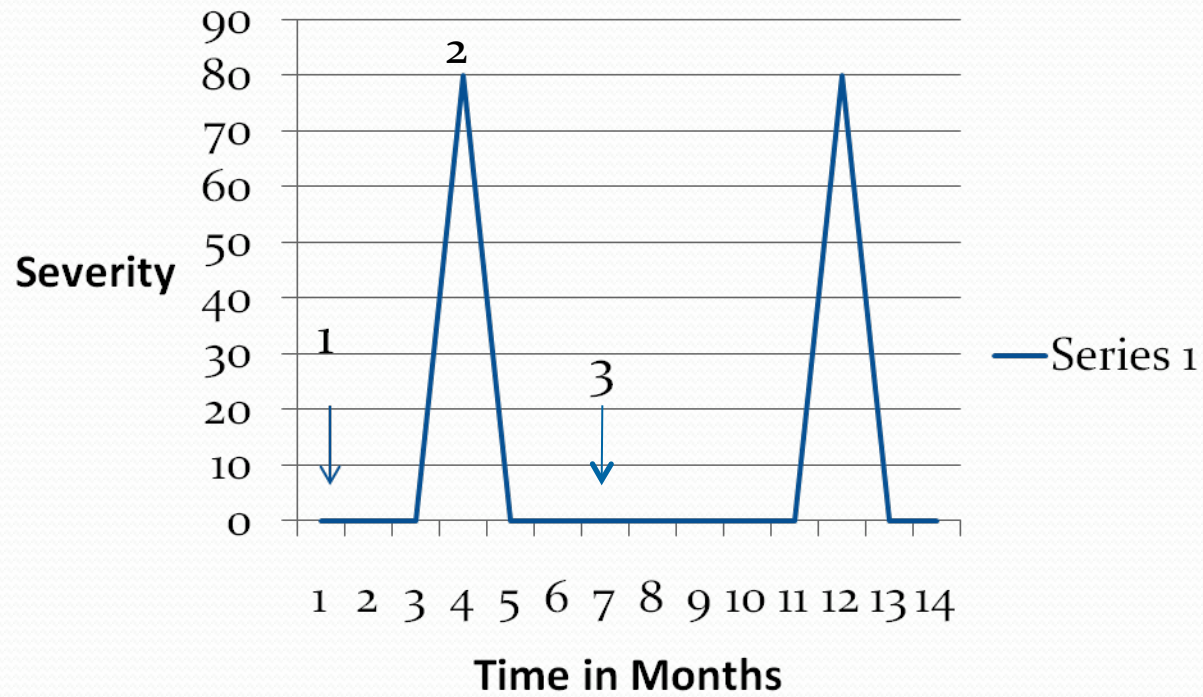




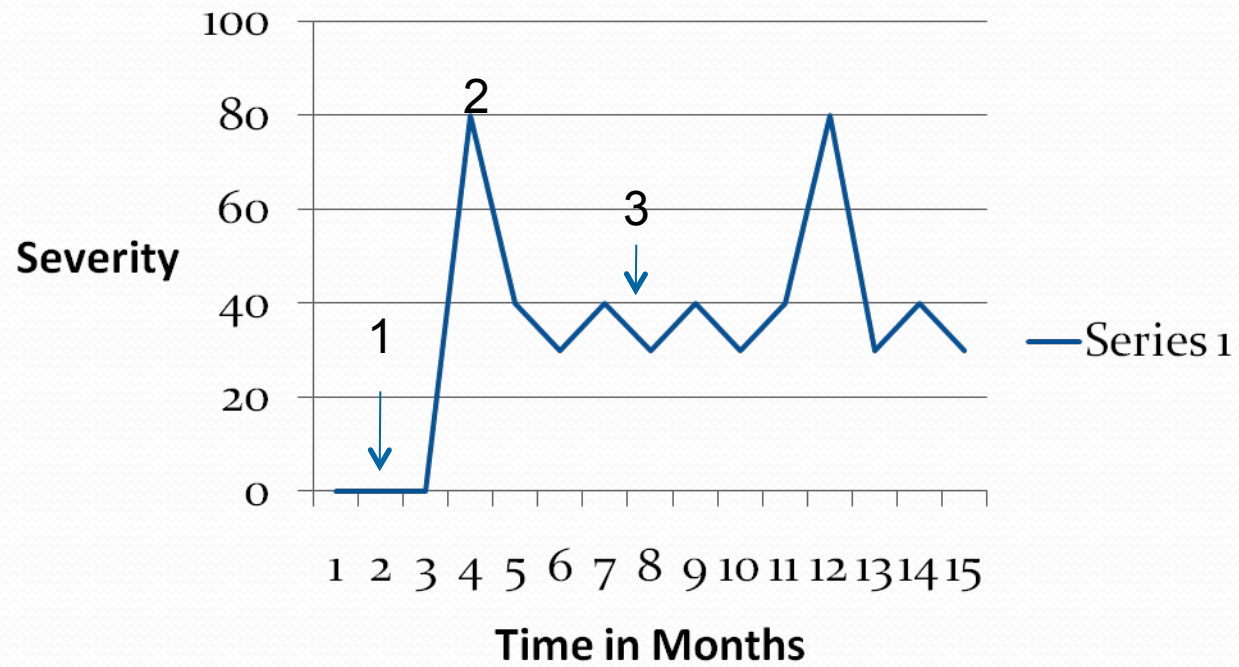
“LBP is a common problem affecting both genders and most ages, for which about one in four adults seeks care in a six-month period.... Careseeking for LBP is a significant proportion of caseload for some primary-contact disciplines. Most recent-onset LBP episodes settle but only about one in three resolves completely over a 12-month period. About three in five will recur in an on-going relapsing pattern and about one in 10 do not resolve at all.” (p. 1)

Kent PM, Keating JL. The epidemiology of low back pain in primary care. *Chiropractic & Osteopathy* 2005, 13: 1-7.

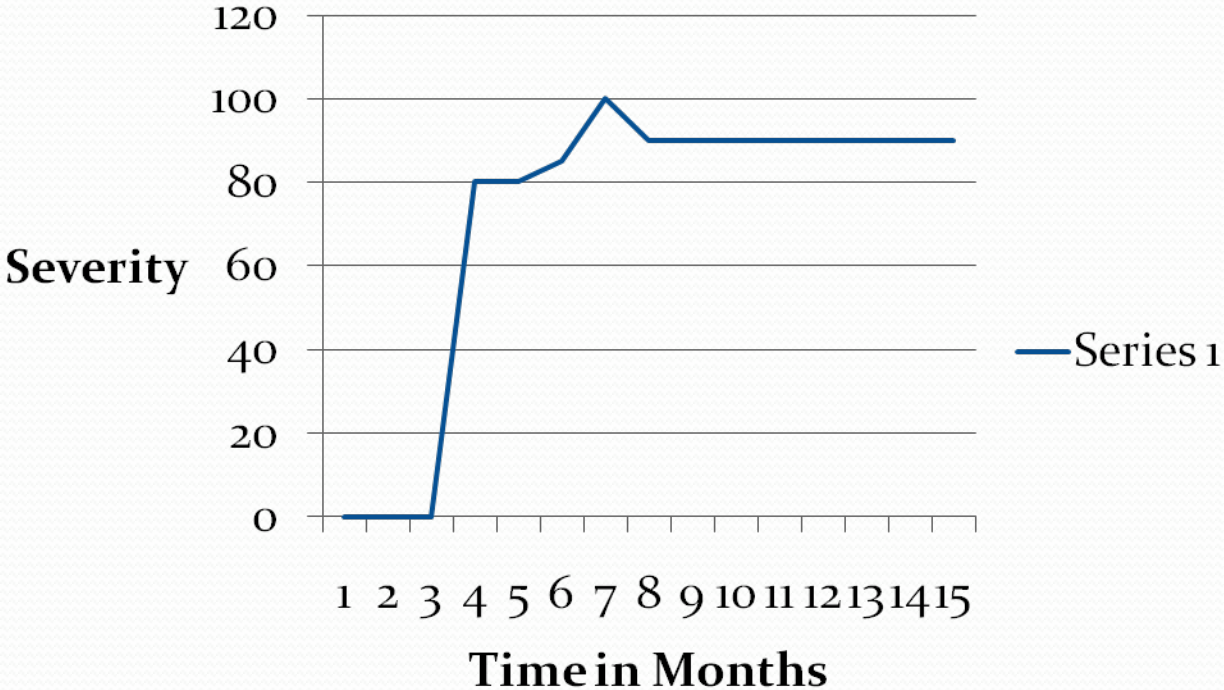
PATTERN 1



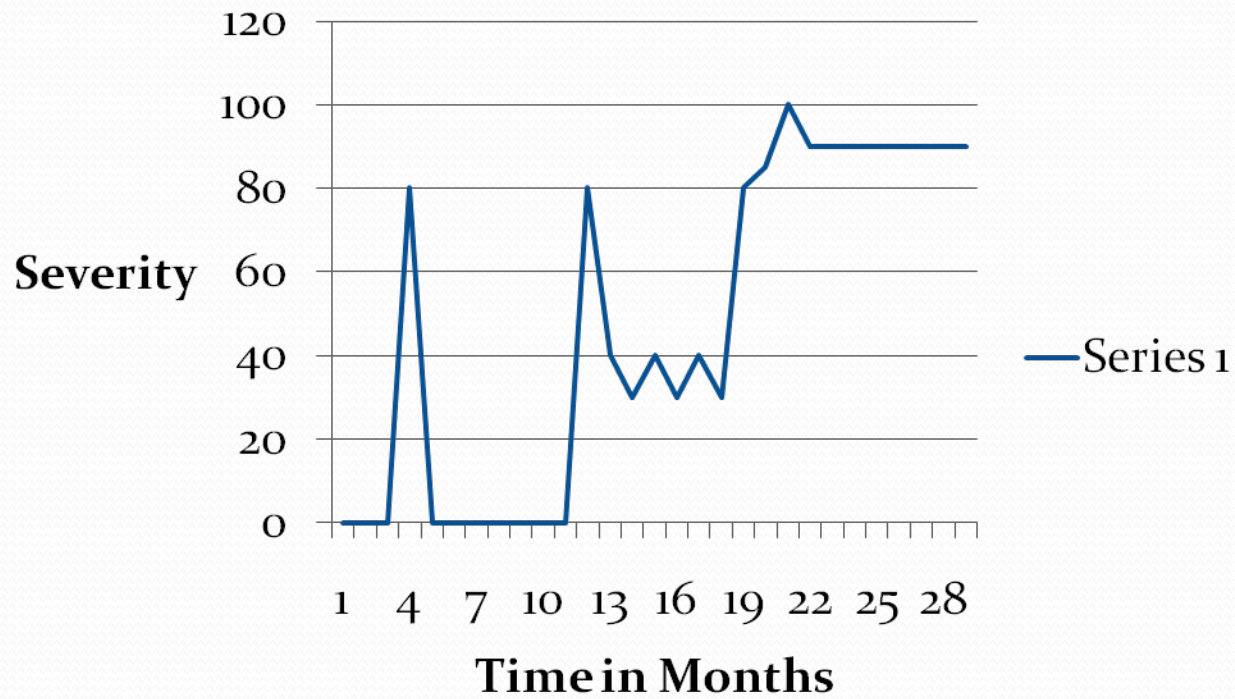
PATTERN 2



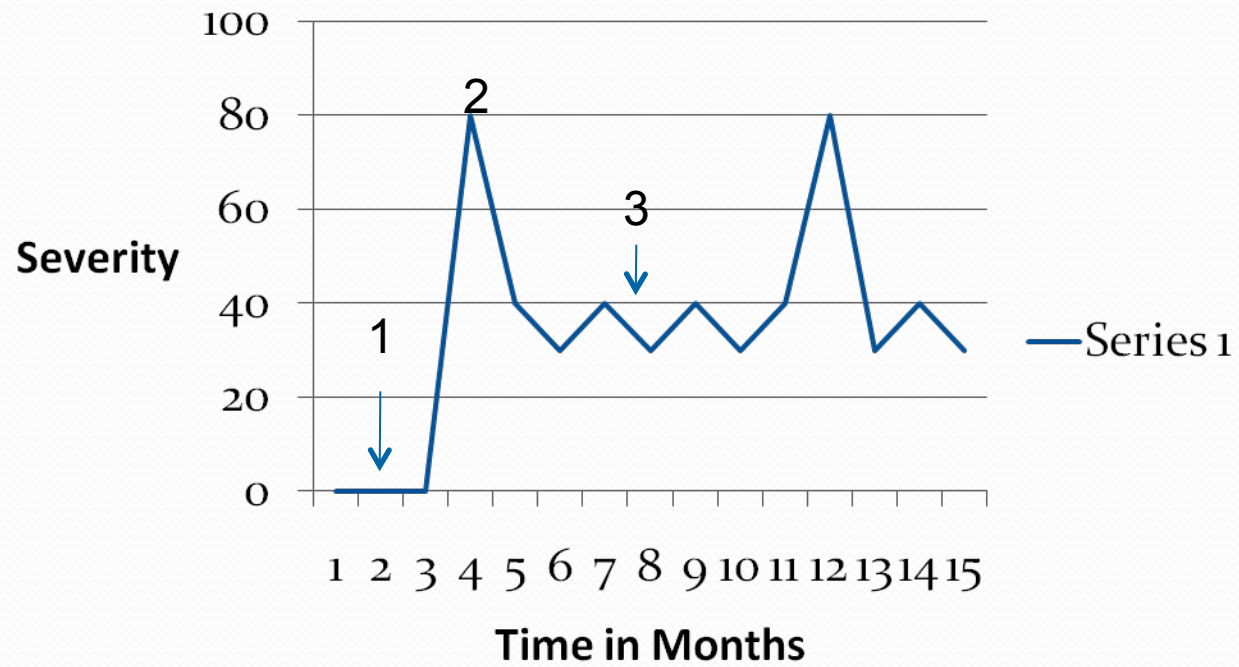
PATTERN 3



PATTERN 4



PATTERN 2





BIGOS – 8 EXERCISE STUDIES

- 7/8 – Hx of LBP – hospital workers (n = 4)
 - RR workers (n = 1)
 - General population (n = 2)
- 1/8 – plus or minus for Hx of LBP – military recruits



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WHEN TO MEASURE OUTCOME

- **Later!!**

- Bigos – 1 year (n = 7); 4 months (n = 1)
- Does long term suppressive therapy = prevention?
- Best case: Treat at t_1 → reduced Sx's at T₂
- Pts lost to f/u



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OUTCOME MEASURES

- Medical costs – lumbar fusion study
- Pain – universal – primary care; surgery
- Self-reported disability – universal
 - 1) SF-36
 - 2) Oswestry Disability Index
 - 3) Roland Morris
- ***Work Disability***



WORK DISABILITY

- Important – to pts and society
- Problems
 - 1) Disability vs. bad economy¹
 - 2) Cultural influences²

1 - Volinn E, Van Koevering D, Loeser JD. Back sprain in industry. The role of socioeconomic factors in chronicity. Spine. 1991 May;16(5):542-8.

2 - Volinn E, Nishikitani M, Volinn W, Nakamura Y, Yano E. Back pain claim rates in Japan and the United States: framing the puzzle. Spine. 2005 Mar 15;30(6):697-704.

■ A Comparison of Pain, Functional Limitations, and Work Status Indices as Outcome Measures in Back Pain Research

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Richard A. Deyo, MD, MPH,‡ William E. Barlow, PhD,† and Harvey Checkoway, PhD*



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Surgical vs Nonoperative Treatment for Lumbar Disk Herniation

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

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LUMBAR DISSECTOMY IS THE MOST common surgical procedure performed in the United States for patients having back and leg symptoms; the vast majority of the procedures are elective. However, lumbar disk herniation is often seen on imaging studies in the absence of symptoms^{1,2} and can regress over time without surgery.³ Up to 15-fold variation in regional discectomy rates in the United States⁴ and lower rates internationally raise questions regarding the appropriateness of some of these surgeries.^{5,6}

Several studies have compared surgical and nonoperative treatment of patients with herniated disk, but baseline differences between treatment

Context Lumbar discectomy is the most common surgical procedure performed for back and leg symptoms in US patients, but the efficacy of the procedure relative to nonoperative care remains controversial.

Objective To assess the efficacy of surgery for lumbar intervertebral disk herniation.

Design, Setting, and Patients The Spine Patient Outcomes Research Trial, a randomized clinical trial enrolling patients between March 2000 and November 2004 from 13 multidisciplinary spine clinics in 11 US states. Patients were 501 surgical candidates (mean age, 42 years; 42% women) with imaging-confirmed lumbar intervertebral disk herniation and persistent signs and symptoms of radiculopathy for at least 6 weeks.

Interventions Standard open discectomy vs nonoperative treatment individualized to the patient.

Main Outcome Measures Primary outcomes were changes from baseline for the Medical Outcomes Study 36-Item Short-Form Health Survey bodily pain and physical function scales and the modified Oswestry Disability Index (American Academy of Orthopaedic Surgeons/MODEMS version) at 6 weeks, 3 months, 6 months, and 1 and 2 years from enrollment. Secondary outcomes included sciatica severity as measured by the Sciatica Bothersomeness Index, satisfaction with symptoms, self-reported improvement, and employment status.

Results Adherence to assigned treatment was limited: 50% of patients assigned to surgery received surgery within 3 months of enrollment, while 30% of those assigned to nonoperative treatment received surgery in the same period. Intent-to-treat analyses demonstrated substantial improvements for all primary and secondary outcomes in both treatment groups. Between-group differences in improvements were consistently in favor of surgery for all periods but were small and not statistically significant for the primary outcomes.

Conclusions Patients in both the surgery and the nonoperative treatment groups improved substantially over a 2-year period. Because of the large numbers of patients who crossed over in both directions, conclusions about the superiority or equivalence of the treatments are not warranted based on the intent-to-treat analysis.

Trial Registration clinicaltrials.gov Identifier: NCT00000410

JAMA. 2006;296:2441-2450

www.jama.com

JAMA. 2006;296:2441-2450



COMPLIANCE

- “**Results:** Adherence to assigned treatment was limited: 50% of patients assigned to surgery received surgery within 3 months of enrollment, while 30% of those assigned to nonoperative treatment received surgery in the same period.” (p. 2441)

COMPLIANCE

- Medications when $Sx's = 0??$



Chou R, Laurie Hoyt Huffman LT. Medications for Acute and Chronic Low Back Pain: A Review of the Evidence for an American Pain Society/American College of Physicians Clinical Practice Guideline. *Ann Intern Med.* 2007;147:505-514.



DRUG	ACUTE	CHRONIC	RADIC	
NSAIDs	++1	+		
Acetaminophen	++1	?		
Muscle Relaxers	++1			
TCAs		++2		
Opioids		+1		
Tramadol		+		
Benzodiazepines	+	+1		
Gabapentin/Topiramate			+	
Systemic corticosteroids				-
Moderate Effect				
Effect size = .5 - .8				
VAS = 10-20				
Oswestry = 10-20				
Roland Morris = 2-5				-



DRUGS?? - VERY DUBIOUS!


- Trials last 4 weeks¹
- No impressive data¹ – no mention of prevention
- No credible theory

¹ - Chou R, Laurie Hoyt Huffman LT. Medications for Acute and Chronic Low Back Pain: A Review of the Evidence for an American Pain Society/American College of Physicians Clinical Practice Guideline. *Ann Intern Med.* 2007;147:505-514.

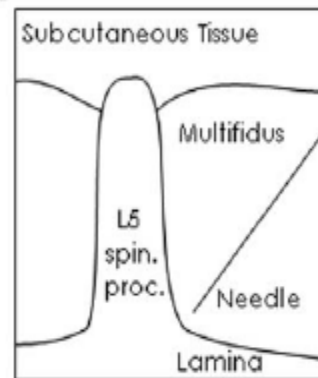


FUTURE DIRECTIONS

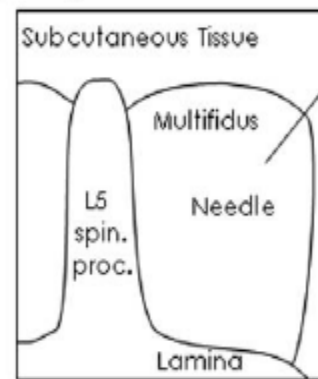
- Possibilities
 - 1) Learn pathophysiology – rationale for Rx
 - 2) Prevent CNS sensitization/ neuroplasticity
- Prognosis bleak for drugs
- Learn more about muscle function

- 
- 1: Why do some patients keep hurting their back? Evidence of ongoing back muscle dysfunction during remission from recurrent back pain.
 - 2: Changes in recruitment of transversus abdominis correlate with disability in people with chronic low back pain.
 - 3: Changes in the mechanical properties of the trunk in low back pain may be associated with recurrence.
 - 4: Reorganization of the motor cortex is associated with postural control deficits in recurrent low back pain.
 - 5: Motor control or graded activity exercises for chronic low back pain? A randomised controlled trial.

A Short fibres of multifidus



B Long fibres of multifidus



C

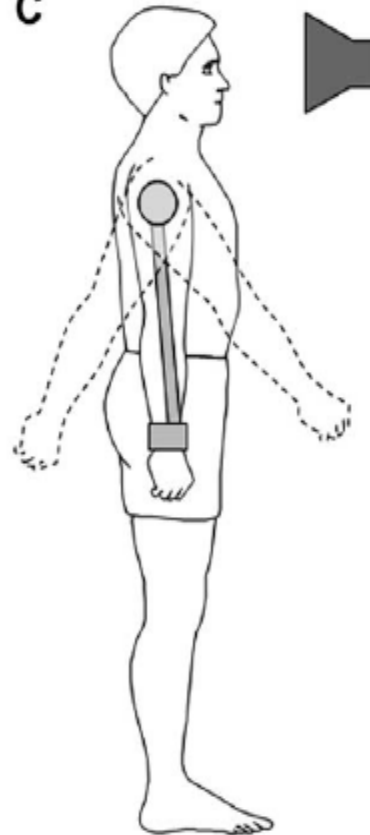


Fig. 1. Experimental Method: Line drawings depict the electrode placement into the (A) short and (B) long fibres of the lumbar multifidus adjacent to the lamina of L5. (C) Subjects performed a choice reaction time task (rapid shoulder flexion or extension) in response to an auditory cue.