

# Spinal Fusion in Worker's Compensation: Can We Help Patients to Make Better Decisions?

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## Objectives

- Identify EBM re: lumbar spine fusion for DDD
- Understand evidence re: lumbar spine fusion vs. non-operative care
- Recognize potential adverse outcomes
- Improve patient information when considering lumbar fusion

## Lumbar Degenerative Disc Disease

- Disc height loss, hypertrophic changes bone, ligament, facet
- Genetics, age, smoking
- Symptomatic?
- Central LBP, inc sitting- lifting- flexion, normal neuro exam
- How to diagnose?
- Diagnostic bias?

## Research Challenges Lumbar Fusion

- Cannot double blind
- Subject and MD beliefs re: fusion vs non-op as reasonable alternatives
- Surgeon beliefs and recruitment
- Subject fear of surgery and recruitment / crossover
- Subject expectations for surgery and crossover / outcomes
  - ◆ Spongford 1972 sciatica relief w/o disc

## Ivar Brox Spine 2003

- #64, 25-60 yo, > 1 year LBP, DDD L4-5 and/or L5-1
  - ◆ Exclude prior surgery, recurrent disc herniation, significant psych, other
- Interventions
  - ◆ PLIF w screws #37
  - ◆ Cognitive intervention and exercises #27
- Crossover
  - ◆ 11% decline surgery; 7% decline cognitive exercise; 3% cross to surgery

## Ivar Brox Spine 2003

- Outcomes
- 1-year follow-up 97%
- No difference Oswestry, pain, analgesic use, distress, life sat
- Cognitive: Less fear-avoidance
- PLIF: Less lower limb pain
  - ◆ 18% early surgical complication (infection, bleeding, dural tear, DVT)
  - ◆ 84% successful fusion
- RTW
  - ◆ Fusion 22%; Cognitive 33%

## Ivar Brox Pain 2006

- #60, 25-60 yo, > 1 year LBP, DDD L4-5 and/or L5-1, prior lumbar discectomy
  - ◆ Similar exclusions
- Interventions
  - ◆ PLIF w screws #29 vs Cognitive intervention and exercises #31
- Crossover
  - ◆ 21% decline surgery; 6% decline cognitive exercise; 6% cross to surgery

## Ivar Brox Pain 2006

- Outcomes
- 1-year follow-up 97%
- No difference Oswestry, pain, analgesic use, distress, life sat
- Cognitive: Less fear-avoidance
- Surgery 9% complications
- RTW
  - ◆ Fusion 7%; Cognitive 26%

## Fairbank BMJ 2005

- #349, 18-55 yo, > 1 year LBP, candidate for fusion
  - ◆ Incl some prior discectomy, Exclude psych
  - ◆ 52% working at baseline, 13% litigation
- Interventions
  - ◆ Surgeon choice fusion #176
  - ◆ Functional restoration 5d/wk x 3 wks ave 60-110 hrs #173
    - PT tailored exercise, Clin psych

## Fairbank BMJ 2005

- Crossover
  - ◆ 21% decline surgery; 28% rehab chose surgery by 2 yrs
- Outcomes
  - 2-year follow-up 80%; lost 20%
  - No difference Oswestry, shuttle walk
  - Fusion 11% complications, 11 reop
  - Similar outcomes listhesis vs. post lami vs DDD

## Fritzell Spine 2001

- #294, > 2 year LBP, DDD L4-5 and/or L5-S1
  - ◆ Incl 19% prior discectomy
  - ◆ Exclude prior fusion, OOW > 1 yr, Sign psych, stenosis
- Interventions
  - ◆ PLF autograft vs. PLF w pedicle screws vs. ALIF/PLIF #222
  - ◆ Control commonly used treatment, unstructured #72
- Crossover 9% decline fusion, 11% opt fusion

## Fritzell Spine 2001

- Outcomes
- 2-year follow-up 98%
- Fusion VAS 64-43 (gradual ↑), Oswestry 47-36
  - ◆ Work 12-47%
  - ◆ Complications 17% early, 4% late (infection, pseudo, nerve injury)
  - ◆ No superiority of specific technique, ↑ cost
- Non-operative VAS 63-58, Oswestry 48-46
  - ◆ Work 20-33%

## Comments RCTs Fusion vs. Non-operative

- Ivar Brox small size
- Recruitment
- Exclude significant psych, Fritzell OOW > 1 yr, other
- Crossover
  - ◆ Decline fusion 9-21% Ivar Brox, 21% Fairbank, 9% Fritzell
  - ◆ Cross to fusion 0-6% Ivar Brox, 28% Fairbank, 11% Fritzell
- Lost to follow-up 20% Fairbank, <3% others

## Comments RCTs Fusion vs. Non-operative

- Controls
  - ◆ No control group Ivar Brox, Fairbank to evaluate interventions vs. natural history
  - ◆ Control Fritzell unstructured community care
- Outcomes
  - ◆ Ivar Brox, Fairbank similar function, pain, med use, satisfaction 1-2 year regardless of prior surgery, presence or absence of prior discectomy, spinal diagnosis
  - ◆ Fritzell short term advantage for pain and function 6 mo-2 year vs. unstructured care

## Comments RCTs Fusion vs. Non-operative

- Surgical complications
  - ◆ Ivar Brox 9-18%, Fairbank 11%, Fritzell 17%
- Increased surgical costs
- RTW
  - ◆ Ivar Brox Cog-Ex 33/26% vs. Fusion 22/7%
  - ◆ Fritzell Fusion 47% vs. Usual care 33%
- Informed consent
  - ◆ Written, physician information
  - ◆ Additional video Fairbank

## Fusion Complications

- Short vs. long term
- Perioperative
- DVT 4%, PE 2%
- Wound infection 3%, discitis, osteomyelitis
- Dural tear 1-2%
- Vascular injury
- Nerve injury 1-3%

## Fusion Complications

- Instability
- Graft site pain 10-15%
- Hardware failure 7%
- Adjacent segment degeneration, herniation
- Pseudoarthrosis 3-10% one level, 10-15% two level
- 21% of deaths in WA due to analgesics (Juratli Spine 2009)

## Lumbar Fusion Turner 1992

- Attempted meta-analysis for several LB conditions
- Pain: 61% good relief
  - ◆ ↑ for single level fusion
  - ◆ Equivalent outcome to non-fusion surgery if no instability
  - ◆ No one procedure best
- Reoperation: 10%
  - ◆ ↑ in instrumented group

## Outcomes of Lumbar Fusion

Franklin Spine 1994

- 386 pts, Washington 1986-7 WC
- 68% work disabled @ 2 yrs
- 23% addl surgery (2x instrumented)
- 10% complications
- 68% worse pain, 56% same/worse quality of life
- Worse outcomes
  - ◆ Older, time from injury to fusion, duration work disability before fusion, #prior LB operations, multilevel fusions

## Outcomes of Lumbar Fusion

Juratli Spine 2006

- Washington WC 1994-2001
- Instrumentation rise 3.6% - 58%
  - ◆ ↑ risk without outcomes benefit
- Complications
  - ◆ Reop 22%, Other 12%
  - ◆ ↑ for multilevel fusion
- 64% disabled at 2 years post fusion
- Worse outcomes for litigation

## Outcomes of Lumbar Fusion

- Trief Spine 2006
  - ◆ Post-fusion pain and function associated with better presurgical mental health, non-WC, non-smoker, lower pain, better function
- Mannion Spine 2009
  - ◆ Lumbar decompression
  - ◆ 40-50% subjects overly optimistic pre-op expectations for improved pain and function

## Surgeons and Outcomes Prediction

- Graz Spine 2005
  - ◆ #197 subjects lumbar decompression
  - ◆ Surgeon prediction 79% great post-op improvement
  - ◆ Subjects only 19% much better

## Informed Consent Issues Fusion and Discectomy Studies

- Vary in type and quality: written, physician, video
- Potential impact of surgeon beliefs and expectations from surgery
- Recruitment issues relating to physician understanding of study
- Crossover issues and subject beliefs regarding surgery vs. rehab; subject fears of surgery; subject not wanting to put effort into rehab
- Developing European Shared Decision Making Tool for Patients with Sciatica

## Occupational Medicine Provider Role

- Discussion prior to surgical consult to assist patient informed consent
- Literature on lumbar spine fusion for spondylosis
- Realistic outcomes
- Risks of surgery
- Rehabilitation benefits and effort
- Consider and address coping and other barriers
- Discussion after surgical consult
- Conference with all parties
- Choose spinal surgeons carefully

## Educational Considerations

- ODG TWC 2009 Low Back
- ACOEM 2004/2007 OMPG Low Back
- Mirza et al. 2007. Systematic Review of Randomized Trials Comparing Lumbar Fusion Surgery to Nonoperative Care for Treatment of Chronic Back Pain. Spine 32: 816
- Gibson et al. Surgery for degenerative lumbar spondylosis. Cochrane update 2008.
- Deyo, et al. 2004. Spinal Fusion Surgery- A Case for Restraint. NEJM 350:722.

## Educational Considerations

- Turner 1992 JAMA abstract
  - ◆ <http://jama.ama-assn.org/cgi/content/abstract/268/7/907>
- Hanley AAOS Bulletin April 1993
  - ◆ Lumbar Fusion: Matching Expectations and Outcomes  
[http://www.pnbconline.com/research/spinal\\_fusion.htm](http://www.pnbconline.com/research/spinal_fusion.htm)

## Educational Considerations

- NY Times 12-31-03 (Reed Abelson)
  - ◆ An Operation to Ease Back Pain Bolsters the Bottom Line, Too
- New Yorker 4-4-02 (Groopman)
  - ◆ A Knife in the Back
- Newsweek 4-18-04
  - ◆ Treating Back Pain