The Evidence For Invasive Treatment of Low Back Pain

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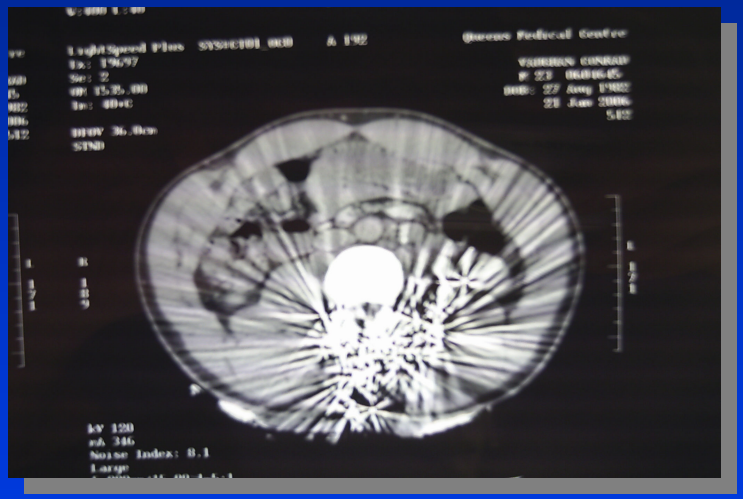
James Cook University Hospital 2009

Causes of Low Back Pain….



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Background

- 70 – 85% experience back pain
- 90% better in 3 months
- Return to work after 2 years is near zero

  – Spitzer Spine 1987; 12 Suppl. S5 – 9

Background

- Low back pain is a multi-factorial entity
- Historically evidence has been lacking of efficacy of ANY treatment of chronic low back pain
  - Cochrane Review Spine 1999: 24; 1820 - 1832

Aims

- Indications for surgery
- Cases
- Range of Fusion Procedures & Results
- Understand the Evidence Base in this complex area

Low Back Pain

- Isthmic or Degenerate Spondylolisthesis
- LBP with central canal or recess stenosis
- LBP with acute radiculopathy
- Degenerate Disc / Facets / Both
- Psychosocial Factors

Other Causes of Back pain

- ★Facet Arthropathy
- ★Nerve Roots
- ★Enthesopathy
- ★Iliolumbar ligaments
- ★Sacroiliac joints

Pre –op Workup

- MRI
- Plain Films
- Discography
- Nerve Root Blocks
- Exclude other pain sources – SIJ

Case JR

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Discography

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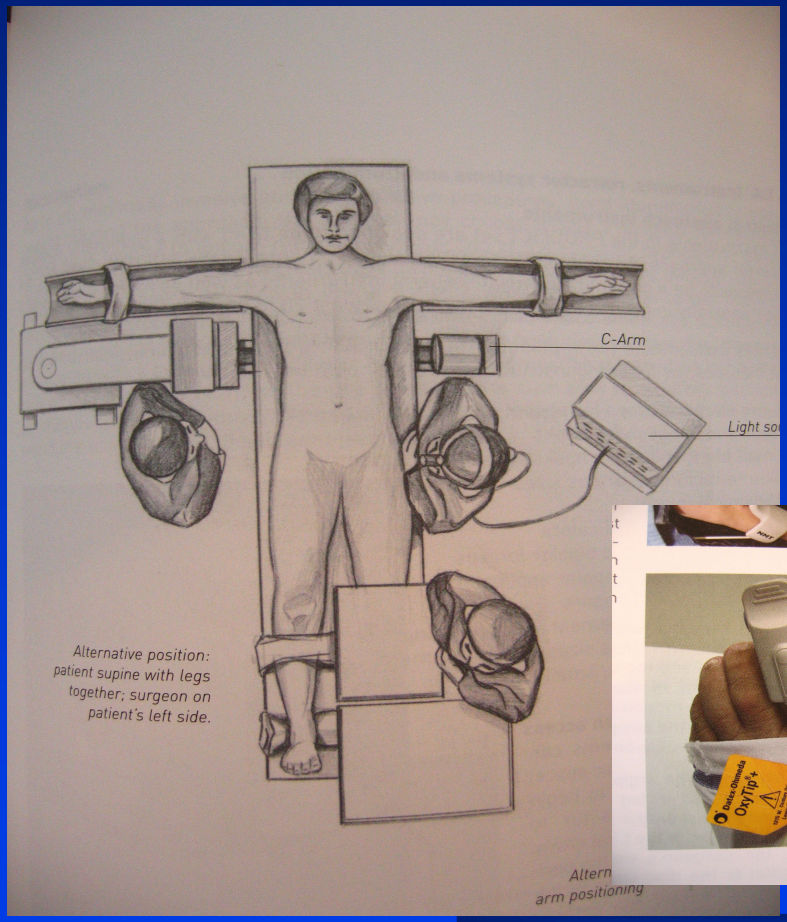
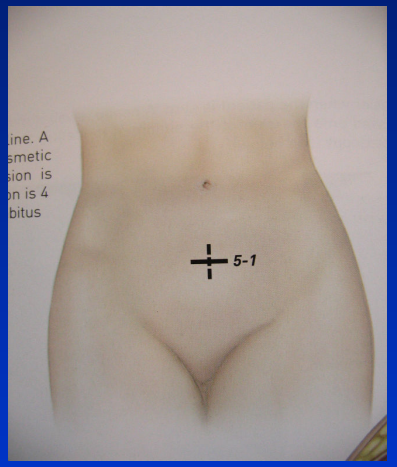
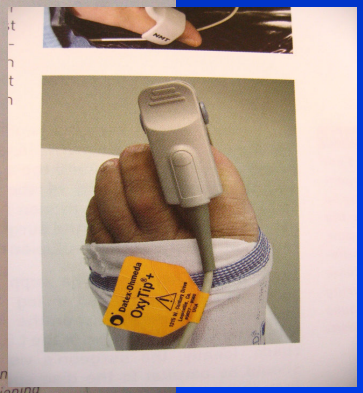
Technique







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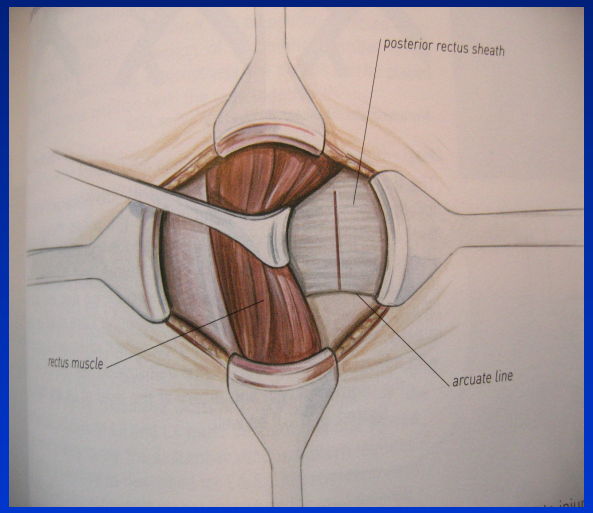
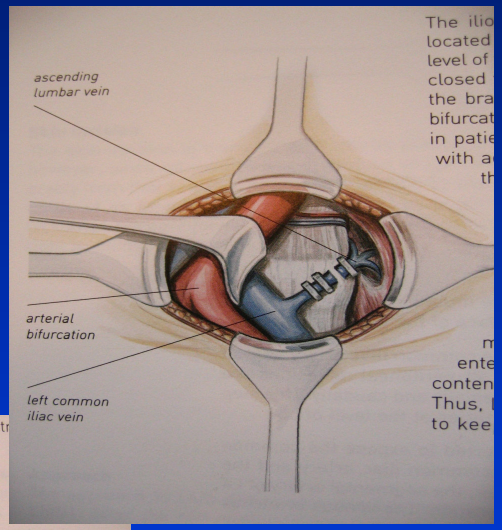
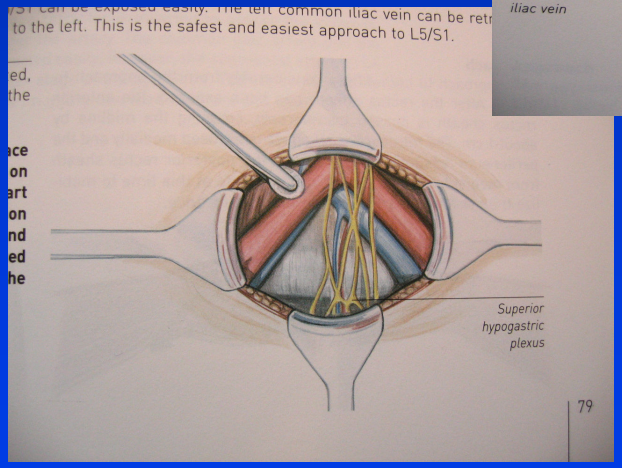
Technique







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Case JR

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Spondylolytic Spondylolisthesis

spinal fusion.mov

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Fusion Techniques

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Medline Meta-Analysis

- Results For Axial Low Back Pain

★ ALIF	66%	80%
★ PLF	68%	88%
★ PLIF	74%	94%

1995

Cochrane Review

- In 1999 no RCT !
- Evidence only concluded that Decompression & Fusion is better than Fusion alone in spondylolytic Spondylolisthesis

» Spine 1999

Swedish Spine Study

- 310 patients
- First randomized study in LBP
- Conclusion – Surgery provides a better outcome at 2-6 years than management by the family physician and physiotherapy

  – Stockholm 2000

Fritzell et Al. 2001

- Lumbar Fusion versus Nonsurgical Treatment For Chronic Low Back pain: A Multicenter Randomized Controlled Trial

Spine Volume 26(23) Dec 2001
pp1521 - 2532

Fritzell - Results

- 294 patients
- Aged 25 – 65
- Three fusion Techniques
- 2 year follow up
- 19 centres
  - 1992 – 1998

Op	47	36
Non Op	48	46
	p	0.015

VAS	6.4	4.3
	6.3	5.8
	p	0.0002

Fritzell - Conclusion

- Lumbar fusion in CLBP can diminish pain and decrease disability more than a commonly used non-surgical treatment
- Back to work 36% vs 13% p0.002
- Depressive symptoms -20% zung

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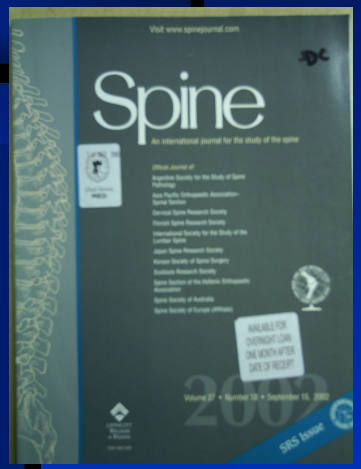
Fritzell 2002



- Chronic Low Back Pain: a comparison of Three Surgical Techniques

Spine Volume 27(11) 1 June 2002
pp 1131-1141

Fritzell 2002 Results

Group 1	PLF (u)	n=73	72%
Group 2	PLF (i)	n=74	87%
Group 3	360	n=56/19	91%

Fritzell 2002 Results

- At 2 years No significant Differences between the groups
- VAS / ODI / Million VAS / GFS / Zung
- Complications 18%

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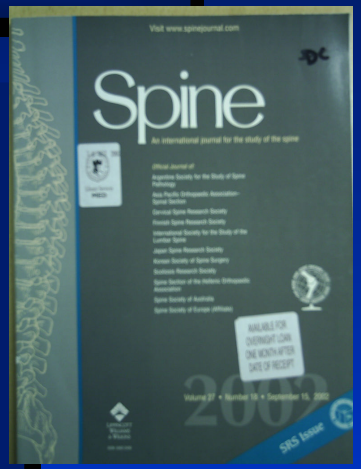
Brox 2003



- Randomized Clinical Trial of lumbar instrumented fusion and cognitive intervention and exercises in patients with chronic low back pain and disc degeneration

  – Spine 28(17) September 1 2003 pp1913-1921

Brox - Results

- 64 patients
- 25-60 years
- DDD
- 1 year f/u

PLF	ODI 41	ODI 26
Rehab	ODI 42	ODI 30 P=0.3

MRC spine stabilisation trial

- Randomized controlled trial to compare surgical stabilisation of the spine with an intensive rehabilitation programme for painful chronic low back pain

- Fairbank et Al. BMJ 23rd May 2005

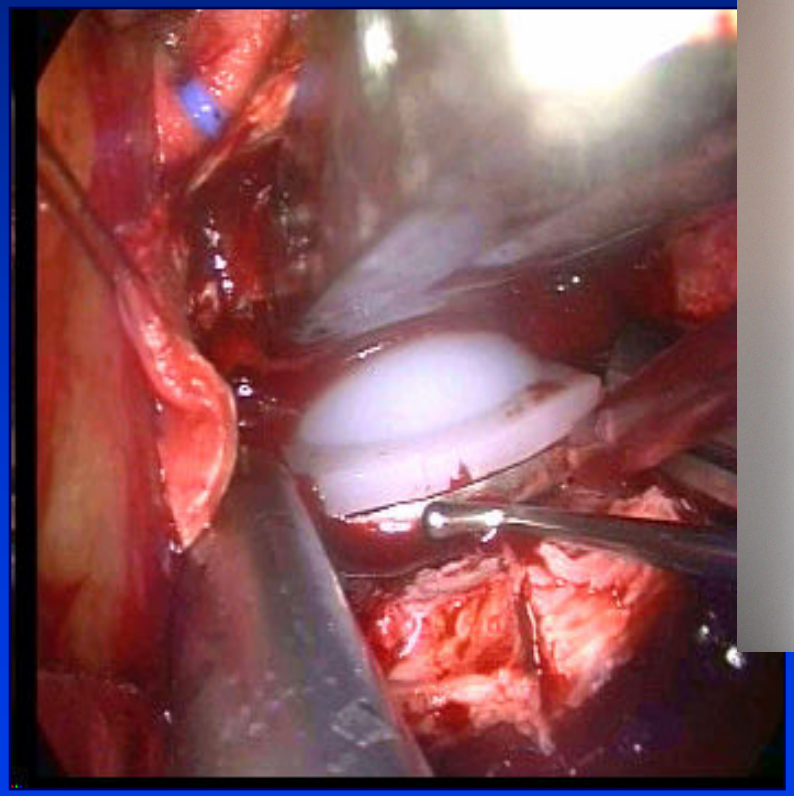
MRC Trial - Results

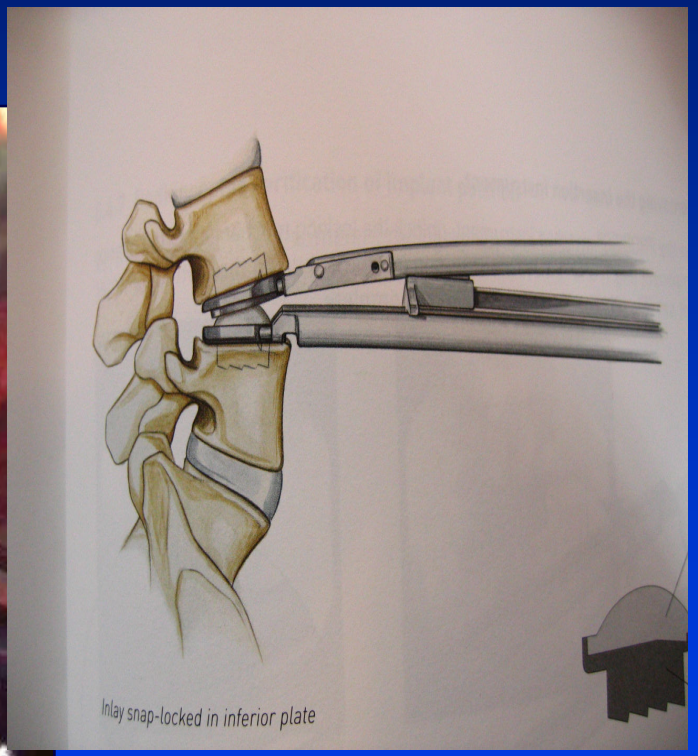
Surgery n =176	46.5 (14.6)	34 (21.1)
Rehab n =173	44.8 (14.8) 4.1CI (8.1-0.1)	36.1 (20.6) P = 0.045

MRC Trial

- Evidence exists to support intensive rehabilitation with cognitive behaviour principles as an alternative to spinal fusion surgery
- No clear evidence that spinal fusion surgery is more beneficial

Disc Arthroplasty





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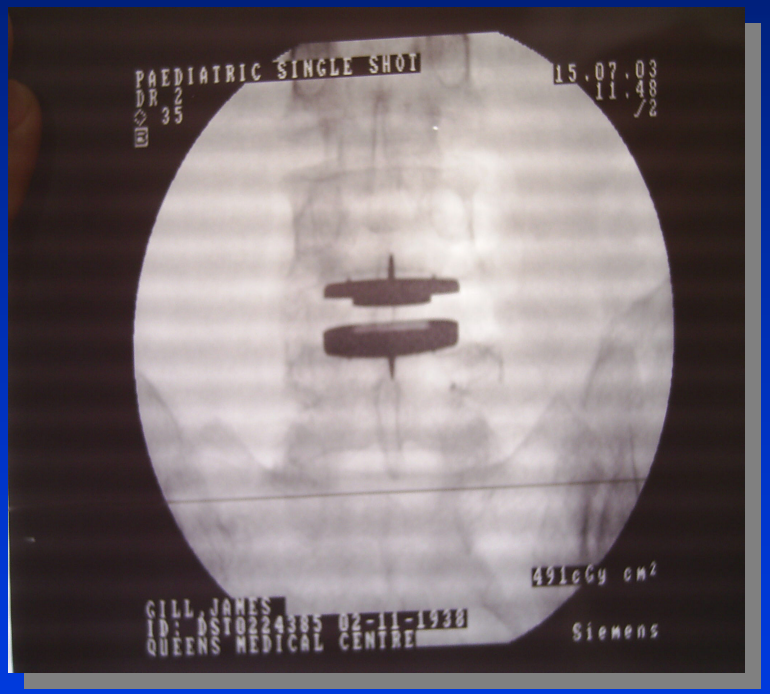
Disc Arthroplasty



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Goals

- ★Remove pain generator (disc)
- ★Restore Disc Height
- ★Preserve Motion Segment
- ★Minimize Adjacent Level Degeneration

Contra-indications

- Osteoporosis
- Degenerative Lumbar Scoliosis
- Spondylolisthesis
- Disc Herniation with radiculopathy
- Facet Arthrosis
- Spinal Stenosis
- Epidural Fibrosis (failed back surgery)

Cautions in Patient Selection

- ★Severe Disc-space Narrowing (5mm)
- ★Avoid Anterolisthesis
- ★Retrolisthesis (reducible)
- ★Degree of Lordosis L5/S1
- ★Endplate Morphology (Deeply concave superior endplate)
- ★Posterior Osteophytes

Outcomes

- Tropiano et Al. JBJS Am 87:490-496. 2005
- Mayer et Al. Eur Spine J 11:S124-130. 2002
- Delamarter et Al. Spine 28:s167-1752003

Change in Outcome Scores STALIF group (n=24)

	Pre-Op	Post-Op
ODI	57 (SD10)	43(SD18)
LBOS	20 (SD 7)	27(SD16)
VAS	8 (SD1)	6 (SD 3)

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Outcome Scores in Prodisc Group (n=17)

	Pre-Op	Post-Op
ODI	51 (SD18)	28 (SD21)
LBOS	21 (SD12)	45 (SD23)
VAS	8 (SD 2)	3 (SD 3)

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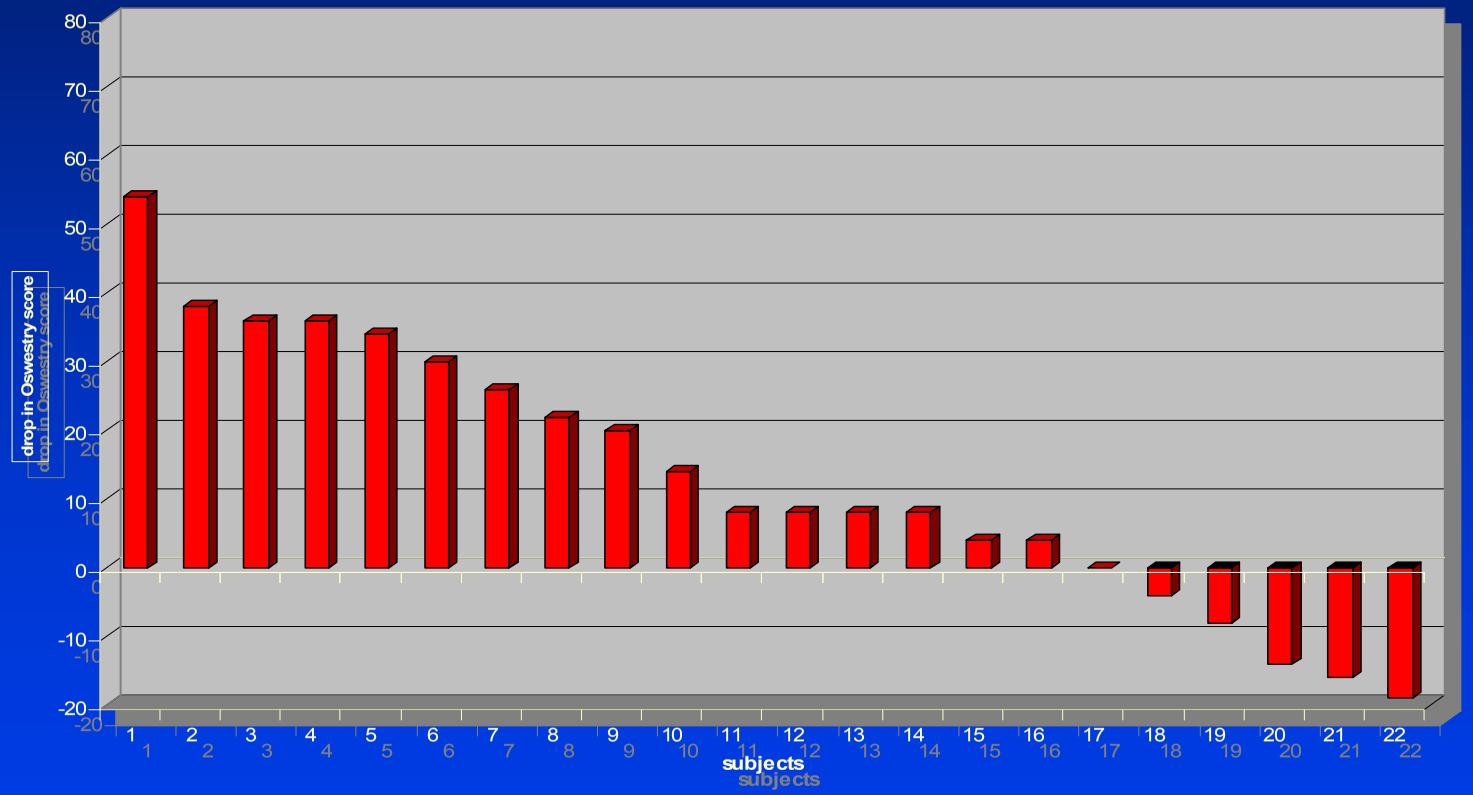
Drop in ODI STALIF group



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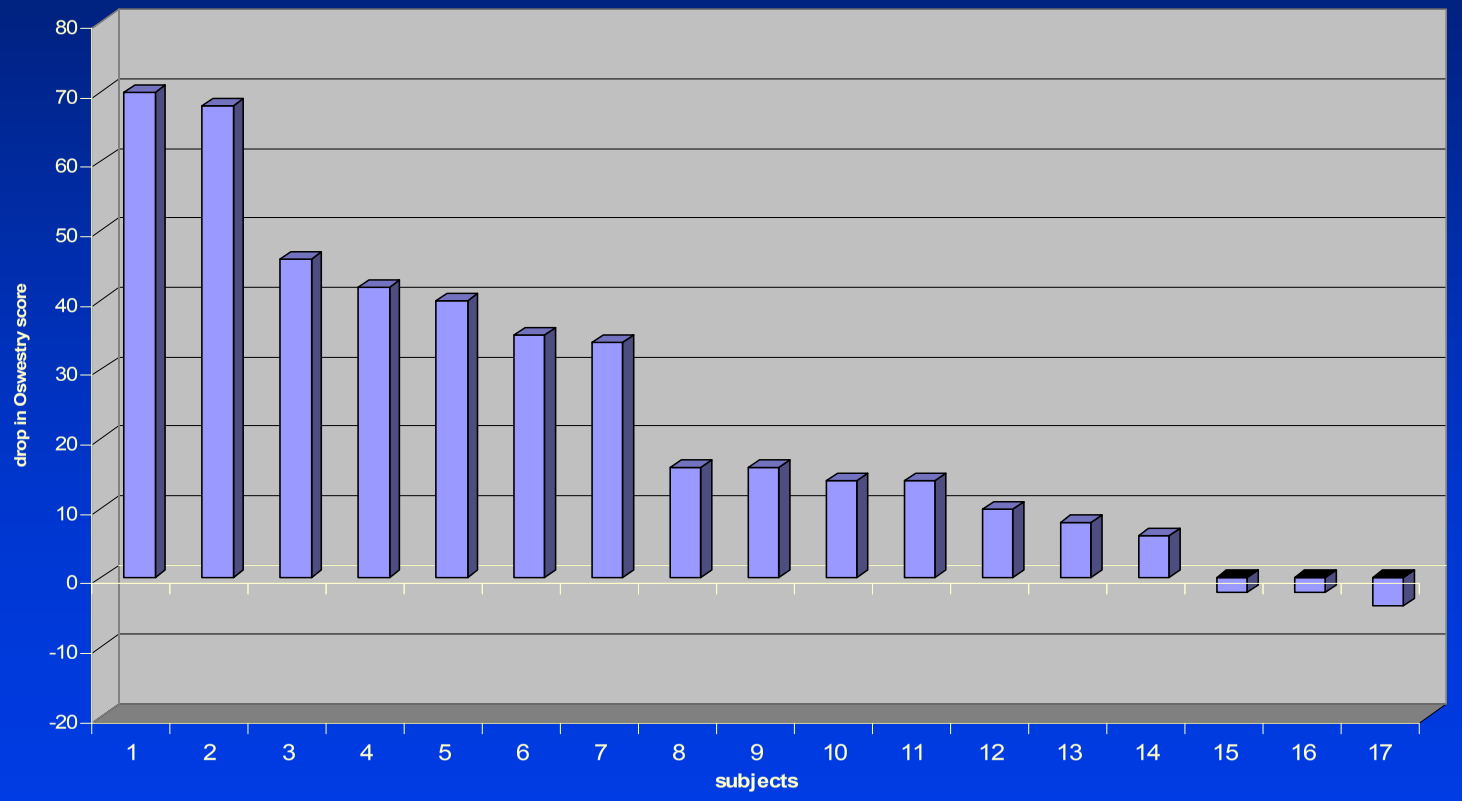
Drop in ODI Prodisc Group



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Observations

- Outcome is similar to fusion at 2 years
- No evidence of prevention of adjacent level wear
- There is a small failure and revision rate
- Longevity / poly wear

Complications

- Implant Related
- Malposition
- Subsidence
- Dislocation

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Dynamic Stabilisation (Dynesis)

- Stoll Eur Spine J 2002
- Grob Spine 2005
  - High early & late re-operation rates
  - Few pure DDD: of those 44% no better or worse
  - Conclude that successful only if combined with decompression

Graf

- Grevitt Eur Spine J 1995
- Frazer Spine 23 1995
  - Early Success ODI 59% to 35%
  - Revision rate 72% at 2 years!
  - Results of conversion to fusion / revision poor.

dynamic stabilisation

- Evidence that decompression alone is as good as decompression plus Dynesis
- High re-operation rate 20%
- Less effective than fusion in treatment of LBP
- Very few numbers

Conclusion

- Choose well, cut well, get well?
- PLIF, ALIF, PLF all carry the same results in surgery for LBP
- Buying Quality of life for 2-10 years
- Patients should have >75 hrs of Rehabilitation & cognitive therapy

Conclusion

- Spinal fusion is better than management by GP and Physio
- Spinal Fusion is Equivalent to an intensive spinal rehab programme employing cognitive therapy, stretching, aerobic fitness, hydrotherapy, muscle training

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Conclusion

- Complications associated with any surgical intervention
- Cost / Benefit for healthcare commissioners
  - 1000yr 1996 – 2003 in UK
  - 33000yr 2003 in USA

Thank You

Orthopaedic Registrar Teaching Programme
16/02/09

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