

# PHYSICAL PROGNOSTIC FACTORS PREDICTING OUTCOME FOLLOWING LUMBAR DISCECTOMY SURGERY: A SYSTEMATIC REVIEW AND NARRATIVE ANALYSIS

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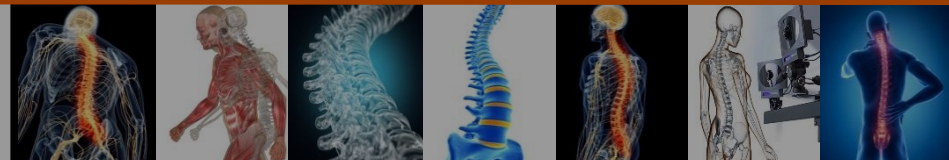
@CprSpine

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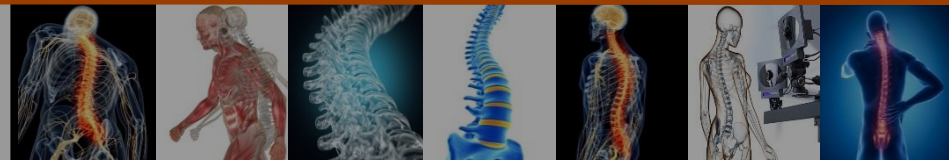
# Background

- Surgery is the largest single component of expenditure (31%) for management of low back pain (Maniadakis and Gray, 2000)
- Discectomy is common
- UK NHS 20% increase since 2001, with 8478 annually (HES online, 2016)
- 287,122 annually USA (Sherman et al, 2010)
- Advocated when conservative management has not resolved pain and function and radiological investigations are consistent with sciatic symptoms (NICE, 2016)



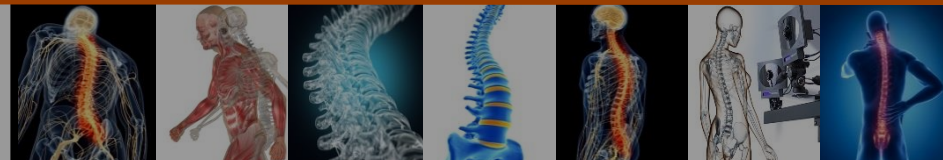
# Lumbar discectomy – what we know

- Success rates are high (Oosterhuis et al, 2014)
  - 46-75% at 6-8 weeks
  - 78-95% at 1-2 years post surgery
- But, ongoing problems are an issue for some patients
  - particularly important as mean age for surgery is 45 years
- 30-70% patients continue to experience pain (Ostelo et al, 2004)
- 14% undergo further surgery in UK (HES online, 2016)



# Important to identify prognostic factors

- To inform decision-making for surgery and for rehabilitation following surgery
- No rigorous systematic review of cohort studies to evaluate factors that may predict outcome following lumbar discectomy
- In particular, an evaluation of potential physical factors is lacking



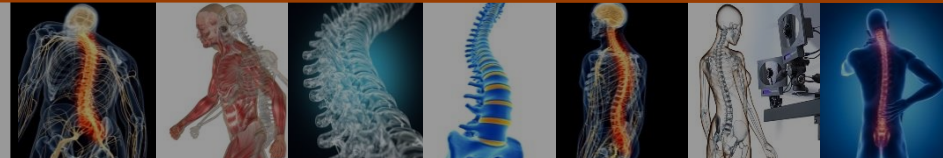
# Objective

- To identify and evaluate the value of physical prognostic factors predicting outcome for adult patients undergoing lumbar discectomy



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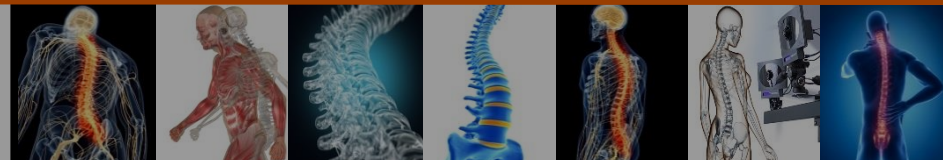
# Methods

- A systematic review and narrative analysis was conducted according to a pre-defined protocol following PRISMA-P
- PROSPERO (CRD42015024168)
- Reported in line with PRISMA



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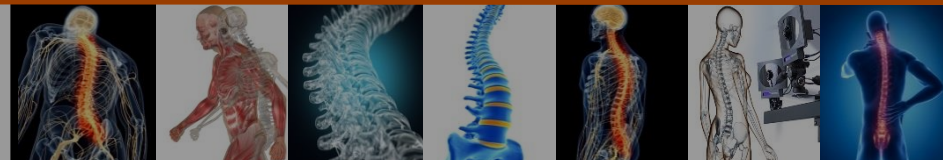
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# Eligibility criteria

- Prospective cohort studies
- $\geq 1$ -year follow-up
- Evaluating candidate physical prognostic factors e.g. leg pain intensity and straight leg raise test
  - scoping search identified need for broad eligibility as little research
- Adult patients undergoing lumbar discectomy/microdiscectomy surgery
- Baseline pre-surgery

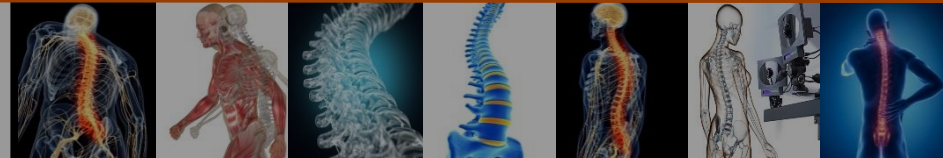


# Search strategy

Key electronic databases  
were searched  
[PubMed, CINAHL, EMBASE,  
MEDLINE, PEDro and ZETOC]

Using pre-defined terms [e.g.  
radicular pain] to 31/3/2017

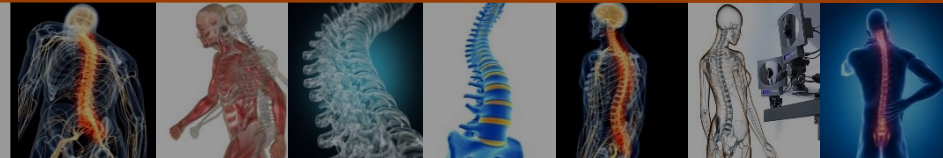
Additional searching of  
journals, reference lists and  
unpublished literature





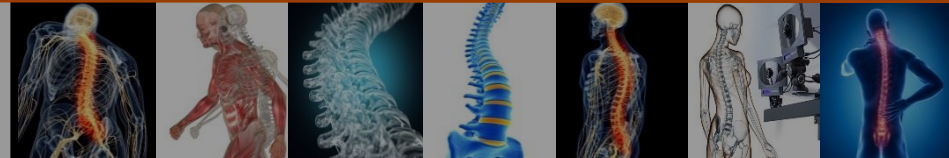
# Use of 2 independent reviewers

- Searched information sources
- Assessed identified studies for inclusion
- Extracted data
- Assessed risk of bias for included studies
  - modified Quality in Prognostic Studies QUIPs tool (Hayden et al, 2013)
- A third reviewer mediated any disagreement at each stage



# Data analysis

- Meta-analysis was not possible
  - risk of bias, clinical heterogeneity
- Narrative synthesis
- GRADE determined the overall quality of evidence [Grading of Recommendations Assessment, Development and Evaluation] (Huguet et al, 2013)



RESEARCH ARTICLE

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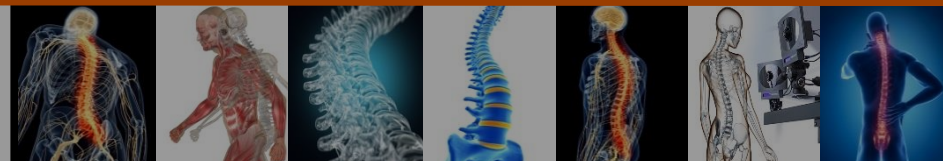
# Physical prognostic factors predicting outcome following lumbar discectomy surgery: systematic review and narrative synthesis

Alison Rushton<sup>1\*</sup> , Konstantinos Zoulas<sup>2</sup>, Andrew Powell<sup>3</sup> and J. Bart Staal<sup>4,5</sup>



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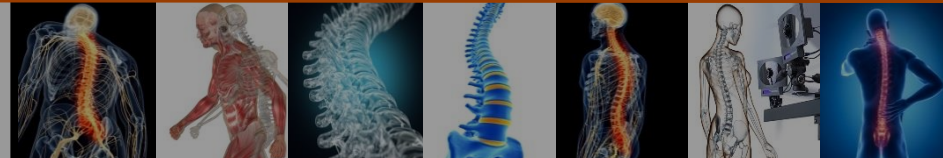
# Results: search and risk of bias

- 6567 potentially relevant studies identified
- 45 full texts assessed
- 6 studies (8 articles)
- Risk of bias:
  - 1 low
  - 5 high



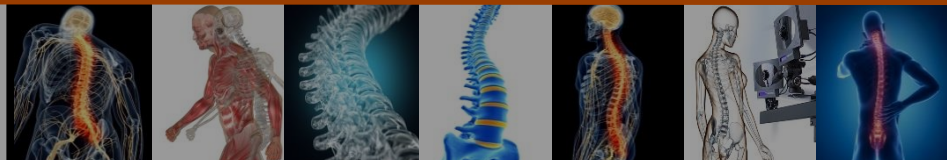
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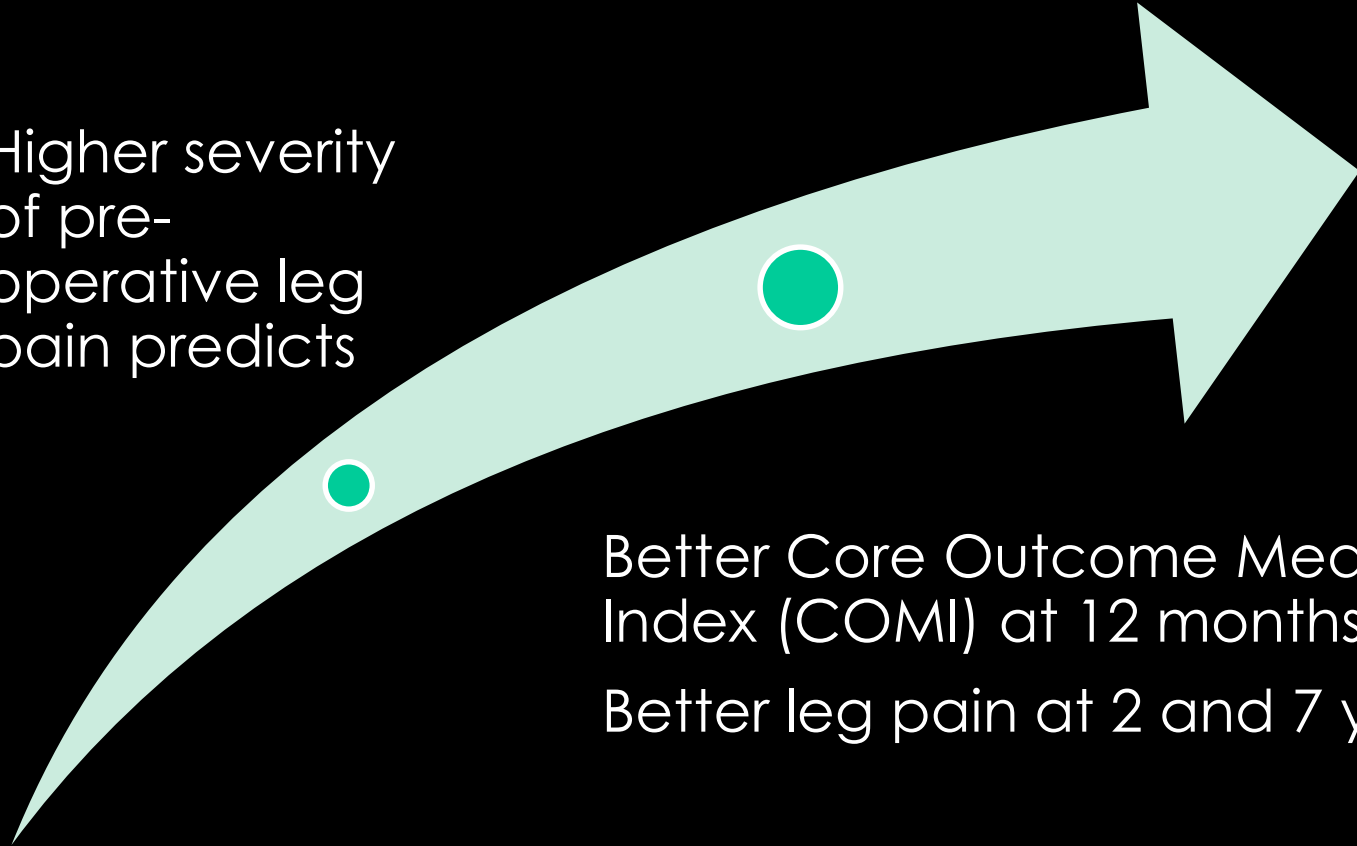
# Results: study characteristics

- Published 1979-2011 from 4 countries
- Follow up period 1-10 years
- Total n=802, range 82-228
- Age range 17-85
- 8 prognostic factors investigated, including:
  - Duration leg pain (5 studies)
  - Intensity leg pain (3 studies)
  - Intensity back pain (2 studies)
- Range of outcome measures e.g. VAS pain, ODI, EQ5D



# Low level evidence of association

Higher severity of pre-operative leg pain predicts

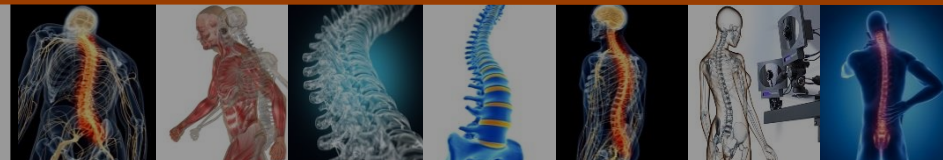


Better Core Outcome Measures Index (COMI) at 12 months  
Better leg pain at 2 and 7 years



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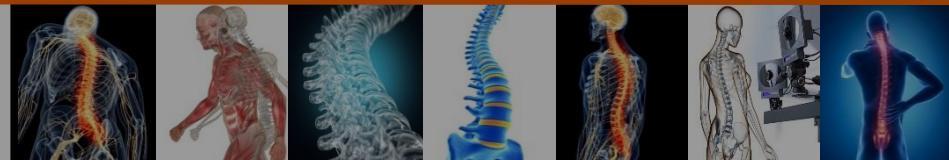
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# Severity leg pain

- Included in 3 studies
- Inconsistencies regarding its association to several outcomes:
  - 2 studies [1 low risk of bias, 1 high risk of bias] found no association [EQ5D at 2 and 7 years; ODI at 12 months]
  - 2 studies [1 low risk of bias and 1 high risk of bias] found that higher severity of leg pain was associated with better patient outcome [leg pain at 2 and 7 years; Core Outcome Measures Index at 12 months]
  - Using GRADE, there is low level evidence that higher severity of pre-operative leg pain predicts better Core Outcome Measures Index at 12 months and better post-operative leg pain at 2 and 7 years



# Low level evidence of NO association

Duration of pre-operative leg pain does NOT predict

## Outcome

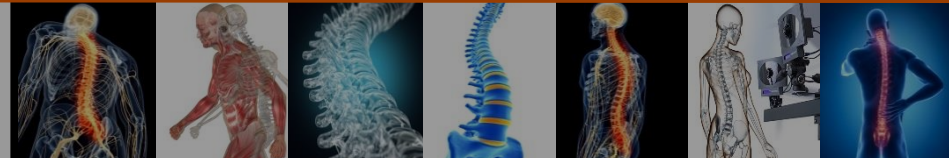
Pain Disability Score, ODI, leg pain, back pain and COS at 12 months

EQ5D at 2 and 7 years



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# Very low level evidence of NO association

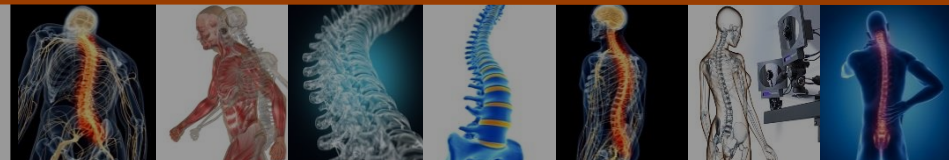
ODI, duration  
back pain,  
severity back  
pain, ipsilateral  
SLR and forward  
bend do NOT  
predict

## Outcome

Leg pain, back pain, ODI, COS,  
at 12 months

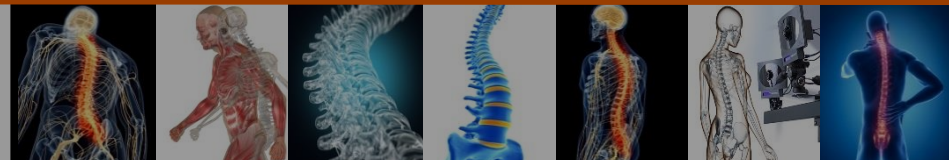
EQ5D at 2 and 7 years

Back pain, leg pain at 5-10  
years



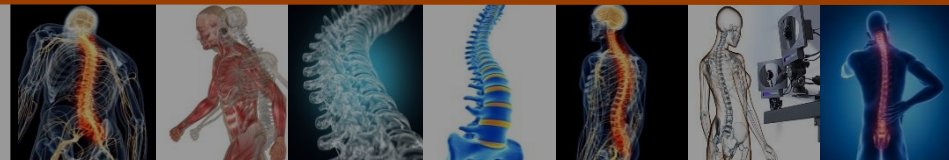
# Discussion

- Current understanding of physical prognostic factors is limited
- GRADE valuable to synthesise across studies taking into account study quality
- Consistent with previous findings that higher severity of pre-operative leg pain was associated with patient outcome  
(den Boer et al, 2006)
- Duration of leg pain not predictive
  - - in contrast to commonly held beliefs that it is



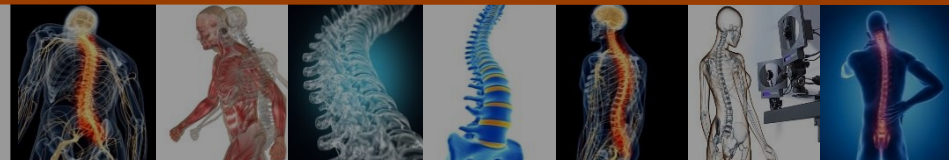
# Key limitations

- Small number and high risk of bias of most studies
- Lack of comparable outcome measures
- Exclusion of 3 non-English studies
- Other physical factors worthy of investigation and examined in studies excluded from this review, include pre-operative motor deficit, sensory loss and walking capacity



# Conclusion and clinical implications

- First rigorous review with inclusion of the gold standard of prospective studies
- Current level of evidence is low/very low
- An adequately powered low risk of bias prospective observational study is required
- Need more data on potential physical prognostic factors
  - particularly as they are often used to inform decision for surgery







## Study with us:

- ❖ MRes Spinal Pain
- ❖ scholarships available!
- ❖ PhD
- ❖ MSc Advanced Manipulative Physiotherapy
- ❖ MSc Exercise & Sports Medicine