

## Acute low back pain: systematic review of its prognosis

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### Abstract

**Objectives** To describe the course of acute low back pain and sciatica and to identify clinically important prognostic factors for these conditions.

**Design** Systematic review.

**Data sources** Searches of Medline, Embase, Cinahl, and Science Citation Index, and iterative searches of bibliographies.

**Main outcome measures** Pain, disability, and return to work.

**Results** 15 studies of variable methodological quality were included. Rapid improvements in pain (mean reduction 58% of initial scores), disability (58%), and return to work (82% of those initially off work) occurred in one month. Further improvement was apparent until about three months. Thereafter levels for pain, disability, and return to work remained almost constant. 73% of patients had at least one recurrence within 12 months.

**Conclusions** People with acute low back pain and associated disability usually improve rapidly within weeks. None the less, pain and disability are typically ongoing, and recurrences are common.

### Introduction

Clinical practice guidelines promote the view that acute low back pain has a favourable prognosis—the 2000 UK guideline states that “90% [of cases] will recover within six weeks.”<sup>1,2</sup> Yet these estimates are either unsubstantiated or based on individual studies. We aimed to systematically review published data on the course of acute low back pain and to identify clinically important prognostic factors.

### Methods

To be included studies had to be of a prospective design, describe the source of participants and method of sampling, have an inception cohort of participants with low back pain or sciatica for less than three weeks, have a follow up period of at least three months, and report on symptoms, health related quality of life, disability, or return to work. Studies were excluded that recruited patients with specific diseases such as arthritis, fracture, tumour, or cauda equina syndrome (but not sciatica).

Studies were identified through searches of Medline, Embase, and Cinahl to March 2002. We also searched personal files and tracked references of

included studies through the Science Citation Index. Methodological quality was assessed by six criteria (see bmj.com).

Study characteristics extracted from eligible papers were target population, sample size, duration of low back pain at time of enrolment, description of interventions, duration of follow up, prognostic factors, and outcome measures. Outcome data extracted were pain, disability, return to work, and recurrences. Data were extracted for time points where follow up was at least 80%. Data on return to work were obtained from the stratum of participants off work at baseline. To facilitate comparison, pain and disability scores were converted to a 100 point scale. Ten studies were controlled trials. For these studies, data were extracted for the control group, defined as the group receiving the least active intervention. In one trial, outcomes were reported only for the whole study sample. Prognostic data from this study are therefore based on the outcomes of the three groups.

When it was possible to pool data across studies we obtained n-weighted pooled means for continuous data and variance weighted pooled proportions for dichotomous data. Studies evaluating prognostic factors used a range of modelling procedures and many different covariates, making pooling across studies problematic.<sup>3</sup> Prognostic data were therefore not pooled. Data on prognostic factors were extracted only if the study reported on at least 80% of participants.

### Results

The search retrieved 4458 articles, of which only 15 were included in our review (see bmj.com). Five studies were described in more than one report. Most studies defined the sample (87%). Five (33%) explicitly described methods for assembling a representative sample. Eleven studies (73%) had follow up of at least 80%. All but one study quantified prognosis. Six studies reported prognostic factors; one (17%) used blinded assessment and four (67%) performed statistical adjustment for prognostic factors.

#### Course of low back pain

Most studies reported that pain decreased rapidly (by between 12% and 84% of initial levels, pooled mean 58%) within one month. Pain continued to decrease, albeit more slowly, until about three months (fig 1). Two studies that provided data beyond the three month follow up showed that pain levels remained nearly constant until the 12 month follow up. The

pooled mean level of pain on a 100 point scale was 22 at one month and 15 between three and 12 months. A similar trend was seen for disability, which decreased by between 33% and 83% of initial levels (pooled mean 58%) within one month (fig 1). One study reported data on six month follow up. The pooled mean level of disability on a 100 point scale was 24 at one month and 13 between three and six months.

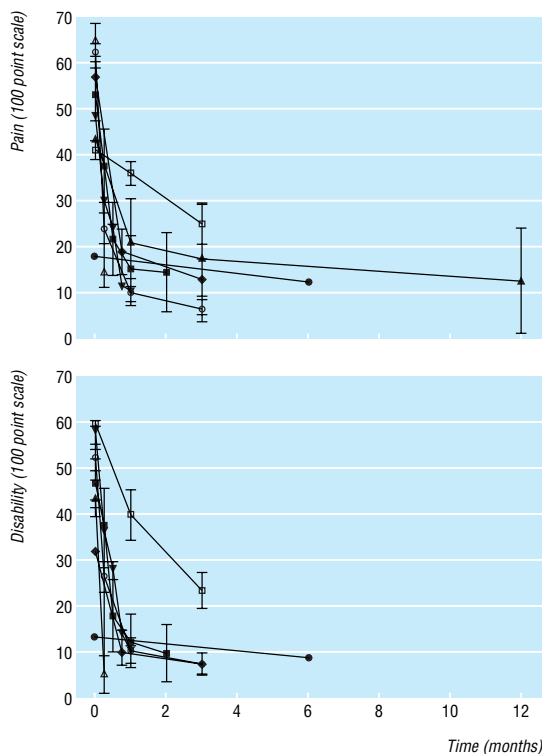
Between 68% and 86% of participants initially off work returned to work within one month (pooled estimate 82%, 95% confidence interval 73% to 91%; fig 2). One study reported data on six month follow up. The pooled estimate of the proportion of participants who returned to work, extracted from studies that reported return to work at three to six months, was 93% (91% to 96%).

The cumulative risk of at least one recurrence within three months was 26% (19% to 34%). The pooled cumulative risk of at least one recurrence within 12 months, as reported by two studies, varied from 66% to 84% (pooled estimate 73%, 59% to 88%). One study reported a cumulative risk of recurrence after three years of 84%.

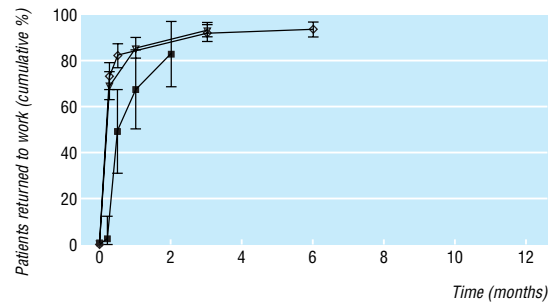
One study included patients with sciatica. In this sample, both back pain and leg pain decreased, on average, by 69% of initial scores within one month. Disability decreased by 57% of initial scores within one month. Data on long term pain and disability were not available.

**Prognostic factors**

Three studies reported on prognostic factors for at least 80% of the population. With one exception, odds ratios of significant prognostic factors ranged from



**Fig 1** Means (95% confidence intervals) for pain (top) and disability (bottom) during 12 months after onset of acute low back pain



**Fig 2** Means (95% confidence intervals) for return to work during 12 months after onset of acute low back pain of those initially off work

0.04 to 10.4. One study reported that scores of 0.48 or more on the Vermont disability prediction questionnaire were predictive of return to work at three months (odds ratio 76.3, 9.6 to 604.9; positive likelihood ratio 5.7, 3.9 to 8.5; negative likelihood ratio 0.07, 0.01 to 0.50).

**Discussion**

Our review confirms the widely held view that most people with acute low back pain have rapid improvements in pain and disability within one month. Most of those off work with back pain also returned to work within one month. Further improvement occurred until about three months. Thereafter levels of pain, disability, and return to work remained almost constant, although only two studies provided follow up data beyond three months.

Although most people return to work within 12 months, low levels of pain and disability persist. The studies did not report enough data to establish if levels of long term pain and disability reflect a small subgroup with high levels of pain and disability or a large subgroup with low levels of pain and disability. Nor is it clear whether chronic low levels of pain and disability are due to persistence of the original episode or to recurrent episodes.

Findings from previous reviews on prognostic factors of low back pain have been inconsistent.<sup>4-7</sup> Putative prognostic factors include psychological factors such as distress,<sup>4 6</sup> personal factors such as previous back pain,<sup>7</sup> and work related factors such as job satisfaction.<sup>5</sup> However, the evidence of the prognostic value of these factors comes mainly from studies that either did not recruit a relevant cohort or were methodologically weak. We located only one relevant, methodologically strong paper that provided evidence of a clinically useful predictor of outcome (in this case return to work) for primary care patients with acute low back pain: scores of 0.48 or more on the Vermont disability prediction questionnaire were associated with a likelihood ratio of 5.7 and scores of less than 0.48 were associated with a likelihood ratio of 0.07. Given the low prevalence of failure to return to work at three months (pooled estimate of 6%), this predictor may be of limited clinical utility. Moreover, the cut-off score of 0.48 was chosen by inspection of the data, which is known to inflate predictive accuracy.<sup>8</sup>

Participants off work with low back pain have higher pain and disability scores than people who are

### What is already known on this topic

Clinical practice guidelines state that recovery from acute low back pain is rapid and complete

### What this study adds

People with acute back pain experience improvements in pain, disability, and return to work within one month

Further but smaller improvements occur up to three months, after which pain and disability levels remain almost constant

Low levels of pain and disability persist from three to at least 12 months

Most people will have at least one recurrence within 12 months

working.<sup>9</sup> Thus it may be sensible to consider separately the prognosis of those off work. It remains unclear if the prognosis of participants initially off work is worse than for those who are not.

Contributors: See [bmj.com](http://bmj.com)

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Competing interests: None declared.

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### Corrections and clarifications

*Outcomes of screening to prevent cancer: analysis of cumulative incidence of cervical abnormality and modelling of cases and deaths prevented*

Three errors appeared in this paper by A E Raffle and colleagues (26 April, 901-4). After proof stage, we inadvertently changed the word "thousand" to the number "100" in the title of table 1. The title should read: "Numbers and rates of women with abnormal cytology and abnormal histology per 1000 women tested since 1976 for those screened in 1991-6." We also incorrectly transferred to the abridged version a change made by the authors at proof stage: in the section "Combined consequences, benefits, and harms" the number of tests involved in screening 1000 women for 35 years should have been reported as 7700 [not 7777]. An error in the section "Progression rates" persisted through all stages to publication: "56 of the estimated 80 cancers per thousand" should have read "56 of the estimated 80 cancers per 10 000."

*Age related macular degeneration: Smoking entails major risk of blindness*

We slipped up on a couple of points in this letter by Simon P Kelly and colleagues (28 June, pp 1458-9). Firstly, during the editing process a rogue "C" got inserted before "Simon." Secondly, we misinterpreted a sentence in their letter. In the third paragraph, the final sentence should read: "Because of this, smoking was estimated to cause or contribute to up to 20% of blindness in people aged over 50." We had wrongly attributed this statement to Chodpar et al's study, instead of the Australian Blue Mountains eye study.

*Socioeconomic and ethnic group differences in self reported health status and use of health services by children and young people in England: cross sectional study*

Sonia Saxena and colleagues would like to clarify how the data were collected for their study, as editing may have resulted in readers thinking that the authors were responsible for the data collection (*BMJ* 2002;325:520-3). The health survey for England was in fact conducted by the Joint Health Surveys Unit at University College London and the National Centre for Social Research. The authors used data supplied by the Essex data archive for their analysis. The first part of reference 11 was also incorrect; the full reference should read: Office for National Statistics. *Health survey for England: the health of minority ethnic groups '99*. London: Stationery Office, 1999.

### One hundred years ago

#### Whisky

It is a matter of common observation that during the last few decades the use of whisky as a beverage in place of beer and wine has increased enormously in England, and that among the British in India it has to a great extent replaced brandy, which used to be foundation of most pegs. We do not at present propose to inquire how this change has been brought about, nor to attempt to estimate the degree of the responsibility which should be accepted by the medical profession in the change, but it will be

admitted that the change of habit cannot be without practical interest to medical men who are often invited to approve the use of whisky as a less harmful alcoholic beverage than others formerly in more general use. This change in habit has been accompanied by a change in the mode of manufacture of the spirit sold as whisky so considerable, that whereas years ago 70 per cent. was malt whisky and 30 per cent. grain or patent spirit, now the proportions are reversed. (*BMJ* 1903;iii:1645)