

## SUGGESTED CITATIONS

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Carter JT, Birrell LN (Editors) 2000. Occupational health guidelines for the management of low back pain at work - principal recommendations. Faculty of Occupational Medicine. London.

Occupational health guidelines for the management of low back pain at work - leaflet for practitioners. Faculty of Occupational Medicine. London. 2000.

Waddell G, Burton AK 2000. Occupational health guidelines for the management of low back pain at work - evidence review. Faculty of Occupational Medicine. London.

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Disability from back pain in people of working age is one of the most dramatic failures of health care in recent years. Its greatest impact is on the lives of those affected and their families. However, it also has a major effect on industry through absenteeism and avoidable costs (the CBI estimate that back pain costs £208 for every employee each year) and at any one time 430,000 people in UK are receiving various social security benefits primarily for back pain.

This review and the guidelines based on it aim to reduce the toll of harm by providing a new approach to back pain management at work which is based on the best available scientific evidence and uses this to make practical recommendations on how to tackle the occupational health aspects of the problem. This project was made possible thanks to the foresight of Blue Circle Industries PLC who funded it as their 1999 Community Project. Completion of the project was only achieved because of the quality of the reviewers, the hard work of the multidisciplinary working group in the Faculty of Occupational Medicine and the logistical support provided by the British Occupational Health Research Foundation.

Evidence-based guidelines are becoming the benchmarks for practice in most areas of health care. It is hoped that this will be the first of many for UK occupational health practitioners. It complements existing guidelines produced for primary care health professionals by the Royal College of General Practitioners (RCGP) and thus should facilitate better links between the workplace and the community for back pain management.

The process used to prepare such guidelines is well established (Royal College of General Practitioners 1995). Six key occupational health areas were identified and a systematic review prepared of the scientific evidence covering each of these areas. Evidence statements were prepared and linked to that evidence. As far as possible, recommendations for practice were based upon and linked to these evidence statements, though there are some important areas where there is a lack of evidence. The evidence and recommendations concentrate on interventions and outcomes rather than on professional disciplines and so do not make any comment on which occupational health professional should provide advice or support. A number of evidence gaps in occupational health management of low back pain are identified. The need to fill these gaps in knowledge is the first of several challenges posed by the review. Revisions of the review and guidelines are envisaged to take account of new information.

Other challenges include:

- The need for everyone to recognise that work is only one contributor to back pain but that back pain whatever its cause can, if poorly managed, have a devastating effect on a person's ability to work.
- The importance of planning ahead at the workplace to reduce back pain disability by following the guidelines and involving all those concerned - because it can be difficult to manage a case well if the ground has not been laid in advance.
- How best to encourage General Practitioners to follow the RCGP guidelines, for instance by offers of collaboration from the workplace to maintain people with back pain at work or to help them to return to work as soon as possible if they have been absent.
- The need for the health care system to develop the sort of rehabilitation measures which have been shown to be effective in other countries and to make them available within a month of the start of an episode of back pain and before it has become a chronic and largely irremediable problem.

*Tim Carter and Lisa Birrell*

*Chair and Secretary of Faculty of Occupational Medicine Guidelines Working Group*

*Editors of Chapters 1- 4*

## 2 INTRODUCTION

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This publication presents the output from the Blue Circle Industries PLC/Faculty of Occupational Medicine/British Occupational Health Research Foundation project on occupational health aspects of low back pain:

1. a systematic review comprising the scientific evidence base underlying the *Occupational Health Guidelines for the Management of Low Back Pain at Work*. This provides a directory and guide to the evidence available, and links it to individual evidence statements. (Chapter 5 onwards)
2. *Occupational Health Guidelines for the Management of Low Back Pain at Work*: the full evidence statements and recommendations based on them for occupational health practitioners. (Chapter 3)
3. a leaflet summarising the evidence based guidelines for occupational health practitioners. (Chapter 4)

The complementary RCGP Clinical Guidelines for the Management of Acute Low Back Pain (1999) are included as an appendix. (Appendix 2)

The development process for the guidelines began with the Faculty of Occupational Medicine (FOM) commissioning a comprehensive review of the available scientific literature, from which a guideline document was developed. Wherever practicable, the methods of guideline development described by the RCGP Clinical Guidelines Development Group were adopted (Royal College of General Practitioners 1995).

The Guidelines consist of **recommendations** accompanied by **evidence statements**, with ratings of the strength of that evidence. The Evidence Review expands on the evidence statements, references the associated literature and specifically links the evidence statements to the recommendations given in the Guidelines.

The Evidence Review was written principally by the appointed *reviewers*, whilst the Guidelines and leaflets resulted from extensive debate by a multidisciplinary *development group* assembled for this purpose by the FOM.

This intensive development process would not have been possible without the support of the British Occupational Health Research Foundation (BOHRF) and funding from Blue Circle Industries PLC (BCI).

**Scope**

The Guidelines are intended for health professionals undertaking the occupational health management of low back pain (LBP). They focus on interventions that might be considered appropriate for occupational health practitioners to implement. They are designed to complement and to be used in conjunction with the RCGP *Clinical Guidelines for the Management of Acute Low Back Pain* (Royal College of General Practitioners 1999).

It is not intended, nor should it be taken to imply, that these guidelines override existing legal obligations. Any duties under the Health and Safety at Work Act 1974, the Management of Health and Safety at Work Regulations 1992, the Manual Handling Operations Regulations 1992, the Disability Discrimination Act 1995, or other relevant legislation must be given due consideration.

### 3 PRINCIPAL RECOMMENDATIONS FOR OCCUPATIONAL HEALTH MANAGEMENT

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This section lists the full evidence statements derived from the systematic literature review. Recommendations for occupational health management based on each set of statements are given alongside. Recommendations are also included which are not strictly evidence-based, but considered good practice either legally or by consensus, and these are identified by the use of italics.

The recommendations linked to evidence statements are grouped according to occupational health context:

- A. Background
- B. Pre-placement assessment
- C. Prevention
- D. Assessment of the worker presenting with back pain
- E. Management principles for the worker presenting with back pain
- F. Management of the worker having difficulty returning to normal occupational duties at approximately 4-12 weeks

The strength of evidence for each statement is classified as follows:

- \*\*\* Strong evidence – provided by generally consistent findings in multiple, high quality scientific studies.
- \*\* Moderate evidence – provided by generally consistent findings in fewer, smaller or lower quality scientific studies.
- \* Limited or contradictory evidence – provided by one scientific study or inconsistent findings in multiple scientific studies.
- No scientific evidence – based on clinical studies, theoretical considerations and/or clinical consensus.

Notes:

1. ‘LBP’ within these guidelines means non-specific low back pain, unless stated otherwise.
2. ‘Worker’ is used to describe all those in employment (including the self-employed, trainees and apprentices).
3. ‘Employer’ is used as a collective term for all those with managerial responsibilities, including all types of employers, line managers, supervisors and their representatives.

## A Background

Recommendation	Evidence
<p><i>You, as an occupational health practitioner, have a professional duty to support the worker with LBP and should do so whether or not occupational factors play any role in causation.</i></p> <p>Make employers and workers aware that:</p> <ul style="list-style-type: none"> <li>- LBP is common and frequently recurrent but acute attacks are usually brief and self-limiting.</li> <li>- Physical demands at work are one factor influencing LBP but are often not the most important.</li> <li>- Prevention and case management need to be directed at both physical and psychosocial factors.</li> </ul> <p>Establish a partnership, involving workers, employers and health professionals in the workplace and the community, with a common consistent approach to agreed goals, to manage back pain and prevent unnecessary disability.</p>	<p>*** Most adults (60-80%) experience LBP at some time and it is often persistent or recurrent. It is one of the most common reasons for seeking health care and it is now one of the commonest health reasons given for work loss.</p> <p>*** Physical demands of work (manual materials handling, lifting, bending, twisting, and whole body vibration) can be associated with increased reports of back symptoms, aggravation of symptoms and 'injuries'.</p> <p>* There is limited and contradictory evidence that the length of exposure to physical stressors at work (cumulative risk) increases reports of back symptoms or of persistent symptoms.</p> <p>*** Physical demands of work (manual materials handling, lifting, bending, twisting, and whole body vibration) are a risk factor for the incidence (onset) of LBP, but overall it appears that the size of the effect is less than that of other individual, non-occupational and unidentified factors.</p> <p>** Physical demands of work play only a minor role in the development of disc degeneration.</p> <p>*** Care-seeking and disability due to LBP depend more on complex individual and work-related psychosocial factors than on clinical features or physical demands of work.</p>

## B Pre-placement assessment

Recommendation	Evidence
<p>LBP is common and recurrent and is not a reason for denying employment in most circumstances. However care should be taken when placing individuals with a strong history of LBP in physically demanding jobs.</p> <p>Enquire about previous history of LBP as part of the pre-placement assessment, in particular the frequency and duration of attacks, time since last attack, radiating leg pain, previous surgery and sickness absence due to LBP.</p> <p>Do not routinely include clinical examination of the back, lumbar x-rays, back function testing, general fitness or psychosocial factors in the pre-placement assessment.</p> <p><i>Placement should take account of the risk assessment and requirements under the Disability Discrimination Act 1995 to provide 'suitable and reasonable' adjustments, but it is ultimately a question of professional judgement.</i></p>	<p>*** The single, most consistent predictor of future LBP and work loss is a previous history of LBP, including in particular the frequency and duration of attacks, time since last attack, radiating leg pain, previous surgery and sickness absence due to LBP.</p> <p>** Examination findings, including in particular height, weight, lumbar flexibility and straight leg raising (SLR), have little predictive value for future LBP or disability.</p> <p>** The level of general (cardio-respiratory) fitness has no predictive value for future LBP.</p> <p>* There is limited and contradictory evidence that attempting to match physical capability to job demands may reduce future LBP and work loss.</p> <p>*** X-ray and MRI findings have no predictive value for future LBP or disability.</p> <p>*** Back-function testing machines (isometric, isokinetic or isoinertial measurements) have no predictive value for future LBP or disability.</p> <p>*** For symptom-free people, individual psychosocial findings are a risk factor for the incidence (onset) of LBP, but overall the size of the effect is small.</p>

## C Prevention

Recommendation	Evidence
<p data-bbox="236 327 783 432"><i>Advise on current good working practices such as specified in the Manual Handling Regulations and associated guidance.</i></p> <p data-bbox="236 506 783 712">Do not recommend lumbar belts and supports or traditional biomedical education as methods of preventing LBP. There is insufficient evidence to advocate general exercise or physical fitness programmes.</p> <p data-bbox="236 1211 783 1379">Advise employers that high job satisfaction and good industrial relations are the most important organisational characteristics associated with low disability and sickness absence rates attributed to LBP.</p> <p data-bbox="236 1458 549 1491">Encourage employers to:</p> <ul data-bbox="236 1525 783 1765" style="list-style-type: none"> <li>- Consider joint employer-worker initiatives to identify and control occupational risk factors.</li> <li>- Monitor back problems and sickness absence due to LBP.</li> <li>- Improve safety and develop a 'safety culture'.</li> </ul>	<p data-bbox="805 506 1359 674">* There is contradictory evidence that various general exercise/physical fitness programmes may reduce future LBP and work loss; any effect size appears to be modest.</p> <p data-bbox="805 719 1359 819">*** Traditional biomedical education based on an injury model does not reduce future LBP and work loss.</p> <p data-bbox="805 864 1359 999">- There is preliminary evidence that educational interventions which specifically address beliefs and attitudes may reduce future work loss due to LBP.</p> <p data-bbox="805 1032 1359 1099">*** Lumbar belts or supports do not reduce work-related LBP and work loss.</p> <p data-bbox="805 1178 1359 1346">*** Low job satisfaction and unsatisfactory psychosocial aspects of work are risk factors for reported LBP, health care use and work loss, but the size of that association is modest.</p> <p data-bbox="805 1424 1359 1850">* There is limited evidence but general consensus that joint employer-worker initiatives (generally involving organisational culture and high stakeholder commitment to identify and control occupational risk factors and improve safety, surveillance measures and 'safety culture') can reduce the number of reported back 'injuries' and sickness absences, but there is no clear evidence on the optimum strategies and inconsistent evidence on the effect size.</p>

## D Assessment of the worker presenting with back pain

Recommendation	Evidence
<p>Screen for serious spinal diseases and nerve root problems (see 'Diagnostic Triage' Figure 1).</p> <p>Clinical examination may aid clinical management (RCGP 1999), but is of limited value in planning occupational health management or in predicting the vocational outcome.</p> <p>Take a clinical, disability and occupational history, concentrating on the impact of symptoms on activity and work, and any obstacles to recovery and return to work.</p> <p>Consider psychosocial 'yellow flags' to identify workers at particular risk of developing chronic pain and disability (Figure 2). Use this assessment to instigate active case management at an early stage.</p> <p>X-rays and scans are not indicated for the occupational health management of the patient with LBP.</p> <p><i>Ensure that any incident of LBP which may be work-related is investigated and advice given on remedial action. If appropriate, review the risk assessment.</i></p>	<p>** Screening for 'red flags' and diagnostic triage is important to exclude serious spinal diseases and nerve root problems.</p> <p>** Examination findings, including in particular height, weight, lumbar flexibility and SLR are of limited value in planning occupational health management or in predicting the prognosis of non-specific LBP.</p> <p>** Patients who are older (particularly &gt;50 years), have more prolonged and severe symptoms, have radiating leg pain, whose symptoms impact more on activity and work, and who have responded less well to previous therapy are likely to have slower clinical progress, poorer response to treatment and rehabilitation, and more risk of long term disability.</p> <p>*** Individual and work-related psychosocial factors play an important role in persisting symptoms and disability, and influence response to treatment and rehabilitation. Screening for 'yellow flags' can help to identify those workers with LBP who are at risk of developing chronic pain and disability. Workers' own beliefs that their LBP was caused by their work and their own expectations about inability to return to work are particularly important.</p> <p>*** In patients with non-specific LBP, x-ray and MRI findings do not correlate with clinical symptoms or work capacity.</p>

## E Management principles for the worker presenting with back pain

Recommendation	Evidence
<b>Clinical:</b>	
<p>Clinical management should follow the RCGP (1999) guidelines. Discuss expected recovery times, and the importance of continuing ordinary activities as normally as possible despite pain.</p> <p>Ensure that workers with LBP receive the key information in a form they understand (see footnote <i>The Back Book</i>).</p>	<p>*** Advice to continue ordinary activities of daily living as normally as possible despite the pain can give equivalent or faster symptomatic recovery from the acute symptoms, and leads to shorter periods of work loss, fewer recurrences and less work loss over the following year than 'traditional' medical treatment (advice to rest and 'let pain be your guide' for return to normal activity).</p> <p>** The above advice can be usefully supplemented by simple educational interventions specifically designed to overcome fear avoidance beliefs and encourage patients to take responsibility for their own self-care.</p>
<b>Occupational:</b>	
<p>Encourage the worker to remain in his or her job, or to return at an early stage, even if there is still some LBP- do not wait until they are completely pain-free. Consider the following steps to facilitate this:</p> <ul style="list-style-type: none"> <li>- Initiate communication with their primary health care professional early in treatment and rehabilitation.</li> <li>- Advise the worker to continue as normally as possible and provide support to achieve this.</li> <li>- Advise employers on the actions required, which may include maintaining sympathetic contact with the absent worker.</li> <li>- Consider temporary adaptations of the job or pattern of work.</li> </ul>	<p>** Communication, co-operation and common agreed goals between the worker with LBP, the occupational health team, supervisors, management and primary health care professionals is fundamental for improvement in clinical and occupational health management and outcomes.</p> <p>*** Most workers with LBP are able to continue working or to return to work within a few days or weeks, even if they still have some residual or recurrent symptoms, and they do not need to wait till they are completely pain free.</p> <p>* Advice to continue ordinary activities as normally as possible, in principle, applies equally to work. The scientific evidence confirms that this general approach leads to shorter periods of work loss, fewer recurrences and less work loss over the following year, although most of the evidence comes from intervention packages and the clinical evidence focusing solely on advice about work is limited.</p>

	<p>* There is general consensus but limited scientific evidence that workplace organisational and/or management strategies (generally involving organisational culture and high stakeholder commitment to improve safety, provide optimum case management and encourage and support early return to work) may reduce absenteeism and duration of work loss.</p>
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**Footnote:** *The Back Book* is an evidence-based booklet developed in conjunction with the RCGP clinical guidelines, for use by patients and published by The Stationery Office.

**F Management of the worker having difficulty returning to normal occupational duties at approximately 4-12 weeks**

<b>Recommendation</b>	<b>Evidence</b>
<p>Ensure that workers, employers and primary care health professionals understand that the longer anyone is off work with LBP, the greater the risk of chronic pain and disability, and the lower their chances of ever returning to work.</p> <p>Address the common misconception among workers and employers of the need to be pain-free before return to work. Some pain is to be expected and the early resumption of work activity improves the prognosis.</p> <p>Encourage the employer to establish a surveillance system to identify those off work with LBP for over 4 weeks so that appropriate action can be taken. Intervention at this stage is more effective than delaying and having to deal with established intractable chronic pain and disability.</p> <p>Advise employers on ways in which the physical demands of the job can be temporarily modified to facilitate return to work.</p>	<p>*** The longer a worker is off work with LBP, the lower their chances of ever returning to work. Once a worker is off work for 4-12 weeks they have a 10-40% risk (depending on the setting) of still being off work at one year; after 1-2 years absence it is unlikely they will return to any form of work in the foreseeable future, irrespective of further treatment.</p> <p>*** Various treatments for chronic LBP may produce some clinical improvement, but most clinical interventions are quite ineffective at returning people to work once they have been off work for a protracted period with LBP.</p> <p>** From an organisational perspective, the temporary provision of lighter or modified duties facilitates return to work and reduces time off work.</p> <p>- Conversely, there is some suggestion that clinical advice to return only to restricted duties may act as a barrier to return to normal work, particularly if no lighter or modified</p>

If medical treatment fails to produce recovery and return to work by 4-12 weeks, communicate and collaborate with primary health care professionals to shift the emphasis from dependence on symptomatic treatment to rehabilitation and self-management strategies.

Where practicable, refer the worker who is having difficulty returning to normal occupational duties at 4-12 weeks to an active rehabilitation programme. Such a rehabilitation programme needs to be carefully designed to fit local circumstances and should consist of a multidisciplinary 'package' of interventions (Figure 3).

duties are available.

\*\* Changing the focus from purely symptomatic treatment to an 'active rehabilitation programme' can produce faster return to work, less chronic disability and less sickness absence. There is no clear evidence on the optimum content or intensity of such packages, but there is generally consistent evidence on certain basic elements. Such interventions are more effective in an occupational setting than in a health care setting.

\*\* A combination of optimum clinical management, a rehabilitation programme, and organisational interventions designed to assist the worker with LBP return to work, is more effective than single elements alone.

**Figure 1: Diagnostic Triage including 'Red Flags'**

**SIMPLE BACK PAIN**

Presentation between ages 20-55

Lumbosacral region, buttocks and thighs

Pain 'mechanical' in nature

Varies with physical activity and time

Patient well

Prognosis good

90% recover from acute attack within six weeks

**NERVE ROOT PAIN**

Unilateral leg pain worse than low back pain

Pain generally radiates to foot or toes

Numbness or paraesthesia in same distribution

Nerve irritation signs

Reduced SLR which reproduces leg pain

Motor, sensory or reflex change

Limited to one nerve root

Prognosis reasonable

50% recover from acute attack within six weeks

**RED FLAGS FOR POSSIBLE SERIOUS SPINAL PATHOLOGY**

Age of onset less than 20 or greater than 55 years

Violent trauma: eg. fall from a height, RTA

Constant, progressive, non-mechanical pain

Thoracic pain

PMH carcinoma, systemic steroids, drug abuse, HIV

Systemically unwell, weight loss

Persisting severe restriction of lumbar flexion

Widespread neurology

Structural deformity

Reproduced from: Clinical Guidelines for the Management of Acute Low Back Pain -  
Royal College of General Practitioners 1999

## Figure 2: Psychosocial Risk Factors - 'Yellow Flags'

When conducting an assessment, it may be useful to consider psychosocial 'yellow flags' (beliefs and behaviours on the part of the patient which may predict poor outcomes).

The following factors are important and consistently predict poor outcomes:

- A belief that back pain is harmful or potentially severely disabling
- Fear-avoidance behaviour (avoiding a movement or activity due to misplaced anticipation of pain) and reduced activity levels
- Tendency to low mood and withdrawal from social interaction
- Expectation of passive treatment(s) rather than a belief that active participation will help

Suggested questions to the worker with low back pain (to be phrased in your own style):

- Have you had time off work in the past with back pain?
- What do you understand is the cause of your back pain?
- What are you expecting will help you?
- How is your employer responding to your back pain? Your co-workers? Your family?
- What are you doing to cope with your back pain?
- Do you think you will return to work? When?

A worker may be considered to be 'at risk' if:

- There is a cluster of a few very salient factors
- There is a group of several less important factors that combine cumulatively

The presence of risk factors should alert the clinician to the possibility of long-term problems and the need to prevent their development. Specialised psychological referrals should only be required for those with psychopathology, or for those who fail to respond to the management advocated in this guideline.

### **Figure 3: Active Rehabilitation Programme**

**Education:**

Directed primarily at overcoming fear avoidance beliefs and encouraging patients to learn to manage and take responsibility for their own self-care (for example *The Back Book*).

**Reassurance and advice:**

Strong reassurance and advice to stay active.

**Exercise:**

An active, progressive exercise and physical fitness programme.

**Pain management:**

Behavioural principles of pain management

**Work:**

In an occupational setting and directed strongly towards return to work.

**Rehabilitation:**

May also include some symptomatic relief measures, but if so these should supplement and reinforce, and must not interfere with the primary goal of rehabilitation.

**Footnote:** *The Back Book* is an evidence-based booklet developed in conjunction with the RCGP clinical guidelines, for use by patients and published by The Stationery Office.

## 4 PRACTITIONERS' LEAFLET - ' OCCUPATIONAL HEALTH GUIDELINES FOR THE MANAGEMENT OF LOW BACK PAIN AT WORK '

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These guidelines represent the main recommendations and evidence statements derived from a detailed Evidence Review and developed by a multidisciplinary group of practitioners. They concern the clinical management of workers affected by non-specific low back pain (LBP), including advice on placement, rehabilitation and measures for prevention. They focus on actions to be taken to assist the individual and do not specifically cover legal issues, health and safety management, job design and ergonomics. They assume that a risk assessment has been conducted and used to define the control measures required, including the need for occupational health advice.

### **The evidence is weighted as follows:**

- \*\*\* Strong evidence - generally consistent findings in multiple, high quality scientific studies.
- \*\* Moderate evidence - generally consistent findings in fewer, smaller or lower quality scientific studies.
- \* Limited or contradictory evidence - one scientific study or inconsistent findings in multiple scientific studies.

These guidelines complement and should be used in conjunction with the RCGP *Clinical Guidelines for the Management of Acute Low Back Pain* 1999. Available from: **Royal College of General Practitioners**, 14 Princes Gate, Hyde Park, London, SW7 1PU. [www.rcgp.org.uk](http://www.rcgp.org.uk)

*The Back Book* is an evidence-based booklet for use by patients, published by The Stationery Office (ISBN 011 702 0788).

### **A. BACKGROUND**

#### **Principal recommendations**

Make employers and workers aware that:

- LBP is common and frequently recurrent but usually brief and self-limiting.
- physical demands at work are only one factor influencing LBP.
- prevention and case management need to be directed at both physical and psychosocial factors.

## **Evidence**

- \*\*\* Physical demands at work can be associated with increased back symptoms and ‘injuries’, but they do not generally produce lasting physical damage. Overall, they are less important than other individual, non-occupational and unidentified factors.
- \*\*\* Disability due to LBP depends more on psychosocial factors.

## **B. PRE-PLACEMENT ASSESSMENT**

### **Principal recommendations**

LBP is not a reason for denying employment in most circumstances. Care should be taken when placing individuals with a strong history of LBP in physically demanding jobs.

Placement should take account of the risk assessment and requirements under the Disability Discrimination Act 1995, but is ultimately a question of professional judgement.

## **Evidence**

- \*\*\* A strong history of LBP is the best predictor of future problems: frequency and duration of previous attacks, time since last attack, radiating leg pain, back surgery and sickness absence.
- \*\* Clinical examination, x-ray, MRI, back-function testing machines and psychosocial screening are not reliable predictors.

## **C. PREVENTION**

### **Principal recommendations**

Advise on current good working practices such as specified in the Manual Handling Regulations and associated guidance.

Encourage employers to:

- Consider joint employer-worker initiatives to identify and control occupational risk factors.
- Monitor back problems and sickness absence due to LBP.
- Improve safety and develop a ‘safety culture’.
- Recognise the importance of providing satisfying work in a climate of good industrial relations.

## **Evidence**

- \*\*\* Traditional biomedical education and lumbar supports do not reduce future LBP and work loss.

- \* There is conflicting evidence whether general exercise/physical fitness programmes have much preventive effect.
- \* Joint employer-worker initiatives to monitor and improve safety can reduce the number of reported back 'injuries' and sickness absence.

## **D. ASSESSMENT OF THE WORKER PRESENTING WITH BACK PAIN**

### **Principal recommendations**

Screen for serious spinal diseases and nerve root problems.

Take a detailed clinical, disability and occupational history.

Consider psychosocial risk factors for chronicity. (see 'Yellow Flags')

### **Evidence**

- \*\* Patients aged >50 years, with more prolonged and severe symptoms or radiating leg pain are at more risk of long term disability.
- \*\* Clinical examination, x-ray and MRI do not predict clinical symptoms or work capacity.
- \*\*\* Individual and work-related psychosocial factors play an important role in persisting symptoms and disability.

**Psychosocial 'Yellow Flags'** (beliefs and behaviours on the part of the patient which may predict poor outcomes).

The following factors are important and consistently predict poor outcomes:

- A belief that back pain is harmful or potentially severely disabling
- Fear-avoidance behaviour and reduced activity levels
- Tendency to low mood and withdrawal from social interaction
- Expectation of passive treatment(s) rather than a belief that active participation will help

## **E. MANAGEMENT PRINCIPLES FOR THE WORKER PRESENTING WITH BACK PAIN**

### **Principal recommendations**

Ensure that workers with LBP receive the key information in a form they understand (*The Back Book*) and that their clinical management follows the RCGP Guidelines (1999). Discuss expected recovery times.

Encourage the worker to continue as normally as possible and to remain at work, or to return to work at an early stage, even if they still have some LBP. Consider temporary adaptation of the job or pattern of work if necessary to achieve this.

### **Evidence**

- \*\*\* Staying active and returning to ordinary activities as early as possible leads to faster recovery and fewer recurrences.
- \*\*\* Most workers with LBP are able to continue working or to return to work within a few days or weeks: they do not need to wait until they are completely pain free.
- \*\* Joint employer-worker initiatives to provide optimum management and to facilitate and support workers remaining at work or returning to work as early as possible may reduce sickness absence.

## **F. MANAGEMENT OF THE WORKER HAVING DIFFICULTY RETURNING TO NORMAL OCCUPATIONAL DUTIES AT APPROXIMATELY 4-12 WEEKS**

### **Principal recommendations**

Address the common misconception among workers and employers that you need to be pain-free to return to work.

Advise on ways in which the job can be adjusted to facilitate return to work.

Communicate and collaborate with primary health care professionals to shift the emphasis from dependence on symptomatic treatment to rehabilitation and self-management strategies. Where practicable refer to an active rehabilitation programme.

### **Evidence**

- \*\*\* The longer a worker is off work with LBP, the lower their chances of ever returning to work.
- \*\* Temporary provision of modified or lighter duties facilitates return to work and reduces time off work.
- \*\* Changing the focus from purely symptomatic treatment to an 'active rehabilitation programme' can produce faster return to work and less chronic disability. This is more effective in an occupational than in a health care setting.
- \*\* A combination of optimum clinical management, a rehabilitation programme, and organisational interventions designed to assist the worker with LBP return to work, is more effective.

## **ACTIVE REHABILITATION PROGRAMME**

**Education** - directed at managing their pain and overcoming disability

**Reassurance and advice** - to stay active

**Exercise** - an active and progressive physical fitness programme

**Pain management** - using behavioural principles

**Work** - in an occupational setting and directed strongly towards return to work

**Rehabilitation** - symptomatic relief measures should support and must not interfere with rehabilitation

**Occupational Health Guidelines for the  
Management of Low Back Pain at Work**

Evidence Review

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## 5 EVIDENCE REVIEW METHODS

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This review is about non-specific low back pain (abbreviated simply as LBP) unless otherwise stated. The main target for the literature search was evidence from occupational settings or concerning occupational outcomes. The review methodology broadly followed that used for the Royal College of General Practitioners (RCGP) clinical guidelines ((Waddell et al. 1996) (Waddell et al. 1999)) and the Swedish SBU Report on back pain (Nachemson & Jonsson 2000).

The clinical management aspects of these guidelines were based on the most recent review of the current evidence in the Swedish SBU report (1999) on back pain and the recommendations of the RCGP clinical guidelines (1999), whilst the key areas of concern to occupational health practitioners were addressed by the present literature search.

The scientific evidence on LBP is now so extensive that it is impossible to carry out a complete systematic review of every aspect of management *de novo* to an acceptable high standard within an acceptable time scale and using reasonable resources. The present evidence review therefore started with a search for all published, methodologically sound, systematic reviews. These were supplemented by narrative reviews in key areas of interest or where systematic reviews were unavailable. These narrative reviews were variously selected according to the following additional criteria: appropriateness to the management of occupational LBP; comprehensive and/or structured coverage of topic; basic aspects of the management of occupational LBP. Selection inevitably involved judgements of quality: the narrative reviews were selected by each of the two reviewers independently with a high level of agreement and any disagreements resolved by discussion. Further literature searches were made for original scientific studies covering key issues not covered by existing reviews, along with searches for more recent studies that might confirm, modify or expand upon the conclusions of the published systematic reviews. In addition, recent guidelines from various countries relevant to occupational health management were obtained and assessed. The resulting guidance is evidence-linked, in that sources supporting each evidence statement in this document are specifically identified.

In view of the occupational health focus of the guidelines and the present review, the following areas were excluded from the review, except where they impact directly on the guideline recommendations:

- chronic intractable pain, long-term disability and pain management programmes
- spinal surgery and post-operative states
- primary ergonomic interventions
- methods of disability evaluation
- workers compensation issues

## Literature searches

The literature was searched systematically to September 1999, using a variety of standard methods.

MEDLINE was searched for articles published in English from 1966, using a number of search terms including:

- back pain *or* back injury
- work *or* occupational
- return to work
- clinical trial *or* intervention *or* prospective study
- appropriate MESH terms were also used
- (some of the systematic reviews did also include studies in other languages)

EMBASE was searched from 1980 based on a number of search terms including:

- back, low back *or* lumbar
- occupation, work *or* working
- prevention, screening, pre-employment, rehabilitation *or* return to work

Additional searching included:

- selected Internet searches
- personal bibliographies and personal communications
- citation tracking
- scanning of relevant journals in the field up to late 1999
- papers known to be 'in press' at the end of 1999

More than 2000 titles and abstracts were considered. Thirty-four systematic reviews were identified dealing with various aspects of management relevant to occupational health guidelines (Table 1a). The main conclusions of these systematic reviews are in Table 1b. Twenty-eight narrative reviews were selected and their main conclusions are in Table 2. Fifty two additional scientific studies (randomised controlled trials and other high quality scientific studies) are listed in Table 3. Two crucial areas in which there is limited scientific evidence are: 1) the advice that occupational health practitioners (and other health professionals responsible for clinical management) should give to patients with LBP about work and return to work; and 2) the effectiveness of return to work interventions which attempt to promote increased activities and early return to work. Twenty two additional, relevant but scientifically weaker, studies on work retention and return to work issues are in Table 4. Most of these are descriptive, retrospective or uncontrolled clinical studies and even when they are controlled they are not randomised controlled trials (RCT). Seventeen previous guidelines and one systematic review of guidelines are in Table 5. A single reference list includes all citations in the Evidence Statements and the text: although some papers in the tables are not directly cited in the Evidence Statements, all of this material is retained as a literature resource for any future work in this field. The evidence is presented under the same logical sequence of

occupational health situations as in the Guidelines. The evidence statements for each situation are preceded by an introduction to the relevant issues, and some important areas are given additional discussion.

The methodology of the review may be best summarised as systematic searching plus rating of the strength of the evidence plus a narrative overview, by agreement between two experienced and independently minded reviewers. There was no attempt at blinded double review or quality scoring.

Separate tables are provided for:

T1: systematic reviews	(Tables 1a & 1b)
T2: narrative reviews	(Table 2)
T3: individual high quality scientific studies	(Table 3)
T4: other scientifically weaker but relevant studies	(Table 4)
T5: previous guidelines relevant to occupational health management	(Table 5)

### **Evidence rating**

Although the present review was based largely upon existing reviews, it was considered important in principle, and the reviews provided sufficient information to make it possible, to rate the strength of the evidence on the original scientific studies in these reviews. We used the RCGP three-star system as modified in the SBU report for scientific studies, but added a fourth category to accommodate additional clinical studies and modified the wording of the definitions slightly to allow for this.

- \*\*\* Strong evidence – provided by generally consistent findings in multiple, high quality scientific studies.
- \*\* Moderate evidence – provided by generally consistent findings in fewer, smaller or lower quality scientific studies.
- \* Limited or contradictory evidence – provided by one scientific study or inconsistent findings in multiple scientific studies.
- No scientific evidence – based on clinical studies, theoretical considerations and/or clinical consensus.

For interventions, *scientific studies* were taken to be RCTs. However, RCTs are not applicable to some important areas such as the epidemiology of LBP, assessment and prognosis. In these areas, scientific studies were taken to be high quality basic science studies, major epidemiological surveys and prospective cohort studies of acute/recurrent LBP in primary care or occupational health settings. Other, scientifically weaker, *clinical studies* included retrospective, cross-sectional, uncontrolled cohort and descriptive studies. RCTs are in principle appropriate for workplace interventions but in that setting

they are generally impractical and certainly rare, thus the evidence in this area consists mainly of weaker, clinical studies (Zwerling et al. 1997).

Evidence linking is to the most comprehensive and most recent source available. Where possible this is to systematic review(s) which should include all of the earlier, original studies in that area. Direct reference to original studies is only made where there is no adequate review, where they are not included in the review(s), or where they are necessary to support an important point. Rating the evidence on the original studies, however, may occasionally produce the paradoxical outcome that T3 evidence based on multiple RCTs can be stronger than T1 or T2 evidence based on reviews in which most of the original studies are of lower scientific quality.

Clinical judgement is necessary when using the evidence statements to guide decision making, but it is also important to consider the relative strength of the evidence. Moreover, weak evidence statements on a particular relationship or effect does not necessarily mean that it is untrue or unimportant but may simply reflect insufficient evidence or the limitations of current scientific investigations.

## A Background

Non-specific low back pain (LBP) can be occupational in the sense that it is common in adults of working age, frequently affects capacity for work, and often presents for occupational health care. It is commonly assumed this means that LBP is *caused* by work but the relationship between the physical demands of work and LBP is complex and inconsistent. A clear distinction should be made between the presence of symptoms, the reporting of LBP, attributing symptoms to work, reporting 'injury', seeking health care, loss of time from work and long term damage. LBP in the occupational setting must be seen against the high background prevalence and recurrence rates of low back symptoms, and to a lesser extent disability, among the adult population. Workers in heavy manual jobs do report rather more low back symptoms, but most people in lighter jobs or even those who are not working have similar symptoms. Jobs with greater physical demands commonly have a higher rate of reported low back injuries, but most of these 'injuries' are related to normal everyday activities such as bending and lifting, there is usually little if any objective evidence of tissue damage (though clinical examination and current *in vivo* investigations may be insensitive tools to detect this), and the relationship between job demands and symptoms or injury rates is inconsistent. Physical stressors may overload certain structures in individual cases but, in general, there is little evidence that physical loading in modern work causes permanent damage. Whether low back symptoms are attributed to work, are reported as 'injuries', lead to health care seeking and/or result in time off work depends on complex individual psychosocial and work organisational factors. The development of chronic pain and disability depends more on individual and work-related psychosocial issues than on physical or clinical features. People with physically or psychologically demanding jobs may have more difficulty working when they have LBP, and so lose more time from work, but that can be the effect rather than the cause of their LBP.

In summary, physical demands of work can precipitate individual attacks of LBP, certain individuals may be more susceptible and certain jobs may be higher risk but, viewed overall, physical demands of work only account for a modest proportion of the total impact of LBP occurring in workers.

T1:(Ferguson & Marras 1997) (Bigos et al. 1998) (Burdorf & Sorock 1997)

T2: (Garg & Moore 1992a) (Andersson 1997) (Burton 1997) (Hadler 1997) (Dionne 1999) (Waddell 1998)

T3: (Brinckmann et al. 1998)

A1 \*\*\* Most adults (60-80%) experience LBP at some time, and it is often persistent or recurrent. It is one of the most common reasons for seeking health care, and it is now one of the commonest health reasons given for work loss.

T2: (Garg & Moore 1992a) (Andersson 1997) (Waddell 1998)

(Jones et al. 1998) (Croft et al. 1998) (Department of Health 1999)

A2 \*\*\* There is strong epidemiological evidence that physical demands of work (manual materials handling, lifting, bending, twisting, and whole body vibration) can be associated with increased reports of back symptoms, aggravation of symptoms and 'injuries'.

T1: (NIOSH 1997) (Vingard & Nachemson 2000) (Ferguson & Marras 1997)

T1: (Burdorf & Sorock 1997) (Bovenzi & Hulshof 1999)

T2: (Andersson 1997) (Burton 1997) (Dionne 1999) (National Research Council 1999) (Wilder & Pope 1996)

T3: (Marras et al. 1993)

A3 \* There is limited and contradictory evidence that the length of exposure to physical stressors at work (cumulative risk) increases reports of back symptoms or of persistent symptoms.

T1: (NIOSH 1997) (Burdorf & Sorock 1997)

T2: (National Research Council 1999)

T3: (Marras et al. 1993) (Macfarlane et al. 1997) (Norman et al. 1998) (Burton et al. 1996)

A4 \*\*\* There is strong evidence that physical demands of work (manual materials handling, lifting, bending, twisting, and whole body vibration) are a risk factor for the incidence (onset) of LBP, but overall it appears that the size of the effect is less than that of other individual, non-occupational and unidentified factors.

T1: (Vingard & Nachemson 2000) (Ferguson & Marras 1997)

T2: (Burton 1997) (Dionne 1999)

T3: (Adams et al. 1999) (Macfarlane et al. 1997)

[Note: A2 and A4 are not incompatible. Whilst the epidemiological evidence shows that low back symptoms are commonly linked to physical demands of work, that does not necessarily mean that LBP is *caused* by work. Although there is strong scientific evidence that physical demands of work can cause individual attacks of LBP, overall that only accounts for a modest proportion of all LBP occurring in workers.]

A5 \*\* There is moderate scientific evidence that physical demands of work play only a minor role in the development of disc degeneration.

T2: (Videman & Battié 1999)

T3: (Battié et al. 1995)

A6 \*\*\* There is strong epidemiological and clinical evidence that care seeking and disability due to LBP depend more on complex individual and work-related psychosocial factors than on clinical features or physical demands of work.

T2: (Burton 1997) (Waddell 1998) (Dionne 1999)

T3: (Papageorgiou et al. 1997)

## **B Pre-placement assessment**

Individual health, fitness and strength can affect the ability to perform tasks. Pre-placement assessment aims to identify those who may be at higher risk for LBP in a given occupational setting. The main factors that have been investigated include clinical and historical features, physical strength parameters and psychosocial factors. The recurrent nature of LBP means that previous history is the best predictor of future LBP, and all other pre-placement measures have no predictive value at all, or only a weak and unreliable predictive value.

T1: (Bigos et al. 1998) (Burdorf & Sorock 1997)

T2: (Dionne 1999) (Andersson 1997)

**B1 \*\*\*** There is strong evidence that the single, most consistent, predictor of future LBP and work loss is a previous history of LBP, including in particular the frequency and duration of attacks, time since last attack, radiating leg pain, previous surgery and sickness absence due to LBP.

T2: (Dionne 1999) (Andersson & Deyo 1997)

**B2 \*\*** There is moderate evidence that examination findings, including in particular height, weight, lumbar flexibility and straight leg raising (SLR), have little predictive value for future LBP or disability.

T2: (Andersson 1997) (Frank et al. 1996a)

**B3 \*\*** There is now moderate evidence that the level of general (cardio-respiratory) fitness has no predictive value for future LBP.

T2: (Andersson 1997)

**B4 \*** There is limited and contradictory evidence that attempting to match physical capability to job demands may reduce future LBP and work loss.

T2: (Garg & Moore 1992a) (Garg & Moore 1992b) (Andersson 1997) (Andersson & Deyo 1997)

**B5 \*\*\*** There is strong evidence that x-ray and MRI findings have no predictive value for future LBP or disability.

T1: (van Tulder et al. 1997)

T2: (Bigos et al. 1992)

T3: (Savage et al. 1997) (Boos et al. 2000) (Borenstein et al. 1998) (Riihimaki et al. 1989)

T3: (Symmons et al. 1991a; Symmons et al. 1991b)

**B6 \*\*\*** There is strong evidence that back-function testing-machines (isometric, isokinetic or isoinertial measurements) have no predictive value for future LBP or disability.

T2: (Szpalski & Gunzburg 1998) (Newton & Waddell 1993)

T3: (Mostardi et al. 1992) (Masset et al. 1998)

B7 \*\*\* For symptom-free people, there is strong evidence that individual psychosocial findings are a risk factor for the incidence (onset) of LBP, but overall the size of the effect is small.

T2: (Waddell 1998)

T3: (Adams et al. 1999) (Croft et al. 1995)

### **High risk patients/physically demanding jobs**

There is a pragmatic argument that individuals at highest risk of LBP should not be placed in jobs that impose the greatest physical demands. The basic concern is that workers with physically (or psychologically) demanding work report rather more low back symptoms, have more work-related back 'injuries' and lose more time off work with LBP. Even if physical demands of work may be a relatively modest factor in the primary *causation* of LBP (see Background above), people who have LBP (for whatever cause) do have more difficulty managing physically demanding work (T3: (Muller et al. 1999) T2: (Waddell 1998)). It may be argued, therefore, that avoiding putting people at highest risk of recurrent LBP and sickness absence into more physically demanding work would be in the interests of the individual worker, the employer and the total societal burden of LBP.

The problem is, a previous history of LBP simply identifies people who are more likely to have recurrent problems, but that has little to do with the job: they are probably likely to have such problems irrespective of which job they are recruited for - and even if they are not recruited (T2: (Garg & Moore 1992a) (Andersson & Deyo 1997) (Dionne 1999)). Indeed, those who remain unemployed may be at highest risk of all for chronic LBP and disability (Waddell & Waddell 2000). Because a previous history of LBP is so common, it could exclude many people who are medically fit for most work. At the same time, all pre-placement assessment methods miss many people who may later develop LBP (T1: (Andersson 1997)). There is no clear evidence for a threshold of what constitutes a strong history of LBP or excessive job demands (T4: (Garcy et al. 1996)). Most of the evidence is from a population-based perspective whilst pre-placement assessment must try to predict future risks for the individual, which is a different matter. It may be concluded that the present evidence base is insufficient for reliable selection of individuals for particular types of work (HSE 1998). Attempts to match individual susceptibility for LBP against a risk assessment of the job (and reduction of the risk of injury to the lowest level 'reasonably practicable') are therefore very much a question of judgement, and there is limited empirical evidence on their effectiveness (B4). Refusal of employment on the basis of such judgements carries substantial personal, societal, legal and political implications, and may need to take into account the requirement under the Disability Discrimination Act 1995 to provide 'suitable and reasonable' adjustments.

## **C Prevention**

Employers have a statutory and moral responsibility to safeguard the health, safety and welfare of workers, and to take reasonably practicable steps to prevent avoidable injuries. Over the last 50 years, there have been considerable reductions in the physical demands of

most work and much effort has gone into ergonomic improvements: that has reduced many serious occupational health risks, but there is inconsistent evidence on whether or to what extent it has reduced occupational LBP. Low back symptoms are common and non-specific, physical demands of work are only one causal factor, and non-occupational and psychosocial issues are important, so it may be questionable to what extent occupational interventions can realistically be expected to reduce the societal impact of LBP. It seems reasonable in principle to attempt to reduce the incidence and prevalence of LBP by interventions designed to reduce known occupational 'risk factors', but the fundamental limitation of this approach may be the lack of any clear causal link (see Background). Much depends on whether the target is reduction of symptoms, 'injuries', sickness absence or long term disability: different interventions may well have differing effects. There is a lack of convincing evidence that it is possible substantially to reduce the incidence or prevalence of the symptom of LBP. Interventions to reduce physical workload have generally had an inconsistent impact on occupational LBP – when there has been an effect it remains unclear if the interventions actually reduced 'symptoms' or 'injuries', or simply modified reporting patterns and altered what workers do about their LBP. Organisational change interventions, directed to improving job satisfaction and psychosocial aspects of work, are difficult to implement and there is conflicting evidence that they have any significant effect on health outcomes (though little of that evidence is specifically about LBP).

T1: (Ferguson & Marras 1997) (Polyani et al. 1998)

T2: (Frank et al. 1996a) (Volinn 1999)

C1 \* There is contradictory evidence that various general exercise/physical fitness programmes may reduce future LBP and work loss; any effect size appears to be modest.

T1: (Lahad et al. 1994) (Gebhardt 1994)

T1: (van Poppel et al. 1997) (Dishman et al. 1998)

T2: (Kaplansky 1998) (Volinn 1999)

C2 \*\*\* There is strong evidence that traditional biomedical education based on an injury model does not reduce future LBP and work loss.

T1: (Lahad et al. 1994) (van Poppel et al. 1997) (Dishman et al. 1998)

T2: (Frank et al. 1996a) (Kaplansky 1998)

T3: (Daltroy et al. 1997)

C3 - There is preliminary evidence that educational interventions which specifically address beliefs and attitudes may reduce future work loss due to LBP.

T3: (Symonds et al. 1995)

C4 \*\*\* There is strong evidence that lumbar belts or supports do not reduce work-related LBP and work loss.

T1: (Lahad et al. 1994) (van Poppel et al. 1997)

T3: (van Poppel et al. 1998)

C5 \*\*\* There is strong evidence that low job satisfaction and unsatisfactory psychosocial aspects of work are risk factors for reported LBP, health care use and work loss, but the size of that association is modest.

T1: (Bongers et al. 1993) (NIOSH 1997) (Vingard & Nachemson 2000) (Davis & Heaney 2000)

C6 \* There is limited evidence but general consensus that joint employer-worker initiatives (generally involving organisational culture and high stakeholder commitment to identify and control occupational risk factors and improve safety, surveillance measures and 'safety culture') can reduce the number of reported back 'injuries' and sickness absences, but there is no clear evidence on the optimum strategies and inconsistent evidence on the effect size.

T1: (Westgaard & Winkel 1997) (Ferguson & Marras 1997) (Dishman et al. 1998) (Polyani et al. 1998)

T3: (Hunt & Habeck 1993) (Shannon et al. 1996) (Ostry et al. 1999)

T5: (Kazimirski 1997)

#### **D Assessment of the worker presenting with back pain**

There is general consensus that a simple clinical interview and examination can distinguish between simple back pain manageable at the primary care level and those pathological conditions requiring specialist referral ('red flags' – see Figure 1). However, conventional clinical tests of spinal and neurological function are of limited value in determining appropriate clinical or occupational management of non-specific LBP. Furthermore, 'diagnostic labelling' may have detrimental effects on outcome. X-rays and MRI are primarily directed to the investigation of nerve root problems and serious spinal pathology. Much more relevant to occupational health management is the identification of individual and work-related psychosocial issues which form risk factors for chronicity ('yellow flags' – see Figure 2). General disaffection with the work situation, attribution of blame, beliefs and attitudes about the relationship between work and symptoms, job dissatisfaction and poor employer-employee relationships may also constitute 'obstacles to recovery'.

T2: (Hadler 1997)

T3: (Abenhaim et al. 1995)

T5: (Royal College of General Practitioners 1999) (Kendall et al. 1997)

T5: (Agency for Health Care Policy and Research. 1994)

D1 \*\* There is moderate evidence that screening for 'red flags' and diagnostic triage is important to exclude serious spinal diseases and nerve root problems.

T5: (Royal College of General Practitioners 1999)

D2 \*\* There is moderate evidence that patients who are older (particularly > 50 years), have more prolonged and severe symptoms, have radiating leg pain, whose symptoms impact more on activity and work, and who have responded less well to

previous therapy are likely to have slower clinical progress, poorer response to treatment and rehabilitation, and more risk of long term disability.

T2: (Andersson 1997)

T3: (Cheadle et al. 1994) (Oleinick et al. 1996) (Baldwin et al. 1996)

T3: (Infante-Rivarde & Lortie 1997) (Hazard et al. 1997) (Haldorsen et al. 1998)

T4: (Lancourt & Kettelhut 1992)

D3 \*\* There is moderate evidence that examination findings, including in particular height, weight, lumbar flexibility and SLR are of limited value in planning occupational health management or in predicting the prognosis of non-specific LBP.

T1: (van den Hoogen et al. 1995)

T2: (Andersson 1997)

D4 \*\*\* There is strong evidence that individual and work-related psychosocial factors play an important role in persisting symptoms and disability, and influence response to treatment and rehabilitation. Screening for 'yellow flags' can help to identify those workers with LBP who are at risk of developing chronic pain and disability. Workers' own beliefs that their LBP was caused by their work and their own expectations about inability to return to work are particularly important.

T1: (Ferguson & Marras 1997)

T2: (Garg & Moore 1992a) (Waddell 1998) (Burton & Main 2000)

T4: (Sandstrom & Esbjornsson 1986) (Lancourt & Kettelhut 1992)

T4: (Carosella et al. 1994) (Fishbain et al. 1997) (Nordin et al. 1997)

T5: (Kendall et al. 1997)

D5 \*\*\* There is strong evidence that in patients with non-specific LBP, x-ray and MRI findings do not correlate with clinical symptoms or work capacity.

T1: (van Tulder et al. 1997) (Nachemson & Vingard 2000)

## **E Management principles for the worker presenting with back pain**

Clinical aspects of management should follow the RCGP clinical guidelines (1999). Occupational health management should focus on supporting the worker with LBP and facilitating remaining at work or returning to work as rapidly as possible, and should deal with any occupational issues that may form obstacles to achieving these goals. Occupational health practitioners should liaise closely with primary care. All stakeholders (i.e. the worker with LBP, supervisor(s) and management, union and health & safety representatives, the occupational health team and other health professionals undertaking clinical management) need to work closely together with a common, consistent approach to agreed goals.

T2: (Frank et al. 1996b) (Snook & Webster 1998) (Nadler et al. 1999)

T5: (Kazimirski 1997)

**Clinical:**

E1 \*\*\* There is strong evidence that advice to continue ordinary activities of daily living as normally as possible despite the pain can give equivalent or faster symptomatic recovery from the acute symptoms, and leads to shorter periods of work loss, fewer recurrences and less work loss over the following year than 'traditional' medical treatment (advice to rest and 'let pain be your guide' for return to normal activity).  
T1: (Waddell et al. 1997) (Abenhaim et al. 2000)

E2 \*\* There is moderate evidence that the above advice can be usefully supplemented by simple educational interventions specifically designed to overcome fear avoidance beliefs and encourage patients to take responsibility for their own self-care.  
T3: (Burton et al. 1999) (Moore et al. 2000) (Pfungsten et al. 2000)

**Occupational:**

E3 \*\* There is moderate evidence that communication, co-operation, and common agreed goals between the worker with LBP, the occupational health team, supervisors, management, and primary health care professionals is fundamental for improvement in clinical and occupational health management and outcomes.

T2: (Frank et al. 1996b) (Frank et al. 1998)

T2: (Snook & Webster 1998) (Nadler et al. 1999)

T3: (Hunt & Habeck 1993) (Shannon et al. 1996) (Ostry et al. 1999) (Loisel et al. 1997)

T4: (Wood 1987) (van Doorn 1995)

T5: (Kazimirski 1997) (van der Weide et al. 1997a)

E4 \*\*\* There is strong epidemiological evidence that most workers with LBP are able to continue working or to return to work within a few days or weeks, even if they still have some residual or recurrent symptoms, and that they do not need to wait till they are completely pain free.

T2: (Andersson 1997) (Dionne 1999) (Burton & Main 2000) (Hartigan 1996) (Hadler 1997)

E5 \* Advice to continue ordinary activities as normally as possible, in principle, applies equally to work. The scientific evidence confirms that this general approach leads to shorter periods of work loss, fewer recurrences and less work loss over the following year, although most of the evidence comes from intervention packages and the clinical evidence focusing solely on advice about work is limited.

T1: (Waddell et al. 1997) (Abenhaim et al. 2000)

T2: (Hartigan 1996)

T4: (Catchlove & Cohen 1982) (Hiebert et al. 2000) (Hall et al. 1994)

E6 \* There is general consensus but limited scientific evidence that workplace organisational and/or management strategies (generally involving organisational culture and high stakeholder commitment to improve safety, provide optimum case management

and encourage and support early return to work) may reduce absenteeism and duration of work loss.

T1: (Westgaard & Winkel 1997) (Ferguson & Marras 1997) (Dishman et al. 1998)

T2: (Frank et al. 1996b) (Frank et al. 1998) (Snook & Webster 1998) (Nadler et al. 1999) (Hadler 1997)

T3: (Hunt & Habeck 1993) (Shannon et al. 1996)

T4: (Wiesel et al. 1994) (Nassau 1999) (van der Weide et al. 1999)

### **Return to work with back pain**

Concern about return to work with residual symptoms is often expressed by workers themselves, their representatives, primary care health professionals, and occupational health professionals as well as supervisors and management, particularly if the LBP is attributed to work and if there is thought to be a risk of 're-injury'. This concern is natural but illogical. A recent study has highlighted the variability in physician advice on return to work and that recommendations often reflect personal attitudes of the physicians and their perception of the severity of symptoms (Rainville et al. 2000). Studies of the natural history show that LBP is commonly a persistent or recurrent problem, and most workers do continue working or return to work while symptoms are still present (Carey et al. 2000): if nobody returned to work till they were 100% symptom free only a minority would ever return to work (E4). Epidemiological and clinical follow-up studies show that early return to work (or continuing to work) with some persisting symptoms does not increase the risk of 're-injury' but actually reduces recurrences and sickness absence over the following year (E1). Conversely, the longer someone is off work the *lower* the chance of recovery (F1). Undue caution will form an obstacle to return to work and lead to protracted sickness absence, which then aggravates and perpetuates chronic pain and disability, and actually increases the risk of a poor long term outcome: this clearly is not in the interest of either the worker or the employer. Concerns are also sometimes expressed about legal liability for 're-injury' if the worker returns to work before they are completely 'cured' which is also illogical. Again, the natural history shows that LBP is commonly a persistent or recurrent problem, so expectations of 'cure' are unrealistic and recurrences are likely irrespective of work status. Refusing to allow a worker to return to work because they still have some LBP increases the likelihood of a break-down in worker-employer relationships and of the worker making a claim; and the longer the sickness absence the higher the cost of any claim. Helping and supporting the worker to remain at work, or in early return to work, is in principle the most promising means of reducing future symptoms, sickness absence and claims (E1, E5). Reducing any legal liability is best achieved not by forcing the worker into protracted sickness absence and possibly an adversarial situation, but by addressing the issues of job reassessment ('newly assessed duties'), the provision of modified work with adequate support, and good worker-employer relationships. All of these goals may best be achieved by the proposed active rehabilitation programme and organisational interventions (F3, Figure 3). That is also more in keeping with the spirit and the requirements of the Disability Discrimination Act.

T1: (Krause et al. 1998)

T2: (Frank et al. 1998) (Johanning 2000)

T4: (Garcy et al. 1996) (Sinclair et al. 1997) (Tate et al. 1999)

T5: (Harris 1997) (Kazimirski 1997)

## **F Management of the worker having difficulty returning to normal occupational duties at approximately 4-12 weeks**

In general, the longer a worker is off work with LBP the more disabling the condition becomes, the less successful any form of treatment, and the greater the probability of long term sickness absence (F1). This could be explained to some extent by selection bias in that those who are off work longer are simply those with a more severe problem. However, the clinical evidence suggests that there is little if any physical difference in their backs and intervention studies show that there is usually no insurmountable physical barrier to rehabilitation (F3). There are strong logical and humanitarian arguments, and strong empirical evidence, that treatment at the sub-acute stage (approximately 4-12 weeks) is more effective at preventing chronic pain and disability than attempts to treat chronic, intractable pain and disability once it is established (F2). There is strong evidence that intervention packages at the sub-acute stage *can* produce desirable occupational outcomes (F3), and these efforts are likely to be more cost-effective (though there is only limited empirical evidence on costs and cost-effectiveness). There is therefore a convincing argument for intense efforts to get workers with LBP back to work before disability and sickness absence become protracted.

T1: (van Tulder & Waddell 2000) (van Tulder et al. 2000a)

T5: (Royal College of General Practitioners 1999) (INSERM 2000)

T5: (Aulman et al. 1999)

F1 \*\*\* There is strong evidence that the longer a worker is off work with LBP, the lower their chances of ever returning to work. Once a worker is off work for 4-12 weeks they have a 10-40% risk (depending on the setting) of still being off work at one year; after 1-2 years absence it is unlikely they will return to any form of work in the foreseeable future, irrespective of further treatment.

T2: (Andersson 1997) (Waddell 1998)

F2 \*\*\* Various treatments for chronic LBP may produce some clinical improvement, but there is strong evidence that most clinical interventions are quite ineffective at returning people to work once they have been off work for a protracted period with LBP.

T1: (van der Weide et al. 1997b) (van Tulder et al. 2000a) (Scheer et al. 1997)

F3 \*\* There is moderate evidence that for the patient who is having difficulty returning to normal activities at 4-12 weeks, changing the focus from purely symptomatic treatment to a 'back school' type of rehabilitation programme can produce faster return to

work, less chronic disability and less sickness absence. There is no clear evidence on the optimum content or intensity of such packages, but there is generally consistent evidence on certain basic elements (Figure 3). There is moderate evidence that such interventions are more effective in an occupational setting than in a health care setting.

T1: (van Tulder et al. 1999) (Di Fabio 1995) (Karjalainen et al. 1999)

F4 \*\* From an organisational perspective, there is moderate evidence that the temporary provision of lighter or modified duties facilitates return to work and reduces time off work.

T1: (Krause et al. 1998)

T2: (Frank et al. 1998)

F5 - Conversely, there is some suggestion that clinical advice to return only to restricted duties may act as a barrier to return to normal work, particularly if no lighter or modified duties are available.

T4: (Hiebert et al. 2000) (Hall et al. 1994)

[Note: These two evidence statements are not incompatible. The agreed goal should be to return to as near normal duties as possible as rapidly as possible, and clinical advice and management must not undermine that, but the best means of achieving this goal may be by the provision of modified or lighter duties for a limited period.]

F6 \*\* There is moderate evidence that a combination of optimum clinical management, a rehabilitation programme, and organisational interventions designed to assist the worker with LBP return to work, is more effective than single elements alone.

T1: (van Tulder et al. 1999) (Di Fabio 1995)

T2: (Frank et al. 1996b) (Frank et al. 1998) (Snook & Webster 1998) (Nadler et al. 1999)

T3: (Loisel et al. 1997)

T4: (Haig et al. 1990) (Ryan et al. 1995) (van Doorn 1995) (Yassi et al. 1995) (Tate et al. 1999)

T5: (Kazimirski 1997) (van der Weide et al. 1997a)

### **Rehabilitation Programmes**

Most of the above principles could be combined in an active rehabilitation programme (see Figure 3), although there is wide variation, lack of clear definition and considerable confusion about exactly what constitutes an effective programme. Some forms of 'back school' or 'multidisciplinary rehabilitation' at the sub-acute stage have produced faster recovery of pain and disability, faster return to work and fewer recurrences over the following year than other treatments to which they have been compared (E1, F3). However, the results are inconsistent, probably because most studies are of packages of interventions of widely varying content and intensity. There is no clear evidence on the optimum content or intensity of such packages, although there is generally consistent evidence on certain basic elements.

Education alone is a relatively weak intervention. Traditional biomedical information and advice based on spinal anatomy, biomechanics and an injury model is largely ineffective (T3: (Roland & Dixon 1989) (Cherkin et al. 1996)) but completely different information and advice, designed to overcome fear avoidance beliefs and promote self-responsibility and self-care, can produce positive shifts in beliefs and reduce disability (T3: (Burton et al. 1999) (Moore et al. 2000)) (Snook et al. 1998).

All of the effective rehabilitation programmes have included a progressive active exercise and physical fitness element (T1: (Di Fabio 1995) (van Tulder et al. 1999)). Such exercise programmes can produce short-term improvement in pain and disability for sub-acute and chronic LBP, although there is no clear evidence that any specific type of exercise has any specific physical effect (T1: (van Tulder et al. 2000b)).

There are theoretical considerations and empirical evidence that most of the effective programmes are based on behavioural principles of pain management (T1: (van Tulder et al. 1999) T2: (Waddell 1998)), but there are few studies which look at this approach in isolation ((Fordyce et al. 1986) (Turner 1996)). There is moderate evidence that these programmes are more effective in an occupational setting (T1: (van Tulder et al. 1999)).

The interventions, resources and costs should be strictly controlled. There is insufficient evidence to justify intensive and expensive programmes and they are likely to be less cost effective. The rehabilitation programme should be closely audited and evaluated to check that it is effective and not having any unplanned adverse effects.

### **Previous guidelines**

A number of guidelines (Table 5) were identified that are relevant to the occupational health management of LBP; though some focus mainly on clinical management. They adopted differing methods for locating and assessing the evidence base, which vary from highly systematic, through consensus appraisal to personal interpretation, and they have been published in varying forms through various media.

Despite the differing methodologies and target audiences, the guidance on LBP has come to broadly similar conclusions in a number of important respects (Burton & Waddell 1998). The clinical guidelines consistently advocate some sort of diagnostic triage to distinguish between non-specific LBP and back pain due to an identifiable pathology (see Figure 1). For non-specific LBP, the guidance stresses the fundamental importance of prevention of chronicity, and advocates an early, active management approach involving consideration of psychosocial factors. In general terms, for primary care management at the acute stage, patients are advised to remain active and then at the sub-acute stage progressive exercise is encouraged, but there is some inconsistency as to where the dividing line should be drawn. The most recent of these guidelines is the 1999 revision of the 1996 RCGP guidelines in UK (Royal College of General Practitioners 1999). The

earlier CSAG report (Clinical Standards Advisory Group. 1994) also addressed the provision of NHS and rehabilitation services in UK.

Most primary care guidelines mention occupational issues, in particular the question of early return to work, as part of general advice on activity but they do not fully address the issues facing the worker with LBP or the occupational health practitioner. A few do address occupational issues slightly more fully, but they come from development groups with differing perspectives and none of them are evidence-linked. In general, the guidelines simply follow the primary care approach of early active management as a strategy to prevent undue disability, whilst the work-related guidance follows a broadly consistent pattern, focusing particularly on workplace factors. There is a general tendency to address obstacles to recovery rather than primary prevention, and job modification is seen as an appropriate aid to remaining at work or early resumption of work. A major feature of the occupational (as opposed to clinical) guidance is the concept that work organisation and communication between workers and supervisors/management are important elements of occupational health management; education both of workers and employers is seen as important.

There is now extensive scientific evidence and general agreement in the guidelines about how the clinical and occupational management of non-specific LBP can and should be improved. There is at present very little empirical evidence on whether such guidelines are implemented or change practice, or if the recommended practice does actually deliver improved clinical and occupational outcomes.

T2: (Volinn 1999)

T5: (Westgaard & Winkel 1996) (van der Weide et al. 1997a)

### **Evidence gaps in occupational health management of LBP**

This review has found considerably more scientific evidence on the occupational health management of LBP than originally anticipated, despite the methodological problems in a workplace setting (Zwerling et al. 1997). There is sufficient evidence to permit a number of strong and moderate evidence statements and recommendations for occupational health management, but this review, however, has also identified inadequacies in the evidence in some important areas.

There is a need for further rigorously designed and carefully controlled studies (where appropriate by RCTs and with sub-categorisation of patients) on:

- Pre-placement assessment, particularly matching (strong) previous history of LBP, physical capabilities and job demands.
- 'Innovative' education approaches to prevention and management specifically designed to overcome psychosocial issues (eg fear avoidance beliefs) and encourage patients to take responsibility for their own self-care.
- Company policies on accident prevention, 'safety culture', surveillance and monitoring to reduce reported back 'injuries' and claims.

- The relative benefits and costs of prescribing sick certification for LBP.
- Early interventions to overcome obstacles to recovery (e.g. focused clinical interventions targeting individual 'yellow flags' for chronicity).
- The optimum combination and relative importance of individual components in an active rehabilitation programme.
- The optimum organisation, content and combination of case management, active rehabilitation and return to work programmes .

When possible, cost-effectiveness analysis should be included in future studies.

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