Review of the Effectiveness and Cost Effectiveness of Interventions, Strategies, Programmes and Policies to reduce the number of employees who take long-term sickness absence on a recurring basis

Report
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Review of the Effectiveness and Cost Effectiveness of Interventions, Strategies, Programmes and Policies to reduce the number of employees who take long-term sickness absence on a recurring basis

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The Institute for Employment Studies

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Executive Summary

The National Institute for Health and Clinical Excellence (NICE) has been asked by the Department of Health to develop guidance for primary care services and employers on the management of long-term sickness and incapacity. The guidance will provide recommendations for good practice that are based on the best available evidence of effectiveness and cost effectiveness.

This report is one in a series of reviews of the literature covering primary studies of interventions, strategies, programmes and policies to reduce the number of employees who take long-term sickness absence on a recurring basis. As such, the report aims to inform the guidance on managing long-term sickness absence through two linked systematic reviews of the literature on the effectiveness and the cost effectiveness of interventions to prevent the re-occurrence of long term sickness absence.

Specifically, this review addressed the following primary research question:

‘What work or primary care-based interventions, programmes, policies or strategies are effective and cost-effective in helping to reduce the number of employees who take long-term sickness absence on a recurring basis?’

A protocol was developed which specified the population, interventions and outcomes of interest for the effectiveness and cost effectiveness reviews. The protocol provided the detailed inclusion and exclusion criteria that were applied to the literature retrieved via the online searches specified in the protocol. In addition to these database and website searches, experts and the Programme Development Group (PDG) were contacted for addition studies. The citations of and references given in the included papers have also been checked. The process took into account the following included and excluded population groups.

- Populations covered:
  - All adults over age 16 in full or part-time employment, both paid and unpaid
  - All adults over age 16 who have experienced long-term sickness (which may be defined as ‘long-term absence’ or ‘sickness absence’ in the research)
All employers in the public, private and ‘not for profit’ sectors.

Locations to be included:
- countries belonging to the Organisation for Economic Co-operation and Development (OECD)

Populations excluded were:
- self-employed individuals
- pregnant women who have taken sickness absence related to their pregnancy, during the course of their pregnancy
- unemployed individuals

The locations excluded were:
- Studies set in developing or non OECD countries

The interventions, programmes, policies and strategies included were:
- Any that aim to reduce the number of incidences of re-occurring long-term sickness absence.

Interventions, programmes, policies and strategies excluded were any that:
- aim to prevent the first occurrence of short or long-term sickness absence (primary prevention)
- target pregnant women exclusively and/or which focus on illnesses associated with pregnancy, during the course of a pregnancy
- tackle workplace absences which are not reported and/or recorded as sickness absence (for example, maternity leave)
- are delivered outside the workplace or primary care settings (subject to above conditions)
- deal solely with the effectiveness of private health insurance schemes and/or claiming of statutory or occupational sick pay
- deal solely with preventing ill-health retirement (ie where recipient has no intention of returning to work).

Based on the protocol, searches were undertaken of 19 research and specialist economics data bases and six websites by the Centre for Review and Dissemination (CRD) at York University plus five more suggested by the PDG.
Initial title and abstract sifting

A total of 17,840 articles were identified (covering 15,345 effectiveness and 2,495 cost effectiveness primary studies) in the initial screening processes supplemented by websites searches, references in relevant reviews, suggestions from the PDG and other experts and subsequent reference checking and citation searching of included papers. The titles and abstracts of these articles were all initially sifted against the agreed inclusion and exclusion criteria from the protocol. Papers definitely meeting the criteria were put forward for full paper screening. Those where it was unclear if a study met all the criteria were also ordered and screened. Otherwise papers were excluded from the review. The list of ‘includes’ and get full papers’ was re-screened prior to the papers being ordered. A total of 813 papers from all sources were ordered for full paper screening for both elements of the review, of which 805 have been screened and eight were not received by the agreed cut off date.

Full paper screening

The full paper screening involved a more thorough check of the studies’ suitability for inclusion in the review. This screening was undertaken using full paper screening checklist based on the agreed protocol. Given that the decisions were based on the full papers rather than simply the title and abstract, and in some cases only the title, more definitive decisions could be made.

Included papers

Articles passing the full paper screen were then put though a process of data extraction and quality assessment. Data extraction was performed by one reviewer and checked by another. Quality assessment was undertaken by two reviewers independently and ratings of quality were then compared. Any differences were settled through discussion. Seven effectiveness articles including three cost-effectiveness articles passed this full paper screen. The seven included papers presented evaluations of the effectiveness and cost-effectiveness in preventing the re-occurrence of long term sickness absence through three broad themes.
Intervention Theme 1: Exercise and education programmes to prevent reoccurrence of lower back pain

**Effectiveness evidence statement for Theme 1**

Four studies present some, mainly limited, evidence of the positive effects of interventions involving exercise and physical activity on preventing the reoccurrence of sick leave among employees who had been previously off sick with low back pain.

One RCT study in Norway (rated ‘+’) found evidence that workers, aged between 18 and 60, on long-term sick leave with lower back pain who receive consultations with a physician (specialising in physical medicine and rehabilitation) and a physiotherapist to improve skills to cope with their condition may be effective at helping workers return to work up to a year after they start sick leave than comparable people who receive were treated in primary care. In the consultation, patients received information, reassurance and encouragement to engage in physical activity as normal as possible and reports were sent to their primary care physician and local national insurance office. However, there was no significant difference between the groups in terms of return to work in the second or third year. Although the study found significant differences in the average number of sick leave days at the 12-month point between the intervention group and the control group, there was no significant difference between the groups in the proportions experiencing further sickness episodes over the three year period. Therefore there is insufficient evidence from this study to suggest that this intervention was effective in preventing the re-occurrence of sickness absence in the long-term. (Molde Hagen et al, 2003).

There is limited evidence from one Norwegian RCT (rated ‘-’) to suggest that the delivery of a physical exercise and education and training programme (involving stretching and relaxation exercises and information on ergonomic and physical exercises), called the Mensendieck approach, delivered by specially trained physical therapists to male and female employees with a history of musculoskeletal symptoms, such as lower back pain, can result in lower reported recurrence of lower back pain and a reduction in re-occurring long-term sickness absence (although the results of the study are limited by the exclusion of one outlying case). (Soukup et al. 1999).

There is limited evidence from a Finnish cohort study (rated ‘-’) to suggest that an intensive exercise programme (involving water and gymnasium-based exercises and lectures on practical physical and relaxation exercises) delivered to a small group of machinists in a military setting by provided by a physician, physiotherapist, a physical training instructor, a psychologist and a specialist in ergonomics can result in lower levels of re-occurring sickness absence and reported re-occurring back pain (Holopainen et al., 2004).

These two studies suggest that the positive impact may be enhanced by increasing the amount of sustained physical exercise taken by participants (Soukup et al. 1999 and Holopainen et al, 2004).

There is limited evidence from a prospective controlled study (rated ‘-’) which examined changes in fitness, health and work ability among male lumberjacks employed by two companies in Finland.
who had been off sick with lower back pain for up to a 30 day period but were back at work that a
free of charge (with 80% of salary losses compensated) intensive one-week residential work-
oriented physical fitness course (involving lectures, fitness tests and exercising - lasting 12 hours
for 5 days), led by a physiotherapist or instructor in physical activity; followed by a re-
enforcement session 6 months posts the residential course had a positive but not statistically
significant effect on the frequency and average number of days of subsequent sick leave. Self-
assessed ‘work ability’ increased after the intervention and was assessed significantly higher than
among the control group at the six-month follow-up. Self-reported leisure time increased in both
groups in the six months after the intervention. (Leino et al. 1994).

Cost effectiveness evidence statement for Theme 1

There is evidence from one Norwegian cost benefit (randomised controlled trial) evaluation (rated
‘++’) that an examination at a primary care spine clinic by physician and physiotherapist and
provision of information and individual instruction, as well as advice on how to stay active, is
likely to be cost effective compared to primary care treatment in preventing the re-occurrence of
long term sickness absence due to low back pain (Molde Hagen et al 2003).

Intervention Theme 2: Pain management through group
learning

Effectiveness evidence statement for Theme 2

There is limited evidence from one Norwegian RCT study (grade ‘-’) to suggest that a learning
programme (based on phenomenological perspectives and Kelly’s personal construct theory)
delivered by specially trained group counsellors to small groups may help adults aged 20-59
experience less musculoskeletal pain and increase their ability to cope with pain. While there is
some evidence that they are less likely to take up disability benefits and make visits to the
doctor, there is insufficient evidence to indicate that such a programme can positively affect self-
reported re-occurring sickness absence from work (Haugli, 2001).

Intervention Theme 3: Clinical interventions to treat lower
back pain

Effectiveness evidence statement for Theme 3

A Dutch RCT study (rated ‘+’), among 196 men and women aged between 18 and 65 who had been
on sick leave for between two and six weeks due to lower back pain, found that a multi-stage
return to work programme (involving a workplace assessment and work modifications based on
participative ergonomics and counselling the employee about return to work) was effective at
going them back to work sooner than if they had just had usual care. There is also evidence that
the workplace intervention was effective in reducing the total number of days taken as re-
occurring sick leave among the study population and that the clinical intervention (in combination with usual care or the workplace intervention) did not have a positive effect, although the clinical intervention was only adhered to by 65 per cent of cases (Steenstra et al., 2006).

A Norwegian RCT (rated ‘+’) of 210 patients aged between 20 and 65 on long-term sick leave which compared medical exercise therapy (under continuous supervision by the physiotherapist) conventional physiotherapy (a combination of methods such as heat or cold massage, stretching, different forms of electrotherapy, traction, and a few exercises on the treatment table) and self exercise (patients given information and told to walk for one hour three times a week for 12 weeks) found all three interventions could be effective in reducing total re-occurring sickness absence. However no significant difference was found in the proportion of patients who returned to work during the trial period among the three groups (Torstensen et al 1998).

Cost effectiveness evidence statement for Theme 3

There is evidence from one Dutch economic (randomised controlled trial) evaluation (rated ‘+’) that work modifications based on participative ergonomics and counselling the employee about return to work are likely to be cost effective in reducing the re-occurrence of absence due to low back pain when compared against usual care as outlined by Dutch Occupational Physician guidelines for lower back pain. Within this study patients are randomised to receive a clinical intervention or usual care at 8 weeks if they have not returned to work and therefore this may confound the results; although the authors have tried to calculate an adjustment for this. The cost per return to work day gained is estimated to be £17 and the cost per quality adjusted life year (QALY) gained is estimated to be dominating (-£1,295) for the workplace intervention in comparison to usual care. However, based on the analysis, it is unlikely that graded exercise based on operant behavioural principles provided for those who remain on sickness absence after 8 weeks of receiving either the workplace intervention or usual care in terms of return to work is cost-effective in comparison to the provision of Dutch usual care for the same indication (Steenstra et al., 2006).

There is evidence from one Norwegian cost benefit (randomised controlled trial) evaluation (rated ‘+’) that both medical exercise therapy (under continuous supervision by the physiotherapist) and conventional physiotherapy (a combination of methods such as heat or cold massage, stretching, different forms of electrotherapy, traction, and a few exercises on the treatment table) are likely to be cost effective in comparison to self exercise (patients given information and told to walk for one hour three times a week for 12 weeks) for preventing the re-occurrence of long term sickness absence in a Norwegian adult population (Torstensen et al 1998).

Conclusions

All of the studies identified for this part of the review are concerned with low back pain. This represents a clear lack of evidence about other forms of intervention or other conditions which may benefit from intervention to reduce or prevent the re-occurrence of long term sickness absence. This is particularly the case in relation to
acute medical conditions, mental health and stress which are the other main recognised causes of long-term sickness absence in the UK.

With the exception of two of the effectiveness studies, the studies are sufficiently diverse as to preclude aggregation of data, so there are limits to the conclusions that can be drawn about specific interventions on the basis of this evidence, particularly in relation to a UK population.

There are, however a few of emergent themes. Across the effectiveness and cost effectiveness studies, the interventions which are successful in reducing the re-occurrence of long term sickness absence share certain characteristics:

■ Most involve early interventions (ie between two and eight weeks from the start of sick leave). This compares to far broader inclusion criteria in the studies which failed to show significant findings (60 days over the past two years; thirty days in the previous year).

■ The interventions tend to involve some direct workplace input, either through design or assessment or workplace adaptation and delivery.

Overall this suggests that successful interventions are more likely to incorporate a range of perspectives, have some form of direct contact with the workplace and involve early intervention.

This review question is very specific in nature, concerned as it is with prevention of the re-occurrence of long term sickness absence and many studies were excluded on the basis that they did not have a ‘prevention of re-occurrence’ outcome. As such, these excluded studies may also be relevant to review question 2 (return to work from long term sickness absence). It is possible that data from review question 2 will also provide greater understanding of promising areas for research into interventions to prevent the re-occurrence of long term sickness absence.
1 Introduction

The National Institute for Health and Clinical Excellence (NICE) has been asked by the Department of Health to develop guidance for primary care services and employers on the management of long-term sickness and incapacity. The guidance will provide recommendations for good practice that are based on the best available evidence of effectiveness and cost effectiveness. The Institute for Employment Studies and the Institute of Work Psychology and School of Health and Related Research (both at Sheffield University) were contracted to undertake a series of three effectiveness and cost effectiveness reviews of primary randomised controlled or longitudinal studies (covering four research questions) and an economic analysis of the evidence in those studies to support the production of this guidance.

This report is the second effectiveness and economic review to be delivered to the Programme Development Group (PDG). The first examined interventions aimed at moving people from Incapacity Benefit to employment (research question 4) and was discussed at the PDG meeting in December 2007. This review covers research question 3 and looks at primary studies of interventions, strategies, programmes and policies to reduce the number of employees who take long-term sickness absence on a recurring basis and was discussed at the PDG meeting in February 2008. The third review, covering the remaining two research questions (ie 1 and 2), was initially presented to the PDG in April 2008.

This review has been revised in the light of the comments received from the PDG and any further evidence received through the search and sifting process since the first draft was completed.

An economic analysis, including economic modelling, will be presented at the PDG meeting in May 2008. This will cover a selection of topics identified in the reviews which have been chosen by the PDG and where there are sufficient data to make modelling feasible.
1.1 Background

In 2006, UK employees were absent for an average 3.5 per cent of the time they were due to spend working. An estimated 40 million working days are lost each year in Britain due to ill health and injury. Sickness absence costs the British economy an estimated £13 billion each year (CBI 2006), although the quality and accuracy of available data on absence and sickness absence is variable (Barham and Leonard 2002; Barham and Begum 2005).

One-fifth of absences are classified as long term (ie four weeks/20 working days or longer) and on average, in 2006, one per cent of the UK workforce was absent from work due to long-term sickness. It is estimated that 12 per cent of employees on long-term leave are covered by the Disability Discrimination Act. Back pain, musculo-skeletal injuries, acute medical conditions, mental ill health and stress are the most common causes. In the public sector, mental ill health and stress were identified as the main causes of long-term sickness absence for non-manual workers; musculo-skeletal injuries and back pain most affected manual workers (CIPD 2006).

It is against this background that the Department of Health has asked NICE to provide guidance to primary care services and employers on the management of long term sickness absence. The guidance is intended to be used by professionals and managers who have public health as part of their remit working in the NHS, local authorities and the wider public, private, voluntary and community sectors.

1.1 Research objectives

This review addresses the following specific research question which is referred to as ‘research question 3’ throughout the report:

‘What work or primary care-based interventions, programmes, policies or strategies are effective and cost-effective in helping to reduce the number of employees who take long-term sickness absence on a recurring basis?’

The following secondary research questions were developed to interrogate the data further (data permitting):

- What is the frequency, content, length and duration of an effective intervention, programme, policy or strategy?

- Which are the most effective, cost effective and acceptable interventions, programmes, policies or strategies for different groups? (eg age, conditions, gender, ethnic groups or social classes)
Does the effectiveness of an intervention, programme, policy or strategy depend on the person leading it? (What are the significant characteristics of an effective leader: what training and skills are required?)

What are the barriers to-and facilitators of-effective implementation?

Does the intervention, programme, policy or strategy lead to any adverse or unintended (positive and negative) outcomes?

Which interventions, programmes, policies or strategies are ineffective and/or are not cost effective?

It is important to recognise that any evidence subsequently presented in relation to the secondary research questions is drawn from a limited pool of studies and cannot be considered on the same level as evidence about the primary outcome.

1.2 Structure of report

The structure of this report is as follows:

Chapter 2 discusses how the literature search was conducted, the retrieval of papers, the selection of studies for inclusion, data extraction and quality assessment.

Chapter 3 presents the effectiveness findings.

Chapter 4 provides the cost-effectiveness findings.

Chapter 5 discusses the review findings, highlighting their applicability, limitations and any gaps.

Seven appendices present supporting documents.
2 Methodology

This chapter details the methodology for identifying studies for inclusion in this review. First the effectiveness and cost effectiveness search strategies are given, with details of the data bases and websites searched. The methods for title and abstract screening are described along with the inclusion and exclusion criteria used. The process for contacting experts and members of the PDG is explained. Next the full paper screening process is detailed, including the review level papers, and the additional inclusion and exclusion criteria used at this stage are given. Finally the data extraction and quality assessment is presented and a summary of included papers given.

2.1 Identifying potentially relevant studies

Because three of the research questions covered such similar issues, in consultation with NICE it was decided to develop a joint search strategy covering research questions 1, 2 and 3 which contained three components:

1. effectiveness – primary studies
2. effectiveness – reviews; and
3. cost effectiveness – primary studies and reviews.

Nineteen databases and six websites were searched by the Centre for Reviews and Dissemination (CRD) at York University, using a search protocol supplied by the IES/University of Sheffield team.

An additional five website searches were undertaken by NICE following suggestions received from the PDG.
2.1.1 Effectiveness literature searches

The following key terms and limiters were used in the search. Key search terms were defined as ‘long term sick’, ‘long term absence’, ‘sick leave’, ‘work absence’, ‘sickness absence’, ‘return to work’ or other synonyms. Methodological filters were also applied to the search in order to identify primary studies of Randomised Control Trials (RCTs) and other intervention studies of longitudinal design, as well as reviews. The search strategies for the Medline search can be seen in Appendix 1.

The following limits were placed on the search strategy:

- Published from 1990 onwards
- Published in English language only
- Developed/Organisation for Economic Co-operation and Development (OECD) countries only
- Intervention studies of RCT or other longitudinal design (ie with at least one measurement after baseline).

The following 19 databases and six websites were searched to identify primary studies and review-level studies for this effectiveness rapid review:

2.1.2 Databases

- Cochrane Database of Systematic Reviews (CDSR)
- Database of Abstracts of Reviews of Effectiveness (DARE)
- Cochrane Central Register of Controlled Trials
- MEDLINE
- EMBASE
- PsycINFO
- CINAHL (Cumulative Index of Nursing and Allied Health Literature)
- AMED (Allied and Complementary Medicine)
- Business Source Premier
- British Nursing Index
- NHS HTA (NHS Health Technology Assessment)
- ASSIA (Applied Social Science Index and Abstracts)
- Social Science Citation Index
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Science Citation Index

Sociological Abstracts.

Four databases of grey literature were also searched:

- HMIC (Health Management Information Consortium. Comprises King’s Fund Database and DH-Data database)
- SIGLE (International System for grey literature)
- National Research Register
- Current Contents.

2.1.3 Websites

A series of websites were also searched to identify any relevant literature:

- Department for Work & Pensions: http://www.dwp.gov.uk/
- Institute for Public Policy & Research: http://www.ippr.org.uk/
- Employment Studies Research Unit: http://www.uwe.ac.uk/bbs/research/esru/wps.shtml
- Centre for Longitudinal Studies: http://www.cls.ioe.ac.uk/
- Health and Safety Executive: http://www.hse.gov.uk/index.htm

The database and website search for research questions 1-3 resulted in 15,345 primary study titles and abstracts. In addition 308 review-level references were also identified by this search.

2.1.4 Cost effectiveness literature searches

Specific economic searches were performed on the following specialist economic databases. These searches used the same limiter as the effectiveness searches with the exception that the study design criteria was not applied:

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1 This comprises 48 titles and abstracts from the website search and 15,297 titles and abstracts from the database searches. The latter number differs slightly from those presented in previous reports as duplicates have been excluded and search results re-allocated between the two elements of the review and between research questions 1 to 3 and research question 4.
The economic search resulted in 2,495 titles and abstracts for research questions 1 to 3.

2.1.5 Suggestions from experts and PDG

The IES/University of Sheffield team put together a list of experts in the area of managing sickness absence and return to work. The list included academics working in the field, policy makers and commentators. This list, together with the titles of articles identified as relevant to research questions 1 to 3 following the first stage of screening (see 2.2.1. for further details), were circulated to PDG members by NICE in October 2007. PDG members were asked to suggest additional experts who should be contacted and for any references they felt relevant to the review, which were not on the list.

Experts suggested by IES/University of Sheffield, NICE and the PDG were then all contacted with the titles of articles identified as relevant (following title and abstract screening ) to research questions 1 to 3 and asked to suggest any additional references.

This resulted in an additional (to the above database and website searches) 18 effectiveness titles and abstracts. No economic titles and abstracts for research questions 1 to 3 were suggested additional to those already identified.

2.1.6 Additional web-site searches

Following consultation with the PDG a further five website searches were undertaken:

- Advisory Conciliation and Arbitration Service (ACAS)
- Institute of Occupational Health
- Oxford Health Alliance
- National Audit Office
- Xpert HR.

The above website searches resulted in a further 611 effectiveness titles and abstracts and no additional economic titles/abstracts for research questions 1 to 3 being identified (see section 2.2.4 below).
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2.2 Selection of studies for inclusion

2.2.1 Title and abstract appraisal

The purpose of title and abstract appraisal is to identify studies that ‘help to answer the questions being addressed by the review’ (NHS CRD, 2001). Study selection should be systematic, replicable and free from bias. Sifting is informed by inclusion criteria reflecting the population, intervention, outcome and study design, and by exclusion criteria defined in the scoping document, such as language and date.

Only the criteria relevant to the research question 3 review are presented here. The criteria for research questions 1 and 2 are reported in a separate review\(^1\).

The inclusion criteria are set out below.

**Settings included covered:**

- Studies based in developed/ Organisation for Economic Co-operation and Development (OECD) countries
- Setting had to be work/employer-based or primary care-based.

**Population included covered:**

- All adults over age 16 in full or part-time employment, both paid and unpaid
- All adults over age 16 who have experienced long-term sickness (which may be defined as ‘long-term absence’ or ‘sickness absence’ in the research)
- All employers in the public, private and ‘not for profit’ sectors.

**Interventions, programmes, policies and strategies included covered:**

- Those aimed at helping to reduce re-occurrence of long-term sickness absences.

**Outcomes included covered:**

- Long-term sickness absence

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\(^1\) J Hillage et al. ‘Review of the Effectiveness and Cost Effectiveness on Interventions, Strategies, Programmes and Policies to reduce the number of employees who move from short-term to long-term sickness absence and to help employees on long-term sickness absence to return to work’.
Return to work after long term sickness absence

Re-occurrence of long-term sickness absence

Other work related outcomes.

Study designs that were included:

Primary level study designs:
- randomised controlled trials (RCTs)
- longitudinal intervention studies (ie there is at least one follow-up measure after baseline).

Review level studies:
- Reviews of RCTs or longitudinal studies.

The sifting was limited to these study designs in line with the requirements of the research question. The aim of the sifting was to identify studies that demonstrate causality, ie that demonstrate that an intervention does have a significant, direct impact on the outcome of choice (ie return to work or work readiness) rather than simply demonstrating an association. Causality can only be demonstrated by research that uses longitudinal study design (ie studies with at least one follow up measure after baseline). Therefore the inclusion criteria were constructed to limit the retrieved studies to those reporting longitudinal data.

The exclusion criteria were as follows:

Excluded locations were:
- Studies set in developing or non OECD countries.

Excluded populations were:
- Self-employed individuals
- Pregnant women who have taken sickness absence related to their pregnancy, during the course of their pregnancy
- Unemployed individuals.
Excluded Interventions, programmes, policies and strategies were any that:

- Aim to prevent the first occurrence of short or long-term sickness absence (primary prevention)
- Target pregnant women exclusively and/or which focus on illnesses associated with pregnancy, during the course of a pregnancy
- Tackle workplace absences which are not reported and/or recorded as sickness absence (for example, maternity leave)
- Are delivered outside the workplace or primary care settings
- Deal solely with the effectiveness of private health insurance schemes and/or claiming of statutory or occupational sick pay
- Deal solely with preventing ill-health retirement (ie where recipient has no intention of returning to work).
- Involved the clinical diagnosis or treatment (including pharmacological treatment) of conditions associated with short and/or long term sickness or incapacity (for example, low back pain).

Excluded study types

- Studies which describe the relationship between health/ill-health and short or long-term absence (ie correlate studies or non evaluative studies of an intervention, policy, programme or strategy). Descriptive studies of participants’ views and experiences and cross-sectional studies (ie with only one data collection point) are also excluded.
- Dissertations/theses.
- Non-English language studies.

2.2.2 Development of title and abstract screening checklists

Detailed sifting criteria in the form of title/abstract screening checklists were developed. The inclusion/exclusion criteria outlined in the scope guided the sift process and helped to ensure consistency in screening across the abstract sifting team. In total, the following three abstract screening checklists were developed and used to screen the titles and abstracts retrieved:

1. Effectiveness:-primary studies: RCTs and longitudinal intervention studies
2. Economics:-primary studies and reviews literature
3. Reviews:-reviews of the effectiveness literature.

The abstract screening checklists are given in Appendix 2.

2.2.3 Title and abstract screening process

For the effectiveness primary studies, a two-stage screening process was established (Figure 2.1). An initial screening of the 15,297 primary studies from the original database search results and the 48 primary studies from the original website results for research questions 1-3 took place using the abstract screening checklists in Appendix 2.

When a title/abstract appeared to satisfy all of the inclusion criteria it was coded as ‘include’. When it was unclear regarding its possible relevance and inclusion, then it was coded as ‘get full paper’ and many were identified for a second opinion by another member of the review team. Any titles and abstracts meeting any of the exclusion criteria were excluded from the review.

This initial process for the effectiveness component of the review identified a total of 1,182 papers as either ‘include’ (493) or ‘get full paper’ (689)\(^1\). As these papers were being ordered it became clear that the list contained a number of additional duplicates and many of those designated ‘get full paper’ were still awaiting a second opinion to see whether they were relevant. As a quality check, a second screening by another set of assessors took place, again using the abstract screening checklists in Appendix 2. This excluded a further 509 papers leaving 673 papers as definite ‘includes’ (415) or ‘get full papers’ (258) for further scrutiny for which full papers were ordered for retrieval. Subsequently at the screening stage further duplicates were identified. Excluding these duplicates further reduces the actual number of ‘includes’ from the main search for research questions 1 to 3 to 654 papers.

Title and abstract screening of the review-level search results were also undertaken using the appropriate checklist (see Appendix 2), this resulted in 102 reviews being identified (once book chapters and duplicates had been excluded) as potentially relevant for full paper retrieval (see section 2.2.7 for further details of the process for dealing with review-level material).

For the economic search results to be considered an economic evaluation, a study has to analyse explicitly both the costs and the outcomes of the intervention under investigation in comparison to the costs and outcomes of at least one alternative. Titles and abstracts could also provide potentially relevant background data which

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\(^{1}\) The numbers referred to in this and subsequent paragraphs are slightly different from those presented in some previous reports as duplicate papers have been excluded and search results reassigned between the effectiveness and cost-effectiveness elements of the review and between research questions 1 to 3 and research question 4.
may assist with the modelling review – any such abstracts were tagged and coded appropriately. The initial search for economics references identified 2,495 papers, from which the title and abstract screening process for the economics references and removal of any duplicates resulted in a total of 96 papers as either ‘include or ‘get full paper’ which were ordered for full paper retrieval (2399 references were rejected).

Any titles and abstracts from the search for the research question 4 that appeared relevant to research questions 1-3 were also tagged as such and then re-screened using the abstract screening checklist in Appendix 2. This process resulted in no further references being identified.

2.2.4 Additional website searches

The searches results for the additional five websites (see above section 2.1.4) identified 611 potential papers for question 1 to 3 (and 280 for question 4). The Xpert HR website search yielded a high number of hits (580 for research questions 1 to 3 and 267 for research question 4 prior to de-duplication). However, it was felt that the titles/abstracts identified by these searches may not be particularly relevant and the time required to screen these results would only yield minimal relevant material. In order to determine this a ten per cent random sample of the titles/abstracts were selected and screened using the appropriate forms by the NICE team. Ten per cent of the sample were considered potentially relevant and coded as ‘get full paper’. Given the small percentage it was agreed that the remaining titles/abstracts from these search results would not be screened at this stage. This therefore left 31 search results for review questions 1 to 3 and 13 search results for review question 4 from the remaining four additional websites searched. Seven effectiveness titles/abstracts were identified as potentially relevant following title/abstract screening and full papers were ordered for retrieval.

2.2.5 Number of papers ordered

The result of the title/abstract screening process was a list of references coded as ‘includes’ or ‘get full paper’ from the original effectiveness and cost-effectiveness literature searches, the additional website searches and the suggestions from experts and the PDG for research questions 1-3. For some of these categories it was possible to identify if a title/abstract was specifically relevant to research question 3 and the full papers were ordered for retrieval. Where it was not possible to identify in a category which of the titles/abstracts were specifically relevant to research question 3 all of the references (ie those relevant for research questions 1, 2 or 3) were ordered for full paper retrieval for this review. Table 2.1 summarises the numbers of titles and abstracts coded as include or get full paper for each of these categories.
Table 2:1: References passing Q3 title and abstract sift by source

<table>
<thead>
<tr>
<th>Source</th>
<th>Number of title and abstracts screened</th>
<th>Number coded as include or get full paper for research questions 1-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1-3 Effectiveness primary studies search</td>
<td>15,345(^5)</td>
<td>654</td>
</tr>
<tr>
<td>Q1-3 Economics primary studies and review-level studies search</td>
<td>2,495</td>
<td>96</td>
</tr>
<tr>
<td>Q1-3 Effectiveness review-level studies search</td>
<td>309</td>
<td>102</td>
</tr>
<tr>
<td>Q4 Effectiveness primary studies search</td>
<td>5,471</td>
<td>0</td>
</tr>
<tr>
<td>Q4 Economics primary studies and review-level studies search</td>
<td>353</td>
<td>0(^6)</td>
</tr>
<tr>
<td>Q4 Effectiveness review-level studies search</td>
<td>716</td>
<td>0</td>
</tr>
<tr>
<td>Q1-3 Additional website searches(^\ast)</td>
<td>31</td>
<td>7 (effectiveness)</td>
</tr>
<tr>
<td>Q4 Additional website searches</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Effectiveness references suggestions provided by experts and PDG members</td>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td>Economics references suggestions provided by experts and PDG members</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

\(^\ast\) Includes four websites suggested by PDG. (It was decided not to fully screen the Xpert-HR website, see section 2.2.4)

2.2.6 Full paper screening

Of the 7597 primary effectiveness and cost-effectiveness papers ordered as ‘includes’ or ‘get full papers’ following the abstract screening stage, 753 (99 per cent) have been retrieved\(^7\). That leaves six outstanding papers (all effectiveness) which had not arrived at the agreed cut off date for processing of potentially relevant primary studies.

Detailed full paper screening checklists were developed to allow a more accurate assessment of whether each paper met all the inclusion and exclusion criteria (see Appendix 3 for details of the three full paper screening checklists developed). The full

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\(^4\) These numbers are slightly different from those presented in previous reports (eg the Mapping Report) as some duplicates have been excluded and search results re-allocated between the two elements of the review and between research questions 1 to 3 and research question 4.

\(^5\) ie 15,297 papers from the initial database search and 48 from the initial website search.

\(^6\) Papers from the searches for the research question 4 review which were tagged as a research questions 1 to 3 paper, then excluded when screened against the research questions 1 to 3 checklist therefore some of the figures presented do not match those in the Mapping Report.

\(^7\) ie 654 from the effectiveness search, 96 from the cost-effectiveness (economics) search, seven from the website search and two from Expert and PDG suggestions. This number excludes the papers ordered through reference and citation checking – see 2.2.8 and 2.2.9 below and includes papers subsequently identified as further duplicates (eg originating from the same initial study).

\(^8\) Including 657 effectiveness papers, 96 cost-effectiveness papers.
paper screening checklists were based on all the inclusion and exclusion criteria detailed in section 2.2.1. Some of these inclusion and exclusion criteria were expanded to reflect the detail in the scope or parameters discussed and agreed by the PDG. This detail enabled a better categorisation of papers included at the full paper screening stage and ensured that any data relevant for the economic modelling was identified and coded appropriately.

The additional criteria are set out below.

*Interventions, programmes, policies and strategies:*

- Delivered in a primary care setting and/or workplace setting and/or planned, designed, delivered, managed or funded in collaboration with primary care providers and/or employers. These interventions, policies, programmes or strategies can be delivered by a number of providers (such as voluntary, private, statutory sectors) and/or in various settings not just workplace or primary care settings as long as they are fully or co-planned, designed, delivered, managed and/or funded in collaboration with employers and primary care settings.

*Primary outcomes*

- Work absence related primary outcomes to be considered (but not limited to):
  - Return to work (paid and unpaid) after re-occurring long-term sickness.
    - □ original role with same hours
    - □ original role with reduced hours
    - □ alternative role with same hours
    - □ alternative role with different hours
  - Reduced incidence of recurring (>1 episode) long-term sickness
  - Shorter periods of recurring sickness absence
  - Reduction in number of sick days taken
  - Improvements in individual and/or population-level health status which enables remaining in work following sickness absence incidences
  - No effect on return to work after re-occurring long-term sickness or no effect on number of sick days taken
  - Cost effectiveness of intervention/policy/strategy or programme.
Study design for effectiveness papers:

At the full paper screening stage the study design of all included papers was classified into one of the following categories to allow grouping of papers for data extraction and quality assessment:

- RCT
- Controlled before and after
- Cohort
- Case control
- Before and after
- Interrupted time series
- Other (please specify).

Study design for cost effectiveness papers:

At the full paper screening stage the study design of all included papers was classified into one of the following categories to allow grouping of papers for data extraction and quality assessment:

- Cost benefit analysis (CBA)
- Cost effectiveness
- Cost utility
- Other (please specify).

Mixed studies

- If the study was a combined population, topic or location can the public health data be disaggregated.

Mixed studies are ones that included data on treatment and an intervention, policy, strategy or programme relevant to this rapid review, or covered multiple population groups or mixed locations which met both inclusion and exclusion criteria. Mixed studies would only be included if the data relevant to the specified inclusion criteria could be sufficiently disaggregated.
Study types excluded

- Studies which describe the relationship between health/ill-health and re-occurring long term sickness absence (ie correlates studies or non evaluative studies of an intervention, policy, programme or strategy).
- Books and book chapters
- Studies that deal solely with the provision of clinical diagnosis, treatment (including pharmacological or therapeutic interventions) and management of conditions associated with short and/or long term sickness.

2.2.7 Review-level material

As noted above in Section 2.1, searches were also made for relevant review-level material, such as effectiveness and cost effectiveness reviews or meta-analyses of RCT’s and longitudinal studies. All 102 review-level references assessed (following title/abstract screening) to be potentially relevant to research questions 1 to 3 were ordered for full paper retrieval and retrieved – see table 2.2. A full paper screening checklist was developed and used to screen these reviews (See Appendix 3).

Additional details on the screening criteria for review studies were also specified as follows:

Population inclusion criteria

- The review must wholly or partly cover evaluations of an intervention/policy/strategy/programme which aims to prevent the re-occurrence of long term sickness absence.

Setting inclusion criteria

- At least one of the studies reported in the review must be concerned with preventing the re-occurrence of long term sickness absence.

Effectiveness study design criteria:

- The review must include at least one RCT or longitudinal study.
Cost effectiveness study design criteria:

- The study must contain effectiveness studies or economic evaluations with cost effectiveness, cost benefit, cost utility, cost consequences, cost minimization or net monetary (cost) benefit data.

If a review met the full paper screening inclusion and exclusion criteria its reference lists were then checked by two reviewers to identify potentially relevant additional primary studies. Any duplicates with primary study references already obtained were removed and titles/abstracts ordered for retrieval. Abstracts of any primary studies thus identified were then screened using the appropriate abstract screening checklist and if accepted/included, they were added to the references requested for full paper retrieval. As Table 2.2 indicates no additional primary level studies were identified for research question 3 from the reference lists of the 43 identified effectiveness reviews (none outstanding) and no economics review-level papers were identified.

| Table 2:2: Review level studies ordered, pending and included for reference tracking |
|---|---|---|
| Review studies ordered | Review studies assessed to be relevant to research questions 1 - 3 | Number of primary studies identified from reference checking of relevant reviews relevant to research questions 3. |
| Effectiveness review-level material for reference checking: | 102 | 43 | 0 |
| Economics review-level material for reference checking: | 0 | 0 | 0 |

Source: IES/IWP/ScHARR

### 2.2.8 Reference tracking

Additionally to the reference checking of included review studies, the reference lists for all primary studies that met the inclusion criteria lists were examined to identify any additional relevant references. To simplify the process and avoid duplication the reference checking for papers included in the review of research question 3 and those from the review of research questions 1 and 2 was combined. A list of any additional references thought to be relevant was checked against the Reference Manager databases of literature search results. Abstracts were obtained for any references not identified in the Reference Manager databases (previously identified references would have already been screened) and they were then screened following the same process described above for titles and abstracts generated by the search of electronic databases. One further, additional reference was identified from the cost effectiveness studies, but was excluded at the full paper screening stage. A further 29 additional references were identified from the effectiveness studies and papers ordered for full
paper screening. One further paper (28 were excluded) has been included in this review as a result of this exercise.

2.2.9 Citation searching

The citations of all included primary studies were also searched for by one reviewer using Web of Science and CINAHL to determine whether any additional primary studies citing these included references had been missed.

Citation searching for the cost effectiveness and effectiveness included papers identified 368 potential cost effectiveness and effectiveness references. These have been checked against the original reference manager databases and any new primary study references ordered for full paper retrieval. Sixteen effectiveness and eight cost effectiveness primary studies were ordered and full paper screened (two effectiveness papers had not arrived at the agreed cut off point). No further papers were identified from this process for inclusion in this review.

| Table 2:3: Primary studies ordered, pending and included in the question 3 review |
|---------------------------------|---------------------|----------------------|
| **Primary studies ordered**     | **Primary studies included** |
| Effectiveness search            | 654                 | 3 (6 pending)        |
| Cost-Effectiveness search       | 96                  | 3 (in cost effectiveness review and also included in effectiveness review) |
| **Other sources**               |                     |                      |
| Additional website searches - effectiveness | 7 | 0 |
| Additional website searches - cost effectiveness | 0 | 0 |
| References suggested by PDG and experts - effectiveness | 2 | 0 |
| Reference suggested by PDG and experts - economics | 0 | 0 |
| Reference tracking of included papers (effectiveness) | 29 | 1 |
| Reference tracking of included papers (cost effectiveness) | 1 | 0 |
| Citation searching of included papers (effectiveness) | 16 | 0 (2 pending) |
| Citation searching of included papers (cost effectiveness) | 8 | 0 |

Source: IES/IWP/ScHARR
2.2.10 Summary of effectiveness studies identified for inclusion

As Table 2.3 outlines, 708\(^9\) effectiveness primary studies were thought to be relevant to this research questions 1-3 and full papers ordered and all but eight have been received (99 per cent retrieval rate) and screened. One reviewer checked all of the received papers against the inclusion criteria using the full paper screening list checklist given in Appendix 3 and at least one in ten were double checked by a second reviewer. As a result of this process, 696 papers were excluded and four studies identified as relevant to this review covering research question 3. An additional three studies were also identified as relevant to the effectiveness component (as well as cost effectiveness) when screening the cost-effectiveness studies. For the sources of all possible studies to answer this question, and the points at which studies were excluded, see Figure 2.1.

The following four effectiveness papers were identified for inclusion using the above process and went forward for data extraction and quality assessment:


- Soukup MG, PT, MSci; Glomsrod B, PT; Lonn JH, PT; Bo K, PT, PE, PhD; Larsen S, MSc, DrSc. (1999) ‘The Effect of a Mensendieck Exercise Program as Secondary Prophylaxis for Recurrent Low Back Pain: A Randomised, Controlled Trial with 12 month follow-up’. *SPINE* Vol 24, Number 15, pp 1585 – 1592.

In addition the following three cost-effectiveness papers were also identified as relevant to the effectiveness section:


\(^9\) This includes 654 from the initial database and website search plus seven from the additional website search, two suggested by experts and PDG members, 29 from reference tracking and 16 from citation searching.
2.2.11 Summary of cost-effectiveness studies identified for inclusion

As table 2.3 outlines, when sitting the list of titles and abstracts generated by the search of electronic databases, 110 primary studies were originally identified as possible papers that satisfied the inclusion criteria for this review. Fourteen studies were duplicates found by two or more of the searches (Abrams, Aldana, Astrup, Gatchel, Karjalainen, Lindberg, Linz, Loisel, Meijer, Monpere, Pinnington, Rutz, Schweikert, Turk), so the final total number of primary studies ordered for retrieval was 96. Two reviewers then assessed these full papers using the economic full paper screening checklist (see Appendix 3). Of these 96 unique primary studies, 93 were ultimately excluded because none satisfied the inclusion criteria. The principal reasons for exclusion were that the studies were not economic evaluations; the studies’ sample populations were either not actually on long-term sickness absence or had not experienced long-term sickness absence; separate data were not given for any numbers in a sample that were actually on or had experienced long-term sickness absence; or the studies’ works were not designed to be cost-effectiveness studies with separately assessed cost and outcome measures. The eight outstanding primary studies identified through the search process that have not been retrieved by the agreed cut off time for processing of any potentially relevant studies are presented in Appendix 5.
absence; or the studies’ outcomes did not include re-occurrence of long-term sickness in any form. For details of these excluded studies, and the principal reason for their exclusion, see Appendix 4. Three studies were found to satisfy all of the cost-effectiveness inclusion criteria and went forward for quality assessment and data extraction:


■ Steenstra IA; Anema JR; van Tulder MW; Bongers PM; de Vet HCW; and van Mechelen W (2006) ‘Economic Evaluation of a Multi-Stage Return to Work Program for Workers on Sick-Leave Due to Low Back Pain’ Journal of Occupational Rehabilitation 5 November 2006

■ Torstensen TA; Ljunggre, AE; Meen HD; Odland E; Mowinckel P Geijerstam S (1997) Efficiency and Costs of Medical Exercise Therapy, Conventional Physiotherapy and Self-exercise in Patients with Chronic Low Back Pain: A pragmatic, randomised, single-blinded controlled trial with one-year follow-up.

Fourteen papers were also identified at this stage which contained potentially relevant data for the modelling stage.

Figures 2.1 and 2.2 present a diagrammatic overview of the results of this comprehensive searching and screening process.
Interventions, strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

Figure 2.1: Process for identifying effectiveness studies

Source: IES/IWP/ScHARR
Figure 2.2: Process for identifying cost-effectiveness studies

Q1-3 Effectiveness search

Q4 Effectiveness search

Q4 Economics search

Q1-3 Economics search

Screening of titles & abstracts using abstracts screening checklist

Tagged as Economic

Tagged as Economic

Tagged as Economic

Screening of titles & abstracts against Q1-3 Economics abstracts screening checklist

Possible papers

Possible papers

Possible papers

Possible papers

Screening of full papers against Q1-3 Economics full paper screening checklist

Definite included studies

Definite included studies

Definite included studies

Definite included studies

Review references

Expert & PDG suggestions

Additional websites

References tracking

Final no of included studies

Citation searching

Source: IES/IWP/ScHARR
2.3 Data extraction and quality appraisal

2.3.1 Data extraction

The study type of each included effectiveness paper was identified using the following algorithm which was adapted from Methods for development of NICE public health guidance (Figure 2.3).

![Algorithm for classifying primary study designs about effectiveness](image)

Source: IES/IWP/ScHARR

The effectiveness data extraction form contained in the Methods for development of NICE public health guidance was adapted to reflect the parameters of this review – please see Appendix 6 for an example of a completed form. One reviewer extracted data for each full paper using this form. A second independent reviewer checked the
data extraction, and any differences were resolved by discussion with a third reviewer.

For the cost effectiveness review, the data extraction form contained in the Methods for development of NICE public health guidance was adapted to reflect the parameters of this review and supplemented with questions from the Drummond checklist (Guidelines for authors and peer reviewers of economic submissions to the BMJ, M F Drummond, 1996, on behalf of the BMJ Economic Evaluation Working Party) – please see Appendix 7. One reviewer extracted data for each full paper using this form. A second independent reviewer checked the data extraction, and any differences were resolved by discussion with a third reviewer.

Secondary outcomes

If a study is included on the basis that it contains data relevant to the primary research question and outcome, then data on any secondary outcomes will also be reported. The following secondary outcomes are to be considered (but are not limited to):

- acceptability of the intervention/policy/programme/strategy – content/frequency/location etc.
- costs of intervention/policy/strategy or programme
- identification of any adverse or unintended (positive or negative) outcomes as a result of the intervention, programme policy or strategy.
- barriers to or facilitators of effective implementation
- reduction in number and duration of reported and/or recorded sickness absences associated with (but not limited to) the following:
  - musculo-skeletal injuries including back pain
  - acute and/or recurring medical conditions
  - stress
  - mental illness
  - alcohol or drug-related problems
  - other long-term conditions and chronic conditions
  - home and family responsibilities
- increase in number of employers that have introduced policies and procedures to monitor/address sickness absence
2.3.2 Quality assessment for effectiveness primary studies

Quality appraisal was conducted based on the NICE CPHE forms. These forms provide criteria for rating a study based on how robust an example it is of that particular study design. For example, a randomised control trial (RCT) will be rated on how well it meets the defined standards for a robust RCT. Different criteria exist for each type of study design. This means that the quality rating for studies of the same design can be compared with each other (ie an RCT rated ++ is more robust than an RCT rated +). However, quality ratings for different study designs cannot be compared and an RCT rated – is still likely to be provide more robust data than a before and after study rated ++ because an RCT is an inherently stronger study design.

It was agreed that the criteria for making the actual quality assessment ratings (++, +, - ) should be adapted to reflect study designs found in the social sciences/public health area (eg an RCT would not be downgraded for failure to use complex concealment designs such as double blinding), because such designs are not always possible with intervention studies where the individual delivering the intervention knows what the intervention is.

Two independent reviewers assessed the quality of each included study. Any differences in quality assessment were resolved by discussion with a third reviewer or, if agreement could not be reached, details were reported in the review. Appendix 6 gives the quality assessment forms used and a completed checklist is given.

The quality assessment checklists contained in the Methods for development of NICE public health guidance were adapted to reflect the parameters of this review – see Appendix 7.
2.3.3 Quality assessment for cost effectiveness primary studies

Quality appraisal was conducted using a form based on Drummond (1996). Two independent reviewers assessed the quality of each included study. Any differences in quality assessment were resolved by discussion with a third reviewer or, if agreement could not be reached, details were reported in the review. Appendix 7 gives an example of the data extraction and quality assessment form used.

2.4 Synthesis and formulation of evidence statements

2.4.1 Effectiveness studies

The results of the data extraction and quality assessment for each theme identified in the included effectiveness studies were presented in a narrative summary and combined in a summary evidence table. An evidence statement was generated for each theme.

Chapter three of the report presents the synthesis of data and evidence statements for the included effectiveness studies.

2.4.2 Cost-effectiveness studies

The results of the data extraction and quality assessment for each theme identified in the included cost-effectiveness studies were presented in a narrative summary and combined in a summary evidence table. An evidence statement was generated for each theme.

Chapter four of the report presents the synthesis of data and evidence statements for the included cost-effectiveness studies.
3 Effectiveness Findings

Seven effectiveness studies were identified which met the criteria for inclusion for interventions, programmes and strategies to reduce the re-occurrence of long term sickness absence. Four of the studies examined interventions based on exercise or physical therapy aimed at reducing absence among sufferers of musculoskeletal disorders (including lower back pain). These are considered under theme 1. One examines the effects of a learning programme on participants’ ability to cope with pain and comprises theme 2. The final two examine multi-disciplinary programmes (often including physical exercise but supplemented by other measures) (theme 3).

Within each category studies are presented in alphabetical order within quality rating (ie with the most positively rated studies first and randomised controlled trials (RCTs) before longitudinal studies). The evidence tables for each of the studies are presented in full alphabetical order (by the first named author) at the end of this chapter.

It should be noted that three studies are included in both the effectiveness and cost effectiveness elements of the review. They are all primarily economic evaluations but have findings on the effectiveness of interventions, though not always as comprehensively reported as the preceding three effectiveness studies (although we have found additional papers which further illuminate the findings). The study quality rating attributed to each study may differ between the effectiveness and cost-effectiveness element of this review as they are being examined from two different perspectives. The fact that they are included twice should not necessarily imply that any greater weight should attributed to these studies than to any other evidence presented.
3.1 Theme 1: Exercise and education programmes to prevent reoccurrence of lower back pain

Four of the effectiveness studies involved interventions which included a physical exercise programme with aim of preventing the recurrence of lower back pain and other musculoskeletal conditions.

3.1.1 Molde Hagen et al. (2003)

This study (rated ‘+’) describes a randomised controlled trial aiming to evaluate the effect and economic benefits of light mobilisation on long-term sick leave of people with sub-acute lower back pain in Norway over a period of three years.

Patients, aged between 18 and 60, to have been sick-listed\(^{10}\) for between eight to 12 weeks for low back pain were drawn from Norwegian National Insurance Offices. Exclusion criteria were pregnancy, recent lower back trauma, cauda equina symptoms, cancer, osteoporosis, rheumatic low back disease, and ongoing treatment for low back pain by another specialist. Patients were randomly allocated to an intervention group and a control group. Five hundred and ten patients were invited to participate in the study. 220 (115 men and 105 women) of the 256 (86 per cent) randomised to the control group agreed to take part and 237 (123 men and 114 women) of the 254 (93 per cent) allocated to the intervention group also agreed. Most (80 per cent) in both groups worked in jobs with heavy physical demands.

The mean age of the participants was 40.9 years (40.8 years for the intervention group and 41.1 years for the control group). There were no significant differences (p values not reported) between the two groups in terms of marital status, education, job security, previous sick leave or diagnoses given by primary care physician. Eighty per cent of the participants in both groups were working in occupations with heavy physical demands (undefined).

The intervention group were invited to the Spine Clinic within week 12 of their sick leave. They were interviewed and examined by a treatment team consisting of a physician (specialising in physical medicine and rehabilitation) and a physiotherapist. Special attention was give to the description of daily activities and the restrictions caused by LBP in addition to psychosocial conditions at home and at work. Unless symptoms and clinical findings indicated any serious spinal disease, the patients were informed about the good prognosis and the importance of staying active to avoid development of muscle dysfunction. They were encouraged to take daily walks. All patients were advised and instructed individually by the physiotherapist in coping with daily activities at home and at work and how to resume normal activities.

\(^{10}\) The term ‘sick-listed’ is used in a number of the studies included in this review and we interpret it to mean off work on sick leave.
patients were encouraged to contact the spine clinic whenever they wanted. Reports from the examination were sent to the patients’ primary care physician and to the National Insurance Office, with diagnoses, recommendations concerning further diagnostic tests, treatment, job and, if possible, recommendations concerning further sick leave.

The control group participants were invited to the local insurance office to complete the same questionnaire as the intervention group, but were treated by a primary health care team, rather than the Spine Clinic.

Participants in both groups answered the same standard questionnaires at three, six 12 and 24 months after the sick leave started. Sick leave data were collected from both groups at 3, 6, 12, 24 and 36 months after the initial sick leave. Data were taken from National Insurance Offices and therefore presumably validated. Overall, 13 cases were discontinued at the three-year follow-up and a further five cases were deceased at three years – these were treated as missing as their deaths were not related to LBP. These data were used to assess the outcomes of the study. Odds ratios adjusted for gender, age, education and marital status were calculated and ANOVA was used to test the difference between the intervention group and the control group in the number of days of sickness compensation.

**Primary outcomes**

Sickness absence data are reported at the one, two and three year follow-up stages. Over the three years of observation, the intervention group had significantly fewer days of sick leave (average 125.7 days per person) than the control group (169.6 days per person).¹¹ The significant differences between the two groups occurred during the first year mainly to a higher level of return to work during the first year (after 12 months 69 per cent of the intervention group were ‘off sick leave’¹² (although it is not stated if this equates to being back at work) compared with 57 per cent of the controls). There was no significant difference for the second or third year.

There was no significant difference between the groups as to their experience of further episodes of sick leave over the three year period: 62 per cent of the intervention group and 61.4 per cent of the control experienced at least one such episodes.¹³

¹¹ The 95% confidence interval for the intervention group was 110.8 days to 140.5 days and for the control group was 151.9 days to 187.3 days).

¹² The relative risk (RR) of the intervention group being off sick leave (ie at work) compared with the control group was 1.2 (95 per cent confidence limits).

¹³ No statistical significance data presented.
The study authors concluded that the intervention is effective in speeding the return to work and has no deleterious effects on long-term attendance, although there is no long-term improvement in the proportion of those at work at the three-year stage. The study authors consider that this may be due to the length of the treatment at the Spine Clinic being too short and implies follow-up consultations may be important (only 25 per cent of the intervention group participants contacted the Spine Clinic after the initial visit).

Secondary outcomes

At the six-month follow-up stage, patients in the intervention group were less likely to use bed rest\(^{14}\) and more likely to use stretching\(^ {15}\) and walking\(^ {16}\) to cope with their back pain compared with the control group. This effect diminished over time. At 12-month follow-up, the only significant difference between the groups was in the use of stretching\(^ {17}\). No data are presented for the two and three year follow-up points.

Limitations of the study

The authors point to the fact that the intervention was relatively short. Participants were invited to re-contact the spine clinic but only 25 per cent took up this offer.

The study does not provide any information about what type(s) of treatment the control group received while in primary care.

3.1.2 Soukup et al., 1999

This study (rated ‘-’) involved a randomised controlled trial in which an exercise and education and training programme (called the Mensendieck approach) was delivered to a group of employees in Norway and their subsequent medical and employment related outcomes compared with a group of similar employees over a period of a year.

A total of 77 study participants were recruited through advertising in local media and referrals from doctors and other clinical practitioners in South Eastern Norway. Of these, 69 took part in the full trial, eight dropped out (five from the Mensendieck

\[^{14}\text{RR} = 0.66 [95 \text{ per cent CI}]
\[^{15}\text{RR} = 1.62 [95 \text{ per cent CI}]
\[^{16}\text{RR} = 1.29 [95 \text{ per cent CI}]
\[^{17}\text{RR} = 1.39 [95 \text{ per cent CI}]\]
The participants were men and women aged 18 to 50 (with an average age of 40 in the intervention group and 39 in the control group) who had experienced one or more episodes of pain to the lumbar region resulting in professional treatment or sick leave from employment (the precise number who had taken sick leave prior to the study is not stated, but the average number of sick leave episodes and days of sick leave are provided). At the time of their enrolment to the trial, participants’ medical treatment had finished and they had returned to work. Various exclusion criteria were applied to eliminate factors that could have confounded results (including previous back surgery, pregnancy, specific rheumatological diseases, spondylolisthesis, spinal tumour, spinal fracture, drug or alcohol abuse and documented mental illness) and ethical permissions obtained. On entry to the trial participants were given a brief medical examination and filled in a questionnaire about their medical history, experience of lower back pain, days of sick leave (in previous three years), demographic details and other health related and well-being factors.

Thirty-four of the participants took part in the intervention. The aim of the Mensendieck programme was to teach participants ergonomic principles for movements of daily activities and improve their knowledge of how to prevent lower back pain. The training sessions involved a selection of exercises and back management techniques administered in 20 group sessions (consisting of between six to ten participants) of 60 minutes each over a period of 13 weeks, each instructed by a Mensendieck-educated physical therapist. The exercises included isometric, dynamic, stretching and co-ordination movements focussing on the pelvis, hip, back and abdomen. The educational elements included the anatomic and physiological principles of the spine and ergonomics. In detail the hour involved ten minutes warm-up, five minutes of leg, hip and buttock stretching, a 35 minute information session combining ergonomic information and pelvic, hip and abdominal exercises, five minutes stretching for the lower extremities, pelvis and back and a five minute relaxation session. According to a basic principle of the Mensendieck approach, special attention was paid to body awareness and the way to apply the ergonomic knowledge in specific, real-life situations.

The control group (of 35 participants) took part in the same data collection exercises as the intervention group. At the beginning of the study they received some information about the Mensendieck approach but did not attend any of the training sessions. There were no significant differences at the baseline stage between the control and the treatment group other than the former were more likely to participate in regular exercise during their leisure time.

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18 for reasons of pregnancy (one) changes in work patterns making it difficult to schedule the intervention (3) and none given (1)

19 two were disappointed with being allocated to the control group and one moved out of the area.
The study found that adherence (assessed by recording individuals’ frequency of participation in the group sessions) to the Mensendieck programme was 86 per cent on average (range 65 per cent to 100 per cent).

Primary outcome

The study found that ten out of 34 in intervention group and 11 out of 35 of control group were reported as taking sick leave in the one year follow-up period, with the Mensendieck group absent for a total of 299 days sick (mean number of days was 30 with a range from 2 to 186) and the control for 416 days (mean number of days was 38 with a range of 2 to 98). One participant in the Mensendieck group was absent for 186 days (no other information about this person was provided). The results are presented with and without this outlier. With the outlier included there was no significant difference (no p value reported) in mean days lost to sick leave between the intervention (29.9 days) and control group (37.8 days). However, once the outlier was excluded, a significant difference (p = <0.01) between the intervention group (12.6 days) compared with the control group (37.8 days) was found.

Secondary outcomes

At the 12 month follow-up point the incidence of reported lower back pain was significantly less (p = <0.05) in the Mensendieck group, compared with the control group. Eleven of the 34 participants in the programme reported recurrent lower back pain episodes, compared with 20 of the 35 in the control group. Furthermore, the number of recurrent episodes of reported lower back pain was lower (no further details provided) and the gap between episodes of lower back pain longer in the Mensendieck compared with the control group (p = <0.05).

The study also found a significant increase (at p = <0.05) in self-reported participation in physical exercise among the Mensendieck group compared with the controls (no further details reported).

The study looked at lower back function and general functioning and although it found a reported increase (no further details provided) in the former among the Mensendieck group, the differences between the two groups were not statistically significant20.

Limitations of the study

This study has been quality assessed and rated ‘-‘.

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20 ‘p’ value not stated.
The number of participants is small, although designed to be sufficient for the statistical conclusions drawn. The authors point out that the participants were self-selected which may have resulted in a study sample with high motivation for physical training. However, most secondary prevention programs for lower back pain are based on voluntary participation. The self-reported measures for sick leave and lower back pain episodes may be affected by recall bias, but any bias should be similar for both groups.

The results are significantly affected by a single outlier (about whom no further information has been found)

Intervention and outcomes are based in a bio-medical approach, which may be an incomplete consideration of factors (such as personality, motivation and emotional issues) critical to the events studied, especially in light of the fact that pain and reports of pain are more commonly understood now in terms of a bio-psychosocial model of health.21

### 3.1.3 Holopainen et al., 2004

A longitudinal cohort study (rated ‘-’) examines the effects of vocationally oriented medical rehabilitation (VOMR)22 on the physical symptoms (including lower back pain), sick leave and perceived work ability of aircraft maintenance personnel in the Finnish Airforce. In this study, 20 machinists with an average age of 37 (sex not reported) from the Finnish Air Force voluntarily participated in the VOMR course. Each had been working in their role for at least three years, had experienced musculoskeletal symptoms causing them to take at least 60 days sick leave over the past two years and did not have any other symptoms which might inhibit rehabilitation. A range of baseline data was collected from participants with further data collected six months and five years after the intervention. There was no control or comparison group.

The intervention was administered in two phases. The first took place over a period of 12 days. Two groups of participants (each comprising ten machinists) were given a physical examination by a physician and a physiotherapist and a rehabilitation plan was established. Each participant then took part in a series of physical training exercises (including water-based and gymnasium-based exercises) and lectures (eg

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21 A bio-medical approach is one which is based on a conceptual model of illness that excludes psychological and social factors and includes only biological factors in an attempt to understand a person’s medical illness or disorder. Where as a bio-psychosocial adopts a conceptual model that assumes that psychological and social factors must also be included along with the biological in understanding a person’s medical illness or disorder.

22 An approach which consists mainly of physical exercise and training in ergonomic techniques.
covering practical physical and relaxation exercises) provided by a physician, physiotherapist, a physical training instructor, a psychologist and a specialist in ergonomics (who provided an evaluation of work techniques and postures and vocational exercises). The second phase (involving similar but shorter interventions) took place over five days, six months after the first sessions.

Prior to each session participants completed a questionnaire which collected data on the subjective severity of neck-shoulder and low-back pain (measured on a visual analogue scale), visits to physicians, sick-leave days because of musculoskeletal symptoms. Physical measurements were also taken. The same data was collected five years later (from all 20 participants).

**Primary outcome**

Self-reported sick leave significantly decreased \((p= < 0.05)\), from a mean of 4.6 days in the previous six months to zero in the six month period prior to the five-year follow-up. The authors suggest that the reduction in sick leave may have been due to the greater physical activation which in turn may be attributed to the rehabilitation regime (although the lack of a control group severely limits the confidence that can be placed in such a conclusion).

**Secondary outcomes**

The self-reported severity of low-back pain was significantly lower (no further details provided) at both the six month and the five year points \((p= < 0.01)\), although no statistically significant\(^\text{23}\) changes (no further details available) occurred in self-reported neck pain or reports of the physical and mental strain of work. The physical measurements showed a significant increase (no further details available) of the measured range of motion of the cervical spine\(^\text{24}\) \((p= < 0.01)\), and also in the dynamic strength of the abdominal and back muscles and strength of the upper arms \((p= < 0.01)\), level).

The number of self-reported exercise breaks at work increased\(^\text{25}\) between the first and second intervention and the increase was sustained at the five year point (99 per cent confidence level).

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\(^{23}\)‘\(p\)’ values not stated.

\(^{24}\)For example left rotation of the cervical spine improved from a mean of 66.8 degrees rotation to 71.3 degrees after six months.

\(^{3}\)From a mean level of 0.1 times a week to a mean of 2.6 times a week.
The limitations of the study

The study is rated ‘−’. It is based on a small number of cases (20), although all are followed up over a period of five years and the study does not include a control group. The authors argue that setting up a control was practically impossible and may have been unethical (given the time period involved) but accept it is a limiting factor. The setting of the study, ie within a military environment in Finland, and the selection criteria used may limit its generalisability.

3.1.4 Leino et al. (1994)

This prospective (non randomised) controlled study, rated ‘−−’, examined the changes in fitness, health and work ability among lumberjacks employed by two companies in Finland who had been off sick with low back pain (LBP) but were back at work and had participated in a one-week work-oriented physical fitness course.

All the lumberjacks working for two large Finnish companies (one based in the north and the other in the east of the country) received a questionnaire on lifestyle, working conditions, health and work ability. There were 1,556 responses (82 per cent of the population). All respondents were male.

The lumberjacks were invited to apply for a fitness course through information in company newsletters and from managers and occupational health staff. They were selected (the basis for selection is unclear) using the information in the questionnaire (which formed the baseline for the study). The inclusion criteria described in the paper was that participants had suffered ‘short-term work disability’ (defined as up to 30 days) because of LBP in the past year. There were no restrictions made as to age or the occurrence of other diseases. No other inclusion or exclusion criteria are reported. Some 87 study participants were allocated to the intervention group and 61 for the control comparison group.

The intervention involved a seven-day residential fitness course at a school of forestry or a school of sports. The course was led by a physiotherapist or an instructor in physical training and lasted 12 hours (sic) each day, apart from the first and last day. Courses were provided free of charge and 80 per cent of salary losses compensated. Eight courses were run with ten to 12 men in each, all from the same company, in each course. Most of the time was spent exercising, but the course also included lectures on spine structure and function and work ergonomics and fitness tests. An individual exercise program was also developed to be followed at home by the participants. The main goal of the courses was get the participants to exercise during their leisure time. The main intervention was followed by a two-day reinforcement session six months later (no further details about this session are provided).

No details were provided about what, if anything, was delivered to the control group.
Muscle function and oxygen consumption tests were administered at the beginning of the course and repeated after six months during the reinforcement session six months later. A follow-up questionnaire was sent to the course participants and the control group one year after the course finished. The questionnaire asked about the extent of physical activity perceived fitness and health, and medical symptoms. Baseline and follow-up questionnaires were received from 90 per cent of course participants and 67 per cent of the controls. Sickness absence data were obtained from company records.

Primary outcomes

The average number of spells of sickness absence fell from 0.20 (in the year prior to the intervention) to 0.11 (during the 12 months after the intervention) compared with 0.25 and 0.23 among the control group. However, this was not statistically significant between the groups (p values are not reported).

The average number of days off sick fell from 2.7 (in the year before) to 2.2 (in the year after) among the intervention group but rose (from 2.4 to 4.0) among the control group. However the change between groups was not statistically significant at 95 per cent confidence limits, but is at the 90 per cent level (p = <0.10).

Secondary outcomes

Self assessed back symptoms among the intervention group and the controls were at a similar level before and remained so six months after the intervention (p values not reported).

Work ability26 (self-assessed) increased significantly among the intervention group (from 7.0 to 7.5 – on an unspecified scale) (p = <0.05), but remained at similar levels among the controls (6.5 and 6.4) (p values not reported). The difference between the intervention group and the controls at the follow-up stage was significant (p = <0.05).

Self reported leisure time increased in both the intervention group and the control group (p = <0.01).

The costs per course were reported as 50,000 Finnish Markka (FIM) and the cost refunding of lost salaries (80,000 FIM) (no other information on costs provided).

26 ‘work ability’ was computed from the answers (based on a scale of 1 to 5) to four questions covering the physical and mental strenuousness of work, subjective ability to work and the need for ‘repose at leisure’.
Interventions, strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

Limitations of the study

The study has been quality assessed and rated ‘‐’. The authors draw attention to the ‘asymmetrical response’ to the follow-up questionnaire, which negatively affected the control group and meant that they were smaller in number than the intervention group. However, this problem did not affect the collection of sickness data from company records.

Both groups reported an increased level of leisure time physical exercise at the follow-up questionnaire. There may have been communication between the two groups or the authors suggest that the baseline questionnaire may have had ‘an interventional effect’.

The authors felt that the course might have been seen as holiday for the participants and generated the small positive impact. However, they felt it more likely that the increased physical capability following the intervention may have directly influenced their functional capacity. Equally, they felt that the participants may also have had an increased belief in the controllability of back pain especially through exercise.

In addition the reviewers identified some gaps in the information provided in the paper, for example the process for selecting participants of the intervention group and the control group is unclear.

<table>
<thead>
<tr>
<th>Evidence statements for Theme 1</th>
</tr>
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<tbody>
<tr>
<td>Four studies present some, mainly limited, evidence of the positive effects of interventions involving exercise and physical activity on preventing the reoccurrence of sick leave among employees who had been previously off sick with low back pain.</td>
</tr>
<tr>
<td>One RCT study in Norway (rated ‘+’) found evidence that workers, aged between 18 and 60, on long-term sick leave with lower back pain who receive consultations with a physician (specialising in physical medicine and rehabilitation) and a physiotherapist to improve skills to cope with their condition may be effective at helping workers return to work up to a year after they start sick leave than comparable people who receive were treated in primary care. In the consultation, patients received information, reassurance and encouragement to engage in physical activity as normal as possible and reports were sent to their primary care physician and local national insurance office. Although the study found significant differences in the average number of sick leave days at the 12-month point between the intervention group and the control group, there was no significant difference between the groups in the proportions experiencing further sickness episodes over the three year period. Therefore there is insufficient evidence from this study to suggest that this intervention was effective in preventing the re-occurrence of sickness absence in the long-term. (Molde Hagen et al, 2003).</td>
</tr>
<tr>
<td>There is limited evidence from one Norwegian RCT (rated ‘−’) to suggest that the delivery of a physical exercise and education and training programme (involving stretching and relaxation exercises and information on ergonomic and physical exercises), called the Mensendieck</td>
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</table>
approach, delivered by specially trained physical therapists to male and female employees with a history of musculoskeletal symptoms, such as lower back pain, can result in lower reported recurrence of lower back pain and a reduction in re-occurring long-term sickness absence (although the results of the study are limited by the exclusion of one outlying case). (Soukup et al. 1999).

There is limited evidence from a Finnish cohort study (rated ‘-’) to suggest that an intensive exercise programme (involving water and gymnasium-based exercises and lectures on practical physical and relaxation exercises) delivered to a small group of machinists in a military setting by provided by a physician, physiotherapist, a physical training instructor, a psychologist and a specialist in ergonomics can result in lower levels of re-occurring sickness absence and reported re-occurring back pain (Holopainen et al., 2004).

These two studies suggest that the positive impact may be enhanced by increasing the amount of sustained physical exercise taken by participants (Soukup et al. 1999 and Holopainen et al, 2004).

There is limited evidence from a prospective controlled study (rated ‘-’) which examined changes in fitness, health and work ability among male lumberjacks employed by two companies in Finland who had been off sick with lower back pain for up to a 30 day period but were back at work that a free of charge (with 80% of salary losses compensated) intensive one-week residential work-oriented physical fitness course (involving lectures, fitness tests and exercising - lasting 12 hours for 5 days), led by a physiotherapist or instructor in physical activity; followed by a re-enforcement session 6 months posts the residential course had a positive but not statistically significant effect on the frequency and average number of days of subsequent sick leave. Self-assessed ‘work ability’ increased after the intervention and was assessed significantly higher than among the control group at the six-month follow-up. Self-reported leisure time increased in both groups in the six months after the intervention. (Leino et al. 1994).

3.2 Theme 2: Pain management through group learning

3.2.1 Haugli et al. (2001)

A randomised controlled trial (rated ‘-’) examined the effects of a group learning programme, based on a phenomenological epistemology and Kelly’s personal construct theory,27 on participants’ experience of pain and sickness absence.

One hundred and seventy-four adults (aged between 20-59 years), drawn through social insurance offices in Oslo in Norway, volunteered to participate in the study. Inclusion criteria were that participants had to have recurrent episodes of

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27 The paper explains that Kelly argues that perception and learning are active processes during which an individual constructs his or her own reality, In Kelly’s view chronic pain should not be understood in terms of isolated sensory events, but rather as an integral part of the person’s construction of reality.
Musculoskeletal symptoms and have been absent from work (for unspecified reasons) for at least four of the previous 52 weeks. Individuals with a history of drug or alcohol abuse or a serious disease were excluded. Each of the initial participants completed a baseline questionnaire before the intervention, which collected data on personal characteristics, experience of pain (eg using self-reported visual analogue scales (VAS\textsuperscript{28})), sickness absence and consumption of health care.

Ninety-two of the volunteers were randomly allocated to the intervention group and 82 to the control group. The control group received standard care (mainly analgesic medication and in some cases physiotherapy), while the intervention group additionally took part in the learning programme. The learning programme participants met in small groups (with six to ten people), each led by two specially trained group counsellors, for four hours every fortnight for a period of eight months. Fourteen participants did not turn up to the first meeting and nine attended fewer than five meetings and were thus recorded as drop-outs, therefore 69 people were counted as full participants throughout the learning programme.

All study participants were given further questionnaires to complete, covering similar ground to the baseline survey, one month and one year after the treatment finished. The first received a 74 per cent response and the latter a 70 per cent response (in each case the response rate from the control group was lower than for the intervention group: 67 per cent compared with 80 per cent and 54 per cent compared with 84 per cent). Thus the final questionnaire was completed by 77\textsuperscript{29} people (84 per cent of the initial sample) from the intervention group and 44 (54 per cent) from the control group.

The learning programme was based on phenomenological perspectives and Kelly’s personal construct theory and focused on self-awareness and self-discovery, sharing and listening to each other. It included experience-based exercises eg creative drawing, moving to music, guided imagery, use of metaphors, relaxation and awareness exercises.

**Primary outcome**

The study did not find a significant effect on participants’ self-reported sickness absence from work between the baseline and the year 1 follow-up. Absence fell by 44 per cent in the intervention group (from a mean level of 93 days to 65 days one month after the intervention and 52 days after one year) and by 30 per cent in control group

\textsuperscript{28} For instance participants were asked ‘ on a scale of 0 to 100 where 0 is no pain and 100 is unbearable pain, how much pain did you have during the last week?’

\textsuperscript{29} This suggests that some of the respondents to the intervention group final questionnaire had not attended the full programme ie had been categorised as drop outs.
(from 102 days through 84 days to 71 days). The difference in the days absent at the year 1 follow-up between the intervention and control groups was not significant (p = 0.28). No other statistical data reported.

The authors also looked at participants’ self-reported receipt of disability benefits (given to patients with more than one year of sick leave). The proportion in the intervention group receiving benefits increased from 24.7 per cent (n = 19) (baseline) to 37.7 per cent (n = 29) ((one year follow-up))\(^{30}\) and from 20.5 per cent (n = 9) to 59.1 per cent (n = 44) in the control group (p = 0.042). The difference between the intervention and control groups in the prevalence of rehabilitation/disability benefits and pensions one year after the intervention was statistically significant (p = 0.042 chi-square). No other statistical data reported.

**Secondary outcomes**

The participants in the learning programme (intervention group) reported a significant (p = 0.03) reduction in pain (scored on a visual analogue scale (VAS)) between the baseline and the one-year follow-up, while the scores of the control group were almost identical at both points (no p values reported). (The scores in the intervention group fell from a mean of 53 to 43.9 and were 55.2 and 54.8 in the control group). At the one year follow-up point, the self reported pain scores were significantly lower in the intervention group than in the control group (p = 0.015).

Significant increases in the intervention group’s self-reported ability to cope with pain (p = 0.04) between baseline and the one year follow-up were also reported (ie from 59.8 to 66.4 on a visual analogue scale compared with a fall from 61.3 to 58.1 in the control group (no p values reported).

The participants in the learning programme significantly (95 per cent confidence) reduced their self-reported healthcare consumption\(^{31}\) one month after their programme finished and maintained this a year later.\(^{32}\) There was a significantly (95 per cent confidence) lower level of healthcare consumption among the intervention group compared with the control group at both follow-up points after the

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\(^{30}\) No data for one-month follow-up.

\(^{31}\) As measured by self-reported number of visits to the doctor.

\(^{32}\) Eg 12 per cent of the intervention group said that they had paid no visits to the doctors in the previous six months at baseline, this increased to 35 per cent at the one month point (although it is unclear whether the same measure scale (ie visits over the previous six months) and 40 per cent after a year.
Interventions, strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

programme\textsuperscript{33}, although there was no significant difference\textsuperscript{34} in the number from each group receiving physical therapy.

Limitations of the study

The study had a number of limitations and it was graded ‘-’.

The authors point to the ‘high’ drop-out rate and particularly that the non-response rate among the control group at the second follow-up stage was 46 per cent (but the authors note no differences in baseline data between responders and non-responders in control group, nor between completers and non-completers in intervention group).

Six dependent variables were used and so the authors advise caution in interpreting the relative effect of the intervention on each separate variable. Given the non-significant effect on absenteeism, authors also advise caution in interpreting apparent effect on rehabilitation/disability benefits.

The reviewers additionally identified that significantly more control group participants were on sick leave at baseline than intervention group participants. The study only had complete data for 77 participants in the intervention group and 44 in the controls. The recruitment and randomisation procedure was open to bias: the paper had a poor description of the randomisation, and selection effects of the opt-in for participating social security centres (through which individuals were recruited) may limit the generalisability of results.

\begin{quote}
\textbf{Evidence statement for Theme 2}

There is limited evidence from one Norwegian RCT study (grade ‘-’\textsuperscript{1}) to suggest that a learning programme (based on phenomenological perspectives and Kelly’s personal construct theory) delivered by specially trained group counsellors to small groups may help adults aged 20-59 experience less musculoskeletal pain and increase their ability to cope with pain. While there is some evidence that they are less likely to take up disability benefits and make visits to the doctor, there is insufficient evidence to indicate that such a programme can positively affect self-reported re-occurring sickness absence from work (Haugli, 2001).
\end{quote}

\textsuperscript{33} In comparison to the intervention group, the proportion of the control group who had no visits to the doctors changed from seven per cent, to 16 per cent a month after the intervention finished (see previous footnote) to 24 per cent after a year.

\textsuperscript{34} No p values available.
3.3 Theme 3: Multi-disciplinary interventions for lower back pain

These last two studies examine the effectiveness of multi-disciplinary interventions for lower back pain.

3.3.1 Steenstra et al. (2006)

This is a randomised controlled study (rated ‘+’) set in Holland which compares the effectiveness of a workplace intervention with a clinical intervention and usual care provided by an occupational physician. It attempts to replicate the evaluation of the ‘Sherbrooke intervention model’ conducted by Loisel et al. (2003)\(^{35}\).

Participants in the study had to be aged between 18 and 65 and on sick leave for between two and six weeks due to lower back pain. Participants were recruited by occupational physicians and 196 (84 men and 112 women) were included. Some (unspecified) causes of lower back pain were excluded as were pregnant women, people with serious psychiatric disorders, people in legal conflict at work and those who had been sick listed due to lower back pain less than one month prior to the current episode.

The study effectively took place in two phases. Participants were initially randomly allocated to either a workplace intervention (WI) (described in detail below) group (n=96) or a usual care (UC) group (as outlined by Dutch Occupational Physician guidelines for lower back pain\(^{36}\)) (n=100). Initial intervention commenced ‘right after inclusion and at least 8 weeks after start of sick leave’. Ten dropped out from the work intervention group (eg by returning to work before the intervention could start). In the second phase, almost half (55) of the 112 people who were still off work eight weeks into the study were then randomly allocated to receive either a clinical intervention (comprising a graded activity) and the other half (57) were allocated to receive usual care. Nineteen of the 55 members of the clinical intervention group could not follow the regime (for a variety of reasons eg contraindications, interference from another practitioner, change in job function), and thus dropped out of the study altogether or received usual care.

The workplace intervention was a modified version of the Sherbrooke intervention model (Loisel, 2003) tested in Quebec, Canada and consisted of usual care plus a workplace assessment and work modifications based on participative ergonomics which involved all relevant stakeholders. Additionally communication took place between the occupational physician and the patient’s general practitioner to reach a

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\(^{35}\) Reported in the review of research questions 1 and 2.

\(^{36}\) Which emphasise the resumption of daily activities and work within two weeks.
Interventions, strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

Thus the study involved a number of different groups (see flow chart below):

- Those who had work intervention (WI) only and who returned to work (RTW) within eight weeks of the programme starting \((n = 44)\).
- Those who had a work intervention (WI) and were still off work after eight weeks and were given a clinical intervention (CI) \((n = 27)\).
- Those who had a work intervention (WI) and were still off work after eight weeks and did not receive a clinical intervention (CI), ie received usual care (UC) \((n = 25)\).
- Those who had usual care (UC) only and who returned to work (RTW) within eight weeks of the programme starting \((n = 40)\).
- Those who had usual care (UC) and were still off work after eight weeks and were given a clinical intervention (CI) \((n = 28)\).
- Those who had usual care (UC) and were still off work after eight weeks and did not receive a clinical intervention (CI) ie continued to receive usual care (UC) \((n = 32)\).

Allocated groups to particular interventions in Steenstra et al. (2006)

<table>
<thead>
<tr>
<th>Total participants ((n = 196))</th>
<th>WI ((n = 96))</th>
<th>UC ((n = 100))</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTW ((n = 44^*))</td>
<td>CI ((n = 27))</td>
<td>UC ((n = 25))</td>
</tr>
<tr>
<td></td>
<td>UC ((n = 32))</td>
<td>CI ((n = 28))</td>
</tr>
</tbody>
</table>

\(^*\) Includes 10 who returned to work before WI started.

Data were collected from participants at baseline (two to six weeks after sick leave began) and at eight, 12, 26 and 52 weeks after the start of sick leave, mainly through questionnaires, although sick leave data were validated by additional information from social security records.
Primary outcomes

After the first randomisation stage the work intervention group returned to work on average 30 days earlier than the usual care group (95 per cent confidence intervals (CI): 3.1 to 51.3). Of those that had not returned to work within 8 weeks of commencing the study, workers in the work intervention/usual care group returned 51 days earlier than the work intervention/clinical intervention group (95 per cent CI = 89.4 to 2.7)). Those in the usual care/clinical intervention group returned to work 21 days later than those who just had usual care (95 per cent CI = -74.1 to 29.2). The workplace intervention group as a whole (ie n = 96) also had a lower total number of days re-occurring sick leave during the year of the study than usual care group (ie n = 100). Workers who had the clinical intervention (with or without WI) had the highest level of re-occurring sick leave\(^{37}\) and the authors state that their study found ‘no positive effect for the clinical intervention’.

Secondary outcomes

No significant differences in secondary outcomes between work intervention and usual care groups were found or between any of the smaller sub-groups.

Limitations of the study

This study has been quality assessed and rated as ‘+’.

It is not clear exactly when baseline data were collected and in particular how far in advance of the intervention.

It was a study aimed at measuring the cost effectiveness of the various interventions. The effectiveness results are sometimes difficult to identify (eg in some cases relevant statistical information not presented).

It is possible that the study was insufficiently powered to detect significant differences in return to work outcomes between the six distinct intervention groups.

In a separate paper (Steenstra et al., 2006) point out that only 65 per cent of the CI group complied with the procedure and that there may have been delays referring patients to the CI intervention which may have reduced its effectiveness.

3.3.2 Torstensen T et al. (1998)

This study (graded ‘+’ ) is based on a randomised control trial set in Oslo in Norway which aimed to evaluate the relative effects of medical exercise therapy (MET)

\(^{37}\) No statistical significance data provided.
conventional physiotherapy (CP) and self-exercise on patients with chronic lower back pain (LBP).

A total of 210 patients from 22 social security offices in Oslo were recruited to take part in the trial. There were 105 men and 105 women and their average age was 41.6. To be included patients had to be aged between 20 and 65, had lower back pain, in employment but on sick leave for at least eight weeks\(^{38}\). Exclusion criteria included physical disorders (such as spondylolisthesis, hip arthrosis or previous back surgery) which would difficult to follow the treatment programme. Patients with psychological disorders such as depression were also excluded. Patients were given a standardised assessment by a physician and 208 were included and randomly allocated to one of three groups:

- **Medical exercise therapy (MET) group** – who received specially designed exercises for mobilising hypomobile areas and stabilising other parts as required by the individual case. Patients are given seven to nine different exercises which they repeat 20 or 30 times each graded to their particular condition and involving the use of specialised equipment. The sessions (involving groups of up to five at a time) were delivered by specialist physiotherapists. Patients received three one-hour treatments a week for 12 weeks.

- **Conventional physiotherapy (CP) group** – received standard physiotherapy (eg application of heat and cold, massage, electrotherapy, stretching exercises etc. at the discretion and based on the judgement of the physiotherapist delivering the session. Again treatments (involving one patient at a time) lasted an hour and were delivered three times a week for 12 weeks.

- **Self-exercise (SE) group** – these patients were asked to take an hour-long walk three times a week for 12 weeks at a time and in a manner of their choosing (though preferably at least one day apart). They were phoned by the project leader every two weeks to try to ensure they kept up their regime.

Thirty-three patients dropped out during the interventions (12 from the MET group, eight from the CP group and 13 from the SE group). Follow-up assessments took place at the end of the intervention and one year later (ie three months and 15 months after the start of the study). Measurements were taken at each point for pain intensity (using a visual analogue score (VAS), functional capacity\(^{39}\), reported satisfaction with their treatment (on a four point scale) and sickness absence (using data collected from social security offices). No-one dropped during the one-year follow-up period.

\(^{38}\) Under the terms of the Norwegian National Insurance Act all people on sick leave for eight weeks or more must be issued with a Special Sickness Certificate II to be eligible for further sickness benefit,

\(^{39}\) Using the Oswestry Low Back Pain Disability Questionnaire.
Primary outcomes

There was no significant difference between the three groups in the proportion who returned to work, 41 (57.7 per cent) of the medical exercise therapy group, 42 (62.7 per cent) of conventional physiotherapy group and 40 (57.1 per cent) of self-exercise group had returned to work by one year follow up point.\(^{40}\) However, the total number of days on sick leave among the self-exercise group (from inclusion in the study to the final follow-up stage ie 15 months) was 13,567 days. This compares with 11,757 days among the medical exercise group and 9,967 days among the conventional physiotherapy group.\(^{41}\)

Secondary outcomes

The study found a positive difference in functional capability after treatment in favour of the medical exercise therapy and physiotherapy groups compared with self-exercise group (p=0.01), but no significant differences between the two therapy groups (p values not reported). The results were similar but stronger (p = 0.005) at the end of the year follow-up period.

The study also found a lower level of pain intensity in lower back and buttock (p=0.01) and lower extremities (p=0.003) after treatment among the medical exercise therapy and physiotherapy groups compared with self-exercise group. Again there were no statistically significant differences between the two therapy groups and the results were maintained at the one year follow-up.

Limitations of the study

This study has been quality assessed and rated ‘+’. The study has been criticised (see Eriksen et al. SPINE Vol. 25, No. 1) because the control group were required to engage in walking exercise and over 40 per cent dropped out and were therefore not in receipt of ‘no intervention’ as argued by the authors.

<table>
<thead>
<tr>
<th>Evidence statement for Theme 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Dutch RCT study (rated ‘+’), among 196 men and women aged between 18 and 65 who had been on sick leave for between two and six weeks due to lower back pain, found that a multi-stage return to work programme (involving a workplace assessment and work modifications based on participative ergonomics and counselling the employee about return to work) was effective at getting them back to work sooner than if they had just had usual care. There is also evidence that the workplace intervention was effective in reducing the total number of days taken as re-</td>
</tr>
</tbody>
</table>

\(^{40}\) No p values or any other statistical significance tests reported.

\(^{41}\) No p values or any other statistical significance tests reported.
Interventions, strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

occurring sick leave among the study population and that the clinical intervention (in combination with usual care or the workplace intervention) did not have a positive effect, although the clinical intervention was only adhered to by 65 per cent of cases (Steenstra et al., 2006).

A Norwegian RCT (rated ‘+’) of 210 patients aged between 20 and 65 on long-term sick leave which compared medical exercise therapy (under continuous supervision by the physiotherapist) conventional physiotherapy (a combination of methods such as heat or cold massage, stretching, different forms of electrotherapy, traction, and a few exercises on the treatment table) and self exercise (patients given information and told to walk for one hour three times a week for 12 weeks) found all three interventions could be effective in reducing total re-occurring sickness absence. However no significant difference was found in the proportion of patients who returned to work during the trial period among the three groups (Torstensen et al 1998).

3.4 Evidence tables for the three themes

Table 3.1 presents a summary of the evidence from the seven included papers.
## Table 3.1: Haugli et al. (1994)

<table>
<thead>
<tr>
<th>Study details</th>
<th>Study design:</th>
<th>Confounders and limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title and source:</strong></td>
<td>Randomised controlled trial</td>
<td>Identified by author:</td>
</tr>
<tr>
<td>Haugli, L., Steen, E., Laerum, E., Nygard, R., and Finset, A. (2001), ‘Learning to have less pain - is it possible? A one-year follow-up study of the effects of a personal construct group learning programme on patients with chronic musculoskeletal pain’, Patient Education and Counselling, vol. 45, no. 2, pp. 111-118.</td>
<td>High drop out rate (but authors note no differences in baseline data between responders and non-responders in control group, nor between completers and non-completers in intervention group). Six dependent variables used, so authors advise caution in interpreting the relative effect of the intervention on each separate variable. Given non-significant effect on absenteeism, authors also advise caution in interpreting apparent effect on rehabilitation/disability benefits. Identified by reviewers:</td>
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<tr>
<td><strong>Study design:</strong></td>
<td><strong>Grade:</strong> -</td>
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<tr>
<td><strong>Sample:</strong></td>
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<tr>
<td>Intervention group: n=92. Control group: n=82. At final follow-up: treatment n=77, control n=44. Participants invited via social security offices.</td>
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<tr>
<td><strong>Included:</strong></td>
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<tr>
<td>Patients with musculoskeletal pain for 2 or more days a week for more than 6 months; 4 or more weeks absent from work in last 12 months; age 20-59; able/willing to actively participate in programme for 6 months.</td>
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<tr>
<td><strong>Excluded:</strong></td>
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<tr>
<td>Those with inadequate knowledge of Norwegian; drug and alcohol abuse affecting ability to participate; malignant/serious disease.</td>
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<tr>
<td><strong>Setting:</strong></td>
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<tr>
<td>Oslo, Norway: precise setting not reported</td>
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<tr>
<td><strong>Duration of study and follow-up period/s</strong></td>
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<tr>
<td>12 group meetings over 8 months; follow-up at 1 month (T1) and 1 year (T2)</td>
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<tr>
<td><strong>Primary and secondary outcomes</strong></td>
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<tr>
<td><strong>Primary Outcome</strong></td>
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<tr>
<td>Self reported reduction in number of sick days. Self reported receipt of disability benefit (for long-term absence from work)</td>
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<tr>
<td><strong>Secondary outcome</strong></td>
<td></td>
<td></td>
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<tr>
<td>Pain and pain coping; coping with life demands; healthcare consumption; psychological distress; evaluation of programme</td>
<td></td>
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<tr>
<td><strong>Results</strong></td>
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<tr>
<td>Self-reported sickness absence fell by 44% in the intervention group (from a mean level of 93 days to 65 days (T1) and 52 days (T2) and by 30% in control group (from 102 days to 84 days (T1) 71 days (T2)). (P =0.283). The proportion in the intervention group self-reporting that they received disability benefits increased from 24.7% (T0) to 37.7% (T2) (T1 data not provided) and from 20.5% (T0) to 59.1% (T2) in the control group (P = 0.042).</td>
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<tr>
<td><strong>Secondary outcomes</strong></td>
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<tr>
<td>Pain: intervention group showed significant reduction (17% of visual analogue scale (VAS) score) from baseline (T1) to one-year follow-up (T3) (p=0.03); control group almost identical at T1 and T3. At T3, pain scores significantly lower in intervention group than in control group (p=0.015).</td>
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<td>Psychological distress contributed to the variance in pain (F=12.6,</td>
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<tr>
<td>Study details</td>
<td>Intervention, policy, strategy or programme description</td>
<td>Sample and setting</td>
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<td></td>
<td>education, marital status, pain duration, absence days, pain, pain coping and coping with life demands. However significantly more control participants were on sick leave (83.7%) than intervention participants (56.3%). (P&lt; 0.05)</td>
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Table 3.2 Holopainen et al. (2004)

<table>
<thead>
<tr>
<th>Study details</th>
<th>Intervention, policy, strategy or programme description</th>
<th>Sample</th>
<th>Duration of study and follow-up period/s</th>
<th>Primary and secondary outcomes</th>
<th>Results</th>
<th>Confounders and limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title and source:</td>
<td>To verify the effects of Vocationally Oriented Medical Rehabilitation (VOMR) courses on machinists’ physical activity, musculoskeletal symptoms and perceived work ability within a follow-up period of 6 months and 5 years.</td>
<td>Sample: 20 Finnish Air Force Machinists (mean age 36.9 yrs, no data on whether male or female) who a) had at least 3 years’ experience as a machinist in the same workplace and intention to continue in this job, b) had experienced musculoskeletal symptoms causing sick leave of 60 days at most during the past 2 years, c) had no other diseases preventing rehabilitation, d) were motivated to work and e) voluntary participation in the course. Final selection by the Finnish Social Insurance Institution (SII).</td>
<td>Duration: Groups of 10 per course, each course realised over two phases. First phase lasted 12 days, the second (held six months after the first) lasted 5 days.</td>
<td>Primary Outcomes</td>
<td>Number of days sick leave, self-reported.</td>
<td>Primary outcomes</td>
</tr>
<tr>
<td></td>
<td>Rehabilitation course consisting mainly of physical exercises and training in ergonomic work techniques.</td>
<td></td>
<td></td>
<td></td>
<td>Secondary outcomes</td>
<td>Changes in working postures measured by Ovako Working posture Analysing System (OWAS):</td>
</tr>
<tr>
<td>Study design:</td>
<td>Cohort</td>
<td></td>
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<tr>
<td>Grade:</td>
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</table>
Interventions, strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

Table 3.3: Leino et al. (1994)

<table>
<thead>
<tr>
<th>Study details</th>
<th>Intervention, policy strategy or programme description</th>
<th>Sample and setting</th>
<th>Duration of study and follow-up periods</th>
<th>Primary and secondary outcomes</th>
<th>Results</th>
<th>Confounders and limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leino P, Kivekäs J, Hänninen K (1994)</td>
<td>'Effects of Work-Oriented Fitness Courses in Lumberjacks with Low Back Pain'</td>
<td>Study design: Prospective (non-randomised) controlled study</td>
<td>Grade: -</td>
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<td></td>
<td>Aim: To examine the changes in fitness health and work ability after a work-oriented physical fitness course arranged for lumberjacks who had been off sick with LBP and still had LBP but were back at work</td>
<td>Setting: Finland</td>
<td>Duration: Course lasted seven days followed by a two day reinforcement session six months later.</td>
<td>Primary outcome: Sickness absence data obtained from company files for one year before and after the intervention.</td>
<td></td>
<td>Identified by author: The authors draw attention to the asymmetrical response to the follow-up questionnaire, which negatively affected the control group and meant that they were much smaller in number than the intervention group. However this problem did not affect the collection of sickness data from company records.</td>
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<tr>
<td></td>
<td>Intervention: Seven day residential fitness course at a school of forestry or a school of sports. Course led by physiotherapist or an instructor in physical training. Course lasted 12 hours each day, apart from the first and last day. Courses provided free of charge and 80% of salary losses compensated. Most of the time was spent exercising, but the course also included lectures on spine structure and function and work ergonomics and fitness tests. An individual exercise program was also developed to be followed at home by the participants.</td>
<td>Sample: Participants were male professional lumberjacks employed by two large Finnish forestry companies (one in the north and one in the east of Finland). Intervention group (n = 87) and comparator group, (n = 61), were selected non-randomly by occupational health personnel from 1556 respondents to a baseline questionnaire (82% response rate).</td>
<td>Follow-up: Questionnaire follow-up occurred at the six month session. Non-response (16%) was higher among the controls than among the intervention group (3%).</td>
<td>Secondary outcomes Additional self assessed data covering age, physical activity, fitness, perceived health, back symptoms, distress symptoms, ergonomic strain and work ability collected before and six months after the intervention.</td>
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<td></td>
<td>The main intervention was followed by a two day</td>
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</table>

42 ‘work ability’ was computed from the answers (based on a scale of 1 to 5) to four questions covering the physical and mental strenuousness of work, subjective ability to work and the need for ‘repose at leisure’. 
No details were provided on what, if anything, was delivered to the control group.

Back symptoms among the intervention group and the controls were at a similar level before and remained so six months after the intervention. (p value data not available).

Work ability (self-assessed) increased significantly among the intervention group (from 7.0 to 7.5 on an unspecified scale) (p = <0.05), but remained at similar levels among the controls (6.5 and 6.4) (p values not reported). The difference between the intervention group and the controls at the follow-up stage was significant (p = <0.05).

Self reported leisure time increased in both the intervention group and the control group (p = <.01).

The costs per course were 50,000 FIM and the cost refunding of lost salaries (80,000 FIM) participants and generated the small positive impact. However, they felt it more likely that the increased physical capability following the intervention may have directly influenced their functional capacity. Equally, they felt that the participants may also have had an increased belief in the controllability of back pain especially through exercise.

Identified by reviewers. The process for selecting participants of the intervention group and the control group is unclear.
Interventions, strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

Table 3.4: Molde Hagen et al. (2003)

<table>
<thead>
<tr>
<th>Study details</th>
<th>Intervention, policy, strategy or programme description</th>
<th>Sample and setting</th>
<th>Duration of study and follow-up period/s</th>
<th>Primary and secondary outcomes</th>
<th>Results</th>
<th>Confounders and limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title and source</td>
<td>Molde Hagen E, Grasdal A, Eriksen H R.</td>
<td>Aim: Evaluate the effects on sickness absence of an simple early intervention on sick-listed employees suffering form lower back pain (LBP), following up a randomised controlled trial.</td>
<td>Intervention:</td>
<td>Duration:</td>
<td>Primary outcomes</td>
<td>Primary outcomes</td>
</tr>
<tr>
<td>Does early intervention with a light mobilisation program reduce long-term sick leave for low back pain: a 3-year follow-up study.</td>
<td>A single interview and assessment (by physician and physiotherapist) at spine clinic within week 12 of sick leave. Information about positive prognosis and importance of staying active to avoid development of muscle dysfunction. Physio provided individual advice and training: how to stretch at home &amp; practical advice on how to cope with and resume daily activities at home and work. Encouraged to contact the Spine Clinic whenever wanted (25% did). Reports from the examination were sent to the patients' primary care physician and to the National Insurance Office, with diagnoses, recommendations concerning further diagnostic tests, treatment, job and, if possible, recommendations concerning further sick leave.</td>
<td>Intervention group: 237 lower back pain employees, sick-listed for 8-12 weeks.</td>
<td>Duration:</td>
<td>Intervention in 1995.</td>
<td>Speed of return to work, frequency of sick leave, total length of sick leave</td>
<td>Significant differences in 1st 12 months: at 3 month 52% of intervention group returned to work vs. 36% control. At 12 months, 68% intervention group vs. 56% in control.</td>
</tr>
<tr>
<td>Study design: RCT</td>
<td></td>
<td>Included</td>
<td></td>
<td>Follow-up:</td>
<td>Work status at specific points in time.</td>
<td>At 2 &amp; 3 years no sig. difference between intervention and control groups in work status or in numbers receiving insurance benefits.</td>
</tr>
<tr>
<td>Grade: +</td>
<td></td>
<td>Excluded</td>
<td></td>
<td></td>
<td>Nos in receipt of sickness benefit</td>
<td>Differences in average number sickness days (after first consultation) at 12 months echoed at 3 years: Intervention group 128 days, Control 170 days (p&lt;0.001).</td>
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<tr>
<td></td>
<td></td>
<td>Setting</td>
<td></td>
<td>Secondary outcomes</td>
<td>Cost benefit analysis.</td>
<td>Net benefit of intervention calculated as 25,526 Norwegian Krone per patient.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spine Clinic, Norway.</td>
<td></td>
<td>Experience and use of strategies to cope with LBP</td>
<td></td>
<td>At 6-month follow-up, patients in the intervention group were less likely to use bed rest and more likely to use stretching and walking to cope with their back pain compared with the control group. This effect diminished. At 12-month follow-up, the only significant difference between the groups was in the use of stretching.</td>
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</tbody>
</table>
Comparison:

220 control group participants invited to local insurance office to complete same questionnaires as intervention group. Treated (‘as usual’ inferred but not stated) by primary healthcare team (as opposed to spine clinic).

Table 3.5 Soukup et al. (1999)

<table>
<thead>
<tr>
<th>Study details</th>
<th>Intervention, policy, strategy or programme description</th>
<th>Sample and setting</th>
<th>Duration of study and follow-up period/s</th>
<th>Primary and secondary outcomes</th>
<th>Results</th>
<th>Confounders and limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title and source:</td>
<td>To evaluate the effect of a Mensendieck Program on the incidence of recurrent episodes of low back pain (LBP) in patients with a history of LBP who currently are working. Mensendieck Program involved 10 min warm-up exercises; 5 min stretching for legs, hips, buttocks; 35 min information session combining ergonomic info and pelvic, hip, back and abdominal exercises; 5 min stretching for lower extremities, pelvis and back, and; 5 min relaxation exercises.</td>
<td>Intervention group: n=39; Control: n=38. At final follow-up: Intervention: n=34; Control: n=35 Included were 18-50 years old, who had experienced one or more episodes of LBP (pain localised to the lumbar region, with or without pain radiating to the lower extremities). Episode further defined as LBP resulting in professional treatment or use of sick leave. At the time of their to the study enrolment, patients required to have finished treatment for their LBP episode and had returned to work. Also needed to have time and opportunity to participate in Mensendieck exercise groups for 13 weeks, and</td>
<td>Duration: A five month study period</td>
<td>Primary outcome Participants’ incidence of sick leave, receipt of disability benefits among participants. Secondary outcome Self-reported recurrence of LBP (observed in days from inclusion until the day of event, during the 12-month follow-up period). Measures: 1) Back pain in general in preceding month 2) Back pain related to 12 daily activities 3) Self assessment of back function using 100mm visual analogue scale 4) General functional</td>
<td>Primary outcomes 10 out of 34 in intervention group with sick leave in follow-up period and 11 out of 35 of control group representing no significant difference (no p value reported) in mean days lost between intervention (29.9 days) and control group (37.8 days). However, once a single outlier was excluded a significant positive (p&lt;0.01) impact of the intervention (12.6 days) compared with control (37.8 days) was found. Secondary outcomes At 12 months, incidence of self reported LBP re-occurring significantly less for intervention group (11 of 34) than in the control group (20 of</td>
<td>Identified by author: Self-selected participants may have resulted in a study sample with high motivation for physical training. However, most secondary prevention programs for LBP are based on voluntary participation. Self-reported measures for sick leave and LBP episodes may be affected by recall bias, but bias should be similar for both groups. Identified by editors Intervention and outcomes are based in a bio-medical approach, which may be an incomplete consideration of factors (such as personality, motivation</td>
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</tbody>
</table>
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**Table 3.6: Steenstra et al. (2006)**

<table>
<thead>
<tr>
<th>Study details</th>
<th>Intervention, policy, strategy or programme description</th>
<th>Sample and setting</th>
<th>Duration of study and follow-up period/s</th>
<th>Primary and secondary outcomes</th>
<th>Results</th>
<th>Confounders and limitations</th>
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<tr>
<td></td>
<td>Based on two randomisation procedures. The first was performed by Occupational Physicians (OPs) (who had been stratified by economic sector) and assigned participants to either a Workplace Intervention (WI) or Usual Care (UC). The second randomisation procedure, conducted by researchers, then allocates those that were still on sickness absence after 8 weeks to Clinical Intervention (CI) or usual care. Clinical intervention involved graded activity protocol developed by Staal et al, 2004</td>
<td>Workplace Intervention (WI) (n=96) followed by Clinical Intervention (CI) (n=27) or only WI (n=25) for those still on sick leave after 8 wks</td>
<td>Follow-up: Baseline measurement 2 to 6 weeks after sick leave begins. Initial intervention at 6 to 8 weeks after start of sick leave. Measurements at 8, 12, 26 and 52 weeks after start after sick leave.</td>
<td>Primary Outcome</td>
<td>Return to Work based on Social Security records. Lasting return to work defined as the duration of work absence due to LBP in calendar days from the first day of sickness leave to full return to own or other work with equal earnings for at least four weeks without partial or full drop out.</td>
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<td>Usual Care (UC) (n=100) followed by CI (n=28) or UC only (n=32)</td>
<td>Usual Care (UC) (n=100) followed by CI (n=28) or UC only (n=32)</td>
<td>Secondary outcomes</td>
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<td></td>
<td>Included: Aged 18 to 65, on sick leave from regular work for 2 to 6 weeks due to Lower Back Pain (LBP) and able to understand Dutch to give informed consent and complete questionnaires.</td>
<td>Excluded: Specific causes of LBP, pregnancy, serious psychiatric disorders, cases of legal conflict at work or if been sick listed due to LBP less than one month prior to current episode.</td>
<td>Functional status: measured using the self report and validated Roland Disability Questionnaire.</td>
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<td></td>
<td>Setting:</td>
<td>Pain severity: measured using self reported 10 point numerical rating scale.</td>
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<td>Undertaken by Occupational Physicians (OPs) in the Netherlands. WI consists of usual care plus a workplace assessment</td>
<td>Baseline status measured by COOP / WONCA charts (note these are a validated measure of functional status, however this was not referenced in the paper).</td>
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<td>(p=0.05). The study also found a significant increase (P&lt;0.05) in self-reported participation in physical exercise among the intervention group compared with the controls.</td>
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<td>and emotional issues critical to the events studied, especially in light of the fact that pain and reports of pain are more commonly understood now in terms of a biopsychosocial model of health.</td>
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<td>Overall, the WI on Social Security was effective but records.</td>
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<td></td>
<td></td>
<td>Lasting return the CI was not based</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Occupational and Environmental Medicine 2006; 63, 718-725

Study design:
RCT with factorial design
Grade: +

and work modifications based on participative ergonomics which involved all important stakeholders. Additionally communication between OP and GP to reach consensus on counselling the work in terms of Return to Work (RTW).

Quality of life: measured using self report and Dutch version of the EuroQol.

General health: measured using self report and visual analogue scale of 100mm.

The differences between the WI*CI and WI*UC as well as the differences between the UC*CI and UC*UC groups also had no significant differences.

Bongers et al. (2006) which emphasised the finding that none of the results ‘showed that graded activity improved return to work for either functional status or for pain in the first 26 weeks after the first day of sick leave’
Interventions, strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

Table 3.7: Torstensen et al. (1998)

<table>
<thead>
<tr>
<th>Study details</th>
<th>Intervention, policy, strategy or programme description</th>
<th>Sample</th>
<th>Duration of study and follow-up period/s</th>
<th>Primary and secondary outcomes</th>
<th>Results</th>
<th>Confounders and limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title and source Torstensen, T. A., Ljunggren, A. E., Meen, H. D., Odland, E., Mowinckel, P., &amp; Geijerstam, S. 1998 ‘Efficiency and costs of medical exercise therapy, conventional physiotherapy, and self-exercise in patients with chronic low back pain: A pragmatic, randomized, single-blinded controlled trial with 1-year follow-up’, Spine, vol. 23, no. 23, pp. 2616-2624.</td>
<td>Three randomly allocated single blinded intervention groups. Medical Exercise Therapy (MET) group, given 36, 1 hour graduated three a week exercise sessions over 12 weeks. Conventional Physiotherapy (CP) group offered standard therapy at therapist discretion at the same intervals. The third group given Self Exercise (SE) and urged to undertake a hours walking exercise three times a week for 12 weeks.</td>
<td>208 total sample. MET: 34 men 37 women 71 in total. CP: 35 men 32 women 67 in total. SE: 34 men 36 women and 70 in total.</td>
<td>Duration: Three month intervention with a follow up after one year. Follow-up: Three way comparison between groups. As well as before intervention, after intervention and one year follow up comparisons</td>
<td>Primary outcomes: Return to work, based on social security records Secondary outcomes: Pain: self reported using 100 mm visual analogue scales. Function: functional capability self reported on basis of Oswestry Low Back Pain Disability Questionnaire. Satisfaction: satisfaction with intervention following intervention using four point scale 1 = completely satisfied and 4 dissatisfied.</td>
<td>Primary outcomes: Return to work, 41 (57.7%) of the MET group, 42 (62.7%) of CP and 40 (57.1%) of SE had returned to work at time of one-year follow up (no p values reported). Secondary outcomes: Pain - difference in pain intensity in lower back and buttock (p&lt;0.01) and lower extremities (p=0.003) after intervention in favour of MET and CP groups compared with SE. Patient satisfaction - 26 (34.2%) of MET group, 19 (32.2%) of CP group, and 6 (9.5%) of SE group completely satisfied (no p value reported).</td>
<td>‘In the current study, the outcome most relevant to society, return to work, showed no difference between any of the three groups.’ ‘It [return to work] is also an outcome measure that seems to live its own life, being influenced by factors outside the domain of any medical or therapeutic intervention.’ The study has been criticised (see Eriksen et al. SPINE Vol 25 No. 1) because of the control group were required to engage in walking exercise and over 40% dropped out and not in receipt of “no intervention” as argued by the authors.</td>
</tr>
<tr>
<td>Study design: Individual RCT QA Grade: +</td>
<td>Setting: Private physiotherapy clinics in city of Oslo in Norway</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

"In the current study, the outcome most relevant to society, return to work, showed no difference between any of the three groups.’ ‘It [return to work] is also an outcome measure that seems to live its own life, being influenced by factors outside the domain of any medical or therapeutic intervention.’ The study has been criticised (see Eriksen et al. SPINE Vol 25 No. 1) because of the control group were required to engage in walking exercise and over 40% dropped out and not in receipt of “no intervention” as argued by the authors."
3.5 Applicability of the evidence to the UK populations in the scope

Seven studies have been included in the effectiveness review all of which compare different interventions for lower back pain. Four describe the use of (different) exercise regimes (supplemented with education) to relieve lower back pain, all in a Scandinavian setting. A fifth examines a learning programme to help participants cope with pain and was again based in a Scandinavian setting. The final two compare the effect of multi-disciplinary intervention, including work-based interventions for musculoskeletal disorders (again mainly lower back pain). One was based in Scandinavia and the other was set in Holland.

In attempting to generalise from these findings to the UK some caution needs to be applied and consideration given to:

- The different contexts in which sickness absence takes place, most notably different sickness benefit regimes which may affect employees’ absence behaviour in different ways to the system in the UK (and therefore alter the results of the studies if they were conducted in the UK).

- The different standards of clinical treatment in the countries in question and the UK (ie what would count as ‘usual care’, the non-intervention case, in the UK).

- The ability to make interventions similar to those in the studies (eg to apply some of the clinical regimes or workplace interventions) in the UK.
4 Cost Effectiveness Findings

4.1 Cost-effectiveness results

Three papers were identified which satisfy the inclusion criteria for this cost-effectiveness review. All three of the economic evaluations were carried out from a societal perspective and consider a population of workers on long-term sick leave with lower back pain. However, it is not viable to meaningfully compare the results of the three studies due to several key differences:

- There is a mixture of cost-effectiveness and cost-benefit analyses (one cost-effectiveness evaluation and two cost-benefit studies). The cost-effectiveness analysis provides a cost per return to work day gained by the intervention whereas the cost-benefit analysis calculates a monetary value saved by the intervention in terms of the outcome ‘return to work’ and adds this to the additional cost of the intervention. The results could therefore not be compared whilst remaining in their current format.

- The studies are based in different countries (two Norwegian, one Dutch). The costs associated with long term sickness absence including direct costs such as hospitalisation and indirect costs such as wages may vary considerably between countries. Similarly outcomes such as general health and quality of life may vary between countries.

- The interventions and comparators considered in the economic evaluations are different, as shown in Table 4.1. This may, in part, be due to the fact that the studies have been carried out in different countries leading to variability in the standard care of lower back pain, and hence in the comparator within the economic evaluations. Both Norwegian studies are cost-benefit analyses. However, because the comparator is different between the studies, it is difficult to draw conclusions about the comparative cost-effectiveness.
The quality assessment grade given to each of the studies is based on the criteria shown in Table 4.1.

Table 4.1: Criteria used in the quality assessment of cost effectiveness studies

<table>
<thead>
<tr>
<th>Rating</th>
<th>Criteria</th>
</tr>
</thead>
</table>
| -      | An economic evaluation is not carried out, or  
Scope is irrelevant  
Modelling approach is insufficient |
| +      | Scope of evaluation is relevant  
Modelling approach is reasonable  
Results and conclusions satisfy objective of evaluation |
| ++     | Model assumptions are reasonable  
A sensitivity analysis is conducted  
Is reasonably generalisable to the UK setting |
| +++    | Modelling approach is robust  
A full probabilistic sensitivity analysis is carried out which  
tests key model assumptions  
Reasonable model validation is carried out |

Source: IES/IWP/ScHARR

All of the interventions and comparators considered within the included economic evaluations are shown in Table 4.2 below.

Table 4.2: Interventions and comparators considered within the economic evaluations

<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Intervention</th>
<th>Comparator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molde Hagen et al (2003)</td>
<td>Norway</td>
<td>Examination at a spine clinic</td>
<td>Treatment in primary care</td>
</tr>
</tbody>
</table>
Physiotherapy based on operant behavioural principles | Usual care as outlined by Dutch Occupational Physician guidelines for lower back pain |
Conventional physiotherapy | Self-exercise                                                               |

Source: IES/IWP/ScHARR

Because of the heterogeneity between the studies, the results of the economic evaluations have been outlined separately, but using two themes which correspond to the themes outlined in the effectiveness review (see Chapter 3):

- exercise and education programmes to prevent the reoccurrence of lower back pain
- multi disciplinary interventions to treat lower back pain
The studies are outlined in greater detail in Chapter 3.

4.2 Theme 1: exercise and education programmes to prevent the reoccurrence of lower back pain

4.2.1 Molde Hagen et al (2003)

The cost-benefit analysis43 by Molde Hagen et al (2003) ‘Does early intervention with a light mobilization program reduce long-term sick leave for low back pain: A three year follow-up study’ is based on a Norwegian population of workers between 18 and 60 years placed on a sick-list for eight to 12 weeks for low back pain. For more details of the intervention please see the description for the effectiveness (3.1.1) and the evidence tables at the end of chapter 3.

Primary outcome:

The economic evaluation compares the cost-benefit of return to work of individuals examined at a spine clinic by a physician and physiotherapist and given information and individual instruction, as well as advice on how to stay active, with those treated within primary care.

The analysis is based on one RCT of 457 male and female workers (237 intervention, 220 control) and is carried out from a societal perspective over a time horizon of three years.

The calculation of the benefits of the intervention expressed in monetary terms is based on gross wage payments, the reduction in public transfers, social value of loss of leisure and the cost of funding public transfers44. The cost of care is based on personnel costs (physician, physiotherapist, secretary), follow-up visits to the physiotherapist and operational expenses (buildings, equipment, cleaning, etc.). The costs of the operating expenses are assumed to be equal to personnel costs. Within the analysis, it is assumed that there is a constant labour supply elasticity of 0.4.45 The quality of life of the individuals has not been taken into account within the cost-benefit analysis and hence the benefits may be underestimated.

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43 A cost-benefit analysis is a form of economic evaluation where all costs and consequences of a programme are expressed in the same unit, usually money.

44 It should be noted that from a societal perspective, transfer costs should not have been included within the analysis.

45 An elasticity of labour supply of 0.4 means that every 10% increase in wage rates would lead to a corresponding 4% increase in labour supply.
However, quality of life estimates would be related to the social value of loss of leisure, limiting the impact of this exclusion within the model upon the results since including both would lead to a certain amount of double counting. Results of the analysis are shown in Table 4.3. This suggests that the intervention is cost saving; however no analysis of uncertainty was undertaken. The ratio of benefits to costs is 12.5 to 1.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total benefits of care at spine clinic due to fewer sick days</td>
<td>27,740</td>
<td>4,072</td>
</tr>
<tr>
<td>Total cost of care at spine clinic</td>
<td>2,214</td>
<td>325</td>
</tr>
<tr>
<td>Total cost savings of intervention in comparison to control</td>
<td>25,526</td>
<td>3,747</td>
</tr>
</tbody>
</table>

**Limitations of the study:**

- The analysis is based on data from only one RCT
- No analysis of uncertainty has been undertaken
- No validation of the model results has been carried out
- The study is not UK-based.
- Follow-up period of three years possibly underestimates benefits

Two reviewers independently assessed the quality of this study; both gave a quality assessment rating of ‘++’.

**Evidence statement for Theme 1**

There is evidence from one Norwegian cost benefit (randomised controlled trial) evaluation (rated ‘++’) that an examination at a primary care spine clinic by physician and physiotherapist and provision of information and individual instruction, as well as advice on how to stay active, is likely to be cost effective compared to primary care treatment in preventing the re-occurrence of long term sickness absence due to low back pain (Molde Hagen et al 2003).
4.3 Theme 2: Multi-disciplinary interventions to treat lower back pain

4.3.1 Steenstra et al (2006)

The ‘Economic evaluation of a multi-stage return to work program for workers on sick-leave due to low back pain’ by Steenstra et al. (2006) is a cost-effectiveness analysis comparing work modifications with usual care as outlined by Dutch Occupational Physician guidelines for lower back pain. Those patients in either group who had not returned to work after eight weeks were randomised to receive either graded activity based on operant behavioural principles or usual care. The population considered is 196 male and female workers aged 18 to 65 years sick-listed for a period of two to six weeks due to low back pain in the Netherlands.

For more details of the intervention please see the effectiveness description for this study (3.3.1) and the evidence tables at the end of chapter 3.

Primary outcome

The outcomes evaluated within the analysis are:

- Cost per Lasting Return to Work (RTW) day (duration of work absenteeism in calendar days from the first day of sick leave to full return to own or other work with equal earnings, for at least four weeks without drop-out.).
- Cost per Point-increase in pain severity score avoided (ten-point numerical self-rating scale).
- Cost per Point-increase in functional status score avoided (Roland disability questionnaire).
- Cost per QALY gained (Dutch version of EuroQol); and Cost per Point-increase in general health score avoided (VAS 0-100mm).

The analysis is based on one RCT (although comprising two separate randomisation steps) and is carried out from a societal perspective over a time period of one year.

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46 A cost-effectiveness analysis is an economic evaluation where the costs and consequences of alternative interventions can be expressed in terms of cost per unit of health outcome.
Costs measured are direct health care costs (cost of intervention plus additional visits to a health care provider, prescription medication, professional home care and hospitalisation), direct non-health care costs (out-of-pocket expenses, costs of paid and unpaid help) and indirect costs (loss of production due to lower back pain related absence from paid and unpaid work). Partial return to work was measured by the occupational physician and means that if a person is back at work with a productivity of 50 per cent this is assumed to be equivalent to half a day’s work. The authors report that the interaction between workplace intervention and graded activity was statistically not significant. Therefore, one model was used to describe the effectiveness of the workplace intervention and graded activity, separately, by adjusting for the effect of the other intervention and confounding factors.

The patient’s quality of life is based on the Dutch version of the EuroQol. Prices have been uplifted from those stated within the paper by assuming that the analysis was carried out in 2003 since the trial upon which the analysis is based was completed in 2003.

For the analysis comparing workplace intervention to usual care, the cost per RTW for one day less sick leave is €19 in 2003 prices which equates to approximately £17 in 2007 prices. Thus, the workplace intervention costs £17 more than usual care for one day less sick leave. The workplace intervention dominates (i.e. is more effective and less costly than the comparator) for all other outcomes (see Table 4.4). Results from the analysis comparing clinical intervention versus usual care following eight weeks of workplace intervention or following eight weeks of usual care suggest that using clinical intervention is dominated by usual care (i.e. is less effective and more costly than usual care) independent of whether the patients had previously received the workplace intervention or usual care.

Table 4.4: Results of cost-effectiveness analysis in 2007 British Pounds for usual care versus the workplace intervention

<table>
<thead>
<tr>
<th>Outcome measure (defined above)</th>
<th>UC against WI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lasting RTW</td>
<td>£17</td>
</tr>
<tr>
<td>Functional status</td>
<td>Dominating (-£113)</td>
</tr>
<tr>
<td>Pain severity</td>
<td>Dominating (-£712)</td>
</tr>
<tr>
<td>Quality of life</td>
<td>Dominating (-£1,294)</td>
</tr>
<tr>
<td>General health</td>
<td>Dominating (-£7)</td>
</tr>
</tbody>
</table>

Note: WI = Workplace intervention; UC = Usual care
A probabilistic sensitivity analysis using the bootstrapping approach was carried out\(^{47}\), presented as expected values and cost-effectiveness planes. This shows that there is limited uncertainty associated with the results.

Limitations of the study

- The analysis is based on data from only one RCT and there is likely to be some confounding in interventions received by the participants (see section 3.1 for further details).
- The time period of the analysis is limited
- The year to which prices refer is unclear
- The study is not UK-based.
- Follow-up period of three years possibly underestimates benefits

Two reviewers independently assessed the quality of this study, both gave a quality assessment rating of ‘+’.

4.3.2 Torstensen et al (1998)

The cost-benefit analysis by Torstensen et al (1998). ‘Efficiency and costs of medical exercise therapy, conventional physiotherapy, and self-exercise in patients with chronic low back pain: A pragmatic, randomized, single-blinded, controlled trial with one-year follow-up’ is based on a Norwegian population of workers aged 20 to 65 with chronic low back pain or radicular pain sick-listed for more than eight weeks and less than 52 weeks.

For more details of the intervention please see the description for the effectiveness (3.3.2) and the evidence tables at the end of chapter 3.

Primary outcome:

This analysis compares the cost-benefit of return to work of medical exercise therapy (MET) (under continuous supervision by the physiotherapist, patients perform 7-9 different, specific exercises relating to symptoms, clinical diagnosis, needs and expectations) and conventional physiotherapy (a combination of methods such as heat or cold massage, stretching, different forms of electrotherapy, traction, and a few exercises on the treatment table) with self-

\(^{47}\) Bootstrapping is a method of resampling using a large number of samples of size n, with replacement, from the original data in order to capture uncertainty within the parameters.
exercise (patients given information and told to walk for one hour three times a week for 12 weeks).

The analysis is based on one RCT of 208 male and female patients (71 MET, 67 conventional physiotherapy, 70 self-exercise) and is carried out from a societal perspective over a time horizon of 15 months. The assumptions employed within the economic evaluation are not outlined. The analysis does not include any estimates of quality of life and hence may underestimate the benefits of the interventions.

Results of the analysis are shown in Table 4.5 below. This suggests that both the medical exercise therapy and the conventional physiotherapy are cost saving compared with self-exercise. No analysis of uncertainty was undertaken.

<table>
<thead>
<tr>
<th>Table 4.5: Results of cost-benefit analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost savings of MET in comparison to self-exercise</td>
</tr>
<tr>
<td>Total cost savings of conventional physiotherapy in comparison to self-exercise</td>
</tr>
</tbody>
</table>

Limitations of the study:

- The analysis is based on data from only one RCT
- No analysis of uncertainty has been undertaken
- No validation of the model results has been carried out
- The study is not UK-based.
- Follow-up period of 15 months probably underestimates long-term benefits

Two reviewers independently assessed the quality of this study, both gave a quality assessment rating of ‘+’

<table>
<thead>
<tr>
<th>Evidence statement for Theme 2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is evidence from one Dutch economic (randomised controlled trial) evaluation (rated ‘+’) that work modifications based on participative ergonomics and counselling the employee about return to work are likely to be cost effective in reducing the re-occurrence of absence due to low back pain when compared against usual care as outlined by Dutch Occupational Physician guidelines for lower back pain. Within this study patients are randomised to receive a clinical intervention or usual care at 8 weeks if they have not returned to work and therefore this may confound the results; although the authors have tried to calculate an adjustment for this. The cost per return to work day gained is estimated to be £17 and the cost per quality adjusted life year (QALY) gained is estimated to be dominating (-£1,295) for the workplace intervention in comparison to usual care. However, based on the analysis, it is unlikely that</td>
</tr>
</tbody>
</table>
graded exercise based on operant behavioural principles provided for those who remain on sickness absence after 8 weeks of receiving either the workplace intervention or usual care in terms of return to work is cost-effective in comparison to the provision of Dutch usual care for the same indication (Steenstra et al., 2006).

There is evidence from one Norwegian cost benefit (randomised controlled trial) evaluation (rated ‘+’) that both medical exercise therapy (under continuous supervision by the physiotherapist) and conventional physiotherapy (a combination of methods such as heat or cold massage, stretching, different forms of electrotherapy, traction, and a few exercises on the treatment table) are likely to be cost effective in comparison to self exercise (patients given information and told to walk for one hour three times a week for 12 weeks) for preventing the re-occurrence of long term sickness absence in a Norwegian adult population (Torstensen et al 1998).

4.4 Applicability of the evidence to the UK populations in the scope

The costs associated with long term sickness absence including direct costs such as hospitalisation and indirect costs such as wages per day may vary considerably between countries. Similarly outcomes such as general health and quality of life may vary between countries. Therefore, generalisability of the results of the economic evaluations within the UK setting should be considered with caution. Further, ‘usual care’ of low back pain within the UK may be different to the comparators used within the studies.

4.5 Evidence tables for the three studies

Table 4.6 presents a summary of the evidence from the three included papers.48

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48 Additional information on these studies is presented in the effectiveness evidence tables in Chapter 3.
### Table 4.6: Summary of evidence from three included papers

<table>
<thead>
<tr>
<th>Study details</th>
<th>Interventions and comparator</th>
<th>Study population</th>
<th>Time period of analysis</th>
<th>Perspective of analysis</th>
<th>Outcomes of interest</th>
<th>Main results</th>
<th>Authors' conclusions</th>
<th>Limitations of analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molde Hagen E, 2003, Norway</td>
<td>Intervention: examined in a spine clinic &amp; given information and advice to stay active Comparator: Treated within primary health care</td>
<td>457 workers between 18 and 60 years placed on a sick-list for 8-12 weeks for low back pain.</td>
<td>3 years</td>
<td>Societal</td>
<td>Return to work; number of sickness days</td>
<td>Net benefit of intervention is estimated to be £3,747 [2007]</td>
<td>Care at the spine clinic has a significant short-term effect in reducing sick leave for patients with low back pain and has economic gains for society. The initial effect on coping strategies diminish at 12 months follow up.</td>
<td>The analysis is based on data from only one RCT No analysis of uncertainty has been undertaken No validation of the model results has been carried out The study is not UK-based.</td>
</tr>
<tr>
<td>Study details</td>
<td>Interventions and comparator</td>
<td>Study population</td>
<td>Time period of analysis</td>
<td>Perspective of analysis</td>
<td>Outcomes of interest</td>
<td>Main results</td>
<td>Authors’ conclusions</td>
<td>Limitations of analysis</td>
</tr>
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<tr>
<td>Steenstra I, 2006, Netherlands</td>
<td>Intervention: Workplace assessment and work modifications based on participative ergonomics implemented between 2 to 8 weeks of sick-leave; Graded activity program based on operant behavioural therapy principles after 8 weeks of sick-leave with usual care/ workplace intervention</td>
<td>196 workers between 18 and 65 sick-listed for a period of 2-6 weeks due to low back pain</td>
<td>12 months</td>
<td>Societal</td>
<td>Return to work (RTW) (days), pain intensity, functional status, quality of life, general health</td>
<td>Cost of work intervention vs usual care per lasting RTW for 1 day’s less sick leave = €19 [2003] = £17 [2007]</td>
<td>The workplace intervention was more effective and slightly more costly than usual care in terms of the primary outcome (RTW) and more effective and less costly in improving most secondary outcomes. The clinical intervention was less effective on all outcomes and more costly.</td>
<td>The analysis is based on data from only one RCT The time period of the analysis is limited The year to which prices refer is unclear The study is not UK-based. Usual care is not further described.</td>
</tr>
<tr>
<td>Study details</td>
<td>Interventions and comparator</td>
<td>Study population</td>
<td>Time period of analysis</td>
<td>Perspective of analysis</td>
<td>Outcomes of interest</td>
<td>Main results</td>
<td>Authors’ conclusions</td>
<td>Limitations of analysis</td>
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<td>------------------------</td>
</tr>
</tbody>
</table>
| Torstensen, T, 1998, Norway | Intervention: Medical exercise therapy and conventional physiotherapy  
Comparator: Self-exercise by walking for 1 hour 3 times a week for 12 weeks | 208 patients aged 20 to 65 with chronic low back pain or radicular pain sick-listed for more than 8 weeks and less than 52 weeks. | 15 months | Societal | Number of working days on sick leave | Medical exercise therapy saved £1,616 [2007] and conventional physiotherapy saved £3,229 [2007] per person compared with the self-exercise group. | Both the medical exercise therapy and the conventional physiotherapy are equally effective and are significantly better than the self-exercise. | The analysis is based on data from only one RCT  
No analysis of uncertainty has been undertaken  
No validation of the model results has been carried out  
The study is not UK-based. |

Both the medical exercise therapy and the conventional physiotherapy are equally effective and are significantly better than the self-exercise.

Not treating patients with chronic low back pain poses a risk of worsening the disability resulting in longer periods of sick leave.
5 Discussion

The effectiveness and cost effectiveness reviews identified seven studies in total which met the inclusion criteria for interventions, programmes and strategies to reduce the re-occurrence of long-term sickness absence. All seven studies were identified for the effectiveness component of this review and three for the cost effectiveness component.

5.1 Effectiveness studies

The seven included effectiveness studies were of low to medium quality. Four (Molde Hagen et al, 2003; Soukup et al, 1999; Holopainen et al, 2004; and Leino et al, 1994) considered exercise programmes for the prevention of re-occurrence of low back pain. The Molde Hagen study also appears in the cost effectiveness section. These studies show mixed results. The most robust study (Molde Hagen et al, 2003) found evidence to suggest that a combination of physical exercise and educational interventions resulted in faster return to work and lower numbers of sick days taken in employees with lower back pain at 12 months and three years (however, there was no difference in the re-occurrence of an episode of sick leave between the two groups over the three year period). Two further studies (Soukup et al., 1999 and Holopainen et al, 2004)) found evidence that a combination of physical exercise and educational interventions led to reductions in subsequent levels of sickness absence, and that this positive effect can be enhanced by increasing the amount of sustained physical exercise undertaken by participants. The final study (Leino, 1994) in this group found no significant differences between control and intervention groups in average number of re-occurring spells of sickness absence or average number of days off sick following intervention.

The evidence base for this theme is insufficient to draw conclusions about these specific interventions, although all four studies have common features and report on interventions that are comprehensive (in terms of range of inputs) and appropriate to participants.
One effectiveness study (Haugli et al, 2001) was of low methodological quality (‘-’) and examined pain management through group learning. The study indicates that the approach had no effect in reducing the re-occurrence of long term sickness absence, although those in the intervention group were significantly less likely than those in the control group to be claiming disability benefits one year post intervention. This study provides limited evidence for the impact of the intervention on musculoskeletal pain, but not re-occurrence of long term sick leave.

The evidence base for this theme is insufficient to draw conclusions about the effectiveness of this intervention on the re-occurrence of long term sickness absence.

Under the third and final theme, two further studies (Steenstra et al., 2006 and Torstensen et al, 1998) looked at multi-disciplinary interventions for low back pain. Both these papers also appear in the cost effectiveness section as they are primarily cost effectiveness or cost benefit evaluations.

Both the studies provide evidence for the effectiveness of the interventions they evaluated. The first (Torstensen et al. 1998), a Norwegian study (graded ‘+’) found that both medical exercise therapy and conventional physiotherapy are effective when compared to self-exercise in reducing total sickness absence. However, no significant difference was found between the control and intervention groups in terms of the numbers of patients returning to work during the study.

The second study (Steenstra et al., 2006) in this theme (also graded ‘+’) evaluated a multi-stage return to work programme. This was found to be more effective than usual care in reducing the number of sick days taken following return to work. It was also effective in increasing the rate of return to work amongst the intervention group.

In general, this reflects a lack of evidence about the effects of interventions to prevent the re-occurrence of long term sickness absence (rather than evidence of no effect). In particular, the seven studies included here deal with low back pain and no evidence was found in relation to other conditions or types of interventions which could equally reduce or prevent the re-occurrence of long term sickness absence, in particular interventions related to other causes of long-term absence (eg acute medical conditions, mental health and stress).

5.2 Cost-effectiveness studies

The cost-effectiveness review identified three studies which (as for the effectiveness review) all evaluated interventions to address low back pain and prevent the re-occurrence of long term sickness absence. One of these papers was of high methodological quality (ie ‘++’) (Molde Hagen et al, 2003) and two were graded as medium methodological quality (ie ‘+’) (Steenstra et al. 2006 and Torstensen et al,
1998)⁴⁹. Due to differences in intervention and methodology, the three papers were considered separately.

The first of these papers (Molde Hagen et al., 2003) compared examination at a spine clinic and information and advice on how to stay active with a control group made up of those treated in the Norwegian primary care system. Their findings indicate that this approach might be cost beneficial in preventing the re-occurrence of long term sickness absence as opposed to primary care.

The second paper (Steenstra et al., 2006) compared two forms of intervention (a workplace assessment and modifications on the one hand and clinical intervention on the other) with usual care (existing Dutch Occupational Physician guidance on management of lower back pain). The study found that compared to usual care for lower back pain, the workplace intervention was both more effective and less costly, while the clinical intervention was opposite (ie less effective and more costly) than usual care.

The third paper (Torstensen et al., 1998) examines two different forms of exercise therapy against self-exercise. The study found evidence for the cost benefit of both medical exercise therapy and conventional physiotherapy over self exercise.

All three papers offer some evidence for the cost-effectiveness or cost benefit of different exercise interventions against self exercise or treatment from existing guidance. There are too many dissimilarities between the studies for these effects to be compared with each other or for to be conclusions to be drawn about which form of intervention is most effective.

5.3 Emergent themes

All of the studies identified for this review are concerned with low back pain. This represents a clear lack of evidence about other forms of intervention or other conditions which may benefit from intervention to reduce or prevent the re-occurrence of long term sickness absence, specifically acute medical conditions, mental health and stress.

With the exception of the first group of effectiveness studies (Molde Hagen et al (2003); Soukup et al (1999); Leino et al (1994) and Holopainen (2004)), the studies are sufficiently diverse as to preclude aggregation of data, so there are limits to the conclusions that can be drawn about specific interventions on the basis of this evidence, particularly in relation to a UK population.

⁴⁹ Please note papers are graded separately, using different criteria, for the effectiveness and cost effectiveness reviews and therefore can have different ratings.
There are, however a number of emergent themes. Across the effectiveness and cost effectiveness studies, the interventions which are successful in reducing the re-occurrence of long term sickness absence share certain characteristics:

- Most involve early intervention (in the Molde Hagen study participants were identified at eight to 12 weeks sick listing; Steenstra, two to six weeks sick leave; and Torstensen, a minimum of eight weeks sick leave). This compares to far broader inclusion criteria in the studies which failed to show significant findings (60 days over the past two years; thirty days in the previous year; four weeks in the previous 52). The only exception is Soukup et al study in which the precise number of participants who had taken sick leave prior to the study is not stated.

- The interventions tend to involve some direct workplace input, either through design or assessment or workplace adaptation and delivery.

Overall this suggests that successful interventions are more likely to incorporate a range of perspectives, have some form of direct contact with the workplace and involve early intervention.

This review question is very specific in nature, concerned as it is with prevention of the re-occurrence of long term sickness absence and many studies were excluded on the basis that they did not have a ‘prevention of re-occurrence’ outcome. As such, these excluded studies may also be relevant to research question 2 (return to work from long term sickness absence). It is possible that data from research question 2 will also provide greater understanding of promising areas for research into interventions to prevent the re-occurrence of long term sickness absence.
References


Curtis L, Netten A. Unit costs of Health and Social Care 2004, Personal Social Services Research Unit, University of Kent.


Results of a pilot and feasibility study", *Occupational & Environmental Medicine*, vol. 51, no. 9, pp. 597-602.


Soukup MG, PT, MSci; Glomsrod B, PT; Lonn JH, PT; Bo K, PT, PE, PhD; Larsen S, MSc, DrSc. (1999) ‘The Effect of a Mensendieck Exercise Program as Secondary Prophylaxis for Recurrent Low Back Pain: A Randomised, Controlled Trial with 12 month follow-up’. *SPINE* Vol 24, Number 15, pp 1585 – 1592


Appendix 1: Example Search Strategy used for Research Questions 1 to 3

MEDLINE primary study search strategy research Questions 1 to 3 (intervention effectiveness)

1. long term absen$.ti,ab.
2. long term sick$.ti,ab.
3. exp sick leave/
4. (sick$ adj3 leave).ti,ab.
5. (sick$ adj3 absen$).ti,ab.
6. (work adj3 absen$).ti,ab.
7. (return$ adj3 work$).ti,ab.
8. work readiness.ti,ab.
9. sick$ benefit$.ti,ab.
10. disability leave.ti,ab.
11. (injur$ adj3 claim$).ti,ab.
12. (stay$ adj3 work$).ti,ab.
13. (participat$ adj3 work$).ti,ab.
15. (attend$ adj3 work$).ti,ab.
17. absenteeism/
18. ((sick$ or work$ or illness$ or employee$) adj3 absenteeism).ti,ab.
19. (welfare adj3 work$).ti,ab.
20. (sicklist$ or sick list$).ti,ab.
21. or/1-20

**Methodological filters**

**Randomized controlled trials:**

**MEDLINE**

1. RANDOMIZED CONTROLLED TRIAL.pt.
2. CONTROLLED CLINICAL TRIAL.pt.
3. RANDOMIZED CONTROLLED TRIALS/
4. CONTROLLED CLINICAL TRIALS/
5. RANDOM ALLOCATION/
6. DOUBLE BLIND METHOD/
7. SINGLE BLIND METHOD/
8. CLINICAL TRIAL.pt.
9. exp CLINICAL TRIALS/
11. ((singl$ or doubl$ or trebl$ or tripl$) adj25 (blind$ or mask$)).ti,ab.
12. PLACEBOS/
13. placebo$.ti,ab.
14. random$.ti,ab.
15. RESEARCH DESIGN.sh.
16. or/1-15
Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

Longitudinal/Intervention studies:

MEDLINE

1. exp longitudinal studies/
2. longitudinal$.tw.
3. exp retrospective studies/
4. retrospective study.tw.
5. exp prospective studies/
6. prospective study.tw.
7. quasi-experimental.tw.
8. (follow-up$ or follow$ up).tw.
9. repeat$ measure$.tw.
10. (post-test or posttest or (pre adj5 post)).tw.
11. (t1 or t2 or t3).tw.
12. baseline.tw.
13. (over time or time period).tw.
14. interrupted time series.tw.
15. predict$ design$.tw.
16. case control$.tw.
17. cohort.tw.
18. exp cohort studies/
19. exp case-control studies/
20. (intervention$ or program$ or strateg$ or initiative$ or policy or policies).ti,ab.
21. or/1-20
Reviews:

**MEDLINE**

1. COCHRANE DATABASE OF SYSTEMATIC REVIEWS.jn.
2. meta-analysis.pt.
3. medline.tw.
4. systematic review.tw.
5. search.tw.
6. or/1-5
Appendix 2: Sifting Criteria Used

The NICE Absence Sift Criteria for Research Questions 1 to 3 are set out below.

NICE Absence Sift Criteria: Effectiveness primary studies Questions 1 to 3

The ultimate aim of this review is to provide guidance on the most effective actions to manage sickness absence and support return to work.

For all titles and abstracts answer ALL questions unless coded as rev or econ at Q1 or excluded at any stage

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>ANS</th>
<th>QUALIFIER</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>Is this an evaluation of an intervention, policy, strategy or programme?</td>
<td>No</td>
<td>Review/Systematic Review or Meta Analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Economic data</td>
<td>Code as Econ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>Exclude</td>
</tr>
<tr>
<td></td>
<td>Yes, ie a piece of empirical research evaluating an intervention, policy, strategy or programme</td>
<td>Population – if focuses solely on children (under 16)</td>
<td>Exclude</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Delivered in non workplace or non primary care setting</td>
<td>Exclude</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Absence not due to sickness (ie maternity leave)</td>
<td>Exclude</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Doc type – dissertation</td>
<td>Exclude</td>
</tr>
<tr>
<td>QUESTION</td>
<td>ANS</td>
<td>QUALIFIER</td>
<td>ACTION</td>
</tr>
<tr>
<td>----------</td>
<td>-----</td>
<td>-----------</td>
<td>--------</td>
</tr>
<tr>
<td>Intervention – if focuses solely on provision of pharmacological treatment</td>
<td></td>
<td></td>
<td>Exclude</td>
</tr>
<tr>
<td>Intervention, policy etc – other</td>
<td></td>
<td></td>
<td>Go to Q2</td>
</tr>
<tr>
<td>Intervention, policy etc., population, setting, absence or document type - unclear</td>
<td></td>
<td></td>
<td>Go to Q2</td>
</tr>
<tr>
<td>Does the study measure work related outcomes?</td>
<td>No</td>
<td></td>
<td>Exclude</td>
</tr>
<tr>
<td>Reduce the numbers of employees moving from short to long term sickness absence?</td>
<td>Yes</td>
<td></td>
<td>Code as Review 1 (R1)</td>
</tr>
<tr>
<td>Aid the return to work of employees after long term sickness absence?</td>
<td>Yes</td>
<td></td>
<td>Code as Review 2 (R2)</td>
</tr>
<tr>
<td>Reduce the re-occurrence of an employees long term sickness absence?</td>
<td>Yes</td>
<td></td>
<td>Code as Review 3 (R3)</td>
</tr>
<tr>
<td>Assist incapacity benefit recipients in returning to work</td>
<td>Yes</td>
<td></td>
<td>Go to Q2a</td>
</tr>
<tr>
<td>Other work-related outcome</td>
<td>Unclear</td>
<td></td>
<td>Code unclear</td>
</tr>
<tr>
<td>If benefits related, is the population UK only?</td>
<td>No</td>
<td>If not relevant to R1, R2, R3</td>
<td>Exclude</td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td>Code as Review 4 (R4)</td>
</tr>
<tr>
<td>Unclear</td>
<td></td>
<td></td>
<td>Code unclear</td>
</tr>
<tr>
<td>Is the study longitudinal? (ie at least one follow up measure after baseline)</td>
<td>No</td>
<td></td>
<td>Tag</td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td>Include</td>
</tr>
<tr>
<td>Unclear</td>
<td></td>
<td></td>
<td>Code unclear</td>
</tr>
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</table>
Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

<table>
<thead>
<tr>
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<th>ACTION</th>
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</thead>
<tbody>
<tr>
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</tbody>
</table>

Enter decision in final column – if any ‘unclear’ code as GFP

Q4 Book chapter? Yes Tag

NICE Absence Sift Criteria: Economics (primary studies and reviews) Questions 1 to 3

The ultimate aim of the economics reviews is to provide guidance on the most cost effective actions to manage sickness absence and support return to work or to help those in receipt of incapacity benefit to return to full or part time work

For all titles and abstracts answer ALL questions UNLESS coded as exclude at any stage

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>ANS</th>
<th>QUALIFIER</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 Is the study a comparative economic evaluation of an intervention, policy, strategy or programme related to sickness absence? Yes Population – if focuses solely on children (16 &amp; under) Exclude Setting - delivered in non workplace or non primary care setting or delivered solely in a developing country Exclude Absence - not due to sickness (eg maternity leave) Exclude Topic – if focuses solely on pharmacological treatment Exclude Topic – if focus is prevention of 1st instance of sickness absence Exclude Topic – if focuses solely on effectiveness of IB system, private health insurance schemes or statutory sick pay Exclude Abstracts describes comparative economic evaluation of an intervention, Go to Q2</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>QUESTION</td>
<td>ANS</td>
<td>QUALIFIER</td>
<td>ACTION</td>
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<td>---------------------------------------------------------------------------</td>
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<tr>
<td><em>ie. not costs of an illness</em></td>
<td></td>
<td>policy etc</td>
<td></td>
</tr>
<tr>
<td><em>Unclear</em></td>
<td></td>
<td>Abstracts unclear if comparative economic evaluation of an intervention,</td>
<td>Code U/C &amp; go to Q2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>policy etc</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abstracts includes work related costs &amp; consequences but not comparative</td>
<td>Code - Modelling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>economic evaluation of intervention, policy etc</td>
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<tr>
<td></td>
<td><strong>No</strong></td>
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<td>Exclude</td>
</tr>
<tr>
<td>Q2 Does the study contain</td>
<td></td>
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<tr>
<td>work related outcome measures?</td>
<td><strong>No</strong></td>
<td></td>
<td>Exclude</td>
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<td><strong>Yes</strong></td>
<td>Reduce the numbers of employees moving from short to long term sickness</td>
<td>code R1</td>
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<td></td>
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<td>absence?</td>
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<td></td>
<td>Aid the return to work of employees after long term sickness absence?</td>
<td>code R2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduce the re-occurrence of an employees long term sickness absence?</td>
<td>code R3</td>
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<tr>
<td></td>
<td></td>
<td>Assist UK incapacity benefit recipients in returning to work</td>
<td>Go to Q3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other work-related outcome</td>
<td>Code Oth</td>
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<td></td>
<td><em>Unclear</em></td>
<td></td>
<td>Code U/C</td>
</tr>
<tr>
<td>Q3 Is the study based in UK</td>
<td><strong>No</strong></td>
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<td>Exclude</td>
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<tr>
<td></td>
<td><strong>Yes</strong></td>
<td>Include in Q4 economics review</td>
<td>Code as Review 4</td>
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<tr>
<td></td>
<td><em>Unclear</em></td>
<td></td>
<td>Code U/C</td>
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</tbody>
</table>

*Enter decision in final column – if any ‘unclear’ code as GFP*

*Tag if book chapter & tag if benefits recipients*
The ultimate aim of the review is to provide guidance on the most effective actions to manage sickness absence and support return to work or to help those in receipt of incapacity benefit to return to full or part time work.

For all titles and abstracts answer ALL questions UNLESS coded as exclude at any stage.

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>ANS</th>
<th>QUALIFIER</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>Is the article a review of interventions, policies, strategies or programmes aimed at reducing sickness absence or aiding return to work?</td>
<td>Yes</td>
<td>Population – if focuses solely on children (16 &amp; under)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Setting – if related to reducing sickness absence and delivered in non workplace or non primary care setting (check IB relevant)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Setting - delivered solely in a developing country</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absence - not due to sickness (eg maternity leave)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intervention – if solely health promotion or prevention of 1st instance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intervention – if focuses solely on pharmacological treatment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intervention – deals solely with effectiveness of IB system, private health insurance schemes or statutory sick pay</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intervention, policy etc – other</td>
</tr>
<tr>
<td>Q2</td>
<td>Is it a review of</td>
<td>Yes</td>
<td></td>
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</table>

Unclear | Intervention, policy etc – unclear | unclear & go to Q2 |
<table>
<thead>
<tr>
<th>QUESTION</th>
<th>ANS</th>
<th>QUALIFIER</th>
<th>ACTION</th>
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</thead>
<tbody>
<tr>
<td>longitudinal studies?</td>
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<td>Exclude</td>
</tr>
<tr>
<td></td>
<td>Unclear</td>
<td></td>
<td>unclear &amp; go to Q3</td>
</tr>
<tr>
<td>Q3 Does the review report on work related outcome measures?</td>
<td>No</td>
<td></td>
<td>Exclude</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>Reduce the numbers of employees moving from short to long term sickness absence?</td>
<td>code Review 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aid the return to work of employees after long term sickness absence?</td>
<td>code Review 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduce the re-occurrence of an employees long term sickness absence?</td>
<td>code Review 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assist UK incapacity benefit recipients in returning to work</td>
<td>Go to Q4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other work-related outcome</td>
<td>Code Other</td>
</tr>
<tr>
<td></td>
<td>Unclear</td>
<td></td>
<td>Code unclear</td>
</tr>
<tr>
<td>Q4 Does the review contain data from (a) UK based study/ies</td>
<td>No</td>
<td></td>
<td>Exclude</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td></td>
<td>Include</td>
</tr>
<tr>
<td></td>
<td>Unclear</td>
<td></td>
<td>Code unclear</td>
</tr>
<tr>
<td>TAG</td>
<td>Book chapter</td>
<td>Tag</td>
<td></td>
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<tr>
<td></td>
<td>Economics data</td>
<td>Tag</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primary study</td>
<td>Tag</td>
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</table>

Enter decision in final column – if any ‘unclear’ code as GFP
## Appendix 3: Full Paper Screening Checklists

### Table 2

<table>
<thead>
<tr>
<th>Full paper screening TRIAGE Form: Q3 Effectiveness (primary study)</th>
<th>Ref Man ID No:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper checked by:</td>
<td>Date of check:</td>
</tr>
<tr>
<td>1. <strong>Population:</strong> Does the study population include adults over age 16 in full or part-time employment, both paid and unpaid who have experienced long-term sickness (which may be defined as ‘long-term absence’ or ‘sickness absence’ in the research)?</td>
<td>Yes No unclear</td>
</tr>
<tr>
<td>2. <strong>Intervention:</strong> Does the intervention/policy/strategy/programme being delivered aim to reduce the re-occurrence or the number of incidences or re-occurrence of long-term sickness absence?</td>
<td>Yes No unclear</td>
</tr>
<tr>
<td>3. <strong>Setting:</strong> Is the setting…</td>
<td>Yes No unclear</td>
</tr>
<tr>
<td>• based in a developed/OECD country/ies</td>
<td>Yes No unclear</td>
</tr>
<tr>
<td>• a primary care setting and/or workplace setting and/or planned, designed, delivered, managed or funded in collaboration with primary care providers and/or employers. (These interventions, policies, programmes or strategies can be delivered by a number of providers (such as voluntary, private, statutory sectors) and/or in various settings not just workplace or primary care settings as long as they are fully or co-planned, designed, delivered, managed and/or funded in collaboration with primary care providers and/or employers? ). Interventions can include mixed component studies - eg treatment and public health)</td>
<td>Yes No unclear</td>
</tr>
<tr>
<td>4. <strong>Outcome:</strong> Is one of the following work absence related outcomes being measured:</td>
<td>Yes No unclear</td>
</tr>
<tr>
<td>• return to work (paid and un-paid) after re-occurring long-term sickness. (This could be a return to work in: original role with same hours, original role with reduced hours, alternative role with same hours, or alternative role with different hours).</td>
<td>Yes No unclear</td>
</tr>
<tr>
<td>• reduced incidence of recurring (&gt;1 episode) long-term sickness</td>
<td>Yes No unclear</td>
</tr>
<tr>
<td>• shorter periods of recurring sickness absence</td>
<td>Yes No unclear</td>
</tr>
<tr>
<td>• reduction in number of sick days</td>
<td>Yes No unclear</td>
</tr>
<tr>
<td>• improvements in individual and/or population-level health status which enables remaining in work following sickness absence incidences</td>
<td>Yes No unclear</td>
</tr>
<tr>
<td>• no effect on return to work after re-occurring long-term sickness or no effect on number of sick days taken</td>
<td>Yes No unclear</td>
</tr>
<tr>
<td>• cost effectiveness of intervention/policy/strategy or programme</td>
<td>Yes No unclear</td>
</tr>
<tr>
<td>• other work absence related outcome (please specify)</td>
<td>Yes No unclear</td>
</tr>
</tbody>
</table>
5. **Study Design**: Is the study longitudinal in design (ie at least one measurement after baseline)
   
<table>
<thead>
<tr>
<th>RCT</th>
<th>Yes</th>
<th>No</th>
<th>unclear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlled before and after</td>
<td>Yes</td>
<td>No</td>
<td>unclear</td>
</tr>
<tr>
<td>Cohort</td>
<td>Yes</td>
<td>No</td>
<td>unclear</td>
</tr>
<tr>
<td>Case control</td>
<td>Yes</td>
<td>No</td>
<td>unclear</td>
</tr>
<tr>
<td>Before and after</td>
<td>Yes</td>
<td>No</td>
<td>unclear</td>
</tr>
<tr>
<td>Interrupted Time Series</td>
<td>Yes</td>
<td>No</td>
<td>unclear</td>
</tr>
</tbody>
</table>

   **Other (please specify as reported)**

   **IF ANY 1-5 = 'NO', CHECK Q8 THEN EXCLUDE**

6. If 1-5 all **Yes**, does the study meet any of the following exclusion criteria:

   - Study – pre 1990
   - Study not English language
   - Deals solely with preventing ill-health retirement (ie where recipient has no intention of returning to work)
   - Deals solely with self-employed individuals
   - Deals solely with unemployed individuals
   - Deals solely with pregnant women who have taken sickness absence related to their pregnancy, during the course of their pregnancy
   - Deals solely with workplace absences which are not reported and/or recorded as sickness absence (eg maternity leave)
   - Solely aims to prevent the first occurrence of short or long sickness absence (primary prevention)
   - Deal solely with the provision of clinical diagnosis, treatment (including pharmacological or therapeutic interventions) and management of conditions associated with short and/or long-term sickness
   - Solely target pregnant women exclusively and/or which focus on illnesses associated with pregnancy, during the course of pregnancy
   - Deal solely with the effectiveness of private health insurance schemes and/or claiming of statutory or occupational sick pay
   - Dissertation or thesis

   **IF ANY Q6 = 'YES', CHECK Q8 THEN EXCLUDE**

7. If the study is a combined population, topic or location, can the public health data be disaggregated?

8. Does the study contain economic/cost data or effectiveness data relevant to the other research questions* OR data relevant for the economic modelling for this research question (which does not have to be UK)

   **Q7 = 'NO', TAG AS MIXED, THEN EXCLUDE: IF ANY Q1-7 = 'UNCLEAR', REFER FOR SECOND OPINION**

   **Put forward for QUALITY ASSESSMENT and DATA EXTRACTION (studies to be grouped by study design type)**

<table>
<thead>
<tr>
<th>Q1</th>
<th>Q2</th>
<th>Q4</th>
</tr>
</thead>
</table>
Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis.
### Full paper screening TRIAGE Form: Q3 Reviews

<table>
<thead>
<tr>
<th>Paper checked by:</th>
<th>Date of check:</th>
<th>Ref Man ID No:</th>
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</thead>
<tbody>
<tr>
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</tbody>
</table>

1. **Population:** Does the review partly or wholly cover studies where the population is adults over age 16 in full or part-time employment, both paid and unpaid who have experienced long-term sickness (which may be defined as ‘long-term absence’ or ‘sickness absence’ in the research)?

2. **Intervention:** Does the review partly or wholly cover studies where the intervention/policy/strategy/programme being delivered aim to reduce the re-occurrence or the number of incidences of re-occurrence of long-term sickness absence?

3. **Setting:** Does the review partly or wholly cover studies where the setting is...
   - based in a developed/OECD country/ies
   - a primary care setting and/or workplace setting and/or planned, designed, delivered, managed or funded in collaboration with primary care providers and/or employers. *(These interventions, policies, programmes or strategies can be delivered by a number of providers (such as voluntary, private, statutory sectors) and/or in various settings not just workplace or primary care settings as long as they are fully or co-planned, designed, delivered, managed and/or funded in collaboration with primary care providers and/or employers?).* Interventions can include mixed component studies - eg treatment and public health *

4. **Outcome:** Does the review cover studies where one of the following work absence related outcomes are being measured:
   - return to work (paid and un-paid) after re-occurring long-term sickness. *(This could be a return to work in: original role with reduced hours, alternative role with same hours, original role with reduced hours, alternative role with different hours).*
   - reduced incidence of recurring (>1 episode) long-term sickness
   - shorter periods of recurring sickness absence
   - reduction in number of sick days taken
   - improvements in individual and/or population-level health status which enables remaining in work following sickness absence incidences
   - no effect on return to work after re-occurring long-term sickness or no effect on number of sick days taken
   - cost effectiveness of intervention/strategy/policy or programme
   - other work absence related outcome (please specify)

5. **Study Design:** Does the review include studies that are longitudinal in design (ie at least one measurement after baseline)?
   - if yes what are the study designs?(circle as appropriate): RCT
   - Controlled before and after
   - Cohort
   - Case control
   - Before and after
   - Interrupted Time Series
   - Other (please specify as reported)………………………………………..

**IF ANY 1-5 = 'NO', CHECK Q8 THEN EXCLUDE**

6. If 1-5 all Yes, does the review meet any of the following exclusion criteria:
   - Review – pre 1990
   - Review not English language
   - Deals solely with preventing ill-health retirement (ie where recipient has no intention of returning to work)
Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

- Deals solely with self-employed individuals
- Deals solely with unemployed individuals
- Deals solely with pregnant women who have taken sickness absence related to their pregnancy, during the course of their pregnancy
- Deals solely with workplace absences which are not reported and/or recorded as sickness absence (eg maternity leave)
- Solely aims to prevent the first occurrence of short or long term sickness absence (primary prevention)
- Deals solely with the provision of clinical diagnosis, treatment (including pharmacological or therapeutic interventions) and management of conditions associated with short and/or long-term sickness
- Solely targets pregnant women exclusively and/or which focuses in illnesses associated with pregnancy, during the course of pregnancy
- Deals solely with the effectiveness of private health insurance schemes and/or claiming of statutory or occupational sick pay
- Dissertation or thesis

| 7. | *Does the review contain economic/cost data or effectiveness data relevant to the other research questions OR data which may be useful for the economic modelling (specify)……………………………………………………………………………………… | Yes  | No  | unclear |
| 8. | Put forward for reference checking | Yes  | No  | unclear |

* Q1 – Preventing/reduce employees moving from short to long term sickness (including re-occurrence of short term sickness); Q2 Help employees return to work from LTSA; Q3 prevent the re-occurrence of LTSA
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Unclear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population: Does the study population include adults over age 16 in full or part-time employment, both paid and unpaid who have experienced long-term sickness (which may be defined as 'long-term absence' or 'sickness absence' in the research)?</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>Intervention: Does the intervention/policy/strategy/programme being delivered aim to reduce the re-occurrence or the number of incidences of re-occurrence of long-term sickness absence?</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>Setting: Is the setting...</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- based in a developed/OECD country/ies</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- a primary care setting and/or workplace setting and/or planned, designed, delivered, managed or funded in collaboration with primary care providers and/or employers.</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>Interventions can include mixed component studies - eg treatment and public health</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>Outcome: Is one of the following work absence related outcomes being measured:</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- return to work (paid and un-paid) after re-occurring long-term sickness. (This could be a return to work in: original role with same hours, original role with reduced hours, alternative role with same hours, or alternative role with different hours).</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- reduced incidence of recurring (&gt;1 episode) long-term sickness</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- shorter periods of recurring sickness absence</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- reduction in number of sick days taken</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- improvements in individual and/or population-level health status which enables remaining in work following sickness absence incidences</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- no effect on return to work after re-occurring long-term sickness or no effect on number of sick days taken</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- cost effectiveness of intervention/policy/strategy/programme</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- other work absence related outcome (please specify)</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>Study design: Is the study an economic evaluation (ie an RCT or longitudinal study with at least one follow up measure after baseline) with cost effectiveness, cost consequence, cost benefit, cost utility, cost minimization or net monetary (cost) benefit data?</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>If yes to Q5, What is the study design?</td>
<td>Cost benefit (CBA)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>- Cost effectiveness</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- Cost utility</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>Other (please specify as reported)</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>IF ANY 1-5 = 'NO', CHECK Q8 THEN EXCLUDE</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>6. If 1-5 all Yes, does the study meet any of the following exclusion criteria:</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- Study – pre 1990</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- Study not English language</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- Deals solely with preventing ill-health retirement (ie where recipient has no intention of returning to work)</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
<tr>
<td>- Deals solely with self-employed individuals</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
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<tr>
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<td>Yes</td>
<td>No</td>
<td>Unclear</td>
</tr>
</tbody>
</table>
94 Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

| • Deals solely with pregnant women who have taken sickness absence related to their pregnancy, during the course of their pregnancy | Yes  No  unclear |
| • Deals solely with workplace absences which are not reported and/or recorded as sickness absence (eg maternity leave) | Yes  No  unclear |
| • Solely aims to prevent the first occurrence of short or long term sickness absence (primary prevention) | Yes  No  unclear |
| • Deal solely with the provision of clinical diagnosis, treatment (including pharmacological or therapeutic interventions) and management of conditions associated with short and/or long-term sickness | Yes  No  unclear |
| • Solely targets pregnant women exclusively and/or which focus on illnesses associated with pregnancy, during course of pregnancy | Yes  No  unclear |
| • Deal solely with the effectiveness of private health insurance schemes and/or claiming of statutory or occupational sick pay | Yes  No  unclear |
| • Dissertation or thesis | Yes  No  unclear |

**IF ANY Q6 = 'YES', CHECK Q8 THEN EXCLUDE**

| 7. If the study is a combined population, topic or location, can the public health data be disaggregated? | Yes  No  Unclear |
| 8. Does the study contain economic/cost data or effectiveness data relevant to the other research questions* OR data relevant for the economic modelling for this research question (which does not have to be UK) | Yes  No  Q1  Q2  Q3  Modelling |

**IF Q7 = 'NO', TAG AS MIXED, THEN EXCLUDE IF ANY Q1-7 = 'UNCLEAR', REFER FOR SECOND OPINION**

9. Put forward for QUALITY ASSESSMENT and DATA EXTRACTION (studies to be grouped by study design type)

(*Q1 Preventing/reduce employees moving from short to long term sickness (including re-occurrence of short term sickness); Q2 Help employees return to work from LTSA; Q4 return to work for IB recipients)
Appendix 4: Excluded Primary Studies by Reason for Exclusion

Effectiveness studies: Excluded studies by reason\textsuperscript{50}

Population

(eg the study did not include employees or people with experience of long-term sickness absence who were back at work and therefore at risk of a re-occurrence of long-term sickness absence)


\textsuperscript{50} Once a study falls against one criterion it is not checked against the others. Studies may not pass a number of criteria for inclusion but are listed here under the first reason for which they are excluded.


Bendix, A. F., Bendix, T., & Haestrup, C. 1998, "Can it be predicted which patients with chronic low back pain should be offered tertiary rehabilitation in a functional restoration program? A search for demographic, socioeconomic, and physical predictors... including commentary by Mayer TG", *Spine*, vol. 23, no. 16, pp. 1775-1784.


Bunketorp, L., Lindh, M., Carlsson, J., & Victorin, E. 2006, "The effectiveness of a supervised physical training model tailored to the individual needs of patients
Burke, Burton, Burton, who take long term sickness absence on a recurring basis


Chyou, P. H., Scheuer, D., & Linneman, J. G. 2006, "Assessment of female participation in an employee 20-week walking incentive program at Marshfield Clinic, a large multispecialty group practice"
Adding a vocational focus to mental health rehabilitation", *Clinical Medicine & Research*, vol. 4, no. 4, pp. 256-265.


Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis


Kerin, A. & Aguirre, A. 2005, "Improving health, safety, and profits in extended hours operations (shiftwork)", *Industrial Health*, vol. 43, no. 1, pp. 201-208.


LeFort, S. M. & Hannah, T. E. 1994, "Return to work following an aquafitness and muscle strengthening program for the low back injured", *Archives of Physical Medicine and Rehabilitation*, vol. 75, no. 11, pp. 1247-1255.


Adding a vocational focus to mental health rehabilitation", Journal of Occupational and Environmental Medicine, vol. 43, no. 11, pp. 959-968.


Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis


Macdonald, S., Wells, S., Lothian, S., & Shain, M. 2000, "Absenteeism and other workplace indicators of Employee Assistance Program clients and matched controls
Adding a vocational focus to mental health rehabilitation", Employee Assistance Quarterly, vol. 15, no. 3, pp. 41-57.


Margo, K. 2000, "An 8-session exercise program was effective for subacute or chronic low-back pain... commentary on Moffett JK, Torgerson D, Bell-Syer S et al. Randomized controlled trial of exercise for low back pain: clinical outcomes,


Moens, G., Johannik, K., Dohogne, T., & Vandepoele, G. 2002, "The effectiveness of teaching appropriate lifting and transfer techniques to nursing students: Results after two years of follow-up", Archives of Public Health, vol. 60, no. 2, pp. 115-123.


Proper, K., Hildebrandt, V., van der Beek, A., & Green, B. B. 2003, "A patient-centred, workplace-based counselling programme may increase workers' physical activity", *Evidence-Based Healthcare*, vol. 7, no. 3, pp. 138-139.


Adding a vocational focus to mental health rehabilitation", *JAMA: Journal of the American Medical Association*, vol. 286, no. 11, pp. 1325-1330.


Adding a vocational focus to mental health rehabilitation", *Work: Journal of Prevention, Assessment & Rehabilitation*, vol. 26, no. 2, pp. 107-114.


Sjolinder, P. O. & Nota, D. F. 1994, "Early return to work following an aggressive rehabilitation program initiated one day after spine surgery", *Journal of Occupational Rehabilitation*, vol. 4, no. 4, pp. 211-228.


Thrift, J. 1999, "Case managers at the helm of return-to-productivity programs”, Case Manager, vol. 10, no. 4, pp. 75-79.


van den Heuvel, S. G., de Looze, M. P., Hildebrandt, V. H., & The, K. H. 2003, "Effects of software programs stimulating regular breaks and exercises on work-related
Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis


Verbeek, J. H. 2006, "How can doctors help their patients to return to work?", Plos Medicine, vol. 3, no. 3, pp. 312-315.


employment outcomes after five years’, *American Journal of Physical Medicine & Rehabilitation*, vol. 72, no. 6, pp. 355-363.


Non-intervention

*(Descriptive or other studies not examining an intervention, strategy, programme or policy designed to reduce the number of employees who take long term sickness absence on a recurring basis).*


Faber, E., Bierma-Zeinstra, S. M., Burdorf, A., Nauta, A. P., Hulshof, C. T., Overzier, P. M., Miedema, H. S., & Koes, B. W. 2005, "In a controlled trial training general practitioners and occupational physicians to collaborate did not influence sickleave of patients with low back pain", *Journal of Clinical Epidemiology*, vol. 58, no. 1, pp. 75-82.


Field, T., Hernandez-Reif, M., Diego, M., & Fraser, M. 2007, "Lower back pain and sleep disturbance are reduced following massage therapy", *Journal of Bodywork & Movement Therapies*, vol. 11, no. 2, pp. 141-145.


Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis


Study design

(ie not an RCT or longitudinal study)


Bentsen, H., Lindgårde, F., & Manthorpe, R. 1997, "The effect of dynamic strength back exercise and/or a home training program in 57-year-old women with

Bevan, S. & Heron, P. 1999, "Reviewing attendance in the NHS. Causes of absence and discussion of management strategies", _p. 34.

Bjerke S. A behavioural-oriented graded activity program reduced the number of days absent from work because of low back pain. Australian Journal of Physiotherapy 2004; 50(3):185.


Cohen, R. D. 2003, "IBD: The drugs work... But do the patients?", *American Journal of Gastroenterology*, vol. 98, no. 4, pp. 722-723.


Kendrick, P. A. 1798, "Trial of Problem-solving by CPNS for depression, anxiety and life-difficulties among General Practice patients Complete", _.

Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis


Trifiletti, B. 2006, "Getting the at risk patient back to work--a strategy", *Australian Family Physician*, vol. 35, no. 12, pp. 952-956.


**No relevant absence related outcome reported**


Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

Not the right setting

*(eg intervention provided in secondary rather than primary care)*


Mixed population


Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

Not in English


Cost effectiveness: Excluded studies by reason

Not an economic evaluation


due to low back pain, design of a population based controlled trial [ISRCTN60233560]. BMC Musculoskeletal Disorders 4:26.


Not a long-term sickness absence population

(including no baseline data on sickness absence)


Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

Potential LTSA population data not disaggregated

(eg. population includes some of sample potentially on LTS, but actual numbers or % of sample on LTSA unclear and outcomes related to this population also unclear)


Not a recurrence of long-term sickness absence outcome


Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

Inappropriate study design


Not English language


Appendix 5: Studies Pending


Watson, D. P. A randomised controlled trial of vocationally orientated pain management versus best practice advice in managing return to work in chronic

and not received by the agreed cut off date of 3 April 2008.
Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

Cost-effectiveness primary studies

There are no pending papers for this element of the review.

Review studies

There are no pending papers for this element of the review.
Appendix 6: Example Completed Effectiveness Data Extraction form and Quality Checklist

Data Extraction Form

<table>
<thead>
<tr>
<th>Authors/Title/Source</th>
<th>Ref ID rct 835:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Margreth G Soukup, PT, MSci; Bredo Glomsrod, PT; Jan H. Lonn, PT; Kari Bo, PT, PE, PhD; Stig Larsen, MSc, DrSc. The Effect of a Mensendieck Exercise Program as Secondary Prophylaxis for Recurrent Low Back Pain: A Randomised, Controlled Trial with 12 month follow-up. SPINE Vol 24, Number 15, pp 1585 – 1592, 1999</td>
<td></td>
</tr>
</tbody>
</table>

Project: Question 3

Data extracted by: Darcy Hill Date of extraction: 18/12/07

Describe the study:
- Systematic review (including at least one RCT) □
- Systematic review of experimental studies □
- Systematic review of observational studies □
- Randomised controlled trial: Individual ☑
- Randomised controlled trial: Cluster □
- Controlled non-randomised trial □
- Controlled before-and-after □
- Interrupted time series □
- Before and after study □
- Economic analysis □
- (use economic data extraction and quality assessment forms) □
- Case study □
- Other (please state) □
**What was the research question?**

To evaluate the effect of a Mensendieck Program on the incidence of recurrent episodes of low back pain in patients with a history of the condition who currently are working.

**Other study parameters:**

**Setting:**

- Geographical (City/country): South-eastern Norway
- Social (school/workplace etc): General physical therapy practice setting
- Date of study (to/from): Paper acknowledged 30 April 1998
- Who funded the study? Norwegian Fund for Post Graduate Training in Physiotherapy, the Royal Norwegian Ministry of Health and Social Affairs

**Participants:**

Number of participants/organisations etc enrolled:

- Treatment group: n=39; Control: n=38. At final follow-up: treatment: n=34; Control: n=35

Details on age, gender, and other characteristics (specifically disability, ethnicity, sexual orientation, religion or belief and socio-economic status) if presented:

- See tables 1 and 2 for full details (photocopy attached)

Were intervention groups balanced at baseline?:

Yes, on most variables (demographic, LBP history) there was no significant differences between groups except with regard to baseline participation in physical training during leisure time. Potential bias is likely to have a negative effect on results, reducing observed differences between groups.

**Comments:**

**Unit of allocation/recruitment:**

- Individual
  - Sex
  - Age (range or mean)
- Group
Organisation/Institution
Community/Environment
Policy/socio-political

**Method of recruitment/enrolment and response rate:**
Sought by advertising in local media, and by referral from doctors, physical therapists and chiropractors in general practice in South-eastern Norway.

**Method of allocation to intervention:**
Was allocation concealed? Yes ☑ No ☐ Not clear ☐

**Selection criteria:**

**Inclusion:**
18-50 years old, who had experienced one or more episodes of LBP (pain localised to the lumbar region, with or without pain radiating to the lower extremities). Episode further defined as LBP resulting in professional treatment or use of sick leave. At the time of enrolment, patients required to have finished treatment for their LBP episode and had returned to work. Also needed to have time and opportunity to participate in Mensendieck exercise groups for 13 weeks, and agreed to randomisation procedure.

**Exclusion:**
Previous back surgery, pregnancy, specific rheumatologic diseases, spondylolisthesis, spinal tumour, spinal fracture, drug or alcohol abuse and documented mental illness.

**Intervention:**

**Description of the Intervention:**
Exercises and biomechanical/ergonomic education in 20 group sessions of 60 minutes each, for 13 weeks (two session per week for 7 weeks, and one session per week for 6 weeks). Detailed breakdown of session content also described.

**Description of the comparator(s):**
Received written and oral information about the Mensendieck approach (no
Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

<table>
<thead>
<tr>
<th>attendance to practical training sessions).</th>
</tr>
</thead>
</table>

Method/mode of delivery (for example, peer education):

Group training sessions

Providers/deliverers of the intervention (including organisations involved):

Mensendieck – educated physical therapists

Length, duration and intensity of the intervention: (see above)

- 10 min warm-up exercises
- 5 min stretching for legs, hips, buttocks
- 35 min information session combining ergonomic info and pelvic, hip, back and abdominal exercises
- 5 min stretching for lower extremities, pelvis and back
- 5 min relaxation exercises

Time to follow-up (average/median):

- 5 months, 12 months

How many (n, %) participants completed the intervention?

- 90% completed (87% of treatment group, 92% of control group)

Details on age, gender, and other characteristics (specifically disability, ethnicity, sexual orientation, religion or belief and socio-economic status) if presented:

- See attached tables 1 and 2

For non-completers, were the reasons for non-completion described?

- Yes. Pregnancy (1); scheduling difficulties due to unforeseen changes to working situation (3); failure to return after randomisation with no reason given (1); disappointment with allocation to control group (2); moved to another city (1).
Outcomes:

Primary outcomes:

- Sustained return to work (paid and un-paid) after long-term sickness.
- Primary outcome: recurrence of LBP (observed in days from inclusion until the day of event, during the 12-month follow-up period).
- Reduced incidence of recurring (>1 episode) long-term sickness
- Shorter periods of recurring sickness absence
- Improvements in individual and/or population-level health status which enables remaining in work following sickness absence incidences no effect on return to work after long-term sickness

Describe outcome measures:

- Type and number of health care contacts
- Number of sick leave days

Were baseline measurements of outcomes assessed?

- Yes ☑
- No ☐

Were the outcome measure(s) validated?

- Yes ☐
- No ☑
- Not clear ☐

If yes, how? Primary outcome measures are self-reported and open to recall bias.

Secondary outcomes:

- Acceptability of the intervention/policy/programme/strategy – content/frequency/location etc.
- Costs of intervention/policy/strategy or programme
- Barriers to or facilitators of effective implementation
- Reduction in number and duration of reported and/or recorded sickness absences associated with (but not limited to) the following:
  - Musculo-skeletal injuries including back pain

---

1 Adapted from Nutbeam’s model (1998).
Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

- acute and/or recurring medical conditions
- stress
- mental illness
- alcohol or drug-related problems
- other long-term conditions and chronic conditions
- home and family responsibilities

Increase in number of employers that have introduced policies and procedures to monitor/address sickness absence

Increase in number of employers who have made reasonable adjustments in the workplace to enable people to return to work

Increase in number of employees who are appropriately referred to an occupational health service when they are on long-term sick leave

Increase in number of people on long-term sick leave who liaise with general practitioners and/or physiotherapists or other support staff about their ability to return to work

Reduction in the number of people who initiate claims under the Disability Discrimination Act 2005

Reduction in personal injury claims

No effect on any other work related outcome

Describe outcome measures

- back pain in general in preceding month
- back pain related to 12 daily activities
- self assessment of back function using 100mm visual analogue scale
- general functional status measured by CIIP/WONCA charts

Were baseline measurements of outcomes assessed?

Yes ☑ No ☐

Were the outcome measure(s) validated?

Yes ☑ No ☐ Not clear ☐

If yes, how?

Some validated: COOP/WONCA instrument for measuring general functional status is validated and reliable (referenced in paper), though may not be
sensitive enough to detect clinically important differences in patients with LBP in the acute phase.

**Analyses:**

Self-reporting and assessment by investigators (not blinded when recording outcome measures at five and 12 month follow-up examinations).

Describe methods used (intention to treat, descriptive statistics, qualitative analysis etc):

Descriptive statistics including means of continuously distributed variables with confidence intervals (95 per cent), contingency tables for categorical variables, Kaplan and Meier plot for time from inclusion to first LBP episode, mean pain scores (in general, and in relation to 12 daily activities). All tests were two-tailed, significance level of five per cent. ANOVA between groups.

**Unit of analysis:**

| Individual | ☑ | Group | ☑ |
| Community/environment | ☐ | Policy/socio-political | ☐ |

**Power**

Was a power calculation presented?

Yes ☑ No ☐

If yes, describe:

Power analysis on the primary end point of the study (incidence of recurrence LBP over 12 months); Required size of study pop. To meet an alpha of 0.05, was 62 patients, at a power of 95 per cent.

Was the study powered to detect an effect if one exists?

Yes ☑ No ☐ Not clear ☐

Any other process details:

**Results:**
Briefly describe the results for each of the main outcomes (what size of effect is identified in the study?) List all measures of effects in the units used in the study – for example, absolute or relative risk, number needed to treat, include p values and any confidence intervals that are provided). Also describe results according to individual or population characteristics including age, gender, and other characteristics specifically disability, ethnicity, sexual orientation, religion or belief and socio-economic status (if presented)?

At 12 months, incidence of LBP significantly less for treatment group (11 of 34) than in the control group (20 of 35); (P<0.05).

Trend towards fewer days of sick leave because of LBP but no significant difference between groups.

Reduction in pain, improvement in function in both groups, no significant difference between groups.

Are there any key criticisms of the conclusions drawn by the author’s?

Self-selected participants may gave resulted in a study sample with high motivation for physical training, however most secondary prevention programs for LBP are based on voluntary participation. Self-reported measures for sick leave and LBP episodes may be affected by recall bias, but bias should be similar for both groups. Statistically non-significant results for pain, back function and general functional status possibly related to relatively low pain levels and good functional status at baseline, thus leaving little room for improvement.

Does the paper address or offer any evidence of effect according to either of the following individual/population characteristics? If so, please ensure that evidence is presented in results above.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Yes □</th>
<th>No □</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older people</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
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<tr>
<td>Socio-economic status</td>
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<tr>
<td>People with disabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion or belief</td>
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<td></td>
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</tbody>
</table>
**Other (please specify):**

| People with history of low back pain | Yes ☑ |

**Does the paper demonstrate any evidence of harms or adverse effects associated with the intervention?** No

**Do the authors identify any strengths and/or weaknesses of the evidence presented?**
Yes, described in discussion.

**In your opinion, are the results generalisable to the UK?**

| Yes ☑ | No ☐ |

Why: None of the sample characteristics, intervention components, or outcome measures are specific to the Norwegian study population

**Do the authors identify any evidence gaps or make any recommendations for further research?** No

**Is there any data on cost-effectiveness presented?** No, but implications for cost-effectiveness are discussed/explored

**Are there policy implications of the work?** Yes

**Are there effective practice implications of the work?** Yes

**Pass to other reviewer for second opinion?**

**Comment:**
Interventions strategies, programmes and policies to reduce the number of employees who take long term sickness absence on a recurring basis

**Quality Assessment: Randomised controlled trials**

**Study identification:**

*author: Soukup, MG et al.*  
*titled: The Effect of a Mensendieck Exercise Program as Secondary Prophylaxis for Recurrent Low Back Pain: A Randomized, Controlled Trial with 12-month Follow-up*  
*reference: SPINE Volume 24, Number 15, pp 1585-1592*  
*year of publication: 1999*

<table>
<thead>
<tr>
<th>Guideline topic: LTSA</th>
<th>Key question no: Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checklist completed by: Darcy Hill</td>
<td></td>
</tr>
</tbody>
</table>

### SECTION 1: INTERNAL VALIDITY

<table>
<thead>
<tr>
<th>In a well-conducted RCT study:</th>
<th>In this study this criterion is:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1</strong> The study addresses a clearly focused question .</td>
<td>Well addressed Adequately addressed Poorly addressed Not addressed Not reported Not applicable</td>
</tr>
<tr>
<td><strong>1.2</strong> The assignment of subjects to intervention groups is randomised.</td>
<td>Well addressed Adequately addressed Poorly addressed Not addressed Not reported Not applicable</td>
</tr>
<tr>
<td><strong>1.3</strong> An adequate concealment method is used .</td>
<td>Well addressed Adequately addressed Poorly addressed Not addressed Not reported Not applicable</td>
</tr>
<tr>
<td><strong>1.4</strong> Subjects and investigators are kept ‘blind’ about intervention allocation.</td>
<td>Well addressed Adequately addressed Poorly addressed Not addressed Not reported Not applicable</td>
</tr>
<tr>
<td><strong>1.5</strong> The intervention and control groups are similar at the start of the trial.</td>
<td>Well addressed Adequately addressed Poorly addressed Not addressed Not reported Not applicable</td>
</tr>
<tr>
<td>Section</td>
<td>Question</td>
</tr>
<tr>
<td>---------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1.6</td>
<td>The only difference between groups is the intervention under investigation.</td>
</tr>
<tr>
<td>1.7</td>
<td>All relevant outcomes are measured in a standard, valid and reliable way.</td>
</tr>
<tr>
<td>1.8</td>
<td>What percentage of the individuals or clusters recruited into each intervention arm of the study dropped out before the study was completed?</td>
</tr>
<tr>
<td>1.9</td>
<td>All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention-to-treat analysis).</td>
</tr>
<tr>
<td>1.10</td>
<td>Where the study is carried out at more than one site, results are comparable for all sites.</td>
</tr>
</tbody>
</table>

**SECTION 2: OVERALL ASSESSMENT OF THE STUDY**

<table>
<thead>
<tr>
<th>Section</th>
<th>Question</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>How well was the study done to minimise bias? <em>Code ++, + or –</em></td>
<td>-</td>
</tr>
<tr>
<td>2.2</td>
<td>If coded as + or – what is the likely direction in which bias might affect the study results?</td>
<td>Weaknesses in study design are likely to affect potential bias in both positive and negative directions, but are generally consistent between groups.</td>
</tr>
<tr>
<td>2.3</td>
<td>Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?</td>
<td>Yes – although the sample size is quite small</td>
</tr>
<tr>
<td>2.4</td>
<td>Are the results of this study directly applicable to the patient group targeted by this guideline?</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Appendix 7: Economic Data Extraction and Quality Assessment Form

0.0  Name of study
Economic evaluation of a multi-stage return to work program for workers on sick-leave due to low back pain

0.1  Authors

0.2  Journal details including year

0.3  Country/countries
Netherlands, repeat of study previously carried out in Canada.

0.4  Cross reference to data extraction for effectiveness evaluation (where applicable)
?

0.5  Sample sizes of original studies (if applicable and if not cross referenced in 0.4 above)
196 (96 workplace intervention, 100 usual care)

1. Was a full economic evaluation undertaken? Did it include a comparative assessment of costs and health outcomes?
Yes

2. Describe the interventions, comparators, population, outcomes, perspective and time horizon included in the economic evaluation.
Interventions:
Workplace intervention (work modifications and case management) for eight weeks.

- If no RTW after workplace intervention for eight weeks, usual care (provided by an occupational physician).
- If no RTW after workplace intervention for eight weeks, clinical intervention (Physiotherapy based on operant behavioural principles).
- If no RTW after usual care for 8 weeks, clinical intervention.

Comparator:
- Usual care as outlined by Dutch Occupational Physician guidelines for lower back pain.
- If no RTW after usual care for eight weeks, continuation of usual care.

Population: Workers aged 18 to 65 years sick-listed for a period of 2-6 weeks due to low back pain.

Outcomes:
- Cost per Return to work (RTW) day (duration of work absenteeism in calendar days from the first day of sick leave to full return to own or other work with equal earnings, for at least four weeks without drop-out.)
- Cost per Point-increase in pain severity score avoided (10-point numerical rating scale)
- Cost per Point-increase in functional status score avoided (Roland disability questionnaire)
- Cost per QALY gained (Dutch version of EuroQol)
- Cost per Point-increase in general health score avoided (VAS 0-100mm).

Perspective: Societal

Time horizon: 52 weeks

3. What form of economic evaluation was undertaken?
- Cost-effectiveness analysis
- Cost-utility analysis
- Cost-benefit analysis
- Cost consequences analysis
Cost-effectiveness and cost-utility analysis.

4. What type of modelling approach was used (cohort versus individual-patient level, dynamic versus static)? Is this appropriate to address the decision problem? What modelling methodology was used (within-trial evaluation, decision tree, markov, discrete event simulation, other)? Is this appropriate to address the decision problem?

An economic evaluation based on a decision analysis using bootstrapping for the cost parameters and for the RTW efficacy parameter. This is appropriate to address the decision problem, although extrapolation of the data over a patient’s lifetime may have been useful. Further, the analysis was carried out using data from one RCT and could have been improved by using data from additional trials.

5. Describe the key structural assumptions employed in the evaluation. Do these appear reasonable? What is the likely impact of these assumptions on the results of the evaluation?

NA

6. Describe the assumptions surrounding the effectiveness data and the sources employed in the model. Were all relevant health outcomes included in the model? How were benefits measured and valued? What are the strengths and weaknesses of these data?

All effectiveness data is based on one RCT carried out alongside the economic evaluation.

Strengths: The evidence is mainly based on one same source which is designed to assess the relevant scope.

Weaknesses: There may be biases within the trial.

All relevant health outcomes were included in the model.

6.1 Quality of life measure used

Dutch version of EuroQol.

6.2 Quality of life for intervention

Note: Figures are Means, with standard deviations in brackets.

Workplace intervention: 0.53 (0.25)
Workplace intervention followed by usual care: 0.55 (0.22)
Workplace intervention followed by clinical intervention: 0.47 (0.24)
Usual care followed by clinical intervention: 0.58 (0.30)

6.3 Quality of life for comparator

Usual care intervention: 0.552 (0.217)
Usual care intervention followed by usual care intervention: 0.43 (0.28)

6.4 Number of QALYs for intervention

The following gives utilities rather than QALYs due to the short timeframe modelled:

Workplace intervention: 0.21 (0.27)
Workplace intervention followed by usual care: 0.27 (0.30)
Workplace intervention followed by clinical intervention: 0.22 (0.25)
Usual care followed by clinical intervention: 0.19 (0.21)

6.5 Number of QALYs for comparator

The following gives utilities rather than QALYs due to the short timeframe modelled:

Usual care intervention: 0.26 (0.29)
Usual care intervention followed by usual care intervention: 0.30 (0.31)

7. Describe the assumptions surrounding the resource use and cost data employed in the model. Were all relevant costs included in the model? How were these measured and valued? What are the strengths and weaknesses of these data?

- Costs measured were direct health care costs (cost of intervention plus additional visits to a health care provider, prescription medication, professional home care and hospitalisation), direct non-health care costs (out‐of‐pocket expenses, costs of paid and unpaid help) and indirect costs (loss of production due to lower back pain related absence from paid and unpaid work).

- Partial return to work was measured by the occupational physician and means that if a person is back at work with a productivity of 50 per cent this is equivalent to half a day’s work.

- Costs of the workplace intervention were based on 8 hours of work multiplied by the fee of an Occupational Health Services’ ergonomist.

- The price of the clinical intervention was the market price of a similar intervention from the graded activity provider.

- Every worker in the production process can be replaced and production losses cease to exist after a certain friction period.

- Production loss is estimated based on age and gender.

All costs were taken from Dutch guidelines, Dutch Central Organization for Health Care Charges or from a ‘professional organisation and mean price of different practices’; hence there should be a reasonable consistency between the costs. All relevant costs appear to be included.

7.1 Year to which prices refer
The paper does not state the year to which prices refer. The analysis was carried out between October 2000 and October 2002; hence in order to uplift costs to 2007 it has been assumed that the costs used within the evaluation are based on 2003 prices. It should be noted that prices have been uplifted up to 2005 using the PSSRU price inflation index (ref) throughout and the price increase has been assumed to be constant in subsequent years following the 2004 to 2005 price increase.

7.2 **Total costs for intervention in original prices and UK 2007 prices**

Workplace intervention: €8993 (€6216) [2003] = £7616 (£5262) [2007]

Workplace intervention followed by usual care: €11096 (€6720) [2003] = £9397 (£5688) [2007]

Workplace intervention followed by clinical intervention: €12391 (€7383) [2003] = £10494 (£6250) [2007]

Usual care followed by clinical intervention: €10537 (€3601) [2003] = £8924 (£3049) [2007]

7.3 **Total costs for comparator in original prices and UK 2007 prices**

Usual care intervention: €9109 (€6375) [2003] = £7714 (£5398) [2007]

Usual care intervention followed by usual care intervention: €10885 (€7363) [2003] = £9216 (£6236) [2007]

8. **Was discounting applied to costs and health outcomes to account for time preferences?**

Discounting was not applied to costs and health outcomes due to the short timeframe of the model.

9. **What were the results of the economic model? Were results presented incrementally? Are the base case results calculated using deterministic parameter values or the expected values?**

For the analysis comparing workplace intervention to usual care, the cost per RTW for 1 day less sick leave = €19 [2003] = £16 [2007]. The workplace intervention dominates for all other outcomes.

Results from the analysis comparing clinical intervention versus usual care following workplace intervention or following usual care suggest that using clinical intervention is dominated by not using clinical intervention.

Expected values have been presented.

10. **Was a comprehensive uncertainty analysis undertaken? What methods were used to evaluate uncertainty (one-way, multi-way, probabilistic). How were the results of the uncertainty analysis presented (cost-effectiveness planes, cost-effectiveness acceptability curves)?**
A probabilistic sensitivity analysis using the bootstrapping approach was carried out, presented as expected values and cost-effectiveness planes. In addition, three different scenarios were tested around three different model assumptions (using production loss cost of €100 per day rather than based on age and gender; using net days on sick leave rather than calendar days; using the human capital approach rather than a friction cost approach to calculate costs).

10.1 Key results of the sensitivity analyses

- There is a 99 per cent probability that the workplace intervention will be more effective than the usual care.
- There is 100 per cent chance that the workplace intervention followed by usual care will be more effective than the workplace intervention followed by clinical care.
- There is 84 per cent probability that the usual care followed by usual care will be more effective than usual care followed by clinical care.
- Limited results were provided in terms of the scenario analysis.

11. Does the study report details of any model validation (concurrence of experts, internal/external consistency, predictive validity)?

The model results were compared with the study which it replicated carried out in Canada (ref). In both studies the workplace intervention was effective for lasting RTW; however contrary to this study, there was a small beneficial effect for the combination of workplace intervention and clinical intervention in the Canadian study.

12. What are the author conclusions? Does the study discuss the generalisability of the results of the evaluation? Is it applicable to the UK setting?

- The workplace intervention was more effective and slightly more costly than usual care in terms of the primary outcome (RTW) and more effective and less costly in improving all secondary outcomes.
- The clinical intervention was less effective on all primary and secondary outcomes at higher costs.

Generalisability: unclear

13. Quality assessment rating

++