



The costs and benefits of active case management and rehabilitation for musculoskeletal disorders

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Margaret A Hanson BSc (Hons), FErgS, MIOSH
Hu-Tech Associates Ltd
91 Hanover Street, Edinburgh EH2 1DJ

Dr Kim Burton, PhD, DO, EurErg
Spinal, Research Unit, University of Huddersfield
30 Queen Street, Huddersfield, West Yorkshire HD1 2SP

Dr Nicholas A S Kendall PhD, DipClinPsych, MNZCCP
Health Services Consultant
10 Westbourne Court, The Crescent, Surbiton KT6 4BN

Rebecca J Lancaster BSc (Hons), MSc (Eng), MSc (OccPsy), MErgS
Work and Wellbeing Consultants Ltd
27 Main Street, North Queensferry KY11 1JG

Dr Adele Pilkington MBBS, MSc, FFOM, MIOSH, MRCGP
DMS, Work and Wellbeing Consultants Ltd

The cost of musculoskeletal disorders (MSDs) to employers is significant, with the most substantial cost component being lost time from work. This study sought to identify the evidence on cost-effective case management and rehabilitation principles for MSDs that could be applied by employers and healthcare providers to help those with MSDs stay in work or return to work.

An extensive literature review was undertaken which focused on high quality international scientific studies. There is good evidence that case management methods are cost-effective and stronger evidence that best practice rehabilitation approaches have potential to significantly reduce long term sickness absence. The review identified that programmes using case management and rehabilitation principles can be an effective intervention, and have been widely adopted in various industrialised countries. The key components for successful programmes were identified from the literature. Consultation (questionnaire and focus groups) with UK healthcare professionals and organisations indicated that a wide range of programmes were being implemented, although the structure and scope varied. Over a third of respondents had started their programmes in the last three years. The programmes were perceived to be effective, although few had cost benefit information to support this. Where organisations did have information on the costs and benefits of their programmes this suggested that they are cost effective. Through discussion with organisations the practicality of implementing these programmes, and obstacles to doing so, were identified.

An evidence-base model for managing workers with MSDs was developed based on this information. Consultation on the model with potential users suggested that it would be useful, and minor modifications were made to it based on feedback. The model is generally applicable to all types of organisation in the UK, and is relevant for all types of MSDs. It describes the principles to apply in order to integrate case management and rehabilitation with the workplace. This report includes the model and details the research that led to its development.

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EXECUTIVE SUMMARY

Overview

The burden of musculoskeletal disorders (MSDs) to employers and workplaces is significant; and the most important cost to employers and society is lost time from work.

‘Case management’ is a goal-oriented approach to keeping employees at work and facilitating an early return to work. There is good scientific evidence that case management methods are cost-effective through reducing time off work and lost productivity, and reducing healthcare costs. There is even stronger evidence that best-practice rehabilitation approaches have the very important potential to significantly reduce the burden of long-term sickness absence due to MSDs. The combination of case management with suitable rehabilitation principles is currently being used effectively in multiple settings throughout the UK, and there is growth within the case management sector. Current providers vary widely in quality and experience. There is limited professional regulation, although localised standards of practice have recently become available.

Many of the factors influencing the adoption of cost-effective case management and rehabilitation approaches rest with employers, and funders/commissioners of healthcare. It may be easier to integrate these practices into large and medium-sized workplaces, but there is no reason why the same principles cannot be applied to small businesses and the self-employed. It appears to be very timely for the distribution of information to employers and other key players about how effective case management and suitable rehabilitation approaches can be, and how applicable they are to UK settings. To this end, an integrated model specific to the UK has been developed.

An evidence-based model for managing those with MSDs was developed that is widely applicable to all types of industry and business in the UK. It describes the principles to apply in order to integrate case management and rehabilitation with the workplace. It was derived from high quality scientific studies, and research conducted into views on the applicability and effectiveness within the UK.

It is recommended that HSE distribute guidance based on this model.

Introduction

The cost of musculoskeletal disorders (MSDs) to UK business and society is substantial. HSE estimate that 1.01 million people are currently affected each year, resulting in 11.6 million lost working days (SWI 04/05). On average, each affected person took an estimated 20.5 days off work in that 12 month period. This equates to an annual loss of 0.50 days due to MSDs per worker in the UK.

It is recognised that while physical adaptations to the workplace may be helpful, they do not, of themselves, ensure successful rehabilitation for those with MSDs; additional approaches are needed. Active case management and rehabilitation are increasingly being adopted by UK organisations, but there is little systematically reviewed evidence of their efficacy.

This study therefore aimed to collate the evidence on the costs and benefits associated with active case management and rehabilitation programmes for those with MSDs; to identify potential motivators for, and obstacles to, the adoption of these programmes; and from this to develop a model programme based on the evidence and assess its acceptability to stakeholders.

‘Active case management’ describes the goal-oriented approach to achieving specific work retention and return to work outcomes. It is a strategy for supporting individuals (with MSDs) stay in work or return to work. In practice, case managers integrate clinical and occupational management with the needs of the individual to facilitate early return to work (or work retention).

‘Rehabilitation’ refers to restoration of productive activity. It should be closely linked to the workplace and may involve multi-dimensional methods to achieve work retention or return to work outcomes for employees with MSDs that have led to time off.

Methods

The research was conducted in two phases. In Phase 1, information was collected on different approaches to MSD rehabilitation and active case management. This was undertaken through:

- a literature review covering the international published literature and grey literature;
- consultation with those involved in providing or managing MSD rehabilitation or active case management programmes, concerning their views of the effectiveness of these programmes and the obstacles to their success; this was undertaken through an on-line questionnaire (126 respondents) and six focus group discussions (over 140 delegates);
- discussions with 26 organisations that had gathered information on the costs and benefits of the programmes they were running, with collection of this cost benefit information where possible;
- a questionnaire for those of working age with MSDs, concerning the obstacles to their returning to or remaining in work (75 respondents).

In Phase 2 a model for effective case management was developed, based on the findings of Phase 1, and potential users of the model were consulted concerning its scope, content, presentation and usability. This was done through:

- Electronic and paper circulation of the model, with invitation to respond; over 95 people received the model in this way, and 34 written responses were received.
- Three focus group discussions, attended by 26 delegates.

A final model was prepared following the outcome of the consultation.

Findings

Literature Review

An extensive and thorough review of the international and grey literature was undertaken, and the level of evidence demonstrated in published papers was assessed using the guidance published by the Oxford Centre for Evidence Based Medicine. The literature review showed that the case management and rehabilitation approach for MSDs can be an effective intervention, and has been widely adopted in other industrialised countries such as Australia, New Zealand, the US and Canada.

Active Case Management

From the literature it appears that for work/vocational rehabilitation the usual practice is to deploy a single case manager for an individual worker. The case manager can function as (a) “broker” who passes on information and arranges referrals without direct contact; (b) “generalist” who

provides both coordination and direct services such as advocacy, casework and support systems; or (c) “primary therapist” who supplements the therapeutic relationship with case management functions. It seems that the skill of individual case managers is more important than their professional training or background.

It may be concluded there is moderate evidence that case management approaches are effective and can yield a variety of benefits which are cost effective. This evidence pertains to using case managers as ‘brokers’ or ‘generalists’, but not as ‘primary therapists’; the potential for a conflict of interest when using the ‘primary therapist’ approach to case management has been widely recognised in various rehabilitation programmes. The benefits observed include reduced healthcare costs, reduced treatment duration, reduced sick-leave and time off work, improved worker productivity, reduced compensation claims and litigation, reduced claim duration and more rapid claim closure.

In summary, the key components of successful and cost-effective case management appear to be:

- Individual worker has their own case manager
- Case manager facilitates safe and sustainable return to work by recognising and addressing personal and occupational obstacles to secure safe and sustainable return to work
- Case manager interfaces with healthcare services, but is not also the provider of healthcare
- Best clinical practice guidelines are available and followed
- Case manager monitors all aspects of treatment – appropriateness, timeliness, adherence, outcome, and cost
- Case manager makes treatment funding decisions
- Duration management techniques are available (using normative data on likely absence durations for conditions, the case manager can identify when a case has exceeded a typical absence period, and this triggers a review of the case)
- Case manager liaises directly with employer about return to work
- Case manager negotiates transitional work arrangements
- Early intervention focus

Effective case managers:

- Help to define a health or injury problem
- Arrange specific healthcare
- Develop a clear plan for safe sustainable return to work
- Manage resources efficiently
- Proactively use resources to purchase interventions with known effectiveness, at the most beneficial time
- Interact with other stakeholders and adopt appropriate roles:
 - When communicating with an employer – emphasise the worker’s needs
 - When communicating with a healthcare provider – emphasise the employer’s needs
 - When communicating with the worker – emphasise early and sustainable return to work

MSD Rehabilitation

There is strong evidence that rehabilitation programmes using a cognitive-behavioural orientation and an activity focus are effective, and cost-effective at reducing pain and increasing productive activity in both the sub-acute and the chronic groups. There is also strong evidence that the use of

these interventions at the sub-acute stage can prevent the development of long-term problems and reduce time off work. Furthermore, there is good evidence that this is highly cost-effective, especially when the intervention is selectively delivered to individuals screened as having a high risk for a poor outcome.

The key components of good quality rehabilitation service delivery have been shown to include:

- An effective method to identify suitable cases is used with a standardised screening process
- Consideration given to the timing of the intervention; not too early and not too late
- Interventions are individualised by targeting specific obstacles to recovery/return to work
- The role of the case manager is integrated with the intervention through an agreed individualised rehabilitation plan
- The content of the intervention is:
 - Focused on return to work
 - Cognitive-behavioural in orientation (with a problem-solving approach)
 - Activity-based
 - Integrated with the workplace
 - Based on evidence-based protocols

The literature provided strong evidence on the cost-effectiveness of the approach. The study then sought to consider the applicability of these principles in the UK.

Consultation with professionals and those with MSDs

Consultation with professionals supporting those with MSDs, and with people who were experiencing MSDs, identified views of the scope and effectiveness of programmes for active case management and rehabilitation, and any benefits and obstacles that may be encountered with them. The consultation was undertaken through questionnaires and focus groups discussions.

Responses to the professionals' questionnaire were received from a wide range of different professions, although most were healthcare providers. A similar pattern was seen with the focus group discussions. The majority of programmes represented had been running for over 3 years, although more than a third had been running for less than 3 years.

There was a strong perception among professionals that programmes to actively case manage those with MSDs were likely to be cost effective, although only a minority of organisations had information to support this. However, there was anecdotal support for the view that they were likely to be cost effective.

Obstacles for individuals to stay in work or return to work were perceived to include:

- Nature of the injury or of the task meant that the individual may not be able to undertake their job.
- Individual psychological obstacles (e.g. fear of re-injury through work activities, loss of confidence, believing they shouldn't work if they experience discomfort, negative attitude to work or specific job, lack of motivation).
- Work pressures (likelihood of the individual not being able to only undertake 'light duties' or work at a reduced pace).
- Lack of suitable adjustments for the individual (both physical adjustments and adjustments to hours / duties).

- Lack of appropriate, timely advice / treatment / rehabilitation programmes (e.g. unable to access treatment if back at work, long referral or waiting times), meaning individuals did not get the treatment they required for their condition, or were (inappropriately) signed off work.
- Lack of support from management and colleagues, and lack of awareness of appropriate measures for those with MSDs.
- Management belief that individuals should be 100% fit before returning to work.
- Individuals not following best practice or implementing information that has been provided (e.g. poor posture, poor manual handling technique).
- Financial and legal concerns (e.g. individual potentially receiving reduced pay during a graduated return to work programme or being better off on Statutory Sick Pay than during a graduated return to work; organisation's legal standing if individual is back at work and is re-injured).

These concerns were echoed in the comments from those with MSDs. Respondents felt some pressure to return to work, but were concerned that this may increase their discomfort. Individuals also expressed the desire to be completely free of discomfort before returning to work. Some felt that disclosing the extent of their discomfort may suggest that they are no longer able to do their job as well as they used to. Some reported a loss of confidence in undertaking their job.

Organisation obstacles to return to work were also highlighted by those with MSDs, such as not being prepared to return to work with reduced paid hours or a lower paid role if they were unable to perform their normal job.

The main obstacles to effective delivery of these programmes were reported by organisations as a lack of awareness of the benefits of such a service and lack of commitment to it, lack of resources and lack of appropriately skilled service providers.

Perceived benefits of these programmes included:

- Quicker return to work for the individual
- Reduced sickness absence costs
- Improvement of the individual's functional ability
- Retention of skilled staff
- Improved morale
- Improved productivity

Information from organisations on the costs and benefits of their programmes

Twenty six organisations provided information on the way that they implemented a programme within their organisation. Where available, costs and benefit information was provided. It is difficult to compare the cost effectiveness of the different models due to the small sample size and differences in ways in which data are collected. Limited information was available, but indicated that with most programmes for every £1 spent there was a saving of £2-3. Specific figures ranged from no measurable saving (for a large company's programme which consolidated existing case management and rehabilitation practices across all sites) to £8 (for a rehabilitation programme for those on long term absence).

The model contains two appendices: one gives guidance on writing policies and procedures in relation to an MSD management plan; the second outlines points to consider when setting up a programme.

Consultation on the model

Comments were provided from potential users of the model through a consultation process. In general it was well received, although there was concern about how easy it would be for Small and Medium-sized Enterprises to use. Minor clarifications were made to the model based on the comments received. The final version of the model is included as Appendix 3.

Conclusions

The international literature shows clearly that the costs of applying active case management for those with MSDs, and running rehabilitation programmes are outweighed by the benefits; there is good economic evidence that these programmes are cost effective. Evidence within the UK also suggests that these programmes are cost effective, and different ways of implementing these principles have been identified; the most appropriate type of programme for an organisation will depend on its size and structure. The key components of successful programmes have been identified, and include providing early access to appropriate advice, remaining at work or returning early, and the organisation staying in touch with the individual during absence. This guidance has been incorporated into a model of best practice for use by UK organisations; potential users have reported the model to be useful.

guidance provides thorough general advice, the remit of this study was exclusively focused on musculoskeletal disorders, the most common occupational health issue. It was anticipated that there were particular ways of managing those with MSDs, and provision of therapy or treatment, which required specific advice for employers. It was anticipated that a model or models could be identified which demonstrated cost-effective ways of managing those with MSDs.

Recent changes in Incapacity Benefit (IB) aim to support and encourage those currently receiving IB in their return to work, with there being a clear focus on work activities. Other recent developments include the Pathways to Work initiative, which provides help and support to those on IB to enable them to return to work. This successful pilot programme is being extended into other parts of the UK. These initiatives will involve more active support from employers, GPs and the NHS to help people get back to work.

This has increased awareness of and interest in this area among employers and healthcare providers. As a result of this growing recognition, many professionals have started to offer case management and rehabilitation services in recent years. Many healthcare providers have extended their role to also undertake case management, while in other situations, insurance companies, or independent bodies are increasingly offering these services. These may be provided in-house, for example where an organisation has an in-house occupational health function; or may be provided by an external service provider.

The traditional route for healthcare provision in the UK has been through the NHS. However, in many parts of the country there can be long waiting times to see a healthcare professional (e.g. physiotherapist) in relation to a musculoskeletal disorder. Providing treatment in a timely fashion is recognised as assisting in recovery, and delays to treatment can result in increased chronicity of a disorder, potentially resulting in absence or increased time off work. To avoid this some organisations have elected to provide or pay for treatment, and also to adopt a case management approach to supporting their employees with MSDs. This has typically been done due to the perceived financial benefits of retaining people in work.

Despite an awareness that some organisations were adopting this approach, there had not been a formal review of the way that this was implemented, and the costs and benefits of this to organisations. It was also thought that if there was cost benefit evidence of the effectiveness of an active case management and rehabilitation programme, organisations could be persuaded of the business benefit in adopting such a programme. This study sought to identify the evidence for the effectiveness and costs and benefits of active case management and rehabilitation programmes, and from this to develop a model programme which could be implemented by organisations wishing to adopt best practice in this area.

to the neediest), and the service advocate function (maximising services for a client, regardless of overall systems needs or costs) (Piette et al., 1990). Naturally, these potentially competing goals affect how programmes are implemented, and how outcomes are evaluated.

In the absence of a clear definition for case management and associated protocol, agencies and organizations have tended to develop case management programmes or models that address a particular set of local issues or problems (Rothman, 1992). These models are inevitably influenced by organisational culture (Piette et al., 1990). For example, if the goal is continuity of care and responsiveness to clients rather than cost containment, greater variability is observed in how case management is implemented. Adopting a flexible definition of case management is attractive, since this means it can be deployed as an intervention for addressing a variety of healthcare, or social ills. However, definitional ambiguity makes it more difficult to construct useful case management models, and to define best practice guidance or methods of evaluating outcomes.

Despite this, case management is now considered by many as an important intervention, although it remains somewhat indistinct and amorphous, and many still disagree about the practice of it (Rothman, 1992). Even within the areas of longest practice, researchers and clinicians have still been unable to agree on one widely accepted definition of case management (Baldwin and Woods, 1994, Dill, 2001).

Case management is a concept, a methodology, not a product or a recipe for better healthcare or rehabilitation. In practice, case managers often describe their work in practice as: “Doing whatever it takes, with whatever you’ve got, for as long as it takes, to get the job done” (Missouri Foundation for Health, 2003).

Case management occurs both as a concept at the systems level and as a process of service delivery. At the system-level case management is a strategy for coordinating the provision of services to clients within the system; and, at the client or service delivery level case management is a client-centred, goal-oriented process for assessing the need of an individual for particular services and assisting them to obtain those services. In healthcare settings case management may be delivered by interdisciplinary teams that allocate specific functions to each member, or as a comprehensive service centre that attempts to function as a “one stop shop”. In this approach it is frequently disease-specific, and therefore context-bound. Common examples include HIV, rheumatoid arthritis, mental health, or specific learning disabilities.

For work, or vocational, rehabilitation it is usual practice to deploy a single case manager for an individual worker. However, within this approach there are also a number of alternative models. The first can be described as the “broker model”, since it does not involve any direct provision of service, rather it is purely information and referral only. The second model is that of the “generalist case manager” who provides coordination of services as well as direct service functions such as advocacy, casework, and development of support systems. The third model is that of the “primary therapist as a case manager” and this focuses primarily on the therapeutic relationship with the client and supplements this intervention with traditional case management functions.

The key features of case management aimed at achieving RTW outcomes are that a single individual (the case manager) is responsible for promoting the overall process of safe and sustainable return to work. The case manager identifies necessary key actions to achieve the goal, but is not responsible for doing all of them. Actions are based on “ownership” of the problem (not

being at work), or responsibility toward it. The case manager actively engages all relevant parties in accepting ownership and responsibility for specific actions.

Definitions of case management vary between countries and the intended application. The Case Management Society UK defines case management as “a collaborative process which assesses, plans, implements, co-ordinates, monitors and evaluates the options and services required to meet an individual’s health, care, educational and employment needs, using communication and available resources to promote quality cost effective outcomes” (Case Management Society UK, 2004). A brief description of the overall philosophy of case management is also provided: “Taken collectively, the services offered by a professional Case Manager should enhance the quality of life for clients while potentially reducing the total overall cost of disability. Thus, effective case management will directly and positively affect the social, ethical and financial health of the country and its population. The role of a Case Manager is to collaborate with clients by assessing, facilitating, planning and advocating for health and social needs on an individual basis. Successful outcomes cannot be achieved without specialised skills and knowledge, such as those exhibited by a Case Manager, throughout the case management process”.

The Case Management Society of America provides the following definition: “Case management is a collaborative process of assessment, planning, facilitation and advocacy for options and services to meet an individual’s health needs through communication and available resources to promote quality cost-effective outcomes” (Case Management Society of America, 2004). Notes to define the philosophy underpinning case management are also provided: “Case management is not a profession in itself, but an area of practice within one’s profession. Its underlying premise is that when an individual reaches the optimum level of wellness and functional capability, everyone benefits: the individuals being served, their support systems, the health care delivery systems and the various reimbursement sources. Case management serves as a means for achieving client wellness and autonomy through advocacy, communication, education, identification of service resources and service facilitation. The case manager helps identify appropriate providers and facilities throughout the continuum of services, while ensuring that available resources are being used in a timely and cost-effective manner in order to obtain optimum value for both the client and the reimbursement source. Case management services are best offered in a climate that allows direct communication between the case manager, the client, and appropriate service personnel, in order to optimise the outcome for all concerned. Certification determines that the case manager possesses the education, skills and experience required to render appropriate services based on sound principles of practice”.

The Case Management Society of Australia has published a draft definition of case management (Case Management Society of Australia, 2004). This states: “First and foremost Case Management is a service delivery approach now widely adopted across diverse settings in the human services and health sectors. The best practices in Case Management require organisational arrangements to support service delivery, staff who have been trained for the approach and its application to the particular practice setting and strategies to ensure that the organization can be responsive to evidence from practice and advocate for systemic and policy change to support service delivery. The principles that underpin Case Management are individualised service delivery based on comprehensive assessment that is used to develop a case or service plan. The plan is developed in collaboration with the client and reflects their choices and preferences for the service arrangements being developed. The goal is to empower the client and ensure that they are involved in all aspects of the planning and service arrangement in a dynamic way. The Case Manager coordinates the process, consulting informal carers and key service providers to ensure that the plan is developed appropriately, clearly contracted and monitored for effective and financially accountable service provision based on specified and desired outcomes. The case

pain problems, such as chronic low back pain (CLBP). For this purpose CLBP is defined as “*activity intolerance due to lower back or leg symptoms lasting longer than 3 months (without a period free of activity limitation or pain)*”. However, there is important evidence that long-term problems may be *prevented* through the provision of Programmes during the *sub-acute* stage, between the “acute” and “chronic” periods (Linton and van Tulder, 2001, Linton and Ryberg, 2001, Linton and Hallden, 1998, Linton et al., 1989, Linton et al., 1993b, Linton et al., 1993a, Karjalainen et al., 2001a, Kendall et al., 1997, Pincus et al., 2002, Van den Hout et al., 2003). There is some uncertainty about the optimal timing for this, but indications are that it may apply to the 4- to 12-week from onset period.

One of the best definitions of an interdisciplinary pain rehabilitation programme available is that it provides “outcomes-focused, coordinated, goal-oriented interdisciplinary team services to measure and improve the functioning of persons with pain and encourage their appropriate use of health care systems and services. The program can benefit persons who have limitations that interfere with their physical, psychological, social, or vocational functioning. Information about the scope of the services and the outcomes achieved is shared by the program with stakeholders” (CARF The Rehabilitation Accreditation Commission, 1999). However, in practice few programmes provide specific RTW pathways, or even an occupational focus (Kendall and Thompson, 1998). For this reason, many individuals are referred to some form of vocational rehabilitation.

“Vocational Rehabilitation” also has a number of synonyms including occupational rehabilitation. In its broadest sense it refers to interventions and supports that help people get into work, and remain at work. However, this clearly embraces a wide variety of interventions, strategies or approaches (Linton, 1995, Loisel et al., 2003, Marnetoft et al., 1999, Chartered Institute of Personnel and Development, 2005), and specific techniques or tactics. These are too long to list here, and have already been comprehensively reviewed elsewhere (Williams and Westmorland, 2002, Carter and Birrell, 2000, Waddell and Burton, 2000, Irving et al., 2004, Verbeek et al., 2002, Guzman et al., 2002b, Pransky et al., 2002, Williams et al., 1998b), however they include methods such as graded programmes (Vlaeyen et al., 2001, Linton et al., 1999, Van den Hout et al., 2003, Lindstrom et al., 1992b, Lindstrom et al., 1992a, Vlaeyen et al., 1995, Ostelo et al., 2000); manager training, such as communication (Linton, 1991, Verbeek et al., 2002, McLellan et al., 2001, Guzman et al., 2002b); and, work trials, modified work, and workplace accommodations (Spitzer, 1993, Aitken and Cornes, 1990, Matheson et al., 1985, Niemeyer et al., 1994, Schonstein et al., 2003c, Shaw and Feuerstein, 2004, Krause et al., 1998).

“Case Management” approaches may involve the use of “treatment”, “programmes”, and/or “vocational rehabilitation” (Lemstra and Olszynski, 2004). It may deploy some or all of these, or none at all, based on the premise that case managers describe their role as: “Doing whatever it takes, with whatever you’ve got, for as long as it takes, to get the job done” (Missouri Foundation for Health, 2003). Case management has a shorter history than either clinical management, or industrial (occupational) rehabilitation. Clinical management is invariably based on the “medical model”. This approach tends to work well with specific injuries such as fractures, or specific diseases such as infections. However, it is weak at both defining and dealing with common MSDs making it limited in what it has to offer the modern workplace.

Historically, vocational rehabilitation developed from military approaches. This was to remove a soldier from the battlefield, patch him up, and return him to fight another day. When applied to the workplace (the “industrial battlefield”) this led to the simplistic idea that a worker should be fully recovered before returning to work, and the “100% or Nothing” myth was born. Modern

occupational rehabilitation recognises that the place to deliver rehabilitation is the workplace itself, however this is still often neglected and rarely delivered in practice.

Case management approaches evolved in response to the limitations of both clinical management and occupational rehabilitation, and subsequently has been refined within the important and necessary milieu of cost-containment (Shaw and Feuerstein, 2004). Western industrialised societies have experienced explosions in the cost of healthcare, and the costs of work disability for MSDs. Long-term work disability is much more costly than healthcare, often by a factor of ten, and most funding systems have faced potential crises if trends for MSDs had continued unabated (Nachemson, 1994, Waddell, 1997, Waddell, 1998). This includes public systems funded by taxation, insurance schemes, and workers compensation systems. The need for effective cost-containment appears to be with us for the foreseeable future.

Case managers appear to occupy a unique role, with dual priorities: to meet the client's needs and make efficient use of resources. Effective case management has the opportunity to play a unique role in ensuring optimum outcomes from efficient use of resources. Most resources need to be deployed to obtain an early and sustainable return to work. Some case management skills may be unique, and are not derived from a specific profession or background. Skilled case managers exercise judgement and make decisions, and do not follow rigid protocols. In this manner, they are a valuable resource.

Case management may be an operational tool, rather than a model in itself. In many circumstances the vocational rehabilitation provider utilises field case management practises as their operational tool. As such the vocational rehabilitation provider is often considered the human face of injury management and a key independent person involved at the interface between the injured worker and the employer (Association of Rehabilitation Providers in the Private Sector, 2004). The funder, or insurer, may also provide case management services. These types of case management services are often delivered by telephone or conducted from an office, with periodic field visits on an as needed basis. It seems clear that there is a need for different types of case management to address different cases and different issues. It may be that the more complex injuries, the more complex workplaces and the more complex issues require the services of a field case manager, perhaps in the guise of a vocational rehabilitation provider.

The context in which active case management for people with MSDs may be successful in achieving a sustainable return to work can be open to debate. Two competing concepts appear worthy of consideration. The first is the suggestion that the roles of a healthcare provider can be combined with active case management. Certainly, it is true that modern best clinical practice strongly endorses the adoption of many of the same conceptual principles. That is, it is now widely believed that healthcare providers who provide self-management advice and problem-solving skills to their patients will produce better clinical outcomes and faster return to productive activity. However, this approach is predicated on the assumption that healthcare providers can, and will, readily adopt self-limiting approaches to their own treatment practices by using appropriate critical analysis of outcomes. The real-world observation that this occurs less frequently than would be desired has led to the second conceptual approach that suggests there is frequently a need to separate the provision of healthcare from the delivery of case management. Clearly this is not a hard and fast rule. However, the available evidence reviewed here that indicates case management can be both effective and cost-effective is substantially based on studies that utilised methods where case management and healthcare delivery were done in a conceptually separate manner. This provides important support to the conclusion that case management should not be the primary responsibility of healthcare professionals who are engaged in providing treatment per se.

The range of available treatments for musculoskeletal problems has increased markedly over recent decades, and the range of potential interventions has become ever more diverse. Even cursory observation of contemporary media publications indicates that novel treatments remain highly newsworthy, and this probably helps to stimulate ongoing demand.

It became clear that despite the increased range of treatments, and ever-increasing expenditures on these, the problem of MSDs was not being effectively addressed. Rather, they continued to increase in frequency and cost. There were also some notable localised epidemics, such as the infamous Australian “RSI epidemic” of the 1980’s. This was later repeated during the 1990’s in New Zealand, where the same problem had been re-labelled as Occupational Overuse Syndrome (OOS). The steadily increasing financial burden from MSDs meant that it became impossible to doggedly pursue the singular approach prescribed by the biomedical model.

This set of circumstances led to the establishment of some task forces, and committees, in various countries (COST Action B13, 2003). Each was charged with trying to come up with a solution. A brief history of the key task force reports and guidelines for back pain problems is outlined in Table A5.

The prevalence of back pain is very high, as are other musculoskeletal problems. Furthermore, once both direct and indirect costs were included the total financial burden can only be described as “huge” (Bigos et al., 1994, Goossens et al., 2000, Clinical Standards Advisory Group, 1994b). It was also apparent that many patients with MSDs were receiving healthcare that was either inappropriate or less than optimal. However, systematic reviews of the evidence on effectiveness of treatments conducted during the 1980’s and early 1990’s were consistent in their condemnation of the overall poor quality. By the mid-1990’s however, sufficient high quality research was becoming available to provide a solid foundation for the development of evidence-based clinical practice guidelines (Bigos et al., 1994, ACC and the National Health Committee, 1997, ACC and the National Health Committee, 1999, Clinical Standards Advisory Group, 1994a, Waddell et al., 1996, Royal College of General Practitioners, 1999, Waddell et al., 1999, Koes et al., 2001, Bekkering et al., 2003, Bogduk, 1999, NHS Centre for Reviews and Dissemination, 2000, COST Action B13, 2003).

There is considerably less information available on the impact of these guidelines, especially on outcomes such as work and costs. A case-control study funded by the Federal Government was conducted in Australia to compare the safety, efficacy and cost effectiveness of evidence-based care (N=430) with usual care (N=83) for acute low back pain (McGuirk et al., 2001). The results reflect favourably on evidence-based healthcare. Significant differences were observed for pain, need for continuing care, cost, and consumer satisfaction. Costs were only calculated for the first 3 months of management. Evidence-based care involved longer and more frequent consultations. Consequently it was more expensive in these respects than usual care. These costs, however, were offset by minimal expenditure on investigations, particularly plain radiographs and CT-scans, and by far less expenditure on physiotherapy and other treatment services. In addition, the patients treated in evidence-based clinics had less spent on non-prescribed treatments. Consequently, the average cost per patient under evidence-based care was \$AUD276, whereas for usual care it was \$AUD472. This study provides Level 3b evidence (Phillips et al., 2001). Further evidence for improved clinical outcomes after implementing clinical practice guidelines comes from a Canadian RCT (Rossignol et al., 2000). However, costs savings through achieving more rapid RTW could not be demonstrated. This study provides Level 1b evidence (Phillips et al., 2001).

During the development of the back pain guidelines it became evident to the various task forces that a new paradigm for understanding and managing back pain problems was required, and that reliance on the classical biomedical model would continue to be inadequate (Deyo, 1993, Kendall, 1999, Deyo, 1996). The adoption of the biopsychosocial model became a standard recommendation (Waddell, 1992, Waddell, 1997). This was at least in part due to the rapidly growing evidence base indicating that psychosocial factors were implicated in the development of long-term persistent, or chronic problems (Waddell, 1998). This culminated in the development of the concept of Psychosocial Yellow Flags (Kendall et al., 1997), analogous to the widely adopted Red Flags. The Yellow Flags concept subsequently became widely adopted (Sullivan and Stanish, 2003, Broadhurst, 1999, Main and Waddell, 1998a, Newton-John et al., 2001).

Gradual recognition of the limitations to the biomedical model in dealing with MSDs led to new interest in a rehabilitation approach. In the pain management field, the history of deploying a rehabilitative model was already well established. This arose from two key historical developments. The first was the concept of pain as behaviour, articulated by Wilbert E. Fordyce (Fordyce, 1978, Fordyce, 1974, Fordyce et al., 1973, Fordyce, 1973, Fordyce, 1970, Fordyce et al., 1968b, Fordyce et al., 1968a); and the second was the development of the cognitive-behavioural model of chronic or long-term pain problems that stemmed from the success of the stress-inoculation approach with in the field of clinical psychology (Turk, 2003, McCracken and Turk, 2002, Turk and Okifuji, 2002, Flor et al., 1985, Turk and Rudy, 1987, Turk et al., 1985, Turk et al., 1980). The notion that individuals are active processors of information, and that this involves many levels of the central nervous system, is a key assumption for the cognitive-behavioural theory of pain (Turk and Rudy, 1989).

It is noteworthy that, in effect, the conclusion that a presenting MSD-related pain problem is a chronic one is ultimately arrived at by exclusion. The consequences of making a Type 2 error in which disease is present but not diagnosed may be severe. For this reason multiple diagnostic tests usually provide comfort to clinicians and patients alike. The conclusion that the presenting pain problem is chronic leads directly to the question of what will be most helpful to the patient. The rehabilitation approach to MSD-related pain problems has led to a useful heuristic that contrasts three different healthcare models:

- The *acute pain model* in which there is an active doctor who provides passive treatments, a passive patient who accepts and complies, and the goal is for a cure to the problem.
- The *rehabilitation model* in which there is an active team of health professionals, an active patient who participates in the process, and the major goal is for maximal restitution of function.
- The *chronic pain model* in which there is a supportive team of health professionals, a patient who is hopefully active and participates, and the major goal is to manage the problem.

The overall biopsychosocial or rehabilitative approach is now considered to be appropriate to all but the acute pain model, where an outright cure is sought. A more full discussion of strategies to prevent the development of long-term pain-related disability due to MSDs is below.

However, demonstration of the effectiveness of treatment and clinical management approaches for MSDs took many years to be completed (van der Weide et al., 1997). It is true to say that the role of pain management programmes, by whatever name they are called, is now well established (van Tulder et al., 2002, Cutler et al., 1994, Guzman et al., 2002a, Karalainen et al., 2001, Flor et al., 1992, Turk, 1996b, Feuerstein and Zastowny, 1996, McQuay et al., 1997, Linton and Ryberg, 2001, Thorbjornsson et al., 2000, Williams et al., 1996), including endorsement for effectiveness with both subacute and chronic problems from systematic reviews within the Cochrane

Collaboration (Karjalainen et al., 2001a, van Tulder et al., 2000c, van Tulder et al., 2001, van Tulder et al., 2002).

There are significant terminological problems in this area of healthcare with the terms “multidisciplinary/interdisciplinary”, “functional restoration”, “work hardening” “functional conditioning (Elders et al., 2000b)”, and “pain management” are often used interchangeably when referring to rehabilitative programmes. However, they may refer to very different services in real life. There is an important lack of standards for programmes in this area (CARF The Rehabilitation Accreditation Commission, 1999, CARF The Rehabilitation Accreditation Commission, 1998). However, it is clear that the most commonly used theoretical model is the cognitive-behavioural, and this remains the most widely researched to date. No matter what jargon or terminology is used, the two principal targets of programmes are:

- Distress reduction (including subjective pain)
- Activity/function/participation enhancement (including productivity)

There are a number of key features that successful programmes hold in common, including the following:

- Selected, motivated participants
- Pre-admission goal setting
- Structured timetable providing routine
- Defined timeframe for the programme
- Emphasis on participation in activity and exercise
- Self-management orientation
- Group programme, with individualisation
- Regular progress review, with feedback (often daily)
- Multiple interdependent therapeutic targets (including social, vocational, psychological, and physical)
- High intensity of input (e.g. >100 hours)
- Problem-solving training
- Relapse prevention approach
- Supportive follow-up emphasizing independence and self-management

There are also a number of important variations between programmes that depend on the case-mix, and clinical or healthcare context. These include:

- Addressing pain, medication, mood
- Occupational/vocational focus
- Target patient group (LBP, fibromyalgia, etc)

It should be emphasised that exercise programmes are not a substitute for the type of rehabilitation programme outlined above. In many countries healthcare providers do promote extended exercise therapy, but in a systematic review for the Cochrane Collaboration van Tulder et al (van Tulder et al., 2000a) concluded that (for CLBP) it is unclear whether exercise therapy is more effective than inactive treatments, or whether any specific type of exercise is more effective than another. Furthermore, the International Paris Task Force on Back Pain in 2000 (Abenheim et al., 2000) concluded that patients who have chronic low back pain should perform physical, therapeutic, or recreational exercises. However these conclusions were made with the caveat to “...[bear] in mind that no specific active technique or method is superior to another”. Another very recent review (Manniche et al., 2002) concluded that “the most effective exercise programme and the optimal combination of exercise and other effective treatment modalities for different subgroups of LBP patients remain to be determined”. This seems to be a reasonable summary statement. This means that admitting a patient to an extended exercise programme, of

A prospective case series conducted in North Carolina in the US investigated the comparative outcomes and costs of health care for 1555 consecutive acute low back pain cases seen by GP's (N=39 urban; N=48 rural), Chiropractors (N=32 urban; N=32 rural), and Orthopaedic Surgeons (N=29) (Carey et al., 1995). Follow-up was by telephone, with total duration of 24 weeks, or just under 6-months. The key outcome variables assessed were level of function, work status, use of healthcare services, and patient satisfaction. The total costs of healthcare were also calculated. No differences were observed for any of the outcome variables between the patients treated by different types of providers. However, there was a significant difference in the total cost of care. Orthopaedic surgeons were the most expensive, then the chiropractors, and the GP's were the cheapest. The authors concluded that these results provided evidence that outcomes are similar for acute low back pain patients irrespective of the type of care they receive, but that primary care providers are the least expensive. This study provides Level 4 evidence (Phillips et al., 2001).

Another US case series involved a retrospective review of 184 workers compensation claims for low back injuries that were treated by employer-retained doctors (company doctors) (Chibnall et al., 2000). The goal of the study was to investigate impairment ratings, costs, and duration from a number of variables using regression analysis. It was found that impairment ratings made by the company doctors were predicted by diagnosis, surgery, pain, the year the rating was made, and the clinic where the doctor worked. These findings suggest that impairment rating for compensation purposes is highly subjective. Diagnosis, medical tests, and impairment rating predicted claim costs. The effectiveness of treatment was not directly addressed. However, the results of this study indicate that for MSDs such as back pain the cost of a claim, and the associated level of disability, may be a result of treatment duration. This study provides Level 4 evidence (Phillips et al., 2001).

A Norwegian case series investigated predictors of not returning to work in a group of low back pain patients who attended a light mobilization programme (Haldorsen et al., 1998). The results supported the view that the prognosis for long-term pain is a multifactorial phenomenon depending on a combination of medical, sociodemographic, and psychological factors. It was concluded these could be identified, making it possible to classify patients into low or high risk of a poor RTW outcome. This study provides Level 4 evidence (Phillips et al., 2001). Another prospective Norwegian study investigated the accuracy of predictions for the length of sick-leave required in a mixed sample of workers with musculoskeletal and minor mental health problems, before a worker returns to work successfully. It was found that the workers were significantly more accurate in these predictions than trained medical personnel (Fleten et al., 2004). This study provides Level 4 evidence (Phillips et al., 2001). Taken together, the results of these studies underscore the complex interaction of factors that potentially influence the RTW process, and that successful RTW does not depend solely on biomedical factors.

A company-wide on-site rehabilitation workshop was implemented in a US case series for workers with industrial back injuries (McElligott et al., 1989). The plant had a baseline injury rate of 20% of employees per annum reporting back injuries, costing about \$US 920,00. Following introduction of the intervention, all employees who participated were successfully returned to work within 60 days, and the company saved about \$US 255,000 or more than 25% of costs. This study provides Level 4 evidence (Phillips et al., 2001).

A U.K. case series and descriptive set out to evaluate prompt access to physiotherapy in primary care for low back pain (Pinnington et al., 2004). Data from 614 patients indicated that prompt access to physiotherapy costs less per episode of backpain than conventional management in primary care. This study provides Level 4 evidence (Phillips et al., 2001).

About 700 low back pain patients were screened for putative risk of poor outcome in a U.S study, and high-risk patients were randomised to either a functional restoration early intervention programme or to no intervention (Gatchel et al., 2003). The intervention group was significantly less likely to develop chronicity. They had less time off work, used less healthcare and medication, and reported less pain. The intervention group cost significantly less than the no-intervention group. The authors concluded that the process of selectively intervening with a high-risk group of injured workers was very cost-effective. This study provides Level 1b evidence (Phillips et al., 2001).

The use of screening patients by risk of poor outcome was also investigated in a Norwegian RCT using 654 subjects with MSDs (Haland Haldorsen et al., 2002). Patients at least 8-weeks off work were classified as good, medium, or poor prognosis for RTW and randomised to a group receiving either ordinary treatment, light multidisciplinary, or extensive multidisciplinary treatment. The key outcome variable was RTW, and follow-up was completed at 14 months. It was observed that the patients classified with a good prognosis for RTW do equally well no matter which treatment they received. However, those with a poor prognosis did significantly better in the extensive multidisciplinary programme than those receiving ordinary treatment, with 55% returning to work versus only 37%. The authors concluded that multidisciplinary treatment is effective concerning RTW when it is delivered to patients who are most likely to benefit from that treatment. That is, patients need to be selected. Cost-benefit analysis indicated a saving of \$US 800 per patient over the 14-month period of the study. This study provides Level 1b evidence (Phillips et al., 2001).

The economics of a behavioural rehabilitation for chronic low back pain was investigated in The Netherlands in a rare example of good-quality health economic methodology (Goossens et al., 1998). Patients were randomised to either a behavioural programme (an operant programme with attention-control), or to a cognitive-behavioural programme (an operant programme with a cognitive component). The economic outcomes were the costs of the programme and other healthcare usage, costs for the patient, and indirect costs associated with lost productivity. The 3-year study determined that adding a cognitive component to a behavioural treatment did not lead to significant differences in costs and improvement in quality of life when compared with the behavioural treatment alone. Compared with the commonly delivered individual rehabilitation therapy it was concluded that the same effects can be reached at the same or lower costs with a shorter, more intense standardised group programme. The behavioural treatment alone was more effective than providing no treatment in the waiting-list control group. This study provides Level 1b evidence (Phillips et al., 2001).

The effects of an early intervention programme using 'light mobilization' was investigated in a Norwegian RCT using 457 patients with low back pain who had been off work for between 8 and 12 weeks (Hagen et al., 2000, Hagen et al., 2003). At 12-month follow-up it was observed that 68.4% of the intervention group had returned to work, whereas only 56.4% of the control group had. This modest gain was obtained in the first year, but by 3 years follow-up both groups were equal. However, a total saving of \$US 3,497 per patient in the intervention group was observed from that first year advantage obtained from the early intervention approach. This study provides Level 1b evidence (Phillips et al., 2001).

A Finnish RCT investigated the effectiveness of an early intervention programme for subacute low back pain (Karjalainen et al., 2004, Karjalainen et al., 2003). 164 patients were randomized to a mini-intervention group (A), a work site visit group (B), or a usual care group (C). Groups A (n = 56) and B (n = 51) underwent one assessment by a physician plus a physiotherapist. Group B received a work site visit in addition. Group C served as controls (n = 57) and were treated in

The WorkCover Corporation of South Australia have promoted for at least the last two years “the best way to manage a work injury claim is to catch it quickly and focus the injured worker on their recovery... Statistics show that reporting an incident and making a claim within 24 hours of an injury will increase the speed of recovery and can reduce claims costs by up to 45 per cent” (WorkCover Corporation of South Australia, 2003). However, the basis for this assertion is not entirely clear. A project sponsored by WorkCover aimed to explore the impact that managers and co-workers have on recovery and outcomes such as RTW (Robertson, 2004). A training initiative for managers that emphasised open communication between all parties was piloted following an initial survey of workers and managers. It was found that this made a significant difference to the ways in which they would support an injured worker, and it was assumed that this had a beneficial effect on total cost of claims. However, information on outcome and costs was not directly collected.

The Australasian Faculty of Occupational Medicine and The Royal Australasian College of Physicians published a report entitled *Compensable Injuries and Health Outcomes* in 2001 (The Australasian Faculty of Occupational Medicine and The Royal Australasian College of Physicians, 2001). This report was not specific only to musculoskeletal injuries, but did make pertinent comments about rehabilitation and case management. For example, they noted that poor outcomes were likely to result from the management of initial treatment in non-specific musculoskeletal injuries, failure to identify psychosocial risk factors or ‘yellow flags’, failing to encourage resumption of normal behaviours as far as possible, failing to encourage return to work or normal activities. They also stated that poor outcomes could be attributed to handling of case management by insurers (for example, not developing appropriate return to work programmes nor monitoring these, not providing claimants with good information about the effects of long term sick leave, etc.); or, the handling of case management by treating doctors, including specialists (for example, not reviewing treatment by service providers and continuing treatment which is not helping, providing unnecessary treatment, not giving early referral to pain management programmes, not addressing psychological problems such as depression, etc.). Furthermore, they recommended that insurers should develop case management processes so they can identify at risk individuals and refer them for early intervention via appropriate medical management.

CRS Australia was known as the Commonwealth Rehabilitation Service until 1998. The original service began in the 1940’s to assist injured men and women from the armed forces and people on invalid pensions to return to the workforce, and provided vocational rehabilitation services through centres. The current focus of CRS Australia remains helping people with a disability or injury to get, and to keep, employment. CRS provides rehabilitation, injury and disability management services for different types of workplaces all over Australia. In 2003 a report on the cost-benefit of these services was published (CRS Australia, 2003). The careful cost-benefit methodology used assessed both private and public benefits, to calculate a “total social benefit”. The outcomes for more than 16,000 clients receiving vocational rehabilitation services over an 18-month period were reviewed. Slightly more than half of this client group were classified with “physical” injuries or disability. The proportion of these with MSDs was not specified. The key findings were that the average CRS Australia client has approximately 30.36 hours contact hours with CRS Australia, of which 25.91 hours are spent in a rehabilitation programme with the 4.45 hours being spent in pre-programme activities including referral and initial assessment. The average cost of delivering a programme to a CRS Australia client is \$4,397. The total social benefit per client participating in a rehabilitation programme was calculated as \$133,000. Approximately half the benefit was private, and the other half public. This represents an impressive cost-benefit ratio of over 30.

their abilities and skills. The auditors concluded that the LMR yielded a cost benefit of \$363m over the period 1998-2003, and that this indicates, "...the WSIB obtains value from the funds invested in the LMR programme". However, they added that "it is a matter of interpretation as to whether this equates to value for money from an outcomes perspective" because there were limitations in the quality of the data available. This audit review had no control group, or other comparison such as historical data.

The WSIB of Ontario has also published a report on a one-year evaluation of a programme of care for acute low back injuries (Workplace Safety & Insurance Board of Ontario, 2004). The implementation of this evidence-based programme in 2002 was aimed at providing the best healthcare interventions to restore workers to maximum function. The review included over 4,000 workers. The key financial outcomes observed were reduced lost time from work, resulting in lower loss of earnings costs; and, slightly higher payments to healthcare providers. However, it was found that overall costs reduced more than the healthcare costs increased. Unfortunately the actual costs were not reported.

The Institute for Work and Health in Toronto, Canada, has recently conducted a systematic review of workplace-based interventions for RTW (Franché, 2005). A summary of this review is publicly available, entitled *Workplace-based Return-to-work Interventions: A Systematic Review of the Quantitative and Qualitative Literature* (Franché et al., 2004). The reviewers set out to determine which workplace-based interventions are effective, and under what conditions. They concluded there is moderate evidence that early contact with the worker by the workplace, a work accommodation offer, and contact between the healthcare provider and the workplace significantly reduce duration of work disability and associated costs. They also found moderate evidence to support ergonomic workplace visits and "the involvement of an individual with responsibility for RTW coordination" in reducing absence / work disability duration and costs. Moderate evidence also supports educating supervisors and managers, and labour-management cooperation. They noted that certain intervention components were directly related to insurer (funder/payer) activity and decision-making, including the role of case management.

The Workplace Health, Safety and Compensation Commission of New Brunswick has conducted two studies on MSDs with case manager input (Stanley, 2005). The first of these addressed the problem of cumulative trauma disorders (CTD) (Workplace Health Safety and Compensation Commission, 1998a). CTD is also referred to in various countries by several other names including: repetitive strain injury (RSI); occupational overuse syndrome (OOS); work related musculoskeletal disorder (WRMSD); or, work-related upper limb disorder (WRULD). This project was initiated in response to a rapid rise in the number of CTD claims without obvious explanation. The major focus was to identify best practice, and this was subsequently implemented. Before the programme began it was found that only 44% of cases were returning to work, and 54% of those placed on a graded RTW (GRTW) programme returned to sustained employment. By 2000 73% of CTD cases were returning to work, and 71% of the cases placed on a GRTW programme were successful. It was assumed that this represented a significant cost-benefit. However, outcome and cost data was not collected to demonstrate this directly. The second project addressed the problem of reflex sympathetic dystrophy (RSD) (Workplace Health Safety and Compensation Commission, 1998b). The International Association for the Study of Pain (IASP) favours the term chronic regional pain syndrome (CRPS) Type 1, in place of RSD (Task Force on Taxonomy of the International Association for the Study of Pain, 1994). The goal was also to identify best practice, and implement this. In 1996-7 it was noted that the average RSD claim duration was 12.7 weeks compared to an average for the whole system of only 6.9 weeks, and the RTW rate was only 9.7% compared to 45.4% respectively. By 2000, following implementation of the programme, this had changed so that claim duration was 5.8 weeks

Four relevant randomised-controlled trials were identified. The methodology for RCT's allows a direct test of the effectiveness of an intervention. However, they are limited in scale and the number of variables that can be measured due to higher cost and other practical considerations. Nevertheless, the results of RCT's are considered as level 1 evidence, only superseded by systematic reviews or meta-analyses of multiple RCT's. Of the four identified, two high quality studies reported significant cost-benefit from the use of case management, and two low quality trials reported negative findings. One of the lower quality trials used a very heterogeneous sample that included only a minority of subjects with MSDs, used less suitable measures with so called 'floor effects' where the measure lacks sensitivity below a certain range, and did not measure direct costs. The other low quality trial was an early attempt to select workers with low back pain who had psychosocial risk factors. The early intervention group did no better than the others, but it cost more to deliver this intervention. One of the high quality trials had a six-year follow-up period and found cost-benefit. The other used a shorter time period for follow-up but reported an impressive cost-benefit ratio of 6.8 for those who had case management combined with ergonomic advice. Information from these trials has a high level of confidence and is categorised as level 1b evidence.

In summary, it may be concluded *there is moderate evidence that case management approaches are effective and can yield a variety of benefits which are cost effective*. These include faster return to work, reduced claim costs, and shorter claim duration. However, this evidence only applies to case management that is delivered independently from the provision of healthcare. That is, this evidence does not apply to providers who are simultaneously delivering healthcare interventions and trying to be case managers to their patients.

In summary, the key components of successful and cost-effective case management appear to be:

- Individual worker has their own case manager
- Case manager recognises and addresses personal and occupational obstacles to secure safe and sustainable return to work
- Case manager interfaces with healthcare services but is not also the provider of healthcare
- Best clinical practice guidelines are available and followed
- Case manager monitors all aspects of treatment – appropriateness, timeliness, adherence, outcome, and cost
- Case manager makes treatment funding decisions
- Duration management techniques are available¹
- Case manager liaises directly with employer about return to work
- Case manager negotiates transitional work arrangements
- Early intervention focus

¹ 'Duration management' techniques refer to methods for managing the duration of lost time at work due to injuries/illnesses. The most common method used is a database of normative values for recovery periods by diagnosis and work type, which attempts to predict recovery periods. This can be used to establish expected time periods for recovery and return to work, to assist with planning an individually tailored rehabilitation plan, and as a basis for discussing sick certification with medical practitioners. There are a number of proprietary systems available including those from the Reed Group and Milliman in the US. Sophisticated case management software is usually integrated with this type of database to provide alerts for case managers that specific cases need further scrutiny, and possibly to trigger further action.

- A cognitive-behavioural intervention for sub-acute back and neck pain that was superimposed on regular primary care yielded a nine-fold reduction in subsequent work loss;
- Behavioural intervention for sub-acute low back pain can be improved with the addition of problem-solving therapy, and this makes the intervention more cost-effective due to reducing time off work;
- Modifying work duties while continuing to receive 100% of normal wages does not appear to confer any benefit on clinical outcomes, or costs;
- Modifying work duties while continuing to receive 100% of normal wages from an insurer or benefit so that the employer could obtain a substitute worker at no additional cost does not appear to confer any benefit on clinical outcomes, or costs.

Information from these trials has a high level of confidence and is categorised as level 1b evidence.

There are a number of relevant systematic reviews available. The key findings from these reviews include the following:

- A small minority of cases with chronic MSDs are responsible for the most costs;
- Employers who promptly offer appropriately modified duties can reduce work loss by at least 30% in workers with back pain;
- Intensive multidisciplinary biopsychosocial rehabilitation programmes are effective in reducing pain and improving function in chronic low back pain, and less intense programmes are not effective;
- Back schools delivered at the workplace may be helpful;
- Multidisciplinary rehabilitation programmes for sub-acute low back pain are effective, but it is not clear whether this extends to neck or shoulder pain due to lack of research.

Information from these reviews has the highest level of confidence and is categorised as level 1a evidence.

In summary, it may be concluded there is strong evidence that *rehabilitation programmes using a cognitive-behavioural orientation and an activity focus are effective, and cost-effective at reducing pain and increasing productive activity in both the sub-acute and the chronic groups.* There is also strong evidence that *the use of these interventions at the sub-acute stage can prevent the development of long-term problems and reduce time off work.* Furthermore, there is good evidence that *this is highly cost-effective, especially when the intervention is selectively delivered to individuals screened as having a high risk for a poor outcome.*

The key components of good quality service delivery appear to be:

- An effective method to identify suitable cases is used with a standardised screening process
- Consideration given to the timing of the intervention, not too early and not too late
- Interventions are individualised by targeting specific obstacles to recovery
- The role of the case manager is integrated with the intervention through an agreed individualised rehabilitation plan
- The content of the intervention is:
 - Focused on return to work
 - Cognitive-behavioural in orientation (with a problem-solving approach)
 - Activity-based
 - Integrated with the workplace
 - Based on evidence-driven protocols

caused MSDs would prefer to extend the service to cover all causes of MSDs, but were constrained by financial restrictions.

The main obstacles to effective delivery of services were reported as lack of awareness of the benefits of such as service and commitment to it, lack of resources and lack of appropriately skilled service providers.

Based on the information generated in the first phase of this research, the key features of any workplace MSD case management / rehabilitation programme can be summarised as:

- Strong business case to persuade managers of the benefit of these programmes.
- Awareness within the whole organisation (management, individuals, HR, occupational health) of the benefits of a programme, and expectations of it.
- Supportive culture including commitment from senior management.
- Planned data collection, evaluation and benchmarking in order to ensure continual improvement of the programme and measure the economic impact.
- Effective case management.
- Competent professionals.
- Early referral and assessments of individuals into a case management programme.
- Flexibility to respond to each case appropriately, with a multidisciplinary approach, providing appropriate therapy as well as responding to individual concerns / psychosocial obstacles.
- Involvement of, and communication with, all stakeholders in tailoring a programme for an individual.

Table 1: Summary of models of active case management and rehabilitation programmes

Glossary

FTE – Full Time Equivalent
 GP – General Practitioner
 OH – Occupational Health
 OHA – Occupational Health Advisor
 OHN – Occupational Health Nurse
 OP – Occupational Physician

| Overview | Example | Details | Cost - benefit |
|--|-------------------------------------|---|-------------------|
| 1. Internal case management by Occupational Health (OH); in-house provision of treatment / therapy from internal supplier | | | |
| Internal case management by occupational health, with referral to in-house physiotherapist if required. | West London Mental Health NHS Trust | <p>NHS Trust with approximately 3,500 staff at approximately 30 sites. OH department (8 staff = 1 OP, 1 senior advisor, 3 OHA, 3 admin) supported by 4 physiotherapists providing clinics at 4 main sites.</p> <p>Employees with MSDs are referred to the OH department, either through line manager referral or self-referral. Manager referral is prompted by absence of >4 weeks (although sooner, and prior to absence, is encouraged). Cases are reviewed by the OH department, and referred to in-house physiotherapists if judged appropriate (cases are typically seen by physiotherapist within 2 weeks). Where appropriate, work site assessments for individuals are undertaken by the physiotherapists, and the findings are fed to OH department, who act as case managers. The programme has been running for several years.</p> <p>Self-referral to physiotherapy is no longer possible due to lack of funding, but when it was practiced it was thought to be beneficial as it allowed faster access to physiotherapy. Now all cases have to go through the OH department.</p> | No data available |

| Overview | Example | Details | Cost – benefit |
|--|--|--|--|
| 1 (continued). Internal case management by Occupational Health (OH); in-house provision of treatment / therapy from internal supplier | | | |
| Internal case management by OH Physiotherapists. In-house provision of advice, and physiotherapy from day 1, if assessed as required. | Lothian University Hospitals Division of NHS Lothian | <p>An in-house physiotherapy and rehabilitation service is provided to staff in the Division (13,500 employees). Most referrals (85%) are self-referral. Others are through the line manager. Referrals are screened by telephone triage; high priority cases are seen within 48 hours. For the rest, advice is provided (written and verbal via telephone). Individuals are encouraged to self-manage and come back to the service if their discomfort has not improved in 5-7 days. Those who return are assessed and receive physiotherapy, advice and workplace assessments / return to work support as appropriate.</p> <p>The service was established in 1997; the estimated cost of initially setting up the service is £6,061 in staff time.</p> | <p>See detailed costing for the service running in 2003 and 2004 in Tables 2a and 2b.</p> <p>For every £1 spent on the service provision there was a saving of between £0.65 and £6.52 (medium estimate £3.08) for 2003 and £1.35 to £5.79 (medium estimate £3.38).</p> |
| | Primary Care Trust (NHS) | <p>NHS Trust with approximately 1,100 staff at approximately 200 sites. A physiotherapy programme (staffed by one 0.5 FTE) was piloted for 12 months (2003/04); it was run in the physiotherapy department at the Trust's main hospital. Most people self-referred; they received a 45 minute assessment and advice within 3 days of referring, with an average of 3 further 30 minute sessions, if required. 159 people were seen during the programme; 122 were at work, 37 were absent.</p> | <p>See detailed costing in Table 3. For every £1 spent on service provision there was a saving of between £1.31 and £1.62.</p> <p>There were fewer MSD related absences during the pilot (56 incidents in 12 months prior; 37 incidents during the programme). However, the average length of MSD absence was not affected (14 days both before and during pilot).</p> |
| | Food production | <p>An on-site physiotherapy service was provided for staff in a food production factory. Staff were assessed by the physiotherapist (or OHN out of hours), and provided with treatment if required. This was done as soon as the condition was reported to the service. It was perceived that the service was 'very helpful' in returning people to work or keeping them in work.</p> | <p>The physiotherapy service was calculated to be sufficiently beneficial to warrant the appointment of an extra full-time physiotherapist so that holidays / sickness absence were covered.</p> |

| Overview | Example | Details | Cost - benefit |
|---|---------------------|--|--|
| 2. Internal case management by Occupational Health (OH); in-house provision of treatment / therapy from external supplier | | | |
| Internal case management by occupational health, with referral to internally provided (contracted) physiotherapy if required | Unilever | <p>Food production facility with 500 staff.</p> <p>The programme is run by 2 on-site OHAs, a contracted physiotherapist providing 4 sessions per week, and a contracted OP providing 1 session per fortnight.</p> <p>Employees are encouraged to self-refer to OH if they have MS pain which has lasted >7-10 days. Most referrals are self referrals, or OH may contact an employee if informed through line manager, or through Med 3 certification. The OHA assesses the individual and provides advice; if appropriate they refer for physiotherapy. There is approximately a 2-3 week wait for physiotherapy; 8-10 sessions may be provided. The physiotherapist undertakes worksite assessments where appropriate. The OHA case manages: OH, physiotherapist and line manager are involved in case conferences.</p> | Data not available |
| Internal case management through occupational health, with referral to internally provided (contracted) physiotherapy and osteopathy if required, and on-site rehabilitation. | Honda of the UK Mfg | <p>Car manufacturing with 4,000 employees.</p> <p>The MSD management programme has run for 9 years; it includes prevention (ergonomics and pre-employment testing), on-site treatment (physiotherapy and osteopathy), and rehabilitation (work hardening and work shadowing).</p> <p>The on-site rehabilitation programme involves: assessment of the injury, development of the treatment programme, treatment with continual reassessment, matching the individual's capabilities to the demands of the process / tasks, process / task simulation exercises, process shadowing and return to work. Cases are managed by the OH staff.</p> | Benefits are seen in terms of good morale, low absence, decreasing number of accidents, reducing number of employer liability claims, and improved quality. However, due to many process changes and evolution of the programme over a number of years, it is not possible to undertake a cost benefit analysis. |

| Overview | Example | Details | Cost - benefit |
|---|------------------------|---|--|
| 3. Internal case management by Occupational Health (OH) / HR; external provision of treatment / therapy from external supplier | | | |
| Internal case management by occupational health, with referral to external physiotherapy or other treatment if required | Pharmaceutical factory | <p>Pharmaceutical company with 300 staff.</p> <p>Employees come to OH through self referral, line manager referral or HR referral if RTW. OH reviews and manages MSD cases; where appropriate they refer for up to 6 physiotherapy sessions, with review, provided by an external physiotherapist; employees attend in their own time.</p> <p>Use of the physiotherapy service started in 2004. Eight staff were referred in 6 months, receiving 53 physiotherapy sessions in total; several only required 1-2 sessions. The service provided relief from pain, accurate diagnosis of conditions and empowered employees to manage their condition.</p> | <p>The cost of the service was £1,325 in 6 months. The cost per day's absence is estimated at £91 (HSE estimated cost for manufacturing).</p> <p>It is reported that as a result of the physiotherapy 2 employees did not require time off work, which had been expected; 2 employees who had a history of repeated absence had significantly improved attendance; 1 employee awaiting NHS physiotherapy following an operation (likely wait >6 weeks), was able to RTW 6 weeks after the operation having received the company-provided physiotherapy; this was estimated to have saved at least 6 weeks absence (salary cost of £2,730). Another had been inappropriately informed they may require 6 months off work (salary cost of £11,830). Appropriate advice and treatment by the physiotherapist prevented this.</p> <p>Based only on the data relating to the case where 6 weeks absence is thought to have been saved it can be estimated that for every £1 spent on the physiotherapy</p> |

| | | | |
|--|----------|--|--|
| | | | <p>programme (for all staff) there was a saving of £2.06 on speedier return to work.</p> <p>Including the data relating to a worker taking 6 months off work it can be estimated that for every £1 spent on the programme (for all staff) there was a saving of 10.99.</p> <p>The organisation perceives the service to be positive; employee feedback is very positive.</p> |
| | Gleasons | <p>Construction company with 1000 staff.</p> <p>The line manager should refer employee to OH after a significant period of sickness absence, or series of repeated absences. OH case manage, and liaise with the individual, GP, OP, and line manager. The company will pay for 4-6 physiotherapy treatments if required, or some staff receive it through the company's private health insurance.</p> | <p>The cost of physiotherapy treatment is about £400 per individual, but there is no data on the benefits. The service is perceived to be beneficial; staff are thought to return to work quicker having received physiotherapy.</p> |
| | Ethicon | <p>Manufacturing company with approximately 1,100 staff.</p> <p>Line manager or self referral to OH department; self referral to OH is encouraged as it is seen as quicker. OH screen cases, and refers for off-site physiotherapy if appropriate (there is typically a 2 week wait to see the physiotherapist).</p> <p>Workplace risk assessments and modifications are undertaken as appropriate by the OH department, who manage the cases.</p> <p>The number of physiotherapy sessions received by staff was high, partly due to a redundancy programme which confounded recovery.</p> | <p>The cost of physiotherapy was approximately £500 per individual. No benefit data, but 30 of 68 staff receiving physiotherapy could continue their normal job without restricted duties; 26 of 38 who had been placed on restricted duties could return to normal job having had physiotherapy. The programme was perceived to be very beneficial, and thought to have prevented people taking sick leave, and reduced the number on alternative duties.</p> |

| Overview | Example | Details | Cost - benefit |
|--|---------------------|--|---|
| 3(continued). Internal case management by Occupational Health (OH) / HR; external provision of treatment / therapy from external supplier | | | |
| | Oil and gas company | <p>Oil and gas production, with approximately 2,500 staff.</p> <p>Staff self refer or are referred by their line manager to the OH department. All cases are seen by the OP. Where an MSD is thought to be related to / affecting work, OH will undertake a worksite assessment and will consult with the line manager, individual and health and safety advisor. If appropriate the individual may be referred for physiotherapy and/or the physiotherapist may be requested to carry out an individual work site assessment and remedial action plan.</p> <p>The GP and OP will develop the RTW plan.</p> <p>If referred for physiotherapy through OH and the line manager for work related MSDs, the department will pay for the cost of treatment.</p> <p>Self referrals are given a 30% discount on the cost of physiotherapy whether the MSD is work- or non work-related.</p> | <p>No data available, but departments have been willing to pay for the cost of physiotherapy as they perceive it to be beneficial.</p> |
| | South West Trains | <p>Train operating company with 5,250 staff.</p> <p>Under the sickness absence management programme line managers should tell OH department if a staff member is absent >2 days with an MSD. OH case manage, and refer for further treatment if appropriate, this includes physiotherapy, and in some cases more complex treatment. Line managers are encouraged to keep in contact with the individual. OH and Personnel will assess the individual if they have been absent for >1 month. OH will undertake worksite assessments and modifications where appropriate. Case conferences with the manager and individual are held when appropriate. OH develops a RTW plan for the individual, and communicates this with managers.</p> | <p>All sickness reduced by 0.9% due to the sickness management programme (saving approximately 6,000 days), but there are no costs specific for MSDs related absences.</p> <p>Fast track physiotherapy is perceived by the company to be cost effective as compared with waiting for NHS treatment.</p> |

Continued

| Overview | Example | Details | Cost - benefit |
|--|--|--|---|
| <p>In house management of cases by trained HR personnel, with referral to externally supplied physiotherapy if required.</p> | <p>HBOS</p> | <p>Financial institution with 36,000 employees at over 1,000 sites nationally.</p> <p>HR support line managers in absence management; the line managers have responsibility for managing absence.</p> <p>All absence is referred to the HR admin centre. Cases are reviewed, and those which may benefit from external support (OP, physiotherapy and psychologists) are provided with this (which may include up to 8 sessions of physiotherapy). A trigger for external support is an absence of over 10 days. Following the series of treatment sessions there is a case conference (with absence champion, service provider manager, and physiotherapist). The outcome is discussed with the line manager, who owns the RTW plan.</p> <p>‘Absence champions’ (from HR department) work with the line manager as they manage the individual and implement the RTW plan.</p> <p>Health and safety advisors assess workstations as appropriate (prior to absence, or prior to RTW).</p> | <p>In one year (pilot in 2003), 19 MSD cases (with 15 of these absent) were fast tracked to physio. The total NHS waiting time for physiotherapy for these staff was estimated by the company as 2,540 days. The number of days off during physiotherapy was 573 (i.e. the physiotherapy helped them get back to work), thus saving 1,967 days. The company’s direct salary costs are given as £58 per day, giving a saving of £94,059. The cost of the physio was £11,576. This indicates that for every £1 spent on physiotherapy, there was a saving of £8.12 through faster return to work.</p> |
| <p>In house management of cases by OH with referral to external physiotherapy service.</p> | <p>NHS Trust, service provided by RehabWorks</p> | <p>An NHS Trust with 2,000 employees.</p> <p>Fast track referrals by OH department to externally provided physiotherapy service which provided advice and treatment.</p> <p>The programme ran for 9 months, during which time 104 people were referred, who were either absent or on restricted duties. Following the physiotherapy 103 were able to return to work.</p> <p>Note that a manual handling advisor was appointed into the Trust during the same time period, and some of the reduction in MSD related absence may be related to other activities than the fast track physiotherapy.</p> | <p>MSD related absence fell from 10,049 working days to 5,839. This equates to a direct cost saving of £218,030. The savings related to those that received physiotherapy are not known, but thought to be about £100,000.</p> <p>The cost of providing the physiotherapy was £21,000.</p> <p>It is estimated that for every £1 spent on physiotherapy there was a saving of £4.76.</p> |

| Overview | Example | Details | Cost - benefit |
|--|---|---|---|
| 4 (continued). Internal provision of treatment / therapy from external supplier; therapist acts as case manager | | | |
| Workstation assessment and physiotherapy treatment provided on-site by a contractor, paid for by company | Oil and gas production | <p>Oil and gas production, with 1,000 staff at this site.</p> <p>A physiotherapist is contracted in for 16 hours per week. Most of their work (75%) involves workstation assessments and MSD prevention, although they also provide advice and treatment for those referred with MSDs (either self referral or through OH department). 45 people have been referred in 6 months. Typically they receive up to 4 sessions of physiotherapy.</p> | No data available, but service 'known' to have been cost effective. One person with 6 months absences has been helped back to work through the service. |
| 5. External case management, providing advice and referring for treatment | | | |
| External case management (telephone) providing advice on self management and exercises, but no treatment | Nationwide Building Society, using Cigna (service provider) | <p>Financial organisation with 16,000 employees over approximately 800 sites.</p> <p>External case management is provided. The triggers for contact with the case manager are an absence of >10 days; the 4th episode of absence in 12 months; workplace accident or injury; planned medical procedure; or concerns over the individual's health. Individuals are referred to the case managers through the line manager (who may be prompted to do so by HR).</p> <p>The case managers (who are OHNs dedicated to Nationwide's case management) provide telephone advice to the individual (self management), and liaise with HR, the line manager and health professionals as to appropriate treatment. They also develop a RTW plan. Treatment is not provided by the company, although the individual is encouraged to use their PHI (not all staff have this), or NHS or to self fund.</p> | No data available |

| Overview | Example | Details | Cost - benefit |
|---|--|---|--|
| 5 (continued). External case management, providing advice and referring for treatment | | | |
| <p>Vocational case management through insurance company, at no extra cost to the company. They support the employer and their employees to identify options for return to work.</p> | <p>Unum-Provident (service provider)</p> | <p>The insurer employs about 30 rehabilitation consultants with experience in vocational rehabilitation who provide active case management services to a range of companies.</p> <p>They support companies in managing those employees who are absent, working closely with the OH and /or HR departments. The service provided to their larger clients is proactive and the vocational rehab consultants will typically get involved 4-6 weeks into the absence. They also provide assistance to those employees who have been absent in excess of 6 months when they are able to identify potential for a return to work and facilitate a plan of action with the agreement of all parties.</p> | <p>The service provider reports a 70% success rate in returning people with MSDs to work. They report that this proves the benefits of supporting people as early as possible in their absence from work.</p> |
| <p>External case management service, with referral for appropriate treatment, and advice to organisation as to effective management</p> | <p>PES (service provider)</p> | <p>PES provides case management to a range of companies.</p> <p>They described the pilot programme run at a utilities company. This involved assessment of 30 individuals with MSDs at the PES centre; some were absent, and some were at work on light duties. Following the assessment a rehabilitation programme was developed for each individual. PES identified suitable treatment providers for this, local to the individual. Physiotherapy was not provided by PES. Following completion of the treatment the individuals were reviewed again by PES. A RTW plan was developed for each individual.</p> | <p>The utility company reported the benefits to be:</p> <ul style="list-style-type: none"> • a 49% reduction in case length • employees back to full duties on average 75 days earlier. • average cost of intervention of £873 per case (evaluation, treatment and final assessment) • Programme cost was reported as £26,190. • Saving arising after removing programme costs was £25,500. • For every £1 spent there was a saving of £1.97 |

| Overview | Example | Details | Cost - benefit |
|---|------------------------------------|--|---|
| 5 (continued). External case management, providing advice and referring for treatment | | | |
| External telephone case management service, with identification of appropriate treatment, and advice to the organisation as to effective management | Service provider | <p>This private health care provider offers external off-site telephone case management for their clients. Different models are used by different companies, depending on their needs and resources.</p> <p>They can refer people for physiotherapy, a functional restoration programme (3-4 weeks), or other treatment or assessment as appropriate; the cost may be taken by the employer or through PHI.</p> <p>They develop RTW plans, which are agreed by the individual, line manager and HR.</p> | No data available, although they report this programme helped one company (brewery), prevent 5 cases of MSD related ill-health retirement, and enabling the individuals to return to work, potentially saving ‘a lot of money’. |
| External absence management programme, with staff required to phone the service with any absence; work related cases are passed to the in-house OH department for case management | Sandwell and West Birmingham Trust | <p>NHS Trust with 7,500 staff based at 3 hospitals.</p> <p>There is an in-house OH department which employs approx 35 staff – including OP, specialist practitioners in OH, OHA, a nurse manager, a specialist practitioner in ergonomics, moving and handling co-ordinators and trainers, physiotherapist, safety advisors and specialists working with the PCT. Within this they have an MSD team (comprising of ergonomist, physiotherapist and moving and handling co-ordinator); this team reports on Trust MSD issues to the OH team, makes recommendations and monitors actions.</p> <p>In 2005 the OH team ran a 6 month pilot of a telephone absence management programme (this is an admin function only); all absent staff phone the external call centre, who take details, screen and pass to OH if work related. If it is an MSD or psychological issue, OH contact the individual (by phone), assess and provide advice. They may request the individual attends the department for a fuller assessment.</p> <p>In addition, managers can refer staff, and staff can self refer, to OH whether or not they are absent. Managers can also consult OH if they have concerns over workplace design issues etc.</p> <p>Staff referred to the service are assessed by an OH nurse (within 5 days), and can be referred for further treatment (physiotherapy, which is provided in house). OH liaises with the line manager, healthcare</p> | No data available. |

| | | provider and develops the RTW plan. | |
|---|------------|---|--|
| Overview | Example | Details | Cost - benefit |
| 6. Exercise and Functional Restoration Programmes | | | |
| Functional Restoration Programme for those absent with chronic back pain – externally provided, paid for by company | RehabWorks | This physiotherapy service provider offers MSD related case management and treatment (see above) and functional Restoration Programmes (FRP). The FRP have been with those who have chronic LBP, and are absent from work or on restricted duties. Specific examples of work with companies are given below. | |
| | | <p>Utilities</p> <p>A FRP was run for 89 staff who were either absent with MSDs, or had repeated episodes of MSD related absence. At the time of the programme 66 were at work, 23 were absent.</p> <p>Individuals were referred to the programme by the occupational physician. They attended between 4 and 12 sessions, each lasting 1 day. Those who were at work attended during work time.</p> <p>Following the programme there were clinically meaningful changes in pain rating (using the Numeric Pain Rating Scale); Oswestry Disability Index scores (from moderate disability to mild disability); and significant differences in Acute Pain Screening Questionnaire scores.</p> <p>There were also statistically significant changes in static strength and dynamic lifting abilities.</p> | <p>See detailed costing in Table 4.</p> <p>For every £1 spent on the programme the organisation is estimated to have saved between £1.33 and £4.14 (median figure of £2.44).</p> <p>Ill health retirements in the 2 years prior to the programme cost the organisation £262,584 (4 individuals) and £80,238 in the 2 years after (1 individual).</p> <p>Claims for back pain in the 2 years prior to the programme cost the organisation £282,016 (15 claims) and £20,440 in the 2 years after (3 claims).</p> |

| Overview | Example | Details | Cost - benefit |
|--|---------|---|---|
| 6 (continued). Exercise and Functional Restoration Programmes | | | |
| | | <p>Royal Mail</p> <p>Case management was undertaken by the company's OH department. RehabWorks provided a FRP for 108 people identified by OH, who had at least 6-12 weeks absence, or episodes of repeated absence.</p> <p>The programme consisted of advice, exercises and work hardening.</p> <p>44 were on long term sick with an average absence of 31 weeks (a total of 26 person years), with a reported direct cost of £400,000.</p> <p>42 were on light duties for an average of 54 weeks with a reported direct cost of £333,000.</p> <p>22 had episodic absences, with an average of 7 weeks per person per year with a reported direct cost of £45,400.</p> <p>Ill health retirement was likely in 22 cases with a projected reported cost of £308,000.</p> <p>The total cost of MSD related injury for these 108 staff was therefore £1,086,000 before the programme.</p> <p>The cost of the programme was £198,000</p> <p>Following the programme 75 people were able to return to full duties. These represented the following costs:</p> <p>31 people who had been on sick leave for an average of 31 weeks (with a reported direct cost of £281,000).</p> <p>28 people who had been on light duties for an average of 54 weeks, with a reported direct cost of £222,000</p> <p>16 people who had episodic absences, for an average of 7 weeks with a reported direct cost of £33,000.</p> <p>The total saving of MSD related injury for these staff was therefore £536,000 after the programme.</p> | <p>For every £1 spent there was a £2.71 return.</p> |

| Overview | Example | Details | Cost - benefit |
|---|-----------------------------|---|--|
| 6 (continued). Exercise and Functional Restoration Programmes | | | |
| | | <p>East Anglia Ambulance Trust (1,200 employees)</p> <p>In 2000 the Trust ran a FRP for 8 staff who were absent for between 9 and 15 months with low back pain, who had no foreseeable plan to return to work.</p> <p>The staff participated in an FRP alongside a gradual return to work, working as a ‘third man’ in a team and gradually reducing restrictions. The FRP lasted between 4 and 12 weeks. All returned to normal duties, with only one relapse of 60 days absence by one employee in the following year.</p> | <p>The direct cost of absence for these 8 workers was £107,080 (1,540 days) before the programme, and £4,172 (60 days) after the programme. The cost of the FRP was £14,292. Staff all returned to productive work. Ill health retirement and claims were avoided.</p> <p>For every £1 spent there was a £7.20 return.</p> |
| <p>Back rehabilitation programmes (group exercises) – provided in-house, paid for by the company, staff may not be absent</p> | <p>Glasgow City Council</p> | <p>Large city council with 35,000 employees over many sites. MSDs are referred to OH/HR through the absence management process. They are screened by OH/HR and referred to a private healthcare provider if appropriate. There they are assessed by a physiotherapy and either provided with up to 4 sessions of therapy or put on a back rehabilitation programme (piloted in 2001). Those who were thought would benefit were put on the programme; some were absent, some at work, and some returned to work during the programme. The programme consists of 12 sessions of 90 minutes over 6 weeks, combining exercise, advice and relaxation. This is conducted at council central facilities.</p> <p>Staff time to attend the programme (if working) can be estimated as 30 hours (including 1 hour travel time per session).</p> <p>The organisation report that there are indications (following 2 pilots) that the programme was more effective for those with acute rather than chronic LBP.</p> <p>The organisation considers the programme shows they are proactive in supporting those with MSDs, and it is perceived to be effective.</p> | <p>The Council estimate that the direct cost of the service provision will equate to between 2.1 and 6.0 days absence (or for every £1 spent there is a saving of between £1.57 and £4.61 assuming absence length is halved). Including the cost of staff time to attend the service, the service will equate to costing between 7.1 and 8.6 days per person.</p> <p>There are no data on the actual amount of absence it saved; absence levels are reported not to have changed significantly in recent years. However, the number of people who have gone through the programme is relatively low.</p> |

| Overview | Example | Details | Cost - benefit |
|--|--|---|--|
| 6 (continued). Exercise and Functional Restoration Programmes | | | |
| Back rehabilitation programmes (group exercises) – provided by NHS, staff released by company to attend; staff may not be absent. (Cost of service provision borne by NHS, benefit felt by company.) | Farnham Hospital | <p>An NHS service provided for patients with chronic LBP, referred by GPs and consultants.</p> <p>Patients attend for a 45 minute group (12) session once per week for 8 weeks. The course involved advice and core stability exercises.</p> <p>Following the programme patients had a statistically significant reduction in Oswestry Pain Index Scores.</p> | No data available. |
| | Wessex rehabilitation <i>(Wright et al, 2005)</i> | <p>The Rehabilitation Department of a District Hospital compared the effectiveness of 2 fast-access evidence-based interventions for treatment of simple LBP (in 2000). Attendees were off work or on light duties.</p> <p>Group 1 (37 patients) received an advice booklet and one session of advice; Group 2 (43 patients) received advice booklet, back programme involving full assessment, individual treatment and exercise classes over 1-2 weeks. Group 2 showed a statistically significant pain reduction and improved speed of return to work compared with Group 1 (saving an average of 7 days).</p> <p>2 months following the programme 65% of Group 1 and 84% of Group 2 patients had returned to work or changed from adapted to full duties.</p> | <p>The cost of running the Group 1 programme was £8 – 17 per patient and of the Group 2 programme was £77 – 154 per patient (depending on numbers attending). The cost of the employee attending the course was not included. The benefit of returning patients to work 7 days earlier is estimated at between £336 and £620.</p> <p>Therefore, for every £1 spent (by NHS) on the Group 2 programme there was a saving of between £2.18 and £8.04 for the employer (direct salary costs).</p> <p>The Group 2 programme was calculated by the study team to provide an approximate cost saving of between £250 and £578 for every patient.</p> |

| Overview | Example | Details | Cost - benefit |
|--|-----------------------------------|--|--|
| 7. Programme to create consistent message on MSD rehabilitation | | | |
| <p>Consistent message on rehabilitation consolidated across sites; roles clarified; fast track access to external physiotherapy and in-house OP provision.</p> | <p>Scottish and Newcastle UK</p> | <p>Beer distribution depot, with 2,000 employees at 35 sites.</p> <p>The OH team were aware of a lack of consistent management approach to absence and rehabilitation, so developed a programme to train line managers about the role of OH and sickness absence. They encourage line managers to become more active in managing those absent, and the employee to have more ownership of their treatment. An OHN assesses the individual and develops an action plan, which could include treatment, modified duties and workplace changes. An in-house OP and externally contracted physiotherapist are available. This has led to active management of those who were absent with MSDs.</p> <p>Following implementation of the programme, more than 85% of employees with MSDs returned to work within 6-8 weeks of reporting the MSD.</p> | <p>The company reports that in the first year (2003/4) the programme cost £95,000 to run, and led to a saving of £285,000 in salary costs. For every £1 spent the company saved £2 (direct salary costs). Similar savings were seen in the second year.</p> |
| <p>Consistent message on rehabilitation consolidated across wide number of sites through internal OH team; in-house physiotherapy programme already in place</p> | <p>Large, multi-sited company</p> | <p>Pharmaceutical company, with 19,000 staff over 21 sites.</p> <p>The OH team employs 64 staff of whom 49 are health professionals (including OHN, OP, physios); in 2003 they perceived the need to standardise on the approach to case management, for all occupational health issues. They developed a toolkit and training for OH team to provide a consistent message and treatment options. One benefit has been that GPs are now following the advice of the OH department, which has resulted in up to 40% of medical certificates being used for shorter periods (for all absences) i.e. staff are returning to work sooner.</p> <p>Following the initial programme (benefits reported opposite), a Musculoskeletal Impact Team has been set up to focus on greater education and awareness of MSDs to try to reduce MSD related absence. The organisation is planning an MSD awareness campaign aligned with the HSE Backs! 2006 campaign.</p> | <p>The company reports that programme was found to have no impact on costs of long term (>7 day) absence MSDs, although it had a significant impact on stress/ anxiety/ depression absences and other OH issues, resulting in significantly reduced costs.</p> <p>There may be a possible impact on the cost of short term MSD absences, but data for <7 day absences are not available.</p> |

Table 2a: Data from Lothian University's Hospital Division of NHS Lothian of 13,500 staff - 2003

Data relates to the period 01/01/03 - 31/12/03. Service staffed by 4 FTE physios.

The service was started in 1997.

Costs of providing the service 2003

| MSD case management | Low | Medium | High | Notes |
|--|-------------------|-------------------|-------------------|---|
| Line management costs | | | | |
| Number of staff seen | 762 | 762 | 762 | 189 of these were absent; 573 not absent |
| Number of hours per case | 0.5 | 1 | 2 | |
| Cost per hour | 22.93 | 22.93 | 22.93 | Assume Manager's salary = £29,100 |
| Total (£) | 8,735.29 | 17,470.58 | 34,941.16 | |
| Service provision costs (staff salaries) | | | | |
| Total (£) | 145,500.00 | 145,500.00 | 145,500.00 | Service maintenance; not set up costs |
| Attendance of MSD sufferers during work time | | | | |
| Number not absent | 573 | 573 | 573 | |
| Number of sessions | 2 | 4 | 6 | Varied from 2 - 6 depending on individual need. |
| Time per session (hours) | 0.75 | 0.75 | 0.75 | 30 minutes contact + travel time |
| Cost per hour | 13.70 | 13.70 | 13.70 | Average D grade Nurse's salary = £17,394 |
| Total (£) | 11,775.15 | 23,550.30 | 35,325.45 | |
| Costs of providing the service (£) | 166,010.44 | 186,520.88 | 215,766.61 | |

Table 2b: Data from Lothian University's Hospital Division of NHS Lothian of 13,500 staff - 2004
Data relates to the period 01/01/04 - 31/12/04. Service staffed by 4 FTE physiotherapists.

The service was started in 1997.

Costs of providing the service 2004

| MSD case management | Low | Medium | High | Notes |
|--|-------------------|-------------------|-------------------|--|
| Line management costs | | | | |
| Number of staff seen | 738 | 738 | 738 | 260 of these were absent; 478 not absent |
| Number of hours per case | 0.5 | 1 | 2 | |
| Cost per hour | 23.64 | 23.64 | 23.64 | Assume Manager's salary = £30,000 |
| Total (£) | 8,723.16 | 17,446.32 | 34,892.64 | |
| Service provision costs (staff salaries) | | | | |
| Total (£) | 150,000.00 | 150,000.00 | 150,000 | Service maintenance; not set up costs |
| Attendance of MSD sufferers during work time | | | | |
| Number not absent | 478 | 478 | 478 | |
| Number of sessions | 2 | 4 | 6 | Varied depending on individual need. |
| Time per session (hours) | 0.75 | 0.75 | 0.75 | 30 minutes contact + travel time |
| Cost per hour | 14.13 | 14.13 | 14.13 | Average D grade Nurse's salary = £17,932 |
| Total (£) | 21.19 | 42.38 | 63.58 | |
| Costs of providing the service (£) | 158,744.35 | 167,488.70 | 184,956.22 | |

See notes in section 6.2.9 for further explanation.

Table 3: Data from a Primary Care Trust (NHS) with 1,100 staff
Data relates to 2002 - 04. Service staffed by 0.5 FTE physiotherapist

Costs of providing the service 2004

| MSD case management | Low | Medium | High | Notes |
|--|------------------|------------------|------------------|---|
| Line management costs | | | | |
| Number of staff seen | 159 | 159 | 159 | 37 of these were absent; 122 not absent |
| Number of hours per case | 0.5 | 1 | 2 | |
| Cost per hour | 23.64 | 23.64 | 23.64 | Assume manager's salary = £30,000 |
| Total (£) | 1,879.38 | 3,758.76 | 7,517.52 | |
| Service provision costs (staff salary) | | | | |
| Total (£) | 16,994.00 | 16,994.00 | 16,994.00 | Service maintenance; not set up costs |
| Attendance of MSD sufferers during work time | | | | |
| Number not absent | 122 | 122 | 122 | |
| Length of initial session (hours) | 1.25 | 1.25 | 1.25 | 45 mins + travel (of 30 mins) * 1 initial session |
| Length of subsequent sessions (hours) | 3 | 3 | 3 | 30 mins + travel (of 30 mins) * 3 sessions |
| Cost per hour | 23.64 | 23.64 | 23.64 | Assume average salary = £30,000 |
| Total (£) | 10,815.30 | 10,815.30 | 10,815.30 | |
| Costs of providing the service (£) | 29,688.68 | 31,568.06 | 35,326.82 | |

Notes:

- The average salary for the PCT staff is taken as £30,000; this includes GPs, nurses and allied health professionals, and administrative staff.
- Management costs are taken as £30,000 (range of £23,000 – 31,000 are quoted as a practice management salary, www.nhscareers.nhs.uk)

Benefits of providing the service 2004

| | Low | Medium | High | |
|---|------------------|------------------|------------------|---|
| Preventing absence | | | | |
| Estimated no days absence prevented | 259.00 | 259.00 | 259.00 | 786 days before programme, 527 after |
| Costs per day | 177.27 | 177.27 | 177.27 | Assume average salary = £30,000 |
| Total (£) | 45,912.93 | 45,912.93 | 45,912.93 | |
| Management time saved due to avoiding absence (project cost to manage staff replacement / investigate incident for those absent) | | | | |
| Number of replacement staff | 19 | 19 | 19 | 56 people absent before the programme; 37 after |
| Number of hours | 1.0 | 2.0 | 5.0 | |
| Cost per hour | 23.64 | 23.64 | 23.64 | Assume manager's salary = £30,000 |
| Total (£) | 449.16 | 898.32 | 2,245.80 | |
| Speedier return to work | | | | |
| No of staff returned to work 'earlier' | n/a | n/a | n/a | Not known |
| No of days returned earlier | | | | |
| Productivity rate | | | | |
| Costs per day | | | | |
| Total (£) | | | | |
| Improved productivity / work without restrictions | | | | |
| No staff whose treated MSD doesn't limit work | n/a | n/a | n/a | Not known |
| No of hours saved due to full productivity | | | | |
| Costs per hour | | | | |
| Total (£) | | | | |
| Prevention of repeated absence | | | | |
| No of staff prevented from repeat absence | n/a | n/a | n/a | Not known |
| No of days saved per person | | | | |
| Costs per day | | | | |
| Total (£) | | | | |
| Total benefit of providing the service (£) | 46,362.09 | 46,811.25 | 48,158.73 | |

| | | | | |
|--|------|-----------|------|--|
| Low cost estimate : low benefit estimate = | 1.56 | 1.48 | 1.36 | = High cost estimate : high benefit estimate |
| High cost estimate: low benefit estimate = | 1.31 | (med:med) | 1.62 | = Low cost estimate: high benefit estimate |

Table 4: Data from a Utility company
Data relates to 2002 - 04

Costs of providing the service

| MSD case management | Low | Medium | High | Notes |
|--|-------------------|-------------------|-------------------|---|
| Line management costs | | | | |
| Number of staff seen | 89 | 89 | 89 | 89 people; 66 not absent |
| Number of hours per case | 1 | 2 | 5 | |
| Cost per hour | 22.92 | 22.92 | 22.92 | Assume manager's salary = £30,000 |
| Total (£) | 2,039.88 | 4,079.76 | 10,199.40 | |
| Service provision costs | | | | |
| Total (£) | 81,631.00 | 81,631.00 | 81,631.00 | Includes set up and service maintenance costs |
| Attendance of MSD sufferers during work time | | | | |
| Number not absent | 66 | 66 | 66 | |
| Number of sessions | 4 | 8 | 12 | Reported between 4 and 12 sessions per person |
| Time per session (days) | 1 | 1 | 1 | Each session was 1 day |
| Cost per day | 115.00 | 115.00 | 115.00 | HSE data |
| Total (£) | 30,360.00 | 60,720 | 91,080 | |
| Costs of providing the service (£) | 114,030.88 | 146,430.76 | 182,910.40 | |

