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Work-relevant upper limb disorders

Their characterisation, causation and management



Dave Williams

A major evidence review on the classification, aetiology, work-relatedness and management of upper-limb disorders has revealed a spectrum of conditions, from disorders with clear pathology to syndromes with uncertain diagnosis. The authors of this HSE-funded research explain their findings.

UPPER limb disorders (ULDs) are extremely common and they have an enormous impact on individuals and on the economy through lost productivity, work loss and disability. Yet, while some conditions that come under the broad umbrella of ULDs attract a specific diagnostic label, others are of a non-specific nature; both may encompass psychological as well as physical elements, often with 'work' held up as the major cause or exacerbating factor of the sufferer's pain. Research was thus commissioned by the Health and Safety Executive (HSE) to provide a more complete picture of

the nature of ULDs and a better understanding of their management. This article is based on a more-detailed research report comprising a comprehensive scientific review, complete with extensive tables of evidence¹.

Upper limb disorders (ULDs) are responsible for considerable work loss and disability. It is recognised by the HSE and others that *preventing* ULDs is not usually possible, thus emphasising the need to manage cases effectively to minimise the working days lost². This review outlines the scientific evidence on how ULDs should best be managed, taking particular account of

Box 1: Evidence rating system

*** Strong evidence – generally consistent findings provided by (systematic review(s) of) multiple scientific studies.

** Moderate evidence – generally consistent findings provided by (review(s) of) fewer, and/or lower quality scientific studies.

* Weak evidence – based on a single scientific study, general consensus and guidance, or inconsistent findings provided by (review(s) of) multiple scientific studies.

Source: adapted from Waddell G, Burton AK 2006³.

the biopsychosocial model. This proposes that biological, psychological, and social factors can play a significant role in disability and return to work.

The whole ULD field was covered, necessitating an extensive literature search. This was synthesised into evidence statements, from which a sequence of key messages was developed. A 'best evidence synthesis' method was used, drawing conclusions from the overall balance of the evidence based on its quality, quantity and consistency. This approach was sufficiently flexible for a complex topic, but provided rigour by assessing the strength of the evidence. Each statement was graded with stars according to a standard classification system (see box 1 above).

FINDINGS

Evidence on the nature of ULDs and how best to manage them was identified and grouped into four categories: classification and diagnosis; epidemiology and risk factors; medical treatments; and management approaches with a specific focus on return to work (RTW).

Classification and diagnosis

*** Classification and diagnosis of ULDs is particularly problematic; there is a lack of agreement on diagnostic criteria, even for the more common specific diagnoses (eg tenosynovitis, epicondylitis, rotator cuff syndrome). Inconsistent application, both in the clinic and workplace, leads to misdiagnosis, incorrect labelling, and difficulties in interpretation of research findings.

** *The scientific basis for descriptive classification terms implying a uniform aetiology, such as 'repetitive strain injuries' (RSI) and 'cumulative trauma disorders' (CTD), is weak or absent and they are inconsistently applied/understood; there is an argument that such terms should be avoided.*

Epidemiology and risk factors

*** There is a very high background prevalence of upper

limb pain and neck symptoms in the general population: one-week prevalence in the general population can be greater than 50%. Estimates of the prevalence rates of specific diagnoses are less precise, but are considerably lower than for non-specific complaints. Rates vary depending on region, population, country, case definition, and on the question asked.

*** ULDs often lead to difficulty with normal activities and to sickness absence, yet most workers with ULDs can, and do remain at work.

Associations and risks

Preventing ULDs might be possible if we fully understood risk factors, and could control them. A whole host of occupational and personal factors have been suggested, but these are inconsistently documented and readily misunderstood.

** *Large-scale influential reviews published around the turn of the millennium (which included much cross-sectional data) concluded that there were strong associations between biomechanical occupational stressors (eg repetition, force) and ULDs: backed by plausible mechanisms from the biomechanics literature, the association was generally considered to be causative, particularly for prolonged or multiple exposures (though a dose-response relationship generally was not evident).*

*** More recent epidemiological studies involving longitudinal designs also suggest an association between physical exposures and the development of ULDs, but they report the effect size to be rather modest and largely confined to intense exposures. The predominant outcome investigated (primary causation, symptom expression, or symptom modification) is inconsistent across studies and remains a subject of debate. This is true for regional complaints and (with few exceptions, see for example reference 4) most of the specific diagnoses.

* *The evidence that cumulative exposure to typical (modern) work is the cause of most reported upper limb injury is limited and inconsistent.*

*** Workplace psychosocial factors (beliefs, perceptions, and work organisation) have consistently been found to be associated with various aspects of ULDs, including symptom expression, care seeking, sickness absence, and disability.

*** Individual psychological factors (such as anxiety, distress, and depression) have consistently been found to be associated with various aspects of ULDs, including

Box 2: Key messages

CONCEPT MESSAGES

Upper limb symptoms are a common experience

- they are generally transitory but recurrent
- they are often triggered by physical stress (minor injury):
 - due to everyday activities as well as work
 - rarely do they reflect irreparable damage
- some cases need treatment, but many settle with self-management:
 - activity is usually helpful: prolonged rest is not
- recovery and return to full activities can be expected:
 - lasting impairment is rare

Work is not the predominant cause

- some work will be difficult or impossible for a short while:
 - yet that does not mean the work is unsafe (indeed, over-attribution to work is detrimental)
- most people can stay at work (sometimes with temporary adjustments):
 - but, absence is appropriate if job demands cannot be tolerated

Early return to work is important

- it contributes to the recovery process and will usually do no harm
- facilitating early return requires support from workplace and healthcare

All players onside is fundamental

- sharing goals, beliefs and a commitment to coordinated action

PROCESS MESSAGES

Promote self-management

- give evidence-based information and advice:
 - adopt a can-do approach
 - dispel myths
 - focus on recovery rather than what has happened

Intervene using stepped care approach

- provide only what is needed when it is needed:
 - treatment only if required
 - beware detrimental labels and over-medicalisation
- encourage and support early activity:
 - avoid prolonged rest
 - focus on participation, including work

Encourage early return to work

- stay in touch with absent worker
- use case management principles
- focus on what worker can do rather than what they can not:
 - a fit note may be more helpful than a sick note
- provide transitional work arrangements:
 - but only if required, and time-limited

Endeavour to make work comfortable and accommodating

- assess and control significant risks:
 - ensure physical demands are within normal capabilities
 - do not rely on ergonomics alone
- accommodating cases shows more promise than prevention

Overcome obstacles

- principles of rehabilitation should be applied early:
 - focus on tackling biopsychosocial obstacles to participation
- all players communicating openly and acting together:
 - avoiding blame and conflict

symptom expression, care seeking, sickness absence, and disability.

Certain jobs undoubtedly entail hazards that are, on the balance of probabilities, risk factors for the development of certain specific diseases³, yet these diseases account for a relatively small proportion of all ULDs. Many upper limb symptoms result from some physical stress across joints and in soft tissues, but work is not the exclusive (or necessarily most important) source of such stress. The epidemiology indicates clearly that many people will experience upper limb symptoms without any exposure to the sort of physical stress that conceivably could result in meaningful injury. The duration of exposure has been inconsistently reported across the epidemiological literature. This means that attributing ULDs to

cumulative exposure is by no means fully justified, and the concept should be put aside unless and until further evidence becomes available.

The term work-related appears potentially misleading and inaccurate, given the difficulty in establishing a clear causal link between work characteristics and ULDs (both non-specific and specific). For this reason the term work-relevant is recommended. This avoids focusing on possible occupational causation, but recognises that work can be troublesome for people experiencing upper limb symptoms, irrespective of their cause. Making this distinction allows fundamental advances in the management of ULDs.

Management approaches and treatment

Many commonly used biomedical treatments are less

effective for ULDs than expected. Some are effective for specific diagnoses (exercise for rotator cuff tendonitis; oral steroids for shoulder pain such as impingement syndrome or capsulitis; and, corticosteroid injections for tenosynovitis), but effect sizes tend to be small and are limited to clinical outcomes. The evidence on other types of intervention is as follows:

Interventions in respect of general musculoskeletal disorders

** General management principles are to provide advice that promotes self-management, such as staying active and engaging in productive activity (with appropriate modifications). Pain modulation and control should be directed toward allowing appropriate levels of activity.*

******* Programmes using cognitive-behavioural approaches are effective and cost-effective at reducing pain and increasing productive activity in both the earlier and later phases.

** Multimodal integrated interventions that address both biomechanical and psychosocial aspects at the same time should be useful for managing musculoskeletal problems in the workplace.*

Interventions specifically in respect of upper limb disorders

****** *Pain management programmes, using cognitive-behavioural principles, and multidisciplinary occupational rehabilitation for people with ULDs can improve occupational outcomes in the short term, and significantly reduce sickness absence in the longer term. Earlier intervention appears to yield better results.*

** There is a conceptual case that rehabilitation should be started early, and that long periods of rest or sick leave are generally counterproductive. In general, resting injured upper limbs delays recovery; early activity improves pain and stiffness, and can speed return to work yet does not increase complications or residual symptoms, and may lead to less treatment consumption.*

****** *Ergonomic work (re)design, directed at equipment or organisation, has not been shown to have a significant effect on incidence and prevalence rates of ULDs. Ergonomics interventions can improve worker comfort (which is valuable): in principle, that can contribute positively to multimodal interventions.*

** There is limited evidence that ergonomic adjustments (mouse/keyboard design) can reduce upper limb pain in display screen workers, but insufficient evidence for equipment interventions among manufacturing workers.*

Return to work

** There is wide consensus that early RTW is an important goal, which should be facilitated by multimodal interventions, including provision of accurate information, pain relief, and encouragement of activity. An integrative approach by all the players – notably the employer, worker, and health professional – is conceptually a fundamental requirement.*

****** *Although the components of RTW interventions vary, there is emerging evidence that integrative approaches can be effective for musculoskeletal disorders in general and, probably also for ULDs. Case management shows promise for getting all the players onside. Facilitation of RTW through temporary transitional work arrangements (modified work) seems to be an important component.*

Non-specific complaints and specific diagnoses

** There is insufficient robust evidence to identify reliable prognostic indicators that are applicable across the ULD spectrum (in other words, specific diagnoses and regional complaints).*

** There is inconsistent and conflicting evidence on whether, and to what extent, certain specific diagnoses and regional complaints should be conceived differently in terms of overall management targeted at vocational outcomes.*

How terminology is used with patients is known to be important. Achieving a balance between diagnostic labels that ‘alarm and harm’, and those that provide an unemotive complaint based description is important. The latter can help ‘normalise’ the experience and ease the path to participation in productive activity; a specific diagnosis should be invoked with considerable caution. In general, helping the individual with an upper limb complaint towards early activation is likely to be more effective than strategies directed at reducing exposure to physical stressors. Combined interventions tend to be effective: specific treatment (when needed, using a stepped approach) coupled with workplace accommodation (when needed, on a temporary basis).

INTERPRETATION

The epidemiological evidence demonstrates clearly that musculoskeletal symptoms affecting the upper limb and neck are a common experience among the general population, and tend to be recurrent. Most episodes appear to arise from normal physiological processes and everyday events such as fatigue or soft tissue strain, and not from serious pathology. The majority of episodes should be considered as non-specific regional complaints, given that specific

diagnoses cannot usually be established reliably. It is worth remembering that even when a specific diagnosis reflecting pathology or injury is appropriate, the classification remains unreliable. This means that many cases will be mislabelled (either colloquially or by a healthcare professional).

When symptoms are work-relevant, as they often are, work may be painful or difficult irrespective of cause. Even when work is related to the expression of symptoms, that does not mean the job was necessarily the underlying cause. It needs to be emphasised that work is not the predominant cause of most ULDs.

Many people experiencing a spell of upper limb symptoms manage without seeking healthcare or taking time off. Those choosing to seek healthcare do so because they are unable to cope with this particular episode. Irrespective of the diagnosis or severity, a small number of people with ULDs will progress to persistent pain and/or long-term disability.

The literature on low back trouble strongly implicates psychosocial factors as the drivers for symptom reporting, work loss, and disability. These have been characterised as yellow, blue and black 'flags' representing psychosocial, workplace and systems factors acting as obstacles to recovery and obstacles to return to work (see *OH at Work* 2007 4(4): 13–18). Since there is no particular reason to expect that the musculoskeletal apparatus of the upper limbs and neck is fundamentally different from the musculoskeletal apparatus of the lower back, it is logical and reasonable to think that there will be shared influences. Indeed, what evidence there is supports psychosocial factors as being important in understanding and managing ULDs.

Given the finding that biomedical treatment of ULDs is not entirely satisfactory, it seems reasonable to focus on controlling symptoms while offering support and encouragement for early return to usual activities. This needs to be supplemented by addressing those psychosocial factors that act as obstacles to recovery/return to work both for the individual and in the workplace. These efforts need to be coordinated and integrated among all relevant players, including the worker.

Despite the difficulties surrounding identification of specific diagnoses, the 'bio' component must be acknowledged. Some patients will have recognised pathology requiring medical or surgical intervention (which may involve short-term rest). However, once that treatment has been delivered – or even while it is being completed – the same approach to return to activity by addressing obstacles is indicated. Implementing this approach may require something of a cultural shift in how specific diagnoses are conceived and managed.

There is some concern that applying the principles of an active approach together with early return to work will be inappropriate for some conditions, such as tenosynovitis, where, anecdotally, rest is the preferred option. However, these fears may be unfounded – at least in part. Although limited, the evidence on ULDs (both specific and regional) is consistent with the active approach that is promoted and implemented for musculoskeletal disorders in general and, importantly, there is no robust contradictory evidence. The notion of 'rest' as a sole treatment – implying withdrawal from participation – is likely to be unhelpful. Even if specific aggravating activities need to be avoided in the short term, that does not preclude other activities and exercises being undertaken.

Although early work-return is seen as advantageous, simply sending someone directly back to a job they find painful is counter-intuitive and inappropriate. There is a strong case for using transitional work arrangements as the facilitator. This takes account of both biological and psychosocial obstacles. There is considerable evidence for the use of temporary modification of activities to assist people with regional pain to return to normal activity. There is no clear evidence that the principle cannot, or should not, be applied to the specific diagnoses.

Whilst the epidemiological pattern of most ULDs does not favour ergonomic interventions as a significant primary preventive measure, this does not mean there is no merit in making work ergonomically acceptable. However, portions of the ergonomics literature and official guidance give the erroneous impression that work is intrinsically the predominant cause of ULDs, and that by applying an 'ergonomics approach' they will be eliminated. The evidence indicates they will not.

Furthermore, a possible problem with ergonomic interventions is that they can reinforce workers' beliefs that they are exposed to a serious hazard, and thereby encourage undue reporting of symptoms, inappropriate workloss, and development of disability⁵. Nevertheless, an ergonomics approach, correctly applied, should improve comfort and efficiency, and assist in accommodating those with work-relevant complaints or disorders. Whilst good ergonomics will not stop all workers' arms hurting, it can make an effective contribution to managing the ULD phenomenon.

Viewed overall, the evidence on the management of ULDs favours neither biomedical nor workplace interventions alone, either for regional complaints or specific diagnoses. Rather, the evidence indicates that what is needed is a biopsychosocial approach, which necessitates multimodal interventions with all the players onside and acting in unison. Whilst the

CONCLUSIONS

- **ULDs** can be triggered by everyday activities including work, but an over-attribution to work as a cause can be detrimental to recovery
- **Over-medicalisation** and negative diagnostic labels are also unhelpful
- **Many cases** settle with self-management – and this should be encouraged – though some need treatment
- **Rehabilitation** should be based on a biopsychosocial approach
- **Early return** to work is important, though some work may be difficult or impossible to perform for a short while
- **Work** should be comfortable and accommodating

evidence base supporting this principle of integrating the beliefs and behaviours of all the relevant players is as yet limited, the concept is central to overcoming biopsychosocial obstacles^{6,7}.

The biopsychosocial model remains ill understood in some circles, thus compromising its adoption. Importantly the biopsychosocial approach does not seek to 'blame' the individual or question the reality of the experience; rather it assumes that biological, psychological, and social factors all play a significant role in determining the full range of outcomes, and that these factors need to be addressed in a positive and constructive climate.

WHERE NEXT?

The findings of this review complement, and should feed into, the government's Health, Work and Well-being strategy. There is an accepted need to shift the culture surrounding the relationship between work and health, and this will involve rethinking the priorities of certain underlying concepts: for example, primary prevention versus management; work-caused versus work-relevant.

Educational material is increasingly seen as a suitable vehicle to contribute to public health and cultural change in respect of health beliefs and behaviours, as exemplified by publications such as *The back book*⁸ and *Work & health*⁹. And, as a Health and Safety Laboratory consensus workshop¹⁰ recommended, the management of ULDs should now be similarly targeted.

This research has shown that, despite the huge spectrum of conditions loosely classified as upper limb disorders, there are some common messages in their management (see box 2 on p.x). Therefore, the review distilled a number of evidence-based messages to reflect the need for:

- facts and ideas to improve understanding and inform attitudes and beliefs – *concept messages*
- advice on the necessary actions, and what should and should not be done – *process messages*.

These points apply to the whole range of players involved – population/workers; employers; health professionals; unions; lawyers; media; policy makers; and enforcers – and they will need to be carefully constructed for each target group, tailored to their needs, and comprehensively disseminated if positive change is to be achieved. ■

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- *The full report, on which this article is based, is available for free download at the HSE website, www.hse.gov.uk/research/rrhtm/rr596.htm*

Notes

1 Burton AK, Kendall NAS, Pearce BG, Birrell LN, Bainbridge LC. *Management of upper limb disorders and the biopsychosocial model*. HSE Books, London, 2008, www.hse.gov.uk/research/rrhtm/rr596.htm

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3 Waddell G, Burton AK. *Is work good for your health and well-being?* London: The Stationery Office, 2006.

4 IAC 2006. *Industrial Injuries Advisory Council. Work-related upper limb disorders*. London: The Stationery Office, 2006, www.iac.org.uk/pdf/command_papers/Cm6868.pdf

5 Coggon D, Palmer KT, Walker-Bone K. *Occupation and upper limb disorders*. *Rheumatology* 2007; 39: 1057–1059.

6 Waddell G, Burton AK. *Concepts of rehabilitation for the management of common health problems*. Norwich: The Stationery Office, 2004.

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9 Anon (compiled by Waddell G, Burton K). *Work & health – changing how we think about common health problems*. ISBN 9999072399. London: The Stationery Office, 2006, www.workingforhealth.gov.uk/documents/work-health.pdf

10 Lee R, Higgins G. *Medical advice on return to work with regard to musculoskeletal disorders*. Workshop report, HSL/2006/69. Buxton: Health and Safety Laboratory, 2006, www.hse.gov.uk/research/hsl_pdf/2006/hsl0669.pdf