

HSE Workplace Health Expert Committee  
(WHEC)

**Work-associated musculoskeletal  
pain: the role of HSE**



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## Work-associated musculoskeletal pain: the role of HSE

This report, its contents, including any opinions and/or conclusions expressed, are those of the committee members alone and do not necessarily reflect HSE policy.



## Foreword

The development of policy in HSE needs to be informed by the best available contemporary scientific evidence. In 2015, HSE formed the Workplace Health Expert Committee (WHEC) to provide independent expert advice to them on:

- New and emerging workplace health issues
- New and emerging evidence relating to existing workplace health issues
- The quality and relevance of the evidence base on workplace health issues

Questions about workplace health issues come to WHEC from many sources, which include HSE, trade unions, employers, interested individuals and members of WHEC. WHEC's responses to these questions are published online as reports to HSE, as position papers following investigation, or as a briefer response where the current evidence is insufficient to warrant further investigation. In cases where the evidence-base is limited WHEC will maintain a watching brief and undertake further investigation if new and sufficient evidence emerges.

In its formal considerations, WHEC aims to provide answers to the questions asked based on the available evidence. This will generally include review of the relevant scientific literature, identifying the sources of evidence relied on in coming to its conclusions, and the quality and limitations of these sources of evidence.

The purpose of WHEC reports is to analyse the relevant evidence to provide HSE with an informed opinion on which to base policy. Where there are gaps in the evidence, which mean that this is not possible, WHEC will identify these and, if appropriate, recommend how the gaps might be filled.

## Executive summary

Musculoskeletal problems are extremely common in the general population. Among workers, symptoms can be caused, aggravated, or perpetuated by the physical demands of work. However, there is compelling evidence that musculoskeletal pain and its consequences are not solely caused by mechanical factors in the work environment and may not be caused by work at all. In practice, therefore, prevention of symptoms is a more challenging goal than might be supposed: 'good' workplace ergonomics is necessary – not least to make work more accommodating for affected individuals – but it is not a panacea. This report summarises some of the background evidence and considers the implications for HSE as a regulator, as well as the contribution further targeted research could make to the problem.



## Size of the problem

According to HSE's Health and Safety Statistics annual report for 2015/16, 539,000 people in Great Britain were estimated to have a musculoskeletal disorder (MSD) that they believed was caused or made worse by their work, including 176,000 "new" cases. It was further estimated that work-related MSDs had caused 8.8 million days lost from work. In THOR-GP, MSDs were identified as the commonest type of work-related illness. Since these statistics rest, to an extent, on people's (and clinicians') beliefs about the work-relatedness of their symptoms, and since such symptoms are common outwith work, and because symptoms may not equate to disease or disability, the estimates carry some uncertainties. Further, the present approach conflates aggravation with causation. Nonetheless, by any measure (and whether or not caused or made worse by work), musculoskeletal symptoms are extremely prevalent among working people and a lot of sickness is attributed to them.

Just how common depends on case definition and setting, and is complicated by the tendency of musculoskeletal pain to run an episodic fluctuating course, with spells of recovery, relapse and recurrence. Challenges exist therefore in assessing prevalence, incidence and the impact of risk control measures. However, considering low-back pain (LBP), one review that drew data from 54 countries and 165 studies put the median point estimate of prevalence at ~15% (interquartile range (IQR) 10% to 24%) and that of lifetime prevalence at 42% (IQR 15% to 60%) (Hoy et al, 2012); LBP in the previous four weeks affected ~1 in 3 people aged 50-59 years in a survey of people aged >50 years from North Staffordshire (Thomas et al 2004); in a British population survey of ~13 000 working-aged adults, 34% reported neck pain in the past 12 months, 11% reported neck pain that interfered with their everyday activities, and 20% had had pain in the past week (Palmer et al, 2001); in Finland, Sweden and Canada, chronic neck pain is said to affect ~14% to 23% of the population (Palmer et al, 2007); in the UK, >2 million working-aged people have sought treatment for knee osteoarthritis (OA), there are ~400,000 cases of rheumatoid arthritis, >30,000 people visit their GP annually because of ankylosing spondylitis, and 620,000 women aged 45-64 years have sought treatment for hand or wrist OA (Arthritis Research UK, 2014).

Given this background, it is natural to assume that prevention of work-related MSDs should be a target of very high priority, which it is.

In an ideal world all musculoskeletal pain would be preventable. However, since these symptoms are almost ubiquitous in most settings, such a goal is unrealistic.

## Relationship to work

A further fundamental problem is that musculoskeletal pain and its consequences are not solely caused by mechanical factors in the work environment and often not caused by work at all. Considering, for example, LBP as the best-researched outcome: young adults entering first employment already report a past history of LBP (Watson et al, 2002); LBP is prevalent even in school children (among whom episodes are unrelated to how heavy their schoolbags are or their posture at a desk, but to emotional problems) (Jones et al, 2003); there is wide international variation in symptoms and disability, even among workers undertaking similar work – in the CUPID study, the one-month prevalence of disabling LBP, ascertained identically among nurses from 17 different countries, varied from 10% to 43% (Coggon et al, 2013); psychological distress is a better predictor of new onset LBP than physical risk factors (Bigos et al, 1991); distress over somatic symptoms and poor mental health are linked with new onset, disabling and persistent LBP (Palmer et al, 2005), and predict new onset LBP leading to GP visits (Croft et al, 1995); workers dissatisfied with their occupation, place of employment, or social situation have higher rates of LBP than happier colleagues (Bergenudd et al, 1988); an 8-fold rise in the number of days of LBP disability claimed through social security occurred between the 1950s and 1990 (Waddell, 2004), an interval over which the physical demands of work tended to decline, owing to a shift from blue- to white-collar employment and improved manual handling practices.

A similar picture can be painted for many other "common MSDs" (Waddell, 2004), psychosocial factors are important determinants – e.g. in one large population survey poor social skills were more strongly associated with neck pain than advanced cervical disc degeneration (Van der

Donk et al, 1991); in a study from Bristol, distress over somatic symptoms and poor mental health predicted new onset and persistent pain in the upper limb (Palmer et al, 2008) and in the knee (Palmer et al, 2007b); in the CUPID study, rates of disabling hand-wrist pain varied >14-fold in office workers from different countries doing similar tasks (Coggon et al, 2013); in Australia in the 1980s an epidemic of work-attributed arm pain developed, peaked, and went away without changes in working practices (at a time when similar epidemics were not seen in other countries with similar technologies) (Gun et al, 1990). An analysis from the CUPID study highlights that many people's pains were not anatomically localised but affected multiple sites, and that personal propensity to experience pain at other sites was a more important driver of LBP than work activities.

For research based on sickness absence as an endpoint, the link with simple biomechanics is weaker still. There is a big literature indicating that episodes have many other determinants. (Three examples suffice to illustrate the complexity of the phenomenon: 1) it was shown several decades ago that there is a geographical gradient in sickness absence for British post office staff, rates being higher the farther away from the South East (Taylor, 1976); 2) annual rates of sickness absence and unemployment have been found to be inversely related across seven Western countries (Enterline, 1964), while in one report sickness absence in the USA was inversely related to an index of national economic activity (Plummer et al, 1955); 3) it is known that sickness absence rates are low in employees working through a period of probationary employment, but that they revert to the mean of their worker group thereafter (Virtanen et al, 2003). Willingness to take sick leave can vary considerably between individuals with similar illness, being affected by feelings about job security, the conflicting advice they may receive, and many other personal factors and beliefs.)

## Prevention and management

'Good' ergonomic practice is necessary and much theory supports its use. Simple improvements can be made cheaply; 'good' ergonomics can be expected to benefit work productivity and assist worker comfort, while the well-known Hawthorne experiment indicates that taking a visible interest in employees' welfare can bring its own benefits; vulnerable groups, such as workers with large joint OA (an increasing proportion of the ageing British workforce) and those with active musculoskeletal pain will benefit particularly from an ergonomically-friendly work environment and reduced physical loading (Chen et al, 2007) – their needs should not be neglected; there is good evidence that cumulative physical loading over a working lifetime (e.g. heavy lifting, kneeling, squatting) can raise risks of large joint OA in retirement (Palmer, 2012b), and better ergonomics might be expected to lessen this burden of long-term morbidity. Individual episodes of musculoskeletal pain can arise from manual handling activities, while health-related job loss attributed to MSDs is ~3-6 times commoner in manual occupations (Palmer et al, 2015).

All these considerations make the case for adapting and improving the work environment, as has happened successfully in some settings (e.g. Jensen et al, 2007).

However, perhaps unsurprisingly with so much 'noise' in the data, and because musculoskeletal pain is multifactorial and only sometimes caused by work, and appropriate work system changes are difficult to execute and to sustain, formal trials of ergonomic interventions to date (as opposed to case studies – <http://www.hse.gov.uk/humanfactors/>) have often had only limited impact on primary and secondary prevention (Hignett, 2003; Boocock et al, 2007; Driessen et al, 2011; Verbeek et al, 2011; Palmer et al, 2012), albeit that such trials are fraught with methodological challenges.

In practice, prevention is a more challenging goal than might be supposed. Poorly designed interventions may carry the inadvertent potential to make some aspects of the problem worse. Coggon (2005) has highlighted the possibility that, since personal beliefs appear capable of influencing symptom chronicity and impact, undue focus on

the harms of work could foster beliefs that worsen rather than improve prognosis. He argues, with some evidential support, that much publicised ‘epidemics’ of back and arm pain in different settings may have been fuelled in this fashion (Coggon, 2005). More empirically, in one randomised controlled trial, the intervention (participatory ergonomic changes to Finland’s municipal kitchens) made a variety of outcomes worse, including job dissatisfaction, mental stress and co-worker relations (Haukka et al, 2010). The so-called “nocebo” effect has been well documented in other contexts.

HSE’s role as a regulator may need to be set within this context. Its actions must of course be planned against a background that legislates to require risk assessments by employers, to control hazardous manual handling operations and tackle ergonomic conditions in workplaces, including computer work stations. And good ergonomics has a clear and definite place as outlined above. Realistically, however, a large part of the burden will not be preventable through workplace measures. False expectations may be created both of the outcome and the power of the regulator to alter things materially for the better. More importantly, there is a danger that a careless focus on the physical hazards of work may fuel morbidity, including fear-avoidance behaviours that can perpetuate chronicity of symptoms and work disability (Waddell, 2004). Some commentators (e.g. Waddell, 2004) also see the focus as a distraction from the modern management of back and upper limb pain, where the ‘normalising’ of symptoms, to discourage fear-avoidance and advice to remain active within the limits of symptoms has brought established clinical benefits (as described in Palmer & Greenough, 2013). Finally, a need exists to develop the evidence base on cost-effectiveness, to ensure the burden on industry is proportionate and will yield predictable and worthwhile benefits.

## Conclusions and recommendations

Certain things seem clear: 1) HSE should intervene to control practices that are unacceptable (those that clearly fail regulatory standards); 2) it should educate concerning good ergonomic principles; 3) ideally it would do so within the context of benefits to worker comfort, long-term well-

being, and business productivity (rather than avoidance of major ‘injury’), recognising the latent potential to do harm through careless words and actions and the welcome downward trend in current MSD statistics from the Labour Force Survey. Nonetheless, 4) HSE should encourage high quality trials of prevention, including ones based on changing beliefs as well as sound ergonomics and thorough assessment of cost-benefits – WHEC could play a role here in advising on suitable study methodology. 5) Suggestions have been made elsewhere (Linaker et al, 2011) on simple changes that might aid interpretation of the data on MSDs coming from the Labour Force Survey (by collecting more information on the duration of spells of associated sickness absence).

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### **What is WHEC?**

The Workplace Health Expert Committee (WHEC) provides independent expert opinion to HSE by identifying and assessing new and emerging issues in workplace health. Working under an independent Chair, WHEC gives HSE access to independent, authoritative, impartial and timely expertise on workplace health.

<http://webcommunities.hse.gov.uk/connect.ti/WHEC/grouphome>