

Worksite Exercise Programs

*Are they an effective control
for musculoskeletal disorders of the upper extremities?*

By Raymond W. McGorry and Theodore K. Courtney

MUSCULOSKELETAL DISORDERS (MSDs) have been associated with occupational and nonoccupational risk factors. Force, repetition, awkward (non-neutral) postures and vibration are among the physical risk factors for the development of MSDs [NIOSH(b) 1; NRC 1]; when found in combination, these factors have been reported to pose a greater risk than the application of high forces alone [Silverstein, et al(b) 343]. Serious workplace injuries due to repetitive motion resulted in an estimated \$2.8 billion in direct costs alone in U.S. industry in 2002 (Liberty Mutual 1).

Recommended approaches for controlling work-related MSDs of the upper extremities (MSDUEs) have included engineering and administrative controls. Engineering controls include modification of the physical work environment such as workstation and tool redesign. Administrative controls include methods training, job enlargement, job rotation and work scheduling [OSHA 1; NIOSH(a) 1; GAO 1].

Worksite exercise programs have also been suggested and implemented specifically as a preventive measure against MSDUEs. For example, guidelines published by Worksafe Australia include exercise as a potential prevention strategy (NOHSC 1). More recently, the Health Council of the Netherlands encouraged the use of physical conditioning and selective training of muscle function as a control approach, in addition to "elimination of the causative strain" (Willems 1969).

The authors first conducted a review of the literature on the effectiveness of workplace exercise programs in 1995 (McGorry and Courtney 22; Table 1). It was concluded that the evidence was insufficient to support the use of worksite exercise programs as a sole intervention. However, the evidence suggested that some comprehensive multidisciplinary programs (including engineering and administrative controls) were effective in reducing incidence of work-related MSDUEs, and worksite exercise programs were included in several of these programs. Based on the review of the literature

available at that time, the authors concluded that multidisciplinary interventions were the most appropriate approach to the control of work-related MSDUEs, and that no evidence precluded the use of an appropriately designed and monitored exercise program as part of a comprehensive effort.

A decade has passed since that initial review. In the interim, guidelines from occupational safety and health agencies in Australia and the Netherlands have suggested exercise as a prophylactic approach to MSDUEs (NOHSC 1; Willems 1969). This led the authors to consider whether more recent developments in the scientific literature support such recommendations. This article provides an updated review of the scientific literature on the efficacy of workplace exercise programs to provide readers with the most recent information available in order to make better-informed decisions regarding exercise as a control strategy for MSDUEs.

The New Literature

As defined for this review, worksite exercise programs take place on site at an office or manufacturing facility. They must include an upper extremity exercise component, although not necessarily to the exclusion of other exercises. Such programs are conducted during regular working hours, and are usually implemented with the goal of mitigating the

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