

Warming Up to On-the-Job Exercise: Effectiveness of Exercise Programs in Preventing or Relieving Musculoskeletal Disorders

Introduction

Effective ergonomic processes require control of the operations, a proactive element to identify and correct physical risk factors and administrative controls like rotation and employee training. Physical capability, general health, and flexibility are also very important for any task. Should your company implement a stretching or exercise program? If so, what key points should you consider?

It has been suggested that exercise can be an effective part of an ergonomics program designed to address work-related musculoskeletal disorders (WRMSDs). Benefits of exercise as part of a more comprehensive health and safety program have been identified in the literature. However, the effectiveness of on-the-job exercise programs in and of themselves has not been conclusively established. Research results vary as a reflection of differences in research criteria, including study designs, methodologies, populations, design of exercise programs (exercises performed, frequency, duration, etc.), and outcome measures. Some examples are illustrated in the following summaries.

Evidence in the Literature

There have been many studies of workplace intervention strategies designed to prevent or mitigate occurrences of work-related musculoskeletal disorders (WRMSDs). While intervention strategies vary, significant attention has been directed toward the potential effects of on-the-job exercise. A review of this literature reveals a variety of objectives, interventions and findings, as illustrated in the following lists:

Objectives:

- Reduce the severity of existing musculoskeletal symptoms of discomfort
- Prevent future occurrences among active workers in a health products plant
- Reduce prevalence of low back pain

Interventions:

- Exercise for seven minutes, twice a shift, with music
- Preventive stretching program
- Pre-work flexibility stretching program
- Six-minute stretching exercises of the wrist, shoulder, neck, and back
- Ten-minute “gymnastic pauses” vs. ten-minute rest periods
- Five-minute rest breaks
- Stretching, isometric, and light dynamic wrist exercises
- Fitness program

LOSS CONTROL TIPS

- Exercise program with job redesign and more aggressive medical management
- Twelve-week preventive/corrective stability training program (30 minutes, 3 times per week)
- Team exercise program (daily and twice a day)

Findings:

- Participants reported feeling better.
- Reduced incidence of injuries
- Fewer medical department visits for musculoskeletal injury related disorders
- Reduced medical costs
- Fewer overexertion injuries and fewer lost-time injuries
- Reduced fatigue
- Improved fitness and absenteeism
- Improved blood flow to the wrist
- Reduction in hand and wrist disorders such as carpal tunnel syndrome
- Decrease in self-reported symptoms of cumulative trauma
- No statistically significant differences in nerve conduction latency or subjective comfort
- Improvement in grip strength over time
- No statistically significant differences in discomfort scores
- Reduced low back pain
- Reduced sick leave
- Reduced neck and shoulder symptoms in sedentary workers

Overall, the findings of this research are generally favorable, demonstrating no negative effects on individuals or job performance. In fact, some studies have demonstrated improvement in criteria like productivity and individual comfort as the result of participation in an exercise program, *particularly when the exercise program is an integral part of a comprehensive and coordinated occupational health and safety program.* The literature supports integration of occupational health and safety programs which have traditionally maintained a work related focus, with health promotion and/or wellness programs which address work and non-work related health problems.

How Do Exercise Programs Work?

Discomfort or injuries (referred to as WRMSDs) are associated with risk factors in the work environment and with individual characteristics. Risk factors in the work environment include static and/or awkward postures, forceful exertion, and repetitive motions. Individual risk factors include poor nutrition, obesity, and substance abuse (nicotine, alcohol, drugs). The likelihood of an employee's developing physical discomfort can be reduced by maintaining a healthy life style, by

working at a well-adjusted workstation, by alternating tasks, and by exercise. In addition, exercise may be a useful preventive measure and an effective tool after an injury has occurred, or when a recovering employee returns to work. Exercise appears to accomplish the following:

- improve circulation, increasing blood flow through the stressed area
- reduce fatigue
- increase muscle strength and endurance
- improve flexibility
- maintain or improve muscle balance
- reduce stress

Types of Exercise Programs

There are different types of exercise programs. *Warm-ups* are designed to limber up muscles before performing strenuous work, much as an athlete would do. *Regular stretch breaks* are intended to periodically stretch unused muscles and to provide relief from being in the same position for too long. *Conditioning exercises* get people in shape by strengthening muscles and by improving flexibility and endurance.

Suggestions for Designing an Effective Exercise Program

- *Implement an effective ergonomic process first to address ergonomic risks.* No amount of stretching can offset workplace stresses that over fatigue the body. Workers will also be less likely to participate if they feel that physical hazards aren't being addressed.
- *Make the program a positive one for everyone.* A voluntary, but well-supported, exercise program is preferred over a mandatory program. Don't force the program on workers. Appealing to workers' sense of self-responsibility and self-interest will generate more participation and sustained effort than asking workers to protect the company's safety record and expenses.
- Consider obtaining the input of your medical provider to design a program that meets the needs of your employees and company
- *Provide complete information.* Be sure employees really understand the purpose of the program and how to perform the exercises properly.
- *Keep the exercise regime short.* Frequency and duration are interdependent and are also influenced by job function. A pre-work warm up exercise regime of 10 minutes, with five minutes of stretching/range of motion exercise every one to two hours during the work day can be effective.

- *Keep the exercise regime simple.* Select exercises that can easily be done at the intended location (e.g., at the work site) and that do not require accessory equipment.
- *Demonstrate stretching and exercise techniques.* Showing people how to stretch is much more effective to using proper techniques over the long term than just providing hand out material.
- *Follow up initial training.* There is a tendency to slide back into old habits after initial training. Follow up training may be needed to reinforce proper techniques. Another effective option is have different people take turns leading a group exercise during the day
- *Promote good overall health practices.* A wellness program is also a very helpful element to promote good health for workers which makes stretching programs even more effective.

Incorporate these guidelines into the exercise program:

- *Remember to breathe while exercising.* Breathing increases the level of oxygen in the system. In addition, slow regular breathing helps maintain a slow, steady exercise pace.
- *Always stretch gently.* Feel a stretch, but not pain.
- *Go easy at first.* Start out with a few exercises and/or a few repetitions and gradually increase. Slowly increase the number of exercises in the program and be more vigorous with stretching over time.
- *Move slowly and smoothly.* Avoid sudden jerky movements. Do not bounce.
- *Exercise regularly.* Try to do some of the exercises every day at regular intervals, even on days off work. Perform some combination of exercises every 1-2 hours.
- *Discontinue the exercise if pain occurs.* If you experience pain and discomfort after you have exercised, it probably means that you did too much. It does not necessarily mean that the exercise is wrong. When in doubt, or if pain persists, check with a medical professional,
- *Evaluate and reevaluate* the design and effectiveness of the program.

For a sample of specific workstation exercises, refer to The Hartford's brochure, *Workplace Ergonomics: Exercises To Keep You Comfortable At Work* (Order Number #103071 REV).

Summary

There are a variety of reasons why employers should consider providing for exercise, including overall employee wellness and morale that provides a better quality of life at home and work. Improved wellness and morale can contribute to cost savings from lower health care premiums, lower absenteeism, and increased productivity. Well-designed exercise programs can serve as part of a comprehensive musculoskeletal disorder prevention program. While the effectiveness of exercise programs in the prevention of work related musculoskeletal disorders has not been proven definitively, the benefits of exercise have been demonstrated in many situations. While many ask "Does exercise help prevent work related musculoskeletal disorders?" the real question is "Which *types* of exercises help prevent what *types* of musculoskeletal disorder and *under what conditions*?"

Key issues which will influence the success of the program include the design of the program, employees' attitudes, and the level of employees' participation. The exercise program itself must be appropriate to the job tasks and environment, and the specific exercises must be selected carefully. Avoid exercises which might add to postural discomfort. As necessary, request the assistance of qualified professionals in the development of the exercise program. Occupational therapists, physical therapists, exercise physiologists, ergonomists, or other healthcare professionals who are knowledgeable about WRMSDs and who are experienced in work programs would be capable of providing such assistance. As with other safety and wellness programs, an approach which places primary responsibility on the employee and emphasizes proper behavior and self-care techniques will be most effective.

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