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Craft-Specific Injury Prevention Programs: A multi-faceted approach to reducing costs associated with musculoskeletal injuries

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Introduction

In 2005, musculoskeletal injuries accounted for 54% of all work-related injuries at Hoffman Construction Corporation. Upon review of OSHA recordables, workers' compensation claims and incident reports, it was apparent that changes in the current program were needed to address issues contributing to musculoskeletal injuries. Attributes that were identified as contributing to this increase included work intensity that reduces recovery time of muscles and soft tissues, an aging workforce that has contributed to a shortage of skilled crafts persons, and inconsistent use of the previous voluntary stretch and flex program. In addition, there was a general lack of knowledge and awareness of proper body mechanics during essential job tasks, ergonomics, and the physiology of stretching and neutral posture. It became apparent to Hoffman's safety leadership that in order to design a more effective program it would be necessary to outsource to a company or individual with a deep understanding of biomechanics, pathophysiology, and a proven track record of preventing musculoskeletal injuries. As the director of Therapeutic Associates' Work Kinetics program, Shawnalea Shelly is an Occupational Therapist and Certified Ergonomist with extensive experience in the prevention of occupational musculoskeletal injuries. Therapeutic Associates, Inc. is nationally recognized as a regional provider of physical rehabilitation services.

The Craft-Specific Injury Prevention Program at Hoffman Construction consists of 3 components, Craft-Specific Stretch and Flex, Craft-Specific Ergonomics, and Early Reporting and Early Intervention and is viewed as a "live" process with significant behavioral and learning components. Stakeholders in the Craft-Specific Injury Prevention Program were identified as Safety Professionals, Subcontractors, Superintendents, Crew Foremen, and Craft Workers. The goals of the program are:

1. Reduce ergonomics related workers' compensation claims
2. Reduce severity of soft tissue claims
3. Demonstrate to workers and stakeholders that Hoffman cares about the health of workers

From the initial phase of implementation, workers and management team members have improved awareness and understanding of stretching, injury risk factors, and ergonomic principles. As a result of improved awareness and knowledge there have been questions from workers that have been easily addressed with simple modifications of stretches and work activities. Intermittent, informal site visits offer workers and management team members the opportunity to ask questions in a non-threatening environment and receive personalized instruction regarding stretches and simple job task modifications. On a quarterly or semi-annual basis, each site and craft receives on-going instruction/information sessions to:

1. Refresh and reiterate stretching, ergonomics, health, and injury prevention information
2. Answer questions from workers and supervisors
3. Provide new layers of information as appropriate.

Craft-Specific Stretch and Flex Program

Musculoskeletal injuries can be traumatic or sudden in nature, but they are commonly due to wear and tear related to daily activities during work, home, and leisure tasks. For health maintenance, a common recommendation for flexibility is 10-12 minutes of daily stretching exercises.[1] When stretch and flex programs are generic, ineffective, inconsistent and/or infrequent it is common that companies implementing these programs do not get the results expected. In addition, workers have to understand and value the importance of executing stretches correctly and stretching following leisure, sport, and home activities, not just while at work.

While reviewing strengths and weaknesses of the stretch and flex program, the following issues were identified:

- some workers were unable to complete the stretches due to the postures/positioning required
- no options for alternative stretches were provided to workers
- workers and supervisors did not understand the purpose of stretching
- at job sites where morning stretch and flex was voluntary it was inconsistently done or may have been done consistently on 1-2 days of the work week
- with job sites requiring mandatory morning stretch and flex, participation was marginal
- workers typically only stretched in the morning prior to starting work

The postures and activities required for each craft may be similar to other crafts (i.e. bending, stooping, kneeling, lifting, etc), but the goals and the end product for each craft-specific program is unique. The stretch and flex program has three components: Craft-Specific Stretch Cards, Employee Stretch Packets, and Updating of Pre-Work Group Stretches. The order in which the crafts were addressed was determined by comparing national injury incidence rates to company

[1] The President's Council on Physical Fitness and Sports *Fitness Fundamentals: Guidelines for Personal Exercise Programs*

incidence rates for each craft while considering the construction schedule of multiple current and impending projects. In developing the Craft-Specific Stretch Program, each craft was observed during an average workday to determine essential job tasks, non-essential job tasks, and the body areas, muscles and soft tissues affected during job duties.

Craft-Specific Stretch Program

Phase 1 of the Craft-Specific Stretch Program was developed in an effort to increase stretching throughout the workday and consists of Craft-Specific Stretch Cards and Employee Stretch Packets. Craft-Specific Stretch Cards were created and posted in gang boxes or other areas where workers would have frequent access to them. Selection of stretches for each craft was based on muscles or muscle groups that are typically loaded during essential job tasks and structures or props in the work environment that could be used to facilitate stretching. Stretch instructions focus on correct execution of the stretches and include specific information regarding positioning, the area where stretch should be felt when completed correctly, and the duration, number of repetitions, and frequency for each stretch. Each Craft-Specific Card has 8 to 9 stretches that are generally beneficial and 3-4 stretches that focus on body parts and movements which are most likely to strain or load muscles and soft tissues for each craft. Through a partnership with VHI PC Kits, Therapeutic Associates, Inc. was able to provide illustrations that are physiologically accurate and instructions can be customized to promote correct execution of each stretch.

At the initial rollout of the Craft-Specific Stretch Program workers were provided with Employee Stretch Packets for use at home, gym or wherever they participate in sport and leisure activities. The combination of Craft-Specific Stretch Cards and Employee Stretch Packets were presented to groups of 15-20 workers at a time. The groups were generally limited to one specific craft, but there were times when more than one craft would be represented in a group. General health information, precautions for safe stretching, explanation of muscle and soft tissue physiology, and rationale for frequent stretching throughout the workday was simplified, but accurate so as to provide workers with a good understanding of information they could immediately put to use. Employee Stretch Packets provide variations of stretches organized by body area or muscle groups affected. The Stretch Packets were handed out to every craft worker and the workers were encouraged to share the Stretch Packets with their family members. Each stretch in the Packet is rated for intensity to assist in choosing variations that are most appropriate for each individual craft. Copies of the Employee Stretch Packets and duplicate Craft-Specific Stretch Cards are available upon request by contacting any Hoffman Supervisor or Safety Professional.

Updating of Mandatory Pre-Work Stretches

Phase 2 of the Craft-Specific Stretch Program was the revision of the Pre-Work Stretch Program to improve and modify stretches to better accommodate individual abilities and limitations. While the previous program provided a very basic level of stretching, it included stretches that placed unnecessary strain on joints and soft tissues or were essentially ineffective for the body areas intended to be stretched. Keeping in mind that the stretch groups could be conducted in a variety of environments on the jobsite that may or may not have props, structures or other items that could be used to facilitate stretching, the Pre-Work stretches can be done without the use of props or equipment. The workers are encouraged to supplement the group stretches with stretches they have found to be effective from the Employee Stretch Packets and the Craft-Specific Cards in the work areas.

Craft-Specific Ergonomics

During the observations to develop the Craft-Specific Stretch Program, workers were noted to utilize a variety of material handling techniques, strategies, awkward postures, and work positioning which resulted in either unnecessary strain of muscles, joints and soft tissues that increased risk of injury or neutral and effective techniques and strategies that reduced the risk of musculoskeletal injury. Ergonomic risk factors that were associated with essential job tasks were categorized in one of three ways: easily changeable, engineering controls required, or unchangeable.

Craft-Specific Ergonomics Recommendations

For all crafts, there were common ergonomic risk factors identified that could be easily changed by improving awareness of work practices such as overexertion when lifting or moving tools, supplies, or equipment, and awkward postures related to incorrect use of tools and equipment. For risk factors requiring engineering controls that could not be implemented within 3 months, short-term administrative controls were provided to workers and supervisors including job task rotation, more frequent stretch breaks, and early reporting and intervention of discomfort. For each craft, specific tasks and activities were targeted based on the degree of injury risk starting with the most obvious. During roll-out of the Craft-Specific Stretch Program, workers were educated about the effects of awkward and sustained postures, forceful and repetitive exertions, and the effects of environmental conditions, work intensity, fitness, nutrition, hydration and age on soft tissues. The general concept of wear and tear was presented and workers were educated about their role in preventing musculoskeletal injuries on and off the job.

Training and Education for Safety and Management Teams

Initial training focused on the field safety professionals of Hoffman Construction because they interact with workers and are involved daily in identification and abatement of safety and ergonomic hazards on the job site. Hoffman's Safety Professionals are actively involved in daily operations and are acutely observant and able to easily identify common construction safety hazards. Training focused on honing their observation skills to include ergonomic risk factors by understanding the short-term and long-term effects of posture, force, repetition, intensity, and environmental factors. Hoffman's Site Safety Professionals received more in-depth information than other stakeholders to provide them with a better understanding of musculoskeletal injury prevention and the ability to educate the various stakeholders as the program progressed. The ultimate goal is for the Craft-Specific Injury Prevention Program to be sustainable by the Safety Professionals at Hoffman Construction.

Safety Professionals of the subcontracting companies were provided with an overview of the Craft-Specific Injury Prevention Program. In general the information provided to the subcontractors was not as in-depth and was more informal than that provided to Hoffman's Safety Professionals, but was more detailed than that provided to craft workers. The subcontracting companies were provided with Craft-Specific Stretch Cards, Employee Stretch Packets, and Pre-Work Stretch Cards. Each subcontractor was provided with a PowerPoint presentation about ergonomics related to their craft and access to an Ergonomist to address questions or concerns.

Hoffman's Safety Professionals act as a resource and gateway to additional information and resources as needed.

Training and education of management teams focused on general ergonomic information, return on investment of implementing engineering controls, reduced labor costs associated with injury prevention, and retention of a skilled labor force that is in high-demand. The management teams at Hoffman Construction are charged with completing projects at or under budget and with the safety of crews in the forefront. Construction schedules and a shortage of skilled crafts persons add to the daily stress encountered by the project management team.

Early Reporting and Early Intervention

With improved awareness and understanding of soft tissue physiology and musculoskeletal injury prevention, workers were more commonly reporting ergonomics challenges and discomfort to safety professionals and members of the project management team.

Early Reporting

Workers are encouraged to report any discomfort so it could be treated early and effectively with little or no reduction in regular work duties. Any worker reporting discomfort is referred to an occupational medicine facility and transportation is provided to these facilities during work hours. Safety Professionals immediately address ergonomic issues with the worker in terms of positioning, posture, use of tools and equipment, and simple modifications to job tasks. If Physical or Occupational Therapy is prescribed for an injured worker, the consulting Occupational Therapist acts as a liaison to ensure the rehabilitation provider has a thorough understanding of essential job tasks and job duty modifications available for the injured worker. Hoffman Safety Professionals have the option of contacting the consulting Ergonomist for additional input if they or the worker feels it would be beneficial. The importance of timely return to modified or regular duties is communicated by Hoffman's Workers' Compensation claims manager to the employee's rehabilitation provider and physician.

Early Intervention

Early intervention consists of employee education, stretching, and physical conditioning while at the job site and is conducted by Hoffman's Site Safety Professionals or the consulting Occupational Therapist. The craft worker is educated about modification of job tasks through appropriate use of tools and equipment, changes in posture and positioning, job task variation/rotation, and first aid interventions. Using the Employee Stretch Packets, workers are instructed regarding the stretches that will target the body area affected. Physical Conditioning focuses on completing work tasks with proper body mechanics to strengthen the affected muscles without additional loading of muscles and surrounding tissues. Workers are educated about the importance of working with good body mechanics to unload affected tissues while concurrently strengthening the affected muscles and thus reinforcing and resting the affected tissues. In this situation, the worker's supervisor or a Hoffman Safety Professional follows up with the worker in 3-5 work days. Additionally, the worker is instructed to report any additional discomfort to his/her supervisor and/or the Hoffman Safety Professional.

Summary

The result of Hoffman Construction Corporation's craft-specific injury prevention program has been consistent with information published regarding stretching programs for the prevention of occupational injuries.[2] While Hoffman's rate of musculoskeletal injuries decreased only 2% from 2005 to 2006, the cost of total injury payouts was unchanged even though the number of man-hours worked more than doubled during this time period. Early analysis of savings indicates that the cost of musculoskeletal injury claims per man-hour worked has decreased by more than 40% for the company as a whole. By consistently stretching prior to work and throughout the workday, workers and management team members have increased awareness of injury risk factors and precursors to musculoskeletal injury such as fatigue, joint stiffness, and sore muscles. As a result, all stakeholders have a better understanding of simple injury prevention measures and have developed an improved awareness of injury signs and symptoms as well as outcomes associated with early reporting of discomfort and musculoskeletal issues. Craft workers praised Hoffman safety leadership for addressing the differences between the crafts and the work that each craft is responsible for each day. Anecdotally, workers have reported a notable difference in the effectiveness of the stretches in the Craft-Specific Stretch Program, reduced frequency of muscle soreness on days that required higher work intensity and improved awareness of work postures, and correct tool and equipment use.

[2] Hess, J.A., Hecker, S.A., Workplace Stretching Programs: The Rest of the Story. 2003 *Applied Occupational and Environmental Hygiene.* 18(5): 331-338