

Humantech's Position

# The Effectiveness of Stretching on Preventing MSD Injuries



## Introduction

Many employers rely on having employees stretch at work in an effort to prevent musculoskeletal disorders (MSDs) and make mandatory stretching an element of their ergonomics program. The idea of stretching as a control continues to be researched and discussed in news stories, social media, and at professional conferences.

One shortcoming of this research is that many of the studies on the effectiveness of stretching programs rely on subjective rather than objective measurements. Demonstrating an improvement in self-ratings of an overall feeling of well-being does not address the impact on human performance or injury reduction. Some of the objective measures used do not translate directly to impact on the job. For instance, demonstrating that a workplace stretching program improved range of motion among employees does not indicate that the program was effective in meeting its primary goal of reducing MSD injuries. The real question is whether the stretching program actually reduces injury rates.

Our position on company-mandated stretching programs is that they can benefit personal wellness and fitness, but stretching is not effective in preventing musculoskeletal disorders. Therefore, it is not a component of an effective ergonomics program.

## The Potential Benefits of Stretching

Flexibility is the range of movement around a skeletal joint in the body. It refers to changes in the length and properties of muscle tendon units. The act of stretching causes a change to the length of the muscle tendon unit over time, which, in turn, changes the amount of force production and range of motion at that particular joint. This will affect the distance the muscle can stretch and the amount of force required to tear the tissue. The assumption is that stretching will increase the length of the muscles, increasing flexibility and decreasing risk of musculoskeletal injuries.

Stretching can provide several benefits for people at work, and may help improve morale and team cohesiveness. Employees may experience greater flexibility, as well as an enhanced perception of their physical fitness. Another benefit of stretching is that participants may increase their range of motion compared to their counterparts who do not participate in stretching programs. In studies of people working at computer workstations, employees who stretched reported lower levels of stress, stiffness, and muscle aches (Viera and Bruno, 1998).

## Can Stretching Reduce or Prevent MSDs?

MSDs are overuse injuries that usually occur at joints in the body. They typically result when regular wear and tear on the joint exceeds the body's ability to heal itself. MSDs include injuries or dysfunctions involving muscles, bones, nerves, tendons, ligaments, joints, cartilage, and spinal discs. Proponents speculate that stretching could reduce the risk of developing an MSD by changing the properties of the ligament muscle unit.

Many studies have been conducted on the effects of stretching on athletes' performance; the results of most of them have been generally negative. However, the workplace and physical condition of employees (and an employer's control of employee physical condition) are different. The evidence of multiple studies on the effectiveness of workplace stretching programs to reduce MSDs are inconclusive at best (Bruno & Viera, 2008; Hess & Hecker, 2003; Silverstein & Clark, 2004). Conclusions included that the studies "failed to definitively prove the case for or against stretching," were "not very compelling," and "provided mixed findings, and suggested that future studies be conducted with improved validity." Choi and Woletz (2010) concluded that, "while research does support that stretching improves flexibility, range of motion (ROM), and self-worth, stretching alone might not prevent work-related musculoskeletal disorders and injuries."

VelocityEHS | MSDSONline | Humantech — Reach Your EHS Goals Faster.

© 2001-2019 VelocityEHS. All rights reserved. VelocityEHS®, MSDSONline® and Humantech® are proprietary trademarks of VelocityEHS. All other trademarks are the property of the respective owners.



Although some companies mandate stretching before and during work, many state that it is challenging to get people to participate in (and continue with) these workplace stretching and wellness programs. In an early study on the effects of exercise on MSDs, Silverstein et al. (1988) found that only 41% of the study group participated in the exercise program daily, while 28% had discontinued all participation.

## Cost of Stretching Programs and ROI

We have heard comments from several employers that “stretching might not be proven to reduce injuries but it does not cost anything to do.” However, in reality, the time taken to implement employer-mandated stretching programs does add up, and must include the time when production and work is not performed.

Stretching programs add measurable non-value-added cost for results that are not yet proven to be successful. In contrast, engineering controls have consistently delivered successful results when applied to reducing MSDs. With limited resources available to invest in the prevention of MSDs, it makes sense to pursue proven methods. Research by Goggins, et al. (2008) showed that engineering controls were much more cost-effective (40-100%) than controls that rely on behaviors in reducing MSD numbers, incidence rates, lost work days, and workers' compensation costs.

## When Stretching becomes Treatment

In the United States, employers who use exercise and stretching to manage MSDs must ensure they are promoting preventive exercise, not therapeutic exercise. OSHA's interpretation of therapeutic stretching is: “If a physician or licensed health care professional recommends therapeutic exercise in response to a work-related injury or illness, the case is considered to involve medical treatment and the case is recordable.” (U.S. Department of Labor, 2010)

## Stretching is not Ergonomics

By definition, stretching is a mechanism to change the physical condition of an employee, and is not ergonomics. In 1997, NIOSH defined occupational ergonomics as “The science of fitting workplace conditions and job demands to the capabilities of the working population. Ergonomics is an approach or solution to deal with a number of problems—among them are work-related musculoskeletal disorders.” In contrast, stretching is not a change to the workplace conditions or job demands, but rather a change to the worker. This definition is consistent with other internationally recognized occupational safety and health agencies and professions.

## Stretching is an Observable Indicator

Group employee workplace stretching programs first came to light with the advent of quality programs in the 1980s. Many Asian companies mandated group stretching routines at the beginning of and during work shifts (calisthenics are part of the Asian culture, engrained in them from when they are first introduced to mandatory stretching programs at school). Many people assumed these routines were being performed in the workplace to improve employee health and to prevent injuries. In reality, the group exercises were performed to “cycle the machine,” that is, for supervisors to watch each employee to ensure they were fully mobile and flexible, and to identify those employees who did not appear to be fully prepared for or capable of the movement demands of the task. The stretching activity is actually an early symptom investigation tool that helps identify employees who may be experiencing the beginning stages of injury.

## Opposing Positions

Stretching has been a mainstay activity in sports and exercise. However, the purpose of stretching before exercise (increase circulation, flex and prepare muscles to perform) is not the same as stretching at work to prevent MSDs. Furthermore, the duration of a sporting event and length of an athlete's career are much shorter than a work day, work week, and a working career. Because the intensity, repetition, and duration of physical exertion vary among athletes and workers, findings of effectiveness of stretching should be interpreted carefully.

## Conclusion

Changing positions and occasional stretching at work are good ways to eliminate static and awkward postures and may help individuals reduce stiffness and discomfort. Although stretching can be used as a tool for early symptom investigation, employer-mandated stretching programs have not been shown to be effective in preventing or reducing the incidence of MSDs.

## Endorsement

This position statement was accepted by Senior Leadership on October 24, 2016.

## References

- Bruno, R.C & Vieira, E.R. (2008). *Stretching to reduce work-related musculoskeletal disorders: A systematic review*. Journal of Rehabilitation Medicine, 40, 321-328.
- Choi, S.D. & Woletz, T. (2010). *Do Stretching Programs Prevent Work-related Musculoskeletal Disorders?* Journal of Safety, Health & Environmental Research, 6(3).



Choi, S.D. & Woletz, T. (2010). *Do Stretching Programs Prevent Work-related Musculoskeletal Disorders?* Journal of Safety, Health & Environmental Research, 6(3).

Hess, J. & Hecker, S. (2003). *Stretching at work for injury prevention: issues, evidence, and recommendations.* Applied Occupational and Environmental Hygiene, 18(5), 331-338.

Goggins, R.W., Spielholz, & P., Nothstein, G.L. (2008). *Estimating the effectiveness of ergonomics interventions through case studies: Implications for predictive cost-benefit analysis.* Journal of Safety Research, 39, 339-344.

Humantech, Inc. 2012. Whitepaper: *Is Stretching a Good Strategy to Lower the Risk of MSDs?*. Available from <http://www.humantech.com/resources/whitepapers/>

Humantech, Inc. 2016. Position Statement: *Calculating Return On Investment for Ergonomics.* <http://www.humantech.com/resources/position-statements/>

Humantech, Inc. 2016. Position Statement: *Definition of Occupational Ergonomics.* <http://www.humantech.com/resources/position-statements/>

NIOSH. (1997). *Musculoskeletal Disorders and Workplace Factors, A Critical Review of Epidemiologic Evidence for Work-Related Musculoskeletal Disorders of the Neck, Upper Extremity, and Low Back.* Cincinnati: NIOSH

Silverstein, B., Armstrong, T., Longmate, A. & Woody, D. (1988). *Can In-Plant Exercise Control Musculoskeletal Symptoms?* Journal of Occupational Medicine, 33(12) 922-927.

Silverstein, B. & Clark, R. (2004). *Interventions to reduce work-related musculoskeletal disorders.* Journal of Electromyography and Kinesiology, 14(1) 135-152.

U.S. Department of Labor, Occupational Safety and Health Administration (2010). OSHA Letter of Standard Interpretation. Keith Goddard, OSHA Director, Directorate of Evaluation and Analysis to Dr. Betsy Buehrer and Michael Nash, 3M. May 21, 2010 Washington, DC. *Therapeutic exercise is considered medical treatment for recordkeeping purposes.* [1904.7;1904.7(b)(5)(ii)(M)]

