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Productivity and Employee Health

Recapture Your Investment

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It is recommended that the average person vary their posture while at work, approximately 8 times throughout the day.

As the work day progresses there are significant changes to the physical demands being placed on the muscles. The sit to stand capability of the **Leader Series** arm, if users are trained and instructed as to the features and benefits of varying their posture as well as how to operate the keyboard arm, can help to decrease strain and thereby reduce the risk of injury and the overall costs to the corporation.

Mr. Paul Bradshaw, Chief Ergonomist for Mayhew & Associates, commented with regards to the benefits of a keyboard arm being able to extend 2.5" inches above the worksurface, providing his thoughts on the benefits of this feature.

"This feature allows for increased flexibility for a wider variety of users. The average workstation height is usually set between 28 and 30 inches, which in actuality is high for the average population who tend to be shorter than the workstations are geared to accommodate. The ability of the **Leader Series** arm to extend 2.5" above the worksurface provides excellent sit to stand options for the majority of workers. The tilt capability on the arm is a beneficial tool in that when used appropriately, it is an essential element to proper posture. This sit to stand capability allows users to keep their hands, wrists and forearms inline, thereby promoting healthy blood flow and circulation."

The problem being addressed by intermittent standing is the fatigue from sitting in the same basic position for extended periods of time such as when working at a computer, referred to as Static Muscle Fatigue. Static Muscle exertion, as in holding your hands out in front of you, does not prompt the heart to pump sufficient blood to the muscles for the energy being expended.

"...prolonged periods while performing repetitive tasks can be very damaging to both productivity as well as employee health"

The stand up capability of keyboard support minimizes Static Muscle Fatigue and prevents frequent walks away from work area to revitalize blood flow.

With the computer as the primary tool for most office work in this day and age, there has been a dramatic change in the evolution of work habits and office routines. This is, to a large degree, a manifestation of the physiological demands that prolonged PC usage has on today's employees. Traditional means of obtaining breaks to avoid prolonged sitting such as file retrieval, faxing, copying of documents, referencing information, and inter-office communication are, in the age of technology, consistently performed through the use of automated processes on a workstation. This shift in the working culture of the office environment has resulted in the premier source of productivity in the modern office being the human in front of the PC. The unfortunate consequences of this shift have been that a large percentage of individuals now spend their workdays sitting in one basic posture with little to no variation.

Ergonomists agree that sitting for prolonged periods while performing repetitive tasks can be very damaging to both productivity as well as employee health. Injuries associated with various Cumulative Trauma Disorders caused by computer use have been researched and documented extensively. (see Appendix A)

When looking at the effect of prolonged static postures from computer use, the primary effects of such activity have damaging consequences on both productivity and health. Static muscle exertion inhibits blood flow and causes muscle fatigue. The buildup of fatigue minimizes the overall effectiveness of worker productivity due to excessive workbreaks and reduced output.

Ergonomists stress the importance of not only implementing ergonomically correct workplace solutions but also of training workers as to the benefits and correct method by which to use the tools. Employees have been shown to respond well to, and to use most often, tools that are simple to maneuver. If the tools take a lot of time and or effort to shift around, employees are unlikely to make use of them and productivity will consistently remain low as will employee health.

"...intermittent standing increases productivity through a reduction in workbreak time, through fewer and shorter breaks throughout the day"

Dr. Dainoff of the Center for Ergonomic Research conducted a study on the effect of worktools on productivity in today's automated workstation design. The primary objective of his study was to assess the effectiveness of periodically standing throughout the day as a means of providing the essential breaks from sitting in prolonged static positions. This would determine whether intermittent standing, while working, relieved fatigue without repetitively departing from the work area or from task accomplishment.

The results of this study indicated that intermittent standing increases productivity through a reduction in workbreak time, through fewer and shorter breaks throughout the day. Employers should be aware that these results indicate that productivity can be increased due to the fact that standing while working reduces the need for traditional work breaks, which take workers away from the work area. Dr. Dainoff's study showed significant changes in productivity between 'Standers' and 'Non-Standers'. All participants were trained on how to use the keyboard arms and were told about the benefits of intermittent standing. The 'Non-Standers' were shown to take an average of 47% more workbreaks, with the average workbreak being 56% longer than the average workbreak of the 'Standers'.

A simple, yet effective, ergonomic intervention for the PC user is a Leader Series articulating arm and keyboard platform. This allows the user to adjust the height of the keyboard to minimize shoulder abduction as well as tilting the keyboard to minimize wrist deflection. A Leader Series solution is easy to install, highly effective and, as shown in Appendix B, results in annual productivity gains equating to approximately 12 times the cost.

Appendix A

Cumulative Trauma Disorder (CTD) is a broad category that includes many common diseases that affect the soft tissues of the body. Some examples of conditions that may be caused or aggravated by cumulative trauma include carpal tunnel syndrome, tennis elbow, and low back pain.

Some causes of CTD in the workplace:

Overuse

Affects people who work in jobs where they keep doing the same action again and again, such as typing, gripping, and lifting. Minor damage occurs continuously, which the body must repair in the normal course of a day. But the damage can occur faster than the repair mechanisms can keep up with it. When this happens, the tissues become weaker. They may begin to hurt. The weaker the tissues become, the more likely they will suffer even more damage.

Muscle Tension

Muscles can get energy without oxygen, but the process produces a chemical called lactic acid. This chemical can be pivotal in causing pain. As pain develops, muscles tighten in an attempt to guard the surrounding area. When pain occurs anywhere in the body, muscles around the painful area go into spasms in an effort to try to limit the movement in the area. This results in diminished blood flow to the affected areas, increasing muscle pain. The nerves that have their blood supply reduced and squeezed by the muscles tingle and grow numb.

Nerve Tension

It is thought that poor postures used over long periods causes muscles to bulk up and interfere with blood flow. The nerves that course through the body become shortened and begin to stick to nearby tissues. Moving the limb puts tension on the nerve and causes pain to radiate through the entire appendage. When the same activities are done over and over again, the tight nerve is pulled and strained to the point that it can't heal eventually resulting in a chronic source of symptoms.

Some examples of CTD's:

- A. Carpal Tunnel Syndrome: nerve disorder in wrists and hands
- B. Tendonitis: inflammation of a tendon from repeated tensing
- C. Tenosynovitis: compression of the nerve and blood vessel between the neck and shoulder
- D. Ulnar Neuritis: nerve inflammation that results from pressure on the Ulnar Nerve (between wrist and elbow) over time, including leaning the elbow on hard or sharp surfaces for extended periods of time
- E. Thoracic Outlet Syndrome: compression of the nerves and blood vessels between neck and shoulder. Symptoms include numbness in fingers and tingling in arms.

Appendix B

Annual recapture of investment in ergonomic keyboard solutions

Assumptions:

A. Average salary level*:	\$55,585.00
Benefits equal to 50% of salary:	\$27,792.50
Average annual cost of employee:	\$83,377.50

B.	365	days in a year
	104	weekends
	12	public holidays (US)
	5	sick days (standard)
	234	work days
	1872	work hours (@ 8 hours per day)
\$44.54		average hourly cost for employee

- C. Assume a productivity increase or time savings of 21 minutes per day or 5% through use of ergonomic keyboard solution. 21 minutes X 234 days X \$44.54 per hour / 60 minutes = \$3,647.83 USD

\$3,647.83 USD Annual savings and recapture of investment in ergonomic keyboard solutions

Investment Recaptured in One Month**

* Using US statistics for 2001

**Based on average cost of \$200.00 per keyboard solution

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