

Ergonomics in the Workplace

Ergonomics

Let's face it: sometimes, work can be a pain in the neck.

Or rather, *the way* in which work is preformed can *cause* a pain in the neck...or the back...or the wrists...or the knees...you get the idea.

In fact, pain and injuries sustained in the office are increasingly common. According to the U.S. Department of Labor and Statistics (BLS), in 2008 work-related musculoskeletal disorders—like nerve damage from typing and injuries caused by improper lifting—accounted for almost 30 percent of all workers' compensation claims. That's 317,440 claims to be exact, with each claim resulting in a median of 10 days out of work for injured parties and costing state fund employers millions of dollars.¹



Enter ergonomics.

Ergonomics is the scientific study of the way humans work. In ergonomics, a worker's capabilities are taken into account in direct relation to the tasks required of him or her. Overall, ergonomics adapts the work to fit the worker, instead of forcing the worker to adapt to the work. Doing so ensures that tasks, equipment, information and the workplace environment maximize productivity and prevent work-related musculoskeletal disorders.²

A business's employees are of course, key to their success. Employees are necessary to create and deliver most products and services and are vital in representing and protecting a business's brand. Ergonomics can help businesses protect this asset while increasing morale, productivity and work quality, while also reducing turnover and absenteeism.

Read on to learn more about the most common sources of injuries in offices nationwide that can be prevented with ergonomics, how to implement ergonomics in your business or organization and tips to share with your employees and coworkers for staying safe and comfortable in the workplace.

WMS-whaaaa?

As mentioned previously, consideration of ergonomics in the workplace can prevent staff from experiencing work-related musculoskeletal disorders. These disorders refer to injuries that relate directly to the soft tissues in the human

¹ "Injuries, Illnesses, and Fatalities." U.S. Bureau of Labor Statistics. Web. 07 Dec. 2009. <http://www.bls.gov/iif/>.
² "Ergonomics encyclopedia topics | Reference.com." Homepage | Reference.com. Web. 07 Jan. 2010. <http://www.reference.com/browse/ergonomics>.

body, primarily muscles, tendons, ligaments, nerves and blood vessels, such as³:

- Sprains, strains and tears
- Back pain or hurt
- Soreness
- Carpal Tunnel Syndrome (a compression of a nerve in the wrist, causing numbness, tingling, pain and weakness)
- Tendinitis (inflammation of tendons) and Bursitis (painful inflammation of the cushiony fluid sack between the bone, muscles and tendons)
- Epicondylitis (tennis and golfer's elbow)
- Hernias (when internal organs protrude through a weak point in a muscle)



Work-related musculoskeletal disorders arise from typical arm and hand movements—bending, straightening, gripping, holding, twisting, clenching and reaching. What makes these movements harmful (and painful) in the work setting is the repetition and speed of movement. Temperature and vibration are also contributing factors.⁴

Symptoms of these disorders include discomfort or pain that lasts more than two days, swelling, change in skin tone or color, stiffness, tight muscles, loss of flexibility, unusual sensations like numbness, tingling or pins and needles, and weakness or unusual clumsiness, such as the inability to hold on to things.⁵

Adoption of ergonomics, these symptoms and disorders are highly preventable. But, ignored or unaddressed they can be extremely painful and often develop and worsen over time. Treatments can range from rest, or braces and casts in early stages, all the way to physical therapy and surgeries as time left untreated goes on.

What causes work-related musculoskeletal disorders?

Tasks that have the most opportunity to put you and your colleagues or employees at risk for these health conditions are those that involve body position

³ "BLS OSH Definitions." U.S. Bureau of Labor Statistics. Web. 07 Jan. 2010. <http://www.bls.gov/iif/oshdef.htm>.

⁴ "OSH Answers: Work-related Musculoskeletal Disorders (WMSDs)." CCOHS: Canada's National Centre for Occupational Health and Safety information. Web. 07 Jan. 2010. http://www.ccohs.ca/oshanswers/diseases/rmirsi.html#_1_4.

⁵ "UW EH&S - Ergonomics Awareness." Environmental Health and Safety. Web. <http://www.ehs.washington.edu/ohsergo/ergohandout.shtm>.

and posture, repetition, sustained exertions, mechanical contact stress and force:⁶

Body position and posture

How a person positions his or her neck, back, arms and legs can increase their risk.

Examples of this include:

- Slouching or leaning forward in a chair
- Looking down at papers flat on a desk or table while typing
- Cradling a phone between the ear and shoulder
- Bending at the waist
- Using a mouse too far from the keyboard
- Typing with bent wrists

Repetition

Those who perform extremely repetitive tasks—the same motion over and over for an extended period of time—are at the most risk for work-related musculoskeletal disorders.

Examples include:

- Typing
- Moving and clicking the mouse
- Scrolling with the mouse
- Writing by hand
- Stapling by hand



Sustained exertions

This refers to movements, or lack thereof really, that require the muscles to support the body's weight while in a single position or force is applied for an extended period of time. Lack of movement reduces circulation and causes muscle tension—creating discomfort or exacerbating already existing injuries. Examples include:

- Holding down a computer key or button
- Sitting still, leaning or standing without shifting your body's weight for long periods of time
- Sitting upright without back support

⁶ "OSH Answers: Work-related Musculoskeletal Disorders (WMSDs)." CCOHS: Canada's National Centre for Occupational Health and Safety information. Web. 07 Jan. 2010. http://www.ccohs.ca/oshanswers/diseases/rmirsi.html#_1_4.

Mechanical contact stress

Sometimes, it's not just a person's body or tools that affects ergonomics—it's the equipment or furniture the body comes in contact with while performing tasks. Hard or sharp surfaces or an object that presses into soft tissues can lead to musculoskeletal disorders. Examples include:

- Resting wrists on the desk edge or edge of laptop while typing
- Sitting in a chair that puts pressure on backs of thighs
- Holding a computer mouse too tightly in the palm
- Using tools that press into the palm of the hand like rubber stamps, knives, nail files or scissors

Force

The force required to carry out a task plays a significant role in the onset of work-related musculoskeletal disorders. More force equals more muscular effort, and consequently, a longer time is needed to recover between tasks. Examples include:

- Dragging and dropping items with a computer mouse
- Using more force than necessary to type
- Opening binders, jars, stuck doors or heavy drawers in filing cabinets
- Lifting heavy books or other rectangular objects with one hand
- As you can see, the tasks that put people most at risk for bodily harm or discomfort are the very tasks that many of us are required to experience in the office each day.



Pinpoint the issues: assessing your workplace

Ergonomics approaches each job and each worker independently—which means that there is no possible one-size-fits-all way in which to implement ergonomics in the work place. So how do you go about determining the ergonomic needs of your staff? Like many areas of business, ergonomics begins with a situation analysis.

At this point, many companies pull in outside consultants, like physicians, certified ergonomists, or ergonomic workplace design companies such as Humantech www.humantech.com or US Ergo www.us-ergo.com. Major companies like

The Wall Street Journal, Ford Motor Company and Pitney Bowes have all in recent years hired consultants to help in their ergonomics assessments and implementation. Truth be told, if you're a small business, outside help isn't always an affordable option. However, there are still steps you can take to make proper assessments.

The analysis starts with the worker and addresses factors on all levels. Create a survey for employees to complete, giving them each the opportunity to have a voice in their work environment and overall health and job satisfaction.

Create such a survey with a concentric circle in mind—at the very center, where your analysis should begin, is the individual worker. Ask employees, if they are comfortable, to share any medical conditions that may make their work difficult or uncomfortable in any way, or if they are experiencing any of the symptoms outlined earlier. Also, address the unique characteristics of each worker and his or her task at hand—what do they do throughout the day? How are they sitting? How often are they moving around or sitting still?

Next address the individual workstation. Ask employees to look at what equipment and furniture they use on a daily basis and how—chairs, desks, tables, computers, telephones, copy machines, etc.—are being utilized.

Then, focus on the office environment at large. Ask employees for their input on lighting (Is it too bright? Too dark?), noise (Are there distracting noises anywhere in the building?), temperature (Is it too cold or too warm?) and design (Can you easily navigate the building? Have you ever tripped over a cord or an uneven floor board?). These factors all play a role in ergonomics, and what's interesting is that some factors really bother certain people and may go unnoticed by others—like the buzz of fluorescent light or a desk directly beneath a heating vent. The goal of asking these questions is to find these potential obstacles.



Case in point: Sno-Isle Regional Library System⁷

Washington's Sno-Isle Regional Library System is made up of 20 branches staffed with workers that type at computer terminals, process thousands of new books each year, staff circulation/check-out desks and deliver truckloads of books throughout the state.

⁷ "Success Stories." *Labor & Industries (L&I), Washington State. Web.*
<<http://www.lni.wa.gov/Safety/Topics/Ergonomics/Success/Stories/default.asp#Library>>.

Through a situation analysis conducted in 2001, Sno-Isle administrators recognized a need for closer attention to be paid to ergonomics in its many libraries. Working with information collected from staff and research conducted through the Washington State Department of Labor and Industries, the human resources department developed a comprehensive ergonomics program for staff.

This program aimed to train current and incoming employees, conduct ongoing evaluations and teach supervisors about accident-prevention programs and ergonomics. Department of Labor & Industries specialists did onsite assessments, conducted workshops and provided safety materials, including several fact sheets specifically about risk factors for library jobs.

“We simply took an awareness approach of risk factors,” said Pat Olafson, human-resources manager.

Following implementation, the library system began to see improvement: lift and strain injuries decreased 75 percent in 1999 from the previous year. During that same period, reportable repetitive-stress injuries dropped by 66 percent.

Find a solution: Implementing ergonomics in your office

Once all employees have given their input and if risk factors have been identified, measures can be taken to improve the work environment with ergonomics by eliminating these factors and training employees.

Desks

According to David Brandenburg, a UCLA–certified ergonomist, the height of most desks is actually fairly arbitrary in consideration of the average heights of both men and women.

“The specs of the standard desk still most common in offices today were actually designed for 18-year-old men in World War II who were typing,” says Brandenburg. Not exactly useful for say a 40-year-old woman or man for that matter, is it?⁸

As a rule of thumb, desks—or at least the keyboard tray—should hit between the belly



⁸ Binkley, Christina. “The Importance of Being Ergonomic: When Office Chairs Wreak Havoc.” Web log post. *The Juggle*. *Wall Street Journal*, 11 June 2009. Web. <<http://blogs.wsj.com/juggle/2009/06/11/the-importance-of-being-ergonomic-when-sitting-at-a-desk-wreaks-havoc/>>.

and the bottom of the rib cage and at least long enough to account for 24 to 27 inches of workable space. Any smaller and desks can become restrictive.⁹

Chris Adams, an industrial design expert, says that computer monitors should be as far away from the worker as possible while still maintaining the ability to read the computer screen without straining to focus. For most people, this is a minimum distance of about 20 inches. Be sure that the center of the computer screen is at about a 15 degree angle down from the eyes, with the neck only slightly bent and the head perpendicular to the floor to reduce strain on both the eyes and the neck.¹⁰

Additional notes on desk posture¹¹:

- Head should be kept level and work should be directly in front of you.
- Sit with shoulders relaxed—not elevated, hunched or rotated.
- Keep elbows close to your sides and bent at about a 90 degree angle.
- Wrists should be kept straight—which usually requires them not to rest on the laptop keyboard or the edge of the desk.

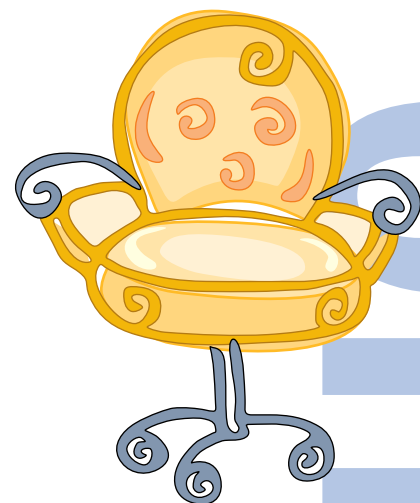
Work area

Another aspect to address is the actual work area—this not only includes the space required of a computer, but what is known as the “reach area.”

The reach area is how far a person can reach from where they sit without straining. For most people, this works out to be an area about 16 to 18 inches in front of their body. Items that are frequently used—like pens, pads of paper and the telephone—should all be placed on the desk within this reach area.¹²

Chairs

If a workstation is only used by one person, standard office chairs (the non-rolley chairs with fixed height) can be modified to fit an employee’s needs. Yet, if a workstation is used by multiple staff members, an adjustable task chair (on wheels with adjustable height and other features) is a much more efficient option. Adjustable chairs are also often a way to combat the stationary



⁹ “Ergonomic Computer Desk | Tips For Ergonomic Computer Desk | Ergonomic Computer Desks.” *Safe Computing Tips on Office Ergonomics, Ergonomic Chair, Ergonomic Seating | Healthy Computing Exercises*. Web. <<http://www.safecomputingtips.com/ergonomic-computer-desk.html>>.

¹⁰ “Guide to Setting Up an Ergonomic Computer Station.” *Ergonomics - What is Ergonomics and How Does it Improve My Life?* Web. <http://ergonomics.about.com/od/office/ss/computer_setup_2.htm>.

¹¹ “Office Ergonomics: Practical solutions for a safer workplace.” *Labor & Industries (L&I), Washington State*. Web. <<http://www.lni.wa.gov/FormPubl/Detail.asp?DocID=1761>>.

¹² “Office Ergonomics: Practical solutions for a safer workplace.” *Labor & Industries (L&I), Washington State*. Web. <<http://www.lni.wa.gov/FormPubl/Detail.asp?DocID=1761>>.

height of most desks.

A few things to consider when finding the right chair for employees¹³:

- Lumbar support—lumbar support decreases the weight placed on a person's back while seated for long periods of time while supporting posture. Many adjustable task chairs have this feature built in and can usually be adjusted to suit the worker. For standard chairs, lumbar cushions can be purchased from most office or medical supply stores for around \$15-25 per cushion.
- Sit with your entire upper body upright or leaning slightly back.
- Sit with your knees at the same level or slightly below the level of your hips. There should be no pressure points along the backs of your thighs or knees—many adjustable tasks chairs also feature seats with a sloped edge to help prevent this, or the ability to adjust the seat angle.
- Feet should be slightly out in front of the knees and supported, with a foot rest if necessary.



Office space should be conducive to a calm, safe and efficient environment. Dr. Alan Hedge, renowned human factors and ergonomics professor at Cornell University, points out that often it's the small environmental details that are often overlooked in the workplace and it's these that can exacerbate musculoskeletal disorders or lead to other health or safety concerns.¹⁴

Take the seemingly harmless hum of exhaust fans or heavy street traffic wafting in through the windows. "Noise can cause stress," says Dr. Hedge, "Which tenses your muscles and increases injury risks."

As such, ensure that all employees have access to quiet workstations. Consider adding more fabric to your office's décor, such as carpet, pillows, upholstered chairs or printed fabric stretched over a wooden frame and hung on walls, to absorb sound. Encourage the use of earphones that either drown out excess noise or connect to an employee's own music or sound source.

Dr. Hedge also recommends attention to details such as ventilation, saying

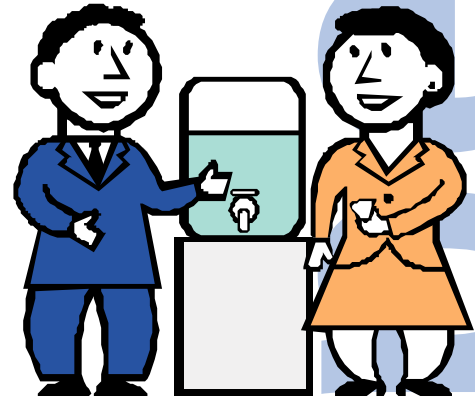
¹³ "Office Ergonomics: Practical solutions for a safer workplace." Labor & Industries (L&I), Washington State. Web. <<http://www.lni.wa.gov/FormPublDetail.asp?DocID=1761>>.

¹⁴ "Design, Arranging Your Workstation Ergonomically." Effective Meetings, Your Meeting Resource Center. Web. <<http://www.effectivemeetings.com/design/ergonomics/workstation.asp>>.

that proper air flow is necessary to keep employees energized, and sunlight, explaining that proper blinds should be installed in windows or anti-glare screens added to computers to reduce eye strain.

Other environmental pointers:

- Provide a central location for common use items like printers, copiers and water coolers.
- Ideal light levels for computer use are actually lower than the light required for reading. Keep overhead office lights slightly dim and provide desk lamps to those who need extra light.
- Have conference or meeting space available that is not in common areas or in a close vicinity to offices or cubicles.
- Keep space heaters and small fans on hand to allow employees to adjust workspace temperature as they need to for maximum comfort and efficiency.



As mentioned earlier, ergonomics requires you to take a look at certain human resource factors. Why? They, too, can be related to work-related musculoskeletal disorders, but primarily affect the overall satisfaction and loyalty of your employees.

Wondering how? Well, employees who are under pressure to meet deadlines will become tense and take fewer breaks, putting them at increased risk for disorders.

Dr. Hedge recommends supporting frequent breaks for employees who spend much of their time in repetitive tasks. "Every 30 to 60 minutes you should take a brief rest break," says Dr. Hedge. "Stand up, move around and do something else. You'll exercise different muscles and feel less tired."¹⁵

Overall, the initial situation analysis and simple efforts to train employees in order to decrease risks for work-related musculoskeletal disorders are often enough for many companies to see vast improvement, even without the capital expense of new office furniture. Additionally, in allowing for employee participation throughout the ergonomics analysis and implementation provides employees and staff with the opportunity to have a say in the structure and content of their own work, which will have a positive effect on injury prevention and productivity.¹⁶

¹⁵ "Design, Arranging Your Workstation Ergonomically." *Effective Meetings, Your Meeting Resource Center.* Web. <<http://www.effectivemeetings.com/design/ergonomics/workstation.asp>>.

¹⁶ "Office Ergonomics: Practical solutions for a safer workplace." *Labor & Industries (L&I), Washington State.*

However, some companies take it one step further by purchasing ergonomically correct office furniture and accessories like keyboards, computer mice and phones...which is perhaps why many people hear the term “ergonomics” and immediately their minds become a flurry of dollar signs. While ergonomic office furniture and accessories designed by ergonomic experts and tailored to your staff can indeed run a pretty penny, remember the return on investment your business may be seeking—fewer workers’ compensation claims, reduced absenteeism and increased morale and productivity. Depending on how many dollars your business currently loses because of potentially related ergonomic factors, the investment in new equipment could be worthwhile.

Case in point: Blue Cross Blue Shield Rhode Island¹⁷

In 1999, managers at Blue Cross Blue Shield Rhode Island recognized a trend—eight related workers’ compensation cases that resulted in 345 days of lost work. It was clear that its offices were experiencing serious ergonomic issues and it was time to develop a plan. Blue Cross Blue Shield outlined its biggest concerns: Finding the most effective methods of intervening and preventing future injury. And, communicating hazards to the chief financial officer in order to secure funding of resources expected to be required by new equipment and enhanced training.

Over the next year, Blue Cross Blue Shield Rhode Island researched and implemented ergonomic processes that included:

- Installation of ergonomic key trays at workstations
- Rearrangement of offices to allow for better traffic flow
- Hosting of brown bag luncheons, during which ergonomists spoke to employees on how to improve ergonomics in all aspects of daily life
- Enrollment of staff members within various departments in ergonomics certification courses
- Development of informational ergonomics materials and an intranet page aimed at educating all employees
- Research and consideration of ergonomics furniture and software for



Web. <<http://www.lni.wa.gov/FormPub/Detail.asp?DocID=1761>>.

17 “Safety and Health Case Study: Blue Cross Blue Shield Rhode Island.” Occupational Safety and Health Administration - OSHA HOME PAGE. Web.

<http://www.osha.gov/dcsp/success_stories/compliance_assistance/abbott/blue_cross.html>.

extremely high-risk employees

- Development of a process for identifying and reporting ergonomics needs and determining whether or not and when outside experts should be consulted
- When all was said and done, Blue Cross Blue Shield Rhode Island was able to reduce lost work days from 345 in 1999 to just 89 in 2002.

Measurement

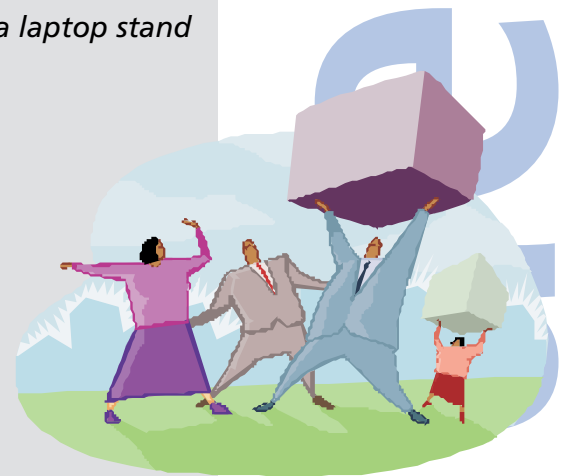
Should your business decide that it is worthwhile to pursue efforts in ergonomics, be sure to put processes in place that will measure said efforts. Track not only the number of workers' compensation cases, but sick days and overall productivity. Many companies also survey staff on a yearly basis to gauge job satisfaction based on ergonomic factors.

Measurement of ergonomic efforts serves to justify expenses incurred through the implementation of ergonomic efforts and can help your business determine if the efforts it is taking are the right ones—if it's not meeting your goals or expectations, it's not the solution.

While working can be a pain in the neck, ergonomics is available to improve the quality of life, job satisfaction and overall health and safety of workers. Protect your employees and cut costs by looking into implementing ergonomics in your offices today.

Additional ergonomics tips and resources

- *Laptops are built with convenience—not comfort—in mind. The key to making laptops ergonomic is to elevate the laptop with a laptop stand or a pile of books at comparable height to a worker's head and install an external keyboard and mouse.¹⁸*
- *Lifting is also a leading cause of disorders in the office setting. Remember the following tips for safe lifting:*
 - *Keep the load close.*
 - *Avoid lifting directly off of the floor.*
 - *Keep your feet a shoulder width apart and bend at the knees while tightening the abdominal muscles.*
 - *Get a good grip on the load and use your leg muscles to lift the load and return to an upright position.*



¹⁸ "When Your Laptop Is a Pain in the Neck - WSJ.com." Business News & Financial News - The Wall Street Journal - WSJ.com. Web. <<http://online.wsj.com/article/SB122938297526708695.html>>.

Keep your back straight throughout lifting and never twist while you lift.

- *Many states have very specific laws and requirements regarding ergonomics—especially within factory or industrial industries. Be sure to make sure your business’s ergonomics efforts meet these requirements and do not interfere with them.*
- *Certain software packages exist to train staff virtually on ergonomics or reduce the opportunity for risk in the workplace, such as voice recognition software that takes verbal commands, hover click software that eliminates mouse clicks and even desktop timers to remind workers to take a break or stretch.*
- *Find ergonomically correct products online via sites like Office Max www.officemax.com, The Ergonomics Store www.theergonomicstore.com or ErgoStore www.ergostoreonline.com.*
- *Check out Dr. Hedge’s extensive work and list of resources and a directory of professionals in your area on the Cornell University Web site: <http://ergo.human.cornell.edu>.*
- *Many states have their own resources on ergonomics and work-related musculoskeletal disorders that can be found by visiting your state’s department of labor and industries page, if there is one. The Washington State’s Department of Labor and Industries’ page are full of useful information, checklists to complete situation analysis and useful ergonomic charts <http://www.lni.wa.gov>, while the United States Bureau of Labor and Statistics <http://www.bls.gov> serves as the definitive resource for comparing ergonomic and work-related musculoskeletal disorders information state by state.*



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