

Body Knowledge: Improved Ergonomics=Improved Productivity

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Managers looking to improve bottom line results often point to rising health care costs—workers' compensation claims in particular—as the reason for poor performance. Well, there's good news and not-so-good-news about workplace injuries: Workers' comp claims and OSHA-reportable injuries have actually been declining in the past few years.

Still, the U.S. Bureau of Labor Statistics (www.bls.gov) reports that in 2005 (the latest data available) 4,214,200 recordable, nonfatal injuries were reported. About one-quarter of those resulted in days away from work; more than one-half million were sprains and strains; and more than 270,000 were back-related injuries.

If there's any kind of trend in work place injuries these days, it seems to be an increase in back and shoulder strains, followed closely by wrist and hand injuries. These injuries are easy enough to prevent through proper stretching before twisting or lifting.

"What's interesting," says Shawnlea Shelly, program coordinator for Therapeutic Associates Inc., (Portland, Ore., www.therapeuticassociates.com), "is that musculoskeletal injuries (sprains and strains), on average with most companies, account for about half of their injuries."

Injury rates don't always provide a true picture of potential economic impact for employers, says Shelly. "For example, carpal tunnel injuries are one of the least in terms of incidence, yet the [financial] effect is huge because of lost work days."

Our Bodies, Ourselves

After all that's been written and said about ergonomics since the signing of the Americans with Disabilities Act in 1990, why hasn't there been a greater reduction in workplace injuries? Shelly has a theory: "People have this black box they carry with themselves everywhere they go," she says. "They have no idea of how the things inside that black box work. The box is called their bodies."

Her job (Shelly is a board-certified professional ergonomist and physical therapist), and that of her company, is to educate. And while she tries to educate in the most simple terms about repetition, force, awkward postures and environmental factors, she admits that most of it goes right over the heads of employees.

"They don't have a clear understanding of 'postures' and 'force' and how to change those things," she says. "Your body can deal with force and repetition if you're in a good posture."

Shelly compares the human body to any mechanical tool: If it's worked within the range it was designed for, it will last for a long time. However, when the tool is stressed, or used for an unintended job, it breaks.

The right tool for the job

Southworth Products (Portland, Me., www.southworthproducts.com) was using the term "ergonomics" in its product literature way back in 1973, a good 10 years before most people had ever heard of the subject, says Jim Galante, the company's director of product development. "Back then, ergonomics was viewed as something everyone had to have. It was a good thing."

Then the political climate changed and President Clinton's controversial rule aimed at curbing repetitive motion stress injuries in the workplace was repealed by Congress in March of 2001. The so-called ergonomics rule would have been one of the most sweeping regulations governing the workplace, affecting more than one million workers. The rule would have forced companies to alter workstations, redesign facilities or change their tools and equipment if their employees suffered work-related injuries from repetitive motions. The rule also would have required that disabled workers receive more compensation than is provided for by many state compensation laws.

The rule was the product of a 10-year effort by OSHA to prevent musculoskeletal disorders in the workplace, such as carpal tunnel syndrome and chronic back pain. It was based upon the science of ergonomics, or the designing of workplace equipment to accommodate workers who perform repetitive tasks, such as typing on a keyboard.

"The problem," says Galante, "was that many business owners thought the rule would mean an end to business in America; that as a country, we just could not afford it."

Because of such perceptions he says that companies like Southworth had to set off on a different tack. Selling on the fear factor—that if companies didn't put this or that device into their plants, they would have huge workers' comp claims—was not the

way to go.

"We took, and still take, the right business approach," he says. "There are enormous productivity gains to be made through the use of ergonomic devices, such as manipulators and lift tables. If a company has an ergonomic issue it also has a production bottleneck."

Solving production bottlenecks

Healthcare professionals understand the health issues surrounding poor ergonomics; business managers might not. But the goal should be familiar to anyone involved in lean manufacturing. It's all about removing waste from a process.

"If it takes two people to lift a crate and put it onto a pallet, that's wasteful if that job could be safely done by a single person," says Galante. "So if the employer can eliminate waste by buying a piece of equipment that increases productivity, and gives him ergonomic benefits in the bargain, he begins to understand."

The next step, if the employer takes a lean-thinking approach, is to determine if the workstation can be reconfigured to cut the employee's walking distance after the crate has been lifted with a manipulator and moved to the pallet, which is now raised on a lift table.

"Ergonomics education is a huge part of our business, as it is for other members of the Ergonomic Assist Systems and Equipment (EASE) product council of MHIA (www.mhia.org/ease), says Galante. "Users are getting the message that ergonomics, like safety and quality, is a process, not a destination."

Educating managers, up close and personal

Any ergonomics education program for managers has to be about thinking forward, says Therapeutic Associates' Shelly, not about the past. Managers must constantly be looking at what tasks can be done mechanically and what must be done by a person.

Toward that end, a new software product from Remedy Interactive (Sausalito, Calif., www.remedyinteractive.com), called On-line Enterprise Safety (OES), helps industrial managers track ergonomic risks. (There is also a version for office employee managers.) Since two workers will rarely do a job in exactly the same manner, this software allows a company with 150,000 employees in 200 countries— such as Hewlett Packard, which is one of Remedy Interactive's customers— take a more personal approach to solving ergonomic problems.

Brett Weiss, chief knowledge officer for Remedy Interactive, says finding a way to approach the employee population, particularly in global organizations, can be a challenge. One of the better ways to collect data and analyze risks is via input from the people doing the job.

"It's a process of having the thousands of employees sit at computer terminals, whether they're job involves a computer or not does not matter," he explains, "and have *them* tell us, following a questionnaire, precisely what they do and how they do it."

The data can be used to assess risk and educate employees. "We are able to train them with company-specific custom education and custom recommendations for that job. No more generic information."

Part of the education process is informing the individual about their risks are and why that behavior is risky. "The other approach a company can take," he says, "once the data is in the system, is to ask what are the risks for X number of employees in a particular job or location." A company might learn that people in one particular geographic area are carrying weight levels that are beyond the company's recommendations, and they're seeing a disproportionate number of lower back injuries.

"Essentially," Weiss explains, "we provide the company with a baseline of risk, by job, location, personal physical characteristics, whatever the company wants to measure."

Managers can make informed decisions, based on analytics and correlate those analytics with risk. Ergonomic information must first be specific to an industry, then the company and finally, and most importantly, the job, says Weiss.

A second approach to improving ergonomics—the first being from the employee up—is from the top down, through an aggregate analysis of what people in the field are doing. In this scenario, managers might use a laptop to go out and analyze jobs, collect data, and store it in a central repository. The data would then go into a Web-based software program that has information on thousands of jobs, risks and breakdowns of what each person does to complete a job.

"Using this approach," Weiss says, "the manager is able to analyze which job has the most risks, and why. Then they can go to the site and determine how to reduce or eliminate the risks of a specific job."

Using the data it is also possible to evaluate new employees and find jobs specific to each person's abilities. "Functional capacity match-ups" is the phrase Weiss uses. "Another important aspect of this for managers is the ability to make judgments on people returning to work. Managers can go into the software and find alternate jobs for people who might have been off work because of a back injury, for instance."

Along with its Web-based application, Remedy Interactive provides a desktop application that "talks" with employees on a regular basis. Following up on the information the employee entered while making a profile of his or her ergonomic issues, the software will ask if they have been doing their stretches or if the newly recommended posture has helped ease any strain problems. The system can keep a real-time snapshot of what's happening, and what changes have occurred in the workplace.

"The system sends messages to supervisors, safety administrators or whomever is designated, to let them know that people they are responsible for are at risk, or are resolving their risks," he says.

No matter which approach managers take—employee up or database down—to defining ergonomic risks and building better jobs, software can build a program specific to a company's needs and policies. "What we do with clients like Verizon, for example, is use an underlying set of clinical risks that relate to the body—back, shoulders, whatever is involved in doing their jobs," he says. "Then we layer on top of those, pictures, questions and graphics that apply to the person driving the van and climbing the pole. They get company-specific data."

Behavioral science

Safety and ergonomics are hugely behavioral, says Therapeutic Associates' Shelly. Part of the multi-faceted approach to better ergonomics she advocates is the need for employers and employees, to recognize that workplace injuries don't always start in the workplace. "People take that body home after work and play or do chores. Injuries don't happen in a vacuum."

Consequently, the education has to carry over into the home, like working both sides of the body when shoveling snow. And while it might be a stretch to think employees are going to take anything they learn at work home with them, stretching is one thing Shelly says none of us do often enough.

"Wear and tear happens. A lot of stretching programs are not effective so managers need to try a variety of things, along with employees, to see what works best," she says.

Managers need to approach ergonomics programs with the same intensity as safety programs. It's not uncommon to see safety posters throughout a workplace. Ergonomics posters advocating stretching for flexibility, however, even for progressive companies might only be found in the break room, at best.

"Companies can fine-tune their safety programs," she says, "by incorporating ergonomics into the plan."

Just as safety is about awareness—a supervisor spotting an employee not wearing eye protection—ergonomics is as well. "Supervisors need to be alert to someone not lifting or bending in the proper manner, or a job that causes an undo amount of stress or strain," says Shelly.

One size fits nobody

Whatever is right and wrong about a job, or its functions, begins with a proper job description. Job descriptions are not often thought of as a part of ergonomics, however they are important, says Shelly. "Many companies use the *Dictionary of Occupational Titles* for job descriptions. These are generic. Companies and people vary, and while the definition might call for the person to lift 50 pounds, the company's policy might be to lift no more than 30 pounds."

Clearly defined ergonomic job descriptions deal with essential job functions. They should include force, repetition and postures for the employee. Having detailed descriptions can help in hiring, or be used as a post-hire screening tool.

"You want to know that the person can do the job safely," says Shelly. "You can use that description as part of the promotional process because you now have a clear idea of what you're looking for and what the job demands are."

A proper job description also helps determine whether a person can return to work. "A doctor might fail to release a person to work if he has only a vague understanding of the work involved," says Shelly. "It might be that the person could return to work with limited duty, thus reducing the expense of a workers' comp claim."

Sometimes ergonomics issues are in the eye, or budget, of the beholder. The employee might have a concern with strain in the job and the therapist looks for ways to reduce that strain. The production manager, however, might look at the job and see only something that slows getting material out the back door.

"If a manager is trying to implement an ergonomics program, he needs to step back and see how such a program would impact all of its users. It's the best way to get buy-in." Shelly adds that the programs with the fastest acceptance are those that show how to reduce labor costs. The best ergonomics programs are designed by committees that include members from all areas of the workforce who can present sides of the issue that other constituencies might not be aware of.

A machine operator or warehouse worker's comfort has quantifiable benefits: higher productivity; improved health and energy; reduced absenteeism and increased job satisfaction. The best way to provide for ergonomic working conditions is through up-front design.

"A lot of ergonomic design is based on usability and ruggedness," says Greg Holland, designer of hardware products for Vocollect (Pittsburgh, Penn., www.vocollect.com). "We have [design] guidelines furnished by OSHA and NIOSH for sound levels, however, many things governing the use of the tool depend on the customer's input, and are his responsibility."

When it comes to equipment for voice-directed picking technologies, the tools can be as variable as the distribution centers they're used in. "Depending on the work environment," says Holland, "we have eight separate headsets."

To test products, Holland uses something called the Highly Accelerated Lifecycle Training program, or, HALT, to find the target point of five years mean time before failure. "This program simulates the ergonomics and goes through thousands of cycles until the point of failure is reached."

New materials and the miniaturization of electronics in general has benefited the design of products worn by people on the job. "The headset is the key," he says. "If the features are intuitive for the user, and the fit and adjustability are right, the equipment has faster acceptability with the user."

One of the better ways to design ergonomics into a piece of equipment is by field observation, says Holland. For example, the protective cover on the terminal part of voice-directed picking hardware is really cumbersome to remove. "We designed an elastomer [a term often used interchangeably with rubber] skin cover that is more incorporated into the unit, kind of like a shell, that takes up less space, has high absorption properties to resist drops and allows the operator to remove it with one hand."

He adds that the company tries to make all of its equipment workable with one hand. It has a mantra of "handsfree eyes-free" when designing products.

Another concern in ergonomic design is geographic regions of the country where the equipment will be used. "There are enough nuances in the demographics of warehouse workers, that we find it important to look at the macro level of the user experience," he says.

A lot of equipment design testing simulates the extreme range of movements an employee might encounter in a warehouse. The idea for having two head straps on the headset units, for example, came about because of the need for stability. Holland suggests, when looking at a piece of equipment that interfaces with a human, a product that's been designed for the specific application can be the better buy.

Whose idea was this?

Product designers say many of their better ideas come from customers. "People don't sit around thinking, 'I guess I'll go out and buy a lift table today,'" says Southworth Products' Galante. "They have a specific job that needs to be done, or a problem to be solved. They come to the equipment provider and go from there. Either we have it or we make it."

Holland says the best way he has for knowing if he's getting it right is for the users to tell him so. "A lot of our design ideas come from the user. Body-worn devices are subjective and personal. They have to be tried over large numbers of people in different geographic regions in the United States and globally."

In the final analysis, the first rule of safety also applies to ergonomics: You can make a tool foolproof but you can't make it damn-fool proof. If people see a shortcut to doing a job, they'll take it. Only through better education of the risks involved by taking shortcuts will ergonomics programs become self-sustaining and workplace injuries diminish.

