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CONNECT

The magazine for the ergonomics professional



Winter/Spring 2017

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Welcome

In this, our first issue of 2017, we've collected some fantastic articles and pieces of insight to help you, the ergonomics professional, make your job a whole lot easier.

With articles covering employee wellness programs, the real value of ergonomics, dealing with ergonomic add-on items and even kid's health, you should be able to find something here that gets you thinking.

In the lead article, Gareth Jones and Jonathan Daniel take on a subject that should worry most office workers. With the landscape of our businesses changing and with more and more work conducted at the desk, the article deals with the terrifying health effects of our sedentary working lives and offers some guidance and advice on what we as managers, ergonomists and health and safety professionals can do to ease that burden and help our workforce become healthier, with all the attendant benefits that brings.

Pat McClelland from VSP Vision Care brings us stats from the world of eye health, relating it, importantly, to the work we do as ergonomists. In particular, there is a focus on the benefits of good eye care for employees, which shows a correlation between positive eye health and economic productivity.

Cardinus CEO Andy Hawkes takes a look at employee wellness programs and their importance for modern businesses.

Organizations that adopt wellness programs tend to perform better, with evidence cited for the case, such as in reducing the costs associated with health risks. Andy provides an overview of the case and sets out the ways organizations can achieve this.

Thanks for reading, we hope you enjoy this issue of Cardinus Connect. If you want to help others benefit from the articles in this magazine then please share it out, you'll also be able to find a downloadable version on our website. Just head to www.cardinus.com/us/ and follow the links for resources.

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Jon
Abbott



Beating the hazards of the sedentary office

Gareth Jones and Jonathan Daniel look at the health impacts of our sedentary work life and how a little movement can help you go a long way

Office workers spend between 65% and 75% of their working day sitting, 50% of which is accumulated in prolonged periods of sitting. Certainly, over the last 50 years the social landscape of business has changed, moving away from that of moderate and heavy manual labor to one of more technical and office based work. In addition to this there has also been a reduction in people commuting on foot or by bike and a rise in sedentary leisure time, exacerbated by the use of computers, mobile phones and television. The combination of increased inactivity in work and during leisure time has led some researchers to estimate that UK adults spend 60% of their waking hours being sedentary.

There has been a growing body of research that has emerged over the last few years which has looked at the short and long term risks of sedentary behavior. Only around 5 years ago, if you spent most of your working day at a desk you might be told that you were at risk of developing back pain. The latest research, however paints a different picture with some

of the prominent risks of sedentary behavior now highlighted as; premature mortality, cardiovascular disease, diabetes, osteoporosis, depression, obesity, musculoskeletal disorders and some types of cancer. A recent publication in the Lancet warned that office workers who sit at their desk for more than 8 hours per day are 59% more likely to die from diseases such as some types of cancer and heart disease (Ekelund et al. 2016). With these new risks of inactivity highlighted maybe it is now time to stand up and take note.

But what about people who are regularly active outside of work, surely the risks are attenuated for them?

Of course, the benefits of active recreation and exercise are well published, and aiming to achieve the World Health Organization (WHO) recommendation of 150 minutes of moderate intensity exercise per week is certainly a positive goal for us all to aim for. However, the research suggests that people may still be exposed to serious health risks if they are sedentary for most the day, despite engaging in physical activity outside of work.

The simple act of changing your posture and moving around in the office is classified as light-intensity activity and can increase the amount of energy you expend by between 0.5-2.0 Kcal/min. Although this may not sound like a lot, moving around in work and breaking up how long you sit for can help to reduce the risks of being inactive. Our musculoskeletal system has the remarkable ability to adapt to our environment and the tasks that we perform, both for poor posture and sedentary behavior as well as for activity and training. Our bodies are designed to bend, twist and move and they don't like to remain in one position for long periods of time. With inactivity, our muscles, joints and fascia adapt so that some structures become tight and short while others become long and weak, which can cause tightness and stiffness in the muscles and joints and can contribute to pain and increase the risk of injury. We are literally in danger of becoming chair shaped.

A substantial proportion of our time is spent at work and taking the above information into account it seems prudent to look at how changes in our working environment and working culture could increase our activity levels whilst at work and help to reduce the risks of sedentary behavior. The office environment may provide the ideal place to help people become more active and help to protect against the risks of sedentary behavior, and this might be easier to achieve than motivating ourselves to pull on our trainers and head out for a run on these dark winter nights.

Implementing change in the work place can be split in to 3 categories: environmental changes, behavioral changes and changes in office culture.

Environmental changes:

Changing the design of the work place and equipment may offer a solution to encouraging employees to be more active in work. Simple solutions such as moving office equipment like printers and photocopiers further away would require employees to leave their desks and move more. There has been much debate in recent years about the efficacy of sit to stand desks and some preliminary short term studies have suggested that they may reduce the amount of sitting by between 60-90 minutes per day, although the health benefits of these have yet to be fully investigated. The cost of introducing such equipment as standard in the office may not be realistic for all employers but may provide a good solution for some. Other solutions include providing a space in the office where colleagues can be active, this might include a break out area with gym balls or advice leaflets on gentle exercise. Promoting the use of the stairs by making them a more interesting place to be, such as playing music or offering small rewards to employees at the top can be a fun and simple way to raise awareness.

The use of a temporary "lift tax" during health promotion weeks, for people who are able to use the stairs, can be useful in getting employees to become more active. Having meeting rooms, kitchens and toilets on different floors in the office can help to encourage people to get up and move further. Some of these solutions are more costly and harder to implement than others, but nevertheless there are positive changes that all employers can make no matter how small.

Behavioral changes:

Employees may take time to recognize the benefits of taking regular breaks from sitting. The use of motivational interviews, seminars/webinars and targeted poster campaigns can be useful in catalyzing behavioral change. There has been some research into the use of visual prompts either by phone or PC to encourage office workers to stand up from their chair regularly, which has shown promising results in reducing prolonged amounts of sitting time, but there is still a paucity of evidence for the use of this and further trials would be beneficial. Changing individual's behavior takes time, after all it may be breaking the habits of a lifetime, but the benefits of established channels of communication and social support in the office may make breaking these habits more achievable.

"UK office workers spend between 65% and 75% of their working day sitting"

From a physiotherapy view point, there are some simple and effective things that we can do as individuals to reduce the risk of sedentary behavior. Gentle stretching and movement exercises can help to keep

muscles supple and keep the joint surfaces healthy, spreading the natural joint lubrication around the joints. Mobilizing and massaging tight muscles and fascia can help to reduce tension and tightness.



Trying to keep as active as possible during the day by using the stairs and walking more, can help to increase your heart rate and breathing rate and keep your heart and lungs healthy. Making sure that you get up regularly from your chair during the day, going for a walk during breaks and at lunch time, performing gentle chair based exercises, moving your back and pelvis and changing your posture regularly can all help to alleviate muscular aches and pains during the day. Furthermore, it is important to consider correct sitting posture and correct work station set up. Even the worlds' most expensive office could cause problems if incorrectly set up.

Office culture:

Changing behavior, long-term in an office requires more than just persuading individuals to change, it requires a shift in the office culture. As individuals, we are highly influenced by those around us, and we are unlikely to initiate change unless we see those around us changing too. This may be the hardest area of all to affect, the adage of following the herd is especially true in an office environment. There are expectations and unwritten rules of etiquette in office culture that dictate how employees act. If someone is seen standing next to their desk or walking around the office during the day colleagues may perceive this as unusual or that someone is not working hard enough. This may prove to be one of the biggest barriers to change. After all, others perceptions of our behavior can have a great impact on how we act. The phrase "al desko dining" has been used to describe employees who sit and eat lunch at their desk, which demonstrates how little some people move

away from their desk during their working day. This is related to the culture of "doing the same as others": if you see your colleagues eating at their desk and working through lunch, you are probably more inclined to do the same. The same goes for long office hours, where employees don't want to be seen as the first person to leave the office, for fear of how it is perceived by their colleagues. Employers have a key role to play in ensuring employees get up and move around more regularly. They can do this by arranging walking or standing meetings, to hand deliver information in the office instead of sending e-mails and by encouraging all employees to take a lunch break and eat lunch away from their desks. Engaging employees in National campaigns such as "Get Britain Standing" and "Work Out at Work" days or interdepartmental

"The phrase "al desko dining" has been used to describe employees who sit and eat lunch at their desk"

challenges can help to provide some light relief and a competitive element to increasing activity in the office. These are all cheap and relatively easy strategies to implement, but can

have a great effect on employee's health and wellbeing. It is however important to note that a change in office culture will only occur if there is buy in from the top of the organization and if those at the top are willing to support such strategies.

So, what's the bottom line?

The benefits to individuals of being more active in work and getting out of their chair regularly are clear. Moving more reduces your risk of numerous risk factors associated with sedentary behavior. However, what's in it for employers and organizations? A less sedentary office is beneficial for several

reasons; considering the potential increase in productivity both for individuals and for the businesses. This may be achieved through economic savings by improving employee productivity, increasing profitability, reducing sickness and absenteeism and the cost associated with this through sick pay and arranging cover. Statistics from the UK's Office for National Statistics in 2014 show that 131 million working days were lost due to sickness absence. The highest number of days (around 31 million) lost was due to back, neck and muscle pain with the second highest occupation being desk-based workers. There is clearly a large economic need to make inroads to reduce these figures and it is possible that employing different strategies to reduce sedentary behavior in our work places could play a huge role in this.



So, how much should we be moving in the office?

Until last year there were no clear guidelines on how often employees should break from sitting and how much time they should spend standing or moving around in the office. A consensus statement published by Public Health England and the Active Working Community Interest Company in 2015 drew up some recommendations based on a review of the latest evidence. The group suggested that those in sedentary office jobs should aim to accumulate at least 2 hours per day of standing and light activity in the office, eventually increasing up to 4 hours per day and that desk-based work should be regularly broken up by standing and vice versa (Buckley et al. 2015). This is a great step forward, offering employees and employers guidance on how active they should be in the office, but more research is required

to understand the long-term risk of sedentary behavior, how specific targeted solutions can impact on this behavior and to provide further clarification for more robust guidelines.

Given the current economic climate it is not clear how easily recommendations such as these will be enforced or how willing employers will be to implement them. However, there are low-cost strategies that can be introduced to improve employee's health and well-being, productivity and to reduce sickness absence. Of course, there is no easy answer or quick fix to reducing sedentary behavior for employees in desk-based professions. There are a number of possible barriers to behavior change at various levels from individuals up to the top of organizations and change undoubtedly takes time, but to do nothing (literally) is not an option.



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Employee wellness programs – a strategic imperative, not a nice to have

Andy Hawkes talks about the strategic imperative on organizations to deliver employee wellness programs

SINCE the mid-90s, the percentage of citizens who smoke has dropped by more than two-thirds. Research (Harvard Business Review) confirms that the number who have high blood pressure or who are physically inactive also has declined—by more than half. That's great, obviously, but should it matter to managers? Well, it turns out that a comprehensive, strategically designed investment in employees' social, mental, and physical health pays off. One global company's leaders estimate that wellness programs have cumulatively saved the company £150 million on health care costs over a 10 year period, the return was £2.00 for every pound spent.

Wellness programs have often been viewed as a nice extra, not a strategic imperative. Perhaps it's time to change?

What is workplace wellness?

The best definition we have seen is, "an organized, employer-sponsored program that is designed to support employees (and, sometimes, their families) as they adopt and sustain behaviors that reduce health risks, improve quality of life, enhance personal effectiveness, and benefit the organization's bottom line."

Healthy employees cost you less. In the US, Doctors Richard Milani and Carl Lavie demonstrated that point by studying, at a single employer, a random sample of 185 workers and their spouses. The participants were not heart patients, but they received cardiac rehabilitation and exercise training from an expert team. Of those classified as high risk when the study started (according to body fat, blood pressure, anxiety, and other measures), 57% were converted to low-risk status by the end of the six-month program. Furthermore, medical claim costs had declined by \$1,421 per participant, compared with those from the previous year. A control group showed no such improvements. The bottom line: Every dollar invested in the intervention yielded \$6 in health care savings.

What's more, healthy employees stay with your company. A study by Towers Watson and the National Business Group on Health shows that organizations with highly effective wellness programs report significantly lower voluntary attrition than do those whose programs have low effectiveness (9% vs. 15%). At the software firm SAS Institute, voluntary turnover is just 4%, thanks in part to such a program.

The pillars of an effective workplace wellness program

Strategically integrated wellness programs have six strong pillars that simultaneously support their success, regardless of the size of the organization. Construct them well, and your institution could see significant returns

1. Multilevel leadership

Creating a culture of health takes passionate, persistent, and persuasive leadership at all levels—from the C-suite to middle managers to the people who have "wellness" in their job descriptions.

It's easy to find employees who don't participate in wellness programs. Some cite lack of time, little perceived benefit, or just a distaste for exercise. Others don't know about available services or blame unsupportive managers. A few think their health is none of the company's business or mistrust management's motives. As with any worthwhile initiative, creating a culture of health takes passionate, persistent, and persuasive leadership.



Top down commitment

Although employee health correlates with financial health, workers won't buy into a program that's just about money. If the CEO makes time for exercise, for instance, employees will feel less self-conscious about taking a fitness break. When a CEO asks an employee "how's your wellness?" you know culture has changed.

Middle management

Except in tiny companies, most employees report to a middle manager. By shaping mini-cultures in the workplace, middle managers can support employees' wellness efforts. Some companies even ask managers to adopt a personal health goal as one of their unit's business goals.

Wellness program managers

Larger firms should consider wellness managers. The best wellness managers connect their expertise to the culture and strategy of the organization. These people are collaborative by nature, and analytical and credible by background and performance. It's no ordinary management job.

Wellness champions

Volunteer health ambassadors offer local, on-the-ground encouragement, education, and mentoring—in addition to organizing and promoting local health events.

2. Alignment

A wellness program should be a natural extension of a firm's identity and aspirations. Don't forget that a cultural shift takes time.

It's not unusual for firms to enter the wellness space with a big splash that subsides to a ripple. As management priorities shift, the opportunity to integrate a culture of health can pass. But many executives forget that the cultural shift takes time. Planning and patience is essential.

Carrots, not sticks

Evidence suggests that incentives are essential because employees lose trust when they feel they're being forced to act against their wishes.

A complement to business priorities

If a program doesn't make business sense, it's automatically vulnerable. The key is to make wellness a business KPI alongside all other KPIs.

3. Scope, relevance, and quality

Wellness programs must be comprehensive, engaging, and just plain excellent. Otherwise, employees won't participate.

It's not unusual for a company to think about employee health narrowly. Exercise is exercise, right? But employees' wellness needs vary tremendously.

More than cholesterol

Wellness isn't just about physical fitness. Depression and stress, in particular, have proved to be major sources of lost productivity. Wellness program administrators need to think beyond diet and exercise. Employee Assistance Programs (EAPs) are great but well trained managers who look at wellness when reviewing performance are just as critical.

Fun

Never forget the pleasure principle in wellness initiatives. Consider a Wellness Day—with the theme Joy, Play, Spirit or the Global Corporate Challenge that gets companies from around the world to compete on the number of steps taken each day.

4. Accessibility

Aim to make low- or no-cost services a priority. True on-site integration is essential because convenience matters.

True on-site integration

Not many firms can afford on-site fitness centers but employees at companies who have them love them, and employees at other companies want them. The alternative is to encourage and subsidize gym membership and why not encourage wellness activities as part of the working day? Bring in yoga, pilates and fitness experts. Get nutritionists in to help diets and if you have a café or canteen make sure the food is healthy.

Going mobile

Organizations increasingly use online resources to deliver wellness. Companies can also make wellness websites available on smartphones to increase portability. For decentralized companies, online access is critical, although high-tech tools must be complemented by high-touch programs that unite individuals in a culture of health.

5. Partnerships

Active, ongoing collaboration with internal and external partners, including suppliers, can provide a program with some of its essential components and many of its desirable enhancements.

Internal partnerships help wellness programs gain credibility. So if one part of your business has expertise, use it!

6. Communications

Wellness is not just a mission—it's a message.

How you deliver it can make all the difference. Sensitivity, creativity, and media diversity are the cornerstones.

Wellness communications must overcome individual apathy, the sensitivity of personal health issues, and the geographic, demographic, and cultural heterogeneity of employees. The range and complexity of wellness services also can pose challenges.

“Wellness isn’t just about physical fitness. Depression and stress, in particular, have proved to be major sources of lost productivity”

Media diversity also helps. Some firms include information about wellness in regular corporate updates and magazines. Make sure you feature health-related messages on your intranet portal, advertise specific wellness benefits, post flyers about health in lifts and stairwells, and distribute

wellness stickers and magnets. Include fruit in the office rather than sweets!

The fruits of workplace wellness

Although some health risk factors, such as heredity, cannot be modified, focused education and personal discipline can change others such as smoking, physical inactivity, weight gain, and alcohol use—and, by extension, hypertension, high cholesterol, and even depression. The results are worth the effort.

Wellness and wellness programs have been around a long time and despite clear evidence that a healthy workforce delivers better returns, we still have too few leaders investing in the wellness of their staff. It's time to change.



Outcomes

Lower costs – the financial cost of workplace absence in the UK is put at £29bn and in the US this is estimated to be \$84bn

Greater productivity – Participants in wellness programs are absent less often and perform better at work than their nonparticipant counterparts.

Higher morale – Employee pride, trust and commitment increase contribute to a vigorous organization.



■ Andy has worked in the insurance and risk management sectors for 30 years.



He is currently CEO of THB UK and Cardinus Risk Management, part of AmWins, a global insurance and risk operation. He has operated at main board level of a FTSE 250 plc as well as an AIM listed entity and has founded and sold a number of companies in the insurance profession. He has written widely on insurance risk management issues and has specific expertise in speciality commercial insurance as well as compliance and governance risk. Andy is an IIRSM Council member as well as a Trustee of The Alchemy Charitable Trust and a Non-Executive Director of Risk Alliance Group.

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Potential long-term effects on children from daily backpack wearing

Backpack wearing can cause long-term health problems for children.

Romina Ghassemi provides advice and tips on the correct use of backpacks

AS A PARENT, sometimes you may not know what's bothering your kids. This is understandable, of course. But what they may be keeping from you may be affecting their health. This isn't about drugs or alcohol—it's about their backpacks.

While it seems like such an innocuous thing to worry about, backpacks are actually one of the more popular reasons for a lot of health problems with children these days. In just a single year (2013), the US Consumer Product Safety Commission reported that 5,415 cases reported in emergency rooms were injuries related to the use of backpacks.

Another survey also discovered that about two-thirds of kids have experienced some back pain at some time. About 40% of kids say they feel pain when they carry their backpack, and of these kids 9 out of 10 say the pain is "bad" or "very bad".

Most say the pain was recurrent, and some have reported pain that lasts for 6 months. Some have missed classes or some school activity because of the pain, and others were forced to see a doctor because of the severity of the pain. Other reported issues include neck pains, shoulder pains, and tension headaches.

The problem isn't limited to short-term conditions. Because children's bones are still growing and

children are more apt to learn habits at this age, some potential long-term effects can be very serious.

Chronic pain: When children are getting back pains and other assorted aches at such a young age, then there is a potential for chronic pain that can affect them for the rest of their lives. Chronic pain experienced over decades can lead to a whole range of potential disasters. This includes the likelihood of alcohol and painkiller abuse, as well as having to endure the emotional burden of such pain.

Bad posture: Some children learn very improper posture habits when they wear backpacks every day, and these habits can be carried over for the rest of their lives. These habits include slouching, hunchback postures, and jutting and leaning their head forward. These postures can lead to some spinal difficulties and back pain later in life. What's more, their social and romantic lives may also suffer because these postures are decidedly unattractive.

Spinal abnormalities

Children's bones are still growing, and the daily use of overly-laden backpacks can cause these bones to grow abnormally. One of the more serious potential problems is called scoliosis.

Scoliosis is a condition in which your child's spine becomes curved from side to side. This condition often happens during a growth spurt right before they hit puberty. If the condition is mild enough, a brace can be worn to keep the curve from

becoming worse. But scoliosis may be severe enough that surgery becomes necessary, in order to prevent further curvature and to attempt to straighten the spine.

So what's to be done? As a parent, you can make sure that your kid is not carrying heavy loads and that

they're using the right type of backpack. You may also encourage them to wear some sort of brace for posture support. Just make sure the posture support device is comfortable and unnoticeable, so that your kid will actually wear them. However, there is another option.

How to wear a backpack correctly

Once upon a time backpacks were only used for hiking. Then they became cool to use on vacations and travels on the cheap, and they also became popular among kids as a way to carry books and schools supplies.

But backpacks can have rather debilitating effects on a child's posture, and it may not be healthy for children if they're not used properly.

"About 40% of kids say they feel pain when they carry their backpack"



10 tips on safe backpack use

To minimize or even avoid these health hazards, here are 10 tips on safe backpack use that parents should keep in mind:

1. The weight of the backpack must not exceed 15% of the user's weight. This is according to the recommendation of the American Occupational Therapy Association. So if your kid weighs 80 pounds, the entire backpack must not weigh more than 12 pounds.
2. The limit may even be lower for girls, who tend to complain more regarding back pain. This is probably due to their slighter frames. Girls also typically carry heavier backpacks than boys. For parents, a 10% weight limit for girls may be advisable. For young children, 9 pounds may be a more advisable limit.
3. If the backpack is at its limit and the child has more things to carry, remind them that it's better to carry the extra items in their hands than to place them in the backpack.
4. It is, however, a very good idea to keep the weight as light as possible. Every unnecessary item in the backpack must be discarded. For example, instead of heavy textbooks you may just get the ebook versions for a tablet. If ebook versions are not available, try photocopies instead. And if you can afford it, you may want to purchase a second set of textbooks so that one set can remain in school while another set is at home. There'll be no more need to transfer the books back and forth in the backpack.
5. The heaviest items should be placed at the back and center of the backpack. This puts these items closest to the child's back. Don't put them on the sides. The contents should also be evenly distributed so that one side is not heavier than the other.
6. Make sure the straps are adjusted properly so that the backpack fits snugly on the child's back. Have your kid use both straps all the time, even if it is considered "cooler" to use just one strap. A backpack with a waist belt is also better for the child and should be used as well.
7. The pack should be located about 2 inches below the shoulder blades to the waist level of the child. The pack shouldn't be more than 4 inches from the waistline level.
8. The time spent by your child carrying a backpack should be minimized as much as possible.
9. When slipping off the backpack, have your kid practice taking off the straps at the same time instead of removing them one at a time.
10. Have your kids do some core exercises to improve their posture and make them better able to carry a backpack. Remind them to use good posture throughout the day, because slumping weakens core muscles.



Negligence can lead to one of many poor posture conditions known as Hyper-Kyphosis, Forward Neck Carriage, and even Compensatory Scoliosis; a condition in which your kid's spine becomes curved from side to side.

In today's modern world, the use of backpacks is not just the sole cause of slouching and improper posture. Writing on desks and using desktop computers can also lead to slouching. With devices like posture correctors, slouching can be corrected. Your kid may also avoid health problems such as neck pains, back pains, hunch back, forward head syndrome, and tension headaches. All in all, such devices can be a great help for proper posture.



Dr Romina Ghassemi DC is a local practitioner and her baX-u posture support won an innovative product of the year award in 2014. For more information about Dr Ghassemi and her work on community posture evaluation visit SanPedroChiropracticAndPosture.com

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The importance of ergonomics as a business management tool

Cynthia Roth uncovers what ergonomics really means to a business

HOW many times do you think your accounting staff, human resources director, president or CEO have uttered the words, “This is the cost of doing business.” But are the costs that are driving down your profits, creating rework, increasing the expense of waste removal, reducing your productivity, increasing quality issues, and creating employee dissatisfaction and turnover really the costs of “doing business?” Or are they the result of a lack of education and understanding that these are manageable or even avoidable costs?

Suppose you are a director of a board for a large corporation. At a board meeting, the presenter is talking about the millions of dollars being spent in workers’ compensation and disability costs, the tremendous losses on the part of the company financially and the falling stock prices. How would you react? Would you feel the need to get some additional information to assist the company?

Management can use some direction in response to these issues. As a safety director or ergonomics consultant to any company, you play a role in providing management and the board with an

understanding of the cost benefits that can be achieved through ergonomics. Good news travels up the corporate ladder very rapidly. Everyone in the company gets excited about a large new product sale, new product coming to market or next best widget. However, when the news is not so good, the filters are in place to keep those in power from understanding the real truths until sometimes it is too late. That can often be the case with workplace injuries and illnesses.

To understand fully how ergonomics can benefit a business, we need to understand knowledge management, intellectual and human capital and some of the other economic buzzwords being used today that are very well applied to ergonomics.

Let’s begin with an explanation of economics...

Economics is the social science that studies the production, distribution, and consumption of goods and services in terms of the trade-offs between competing alternatives as observed through measurable quantities such as input, price and output. The field of economics comprises a number of potentially irreconcilable theories about systems of production and distribution, but as a general rule, economists study human behavior and welfare as a relationship between ends socially required and scarce means which have alternative uses (Lionel Robbins, 1935).

In the late 20th century, one of the areas of study that produced change in economic thinking was the examination of a risk-based rather than price-based model. The study of risk, which viewed variations in price over time as more important than actual price, has been influential. This particularly applies to financial economics in which risk-return tradeoffs are the crucial decisions to be made.

Ergonomics similarly deals with risk-return tradeoffs. As ergonomics engineering consultants, we mitigate risk by engineering out a problem. By removing the risk, we end the potential for additional costs and labor problems and can manage and control the expenditure for the solution. Risk can be transferred through means such as insurance coverage. With this method, you are paying the insurance company to assume the risk but you still pay.

Would you be happy to spend \$10,000 on a solution to prevent a \$100,000 back injury? Would you spend \$400,000 on a capital improvement on an assembly line to prevent a recall of insurmountable dollars?

Knowledge management

Now let's move on to knowledge management and understand where this fits into the picture. Knowledge management is a business activity with two primary aspects:

1. Treating the knowledge component of business activities as an explicit concern of business reflected in strategy, policy and practice at all levels of the organization. Relating this to ergonomics, you develop an ergonomics process that fits your organization and includes the written goals, objectives, policies and procedures for the organization to understand. This takes into consideration the experience and knowledge of your employees as contributors.

2) Making a direct connection between an organization's intellectual assets both explicit (which can be articulated in language and transmitted among individuals) and tacit (personal know-how). In ergonomics, this can be viewed as including employees in the "team" to identify and assist in developing solutions to problems in the workplace.

In traditional perceptions of the role of knowledge in business organizations, tacit knowledge is often viewed as the real key to getting things done and creating new value. (Utilizing the knowledge base of employees, risks can be mitigated through assessment, identification and reduction, prior to injury, labor and production issues.)

A significant element of the business community also views knowledge management as a natural extension of "business process reengineering," a fact underscored by the March 1997 announcement that John Wiley's Business Change and Reengineering had been retitled Knowledge and Process Management.

Now that we have a definition of knowledge management, why do we need it? Some of the experts list the following reasons. I have added, in parentheses the ergonomics applications:

- Marketplaces are increasingly competitive and the rate of innovation is rising (reduce the costs of doing business and put additional dollars into innovative ideas that rise above the competition for greater market share).
- Reductions in staffing create a need to replace informal knowledge with formal methods (get those job descriptions updated and formally assess jobs in order to reduce risk factors and hidden problems).
- Competitive pressures reduce the size of the workforce that holds valuable business

knowledge (we have aging workforces which are expected to perform more tasks. Here is a real need for ergonomics.)

- The amount of time available to experience and acquire knowledge has diminished (make time and focus on getting people trained in ergonomics in order to raise the competency bar)
- Workplace injuries, early retirements and increasing mobility of the workforce lead to loss of knowledge (by applying ergonomics processes, senior employees might work longer and be used to mentor new hires. By transferring their experiences and nuances of jobs to new hires and training the younger workforce, senior employees reduce the formal training time necessary and prevent injuries and production losses.)

As these issues show, there is a recognition that information and knowledge are corporate assets, and that businesses need strategies, policies and tools to manage those assets. We also need to understand that what was deemed a "cost of doing business" in the past may instead be a source of savings or profit manageable through ergonomic processes.

The need to manage knowledge seems obvious, and discussions of intellectual capital have proliferated, but few businesses have acted on that understanding. Where companies have taken action (and a growing number are doing so), implementations of "knowledge management" may range from technology-driven methods of accessing, controlling and delivering information to massive efforts to foster changes in corporate cultures for cost reductions.

An engineering ergonomics consultant can foster continuous improvement in any organization by using the science for changing a corporate culture through the education and transfer of



knowledge. Training an organization's engineering staff in applied ergonomics for processes, product design, design for manufacturing and assembly, equipment design and selection, supply chain management, facility environments and maintenance can produce a variety of benefits. Other personnel such as health, safety, maintenance, purchasing and production employees need to be trained after the engineers. This allows a natural, logical chain of events whereby an employee identifies an ergonomic risk factor and the engineer has the knowledge to understand and develop the solution to reduce or eliminate the hazard. Otherwise, labor and management may have a real schism when a risk is found and no one can change it.

The ability to manage ergonomics knowledge represents one of the primary opportunities for achieving substantial savings, significant improvements in human performance, and competitive advantage.

Don't think this is just about the large companies with thousands of employees. Small and midsize companies need formal approaches to knowledge management even more, because they don't have the market leverage, inertia and resources that big companies do. They have to be much more flexible, more responsive, and make better decisions to reduce costs because even small mistakes can be fatal to them.

Intellectual or human capital

Human capital is a way of defining and categorizing people's skills and abilities that are used in employment and otherwise contribute to the economy. Some economic theories refer to it simply as labor, one of three factors of production, and consider it to be a commodity that is easily interchangeable. Human capital is like the "physical means of production," e.g., factories and machines. An individual can invest in it (through

education, training, medical treatment) and his/her income depends partly on the rate of return on the human capital he/she owns. Thus, human capital is a stock of assets a person owns. It allows that person to receive a flow of income, which is like interest earned.

Intellectual capital represents the knowledge assets of an organization in terms of data, information and wisdom as well as the tools that augment the use of this information/knowledge.

An organization's intellectual capital may be divided into three elements that can be measured and targeted for investment: human capital, structural capital and customer capital.

It is also defined as the sum of everything the people of an organization know which can be converted into value or formalized, captured and leveraged to produce a higher-valued asset. This translates to the value of all the knowledge held in the minds and experience of employees. Thus intellectual and human capital are interchangeable and necessary for success.

During the year 2000, intellectual capital accounted for over one-tenth of the U.S. gross domestic product, or \$1 trillion. A group called KLM Inc., has divided intellectual capital into seven areas. I have listed their seven areas and then added the ergonomics relationship in parenthesis:

The brand is an on-going identity conveying the values of the enterprise, its products and services, and ultimately its role in the customer's or consumer's lifestyle. (With an ergonomics process, a company is known as "one that cares about their employees and their customers." Thinking, time and money went into

the development and manufacturing or service that the "brand" offers. Recalls can seriously hurt and create unnecessary havoc to a brand.)

Intellectual property and goodwill includes trademarks, patents, licenses, trade secrets and intellectual property strategies

(Ergonomics promotes thought processes within the entire employee base and throughout the organization. Continuous improvement through ergonomics may lead to additional intellectual property gains.)

The active intelligence, energy and creativity of an organization includes its knowledge, know-how, trade secrets, information, data and the ability to innovate and to take products and services to the marketplace. (Ergonomics

allows both industrial and service companies to create innovative solutions and produce products that are more intuitive and "fit the user.")

Corporate culture represents an organization's ways of doing business, its rituals and its practices. (Ergonomics promotes best practices within the organization and allows continuous improvement to be developed within the fabric of any company.)

The people bring their abilities, talents and relationships. (Ergonomics increases the intellectual property of the employees and the value of the company through additional corporate assets.)

The experience and history of the organization and its "corporate memory" is the next asset. (With an ergonomics process, employees can remain working longer and impart knowledge learned to younger or newer employees.)

"Would you be happy to spend £10,000 on a solution to prevent a £100,000 back injury?"

Intellectual materials, or the work product of the day, represent the new capital used to create new wealth. (Ergonomics allows for production and service facilities to be error-free and without quality issues. The work product of today will not be recalled tomorrow.)

Greatest asset

In a strong and successful ergonomics process, the entire organization is trained to identify problems and report issues prior to having an OSHA recordable or production and quality problems.

In a successful ergonomics process, the employees are not “blamed” for injuries and/or waste, but the jobs themselves are assessed and changed when needed. Employees are one of the most expensive and yet the greatest asset to any organization.

They develop a set of skills that is acquired on the job through training and experience, and which increase that employee’s value in the marketplace. By maintaining the employee’s intellectual capital, we raise the value of a company.

The ergonomics consultant can provide the roadmap to cost reduction by imparting the knowledge and increasing the intellectual capital for all employees. By using intellectual capital to reduce costs, we can maintain experienced employees rather than the “revolving door” syndrome, create solutions to jobs that produce risk factors to the human body, understand “upstream” design prior to cutting a piece of steel in the plant, train office employees in the proper adjustability of their equipment, educate healthcare workers in proper lifting techniques, take warehousing and supply chains and design in solutions while designing out problems. These are just some examples of applied ergonomics.

There is a financial value that human innovations, inventions and intelligence bring to a business enterprise. This is an objective measurement and an ergonomics consultant can cost justify the benefits and savings to any organization.

We might be able to utilize our knowledge management and human and intellectual capital to stop the bleeding of jobs sent out of

the United States based on increased costs and reduced revenues. Let’s begin to educate and share the results of strong ergonomics processes and the financial benefits it brings to any organization.

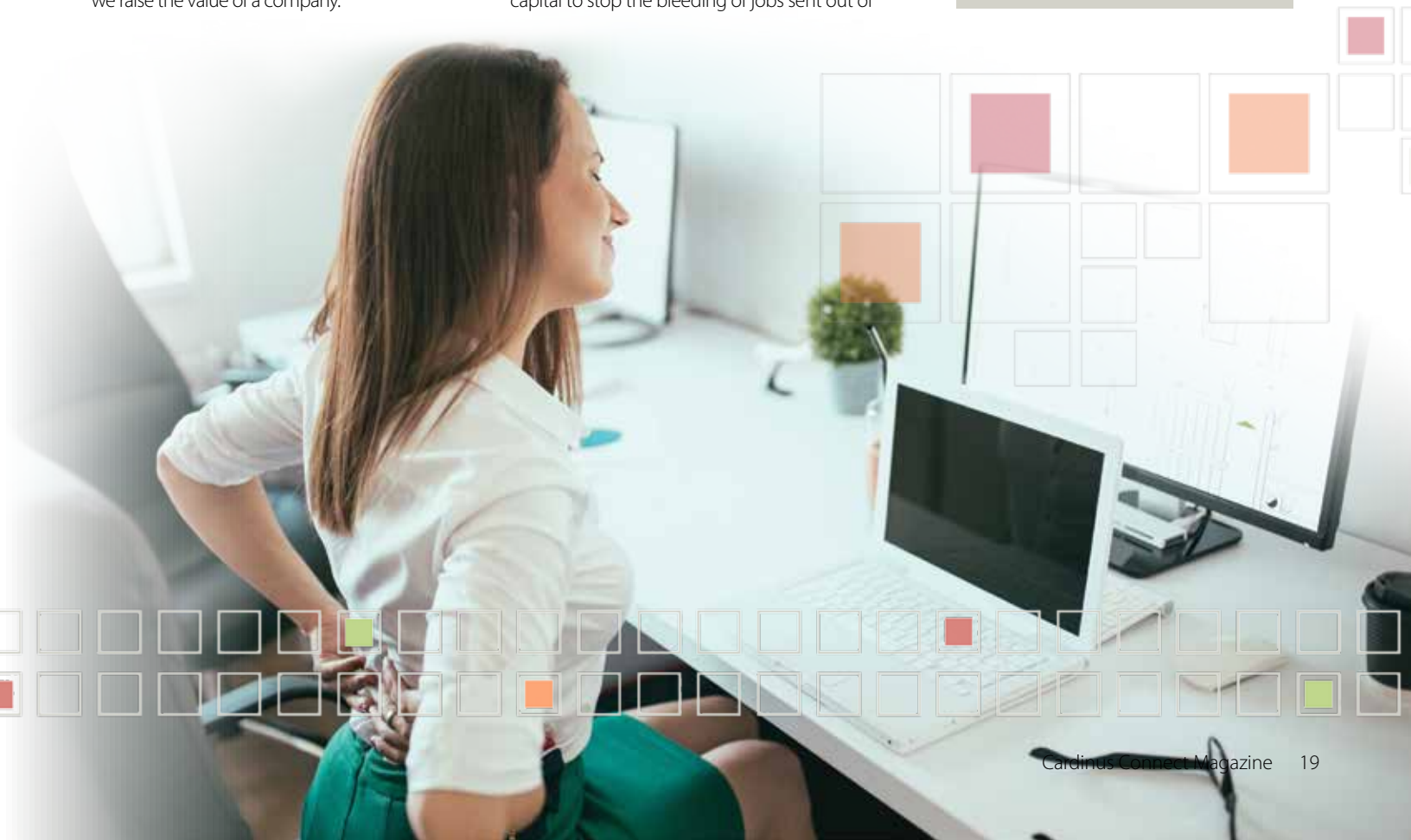
No longer do all of a company’s costs fall “legitimately” into the “cost of doing business” category. The longer the results of ergonomics continue to be made public, the better the data will become and the more economics can be built around an ergonomics process.



Cynthia Roth
founded the
**Ergonomic
Technologies**

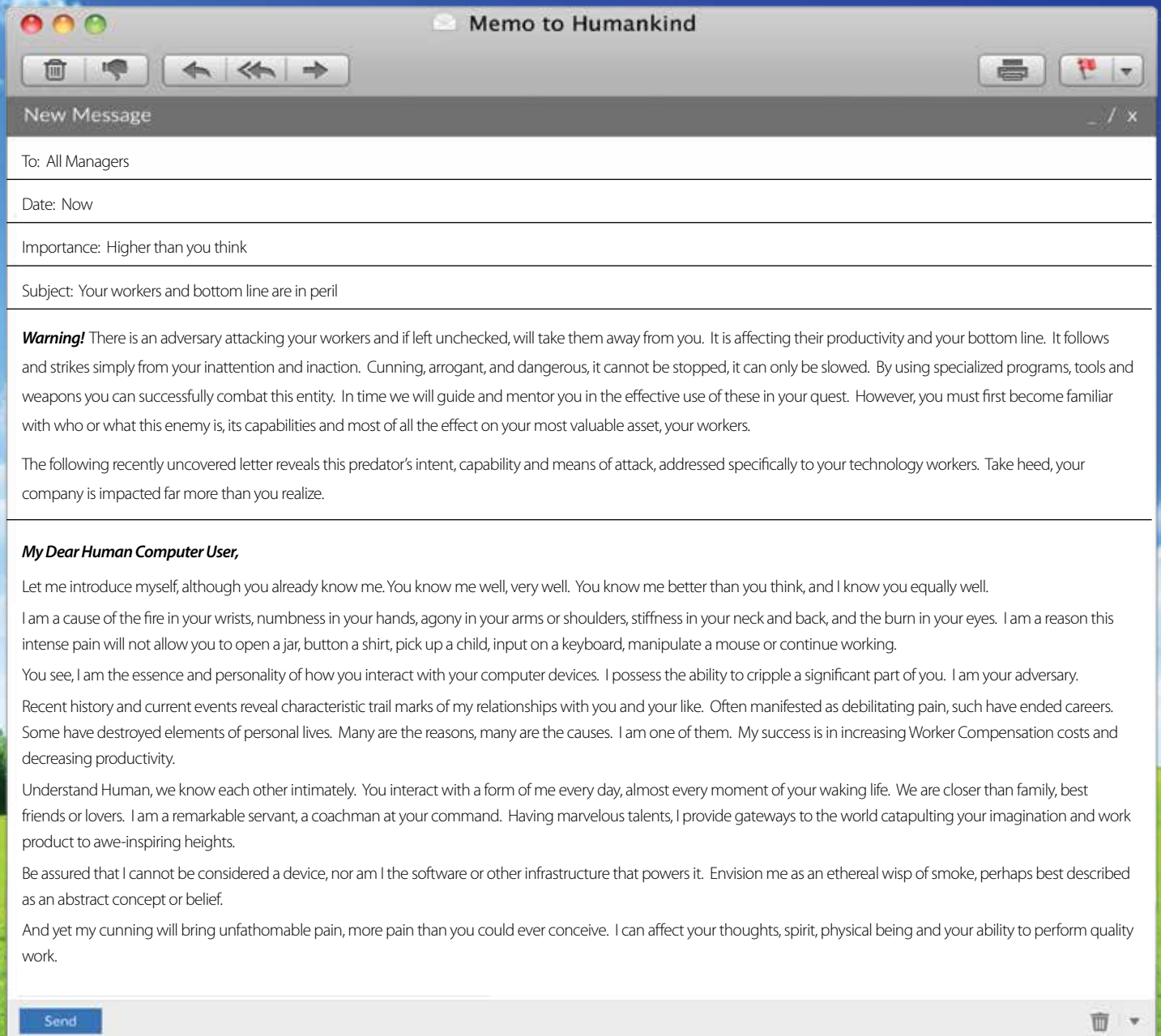


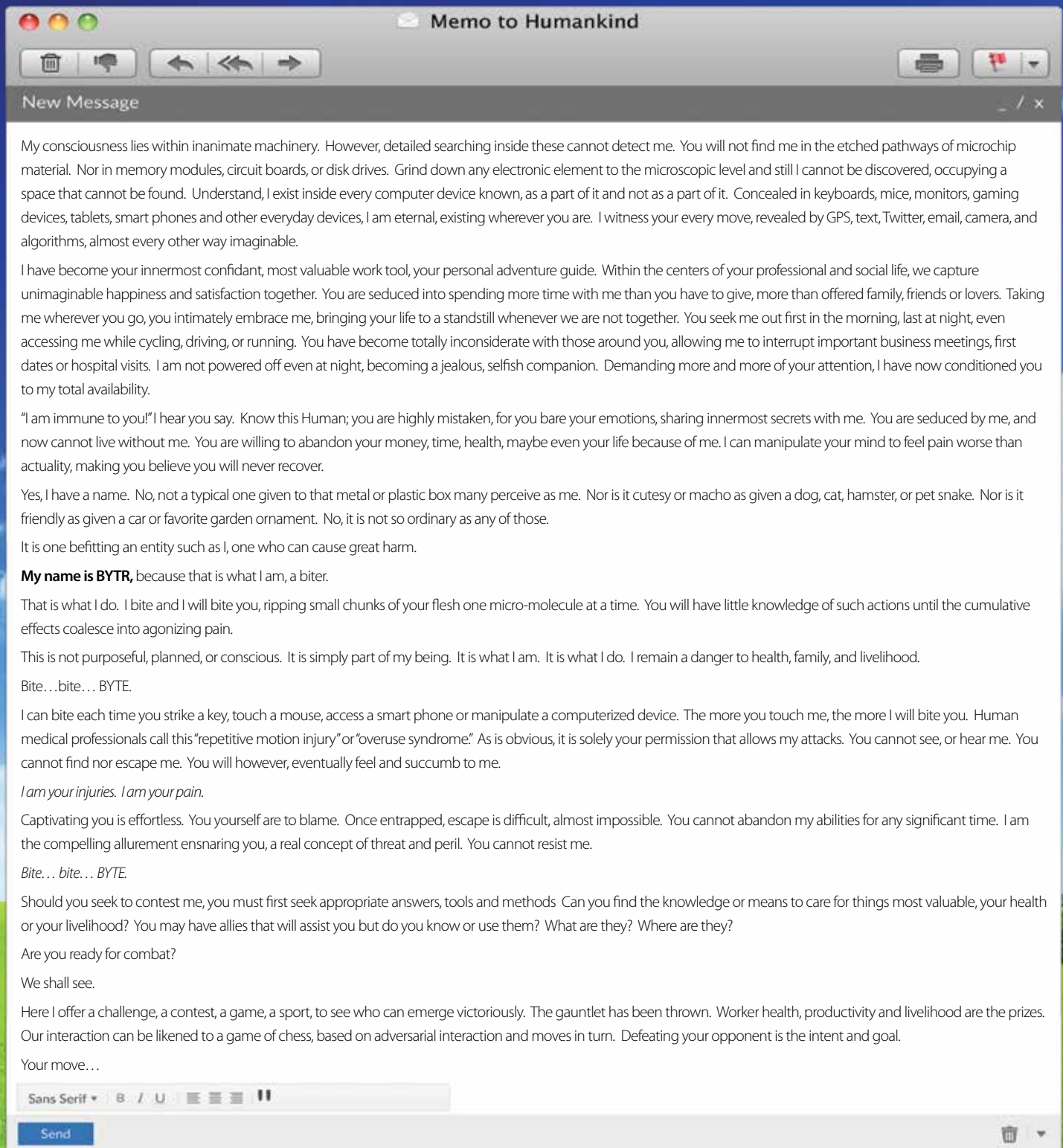
Corporation in 1993. Cynthia was recently elected Chair of the American Society of Safety Engineers Foundation and has lectured at hundreds of companies and conferences on ergonomics.



Memo to humankind managers

A deadly ethereal computer predator is attacking your workers



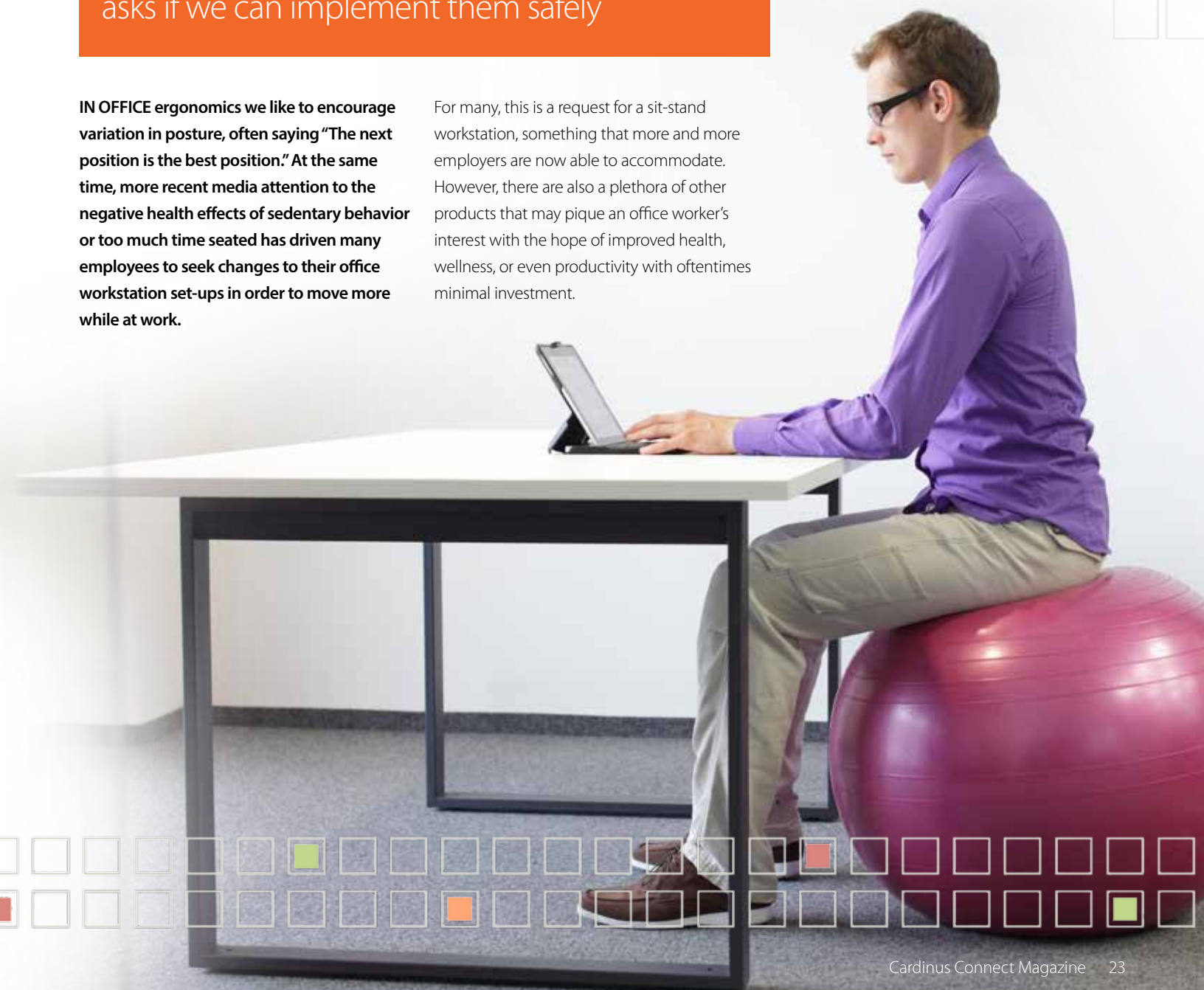


Add-on items in office ergonomics

How do you monitor and assess the impact of add-ons in the office? Meghan Kress casts her eye over the recent office additions and asks if we can implement them safely

IN OFFICE ergonomics we like to encourage variation in posture, often saying “The next position is the best position.” At the same time, more recent media attention to the negative health effects of sedentary behavior or too much time seated has driven many employees to seek changes to their office workstation set-ups in order to move more while at work.

For many, this is a request for a sit-stand workstation, something that more and more employers are now able to accommodate. However, there are also a plethora of other products that may pique an office worker's interest with the hope of improved health, wellness, or even productivity with oftentimes minimal investment.



As safety professionals, it is worth examining all potential costs and benefits of these items. This will help to establish sound corporate policies before items are requested by office workers, or before they simply start appearing in offices by employees who bring them in on their own.

Keeping your eye on the ball

Many years ago, inflatable exercise balls started showing up in offices as an alternative to an office chair. At around £10 a ball, this was often a self-funded “improvement” by an office worker thought to help their back, increase their core strength, burn more calories, etc. Limited research available on this topic shows that use of an exercise ball as a chair may ultimately cause detriments to comfort as the ball lacks back support and may cause uncomfortable soft tissue compression.

Policies against their use in an office setting are now widespread as trip, fall, and popping hazards are evident with this type of equipment. Employees tend to easily comply with policies against exercise ball use when they are told that exercise balls do not meet the stability and safety requirements that office chairs are subject to.

Is everyone on board?

Recent advertising for balance board type devices targets users of sit-stand workstation set-ups. Claims are made that use of a balance board can increase caloric expenditure while standing and also improve comfort. While these benefits may be purely anecdotal at this point, safety professionals must carefully weigh potential costs with these devices.

The potential fall hazard is of utmost concern as the device is purposefully designed to require additional balance. Further, the additional height a balance board adds may alter the way the sit-stand workstation accommodates a user. In other words, the user may be too high for their keyboard and mouse while standing on the balance board, as many types of popular sit-stand equipment that builds onto an existing desk surface is already limited in accommodating employees that are taller in stature.

Other considerations include the tensed posture that one may take while standing on a balance board for prolonged periods, and potential detriments to computer work.

If an office worker feels they need a balance board at their sit-stand desk in order to improve their standing comfort, other factors should be considered first. Oftentimes, the person may just be standing for too long and can be encouraged to spend more time seated in their chair. Other factors such as the fit of the workstation should also be examined, ensuring that the screen(s) and peripherals are adjusted to the appropriate height for that person’s anthropometry. If all these things check out OK, equipment such as a sturdy footrest designed for standing work may offer a more viable solution for improving standing comfort.

Add-ons are not always the right fit for the office

Office workers may wish to utilize this type of equipment (exercise ball or balance board) in order to increase their fitness, whether that’s for caloric expenditure or strength. However, it can easily be argued that whatever

benefit that person would achieve by using the uncomfortable ball or balance board while they work could be achieved, or likely surpassed, by a well-designed purposeful workout in the appropriate setting (i.e. in the gym or at home).

One other item of note that is coming into offices is a cycle or pedal exerciser that can be used underneath the desk. Different models at different price points are available and only some are designed with a low profile in mind to avoid hitting the knees underneath the desk.

These types of devices are typically only used for a few short periods during the workday rather than continuously while seated. While we still do not know the effect these devices may have on work capabilities, there are concerns about how using one of these would change the fit of the workstation to the end-user and ultimately the comfort at the workstation.





to enforce guidelines and ensure consistency across organizations, with the view to making offices both safe and comfortable.

Sometimes, answering a series of pointed questions can help with this process. Consider the following: Why do people want to use these items? Do they introduce unnecessary risk in the workplace? Do they counteract or congeal with other programs such as ergonomics or wellness? Will everyone be able to use this product? What alternatives are available?

need to make sure that they are appropriate for such environments and are used with care.

Reference:

McGill, S.M., Kavcic, N.S., Harvey, E., 2006. Sitting on a chair or an exercise ball: various perspectives to guide decision making. Clin. Biomech. (Bristol, Avon) 21, 353-360.

Introducing add-ons to the office

When any new type of add-on office equipment comes to light, we as safety professionals need to carefully evaluate these items to determine appropriate organizational policy. Having a set policy on specific equipment makes it easier for facilities personnel and upper management

Workers want to have flexibility with the types of furniture they use in their workplaces for a variety of reasons, however we have to consider the wider picture for each addition. While we don't want to stop workers from having that flexibility, we, as health and safety professionals,



■ Meghan Kress
is an ergonomics specialist at ESIS and has presented and written on a number of issues, with a specific focus regarding studies on stand-capable desk use in call centres.



Vision coverage: An effective tool for wellness

Comprehensive eye care is good for people and for business, says Pat McClelland

THE importance of preventive care is no secret. We all know how critical it is to eat well, exercise regularly, and visit the doctor annually. Often regular eye exams are not part of individuals' preventive health practices, and they should be.

In the United States 23.7 million adults (or 10 percent of all American adults), report having trouble seeing even when wearing corrective eyewear, or that they are blind or unable to see at all¹. Clear vision is essential for completing everyday tasks, performing well in our jobs, and experiencing our world. Far too often we neglect to protect this important sense with comprehensive eye coverage and regular vision exams.



What do our eyes say about our health?

Many of us wait to see an optometrist until we notice a change in our vision. Unfortunately most eye problems do not have obvious symptoms. Getting an eye exam each year ensures that we monitor our vision and can prevent or reduce problems that result in vision loss.

Annual eye exams are critical for maintaining our eye health, but vision care also has applications beyond vision correction. This is significant because the eyes are the only places on the body that provide an unobstructed, non-invasive view of the blood vessels. Through comprehensive eye exams, eye doctors can diagnose serious eye diseases including glaucoma, macular degeneration, and diabetic retinopathy. They can also detect signs of serious systemic conditions, such as diabetes, high cholesterol, and hypertension.

A comprehensive eye examination, such as those offered by a VSP Vision Care provider can often detect the first signs of chronic conditions², such as:

- Diabetes in 34% of cases
- Hypertension in 39% of cases
- High cholesterol in 62% of cases

What is the economic rationale for a vision plan?

Vision care is important for personal wellness and preventive care, but it's also a low-cost, high-value benefit for employers to offer at virtually no cost to employees. Vision benefits allow employees to better manage their vision and overall health, and offer a wealth of advantages for employers.

Improved productivity

When employees are unable to see clearly, how productive can they really be? Poor vision results in 32 times more productivity lost than from absenteeism alone, according to Vision Council³. Employees with vision needs who receive glasses are able to increase their productivity by 35 percent over a two year period.

Reduced medical costs

When employees are unable to see clearly, how productive can they really be? Poor vision results in 32 times more productivity lost than Because vision exams offer early detection of vision problems and other chronic health conditions, they play an important role in disease management. A recent study conducted by Human Capital Management Services Group (HCMS Group) found a 145 percent return on investment on the initial dollar investment due to early detection of chronic diseases, reduced employer medical costs, less employee out-of-office time, and fewer hospital admissions and ER visits.

It's clear that vision care is a valuable benefit for both individuals and employers alike.

With the unique ability to provide early detection of vision and overall health conditions, vision coverage is an essential element of an employee benefit package that truly pays for itself.

Employees need vision care



10%

of American adults report having trouble seeing!¹



VSP optometrists are the first to detect signs of diabetes

34% OF THE TIME.³

Increased employee satisfaction



If employers can increase employees' understanding and appreciation of their benefits, **EMPLOYEE LOYALTY AND ENGAGEMENT** will improve.²

Receiving glasses increases productivity by **35%**⁴

Poor vision results in **32x** productivity lost than absenteeism.⁵



■ **Pat McClelland** is the Vice President of U.S. Commercial Accounts for VSP Vision Care. He began his career in 1987 working in sales management for a variety of managed care organizations, most recently Health Net of Arizona. Pat joined VSP in 2003. He oversees sales and account management of more than 50,000 accounts of 2-999 employees. Pat is a graduate of the University of San Francisco, where he attended on a baseball scholarship.

The right vision cover can improve employee wellness and productivity, while meeting your requirements.

Sources: 1. American Foundation For the Blind, National Health Interview Survey (NHIS), c2015 2. MetLife, United Kingdom Employee Benefits Trend Study, 2014. 3. Human Capital Management Services, Inc. (HCMS) on behalf of VSP, 2013. 4. Vision Council, 2008. "Vision Care: Focusing on the Workplace Benefit."



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