



CARDINUS

CONNECT

The magazine for the ergonomics professional



Winter/Spring 2018

The prevention business

Prevention is better than the cure

Controlling costs in workers' compensation

Tech to minimize costs

Supporting an aging workforce

Ergonomics meets the challenge

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Welcome

2018 is set to be a bright year in occupational health and safety and ergonomics. Technology is impacting all our lives and new innovations will lead the way in monitoring, assessing and minimizing risks. We've also seen an increased focus on the health element, with greater emphasis on mental health, wellbeing initiatives and the growth in employee benefits and how this might impact on some of the related risks traditionally combated through ergonomics. At the management level commitment to develop a pro-safety culture will dominate discussions.

Now that we've framed the backdrop for 2018, let's talk about what's going in to this edition of Cardinus Connect. Bill Pace, our US President, and Donna DeFalco, of the Health Enhancement Company, discuss how preventative measures can work to reduce the impact of MSDs, especially in an era of increasing MSD prevalence. With young people bringing pre-existing MSD conditions, through years of unhealthy device use, into the workplace, employers need to be aware of the cost of paying out if those conditions are not managed. Prevention is definitely better than the cure.

We've invited our friends at Underwriter Laboratories to contribute to the discussion around the demographic changes in organizations in the US and how ergonomics can meet the challenge.

We've also got Protaris' Andy Neal (a highly experienced personal security expert) providing insight into modern terrorism tactics and how you and your colleagues can stay safe. If you've ever

read any of his articles before you'll know that they're packed with real-life, usable tips for real-world situations. In this one he talks about the trend in using vehicles as weapons, and gives advice on understanding the environments and situations where they're common and what to do if you're caught up in one. It's valuable, life-saving advice, and worth a share around the office so that your colleagues can be as informed as you are.

There's plenty more in there too, including how technology can reduce the costs of workers' compensation, why people get things wrong and how that manifests itself in a blame culture, the greatest risk to cyber security, clarifying the facts behind sit/stand desks and much, much more.

Thanks for picking up this magazine and having a read of it. It means a lot to us that you've chosen to spend your time with us and I know our contributors appreciate it too. As always, please send your feedback to us at info@cardinus.com so that we can improve what we do here. We look forward to hearing from you.

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Prevention is better than the cure

With musculoskeletal disorders becoming a common feature of working life, and with MSD prevalence increasing, Bill Pace (Cardinus) and Donna DeFalco (The Health Enhancement Company) look at how prevention can be better than the cure.

FOR employers, the future poses many ergonomics-related risks and that means that many more employers will be paying out on reactive medical and technological interventions to minimize those risks. That might mean redesign spaces, bringing in new equipment or increasing healthcare costs.

Millennials, who have been in the workplace for over a decade now, have presented and continue to present a grave threat to the balance sheet. They are the first generation to enter the workforce having been on the screen since the age of five. Significantly, they have handled computer mice and keyboards from an early age, played with mobile devices and touchscreen equipment since they came on to the market. That means by the time they came into the workforce they entered with pre-existing MSD conditions that will only become exacerbated by 8-hour long days at the workstation.

Employees across all industries now spend long work hours (in addition to many hours at home) in front of a multitude of screens — desktops, laptops and mobile devices of all kinds — increasing the likelihood for neck and back pain.

There have been a number of changes in the workplace too, that have had an impact, either good or bad, on the health outcomes of its

employees. We're now used to open offices, hot-desking, home working, lounge and coffee-house-type seating areas, designed to save space, foster collaboration and achieve greater equity among employees. However, these are all risk factors that could contribute to increased MSD prevalence.

All of these changes make the future of employee health difficult to assess. However, we are aware that reported MSD cases have increased over the last 20 years and that means more expense for the employer.

One of the primary methods of reducing this risk is through assessing individual risks and putting in place methods to mitigate them. Traditionally, this has been done through paper-based or spreadsheet-based assessments that are often rolled out individually and managed centrally through a large database, often to the bewilderment of employee safety managers. Now, this can be done in a staggered way with automated software that eases the process for the employee safety manager.

However, the question remains, how do you engage employees, and in particular millennial employees, with programs and services designed

to prevent MSD risk? The effectiveness of prevention programs is a direct function of employees' willingness to engage, which can be fostered by building trust, a perception of need and utility, the intrinsic appeal of the program and the ease of access to the program.

User-friendly offerings, including online training and risk assessments, workplace design and on-site training all contribute to decreasing the incidence and prevalence of MSD and minimize healthcare costs.

Cardinus and the Health Enhancement Company worked with Adventist Health, a hospital system with 20 hospitals and 20,000 employees, to provide an engaging preventative ergonomics system to help manage their risk. By combining online ergonomics with systems implementation expertise, the resulting outcomes were improved, enabling the company to save time, healthcare costs and a reduction on injuries. This preventative approach reduced high risk individuals by half and saw engagement rates soar.

Adventist Health's Workers Compensation and Safety Department found an increase in carpal

"...We've gained the respect of employees who appreciate the program and now trust the workers compensation department."





tunnel syndrome (CT) and related repetitive movement injuries among their office-based staff and faced increasing health costs. Every time a new case came to the department its employees were faced with investigating each case, while additional costs for paid disability leave rose, and the risk of losing insurance due to excessive claims increased. The response was to hire two ergonomists to head out to the field and start combating these injuries. However, demand was high and after a while became overbearing.

Cardinus and the Health Enhancement Company were invited in to help manage the workload, through a mixture of online self-assessment and education and cultural change to foster a better relationship with health and find a reduction in incidents of MSDs.

Like all big projects, engagement proved a problem in the beginning. Due to the relative inexperience of the Cardinus system compared to the existing program senior leadership were easily convinced of the need for the software. However, management at their office locations still needed to be brought

in to the process so that roll-out was smooth and engagement high. The Workers Compensation and Safety Department visited office locations and met with managers to put them at ease over the new program. They also provided training and a new communications plan to win over any last pockets of resistance.

This combination of software, cultural change and internal communications resulted in big wins for the Adventist Health team. Initially they rolled out to 1,400 employees and saw an engagement rate of 75%. This has led Adventist Health to experience a decrease in the number of reported CT-related injuries each year.

And that's not all. From a cost perspective they've seen big changes too:

- 38% decrease in total cost of ergonomics injuries over 1 year
- 25% decrease in total number of ergonomic injuries over 1 year


Ashley Clabeaux, from the Workers Compensation and Safety Department, told us "Now we're

experts [in workplace ergonomics]. We've gained the respect of employees who appreciate the program and now trust the workers compensation department"

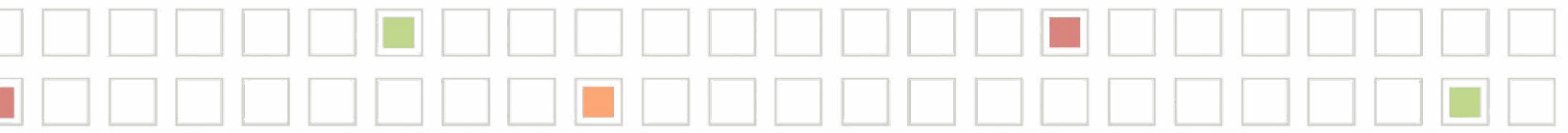
Once prevention becomes part of the management culture, it can profoundly change the employer's and employee's relationship with office-based health risk, making it positive, proactive and meaningful.



Bill Pace is president of Cardinus LLC. Bill has worked in the US HR software market since 1995 and has specialised in ergonomics solutions for business for the last 12 years. He has worked with several Fortune 500 and 100 companies, including Honeywell, Travelers Insurance and USAA.



Donna DeFalco is a consultant and wellness program developer with over 30 years of experience in musculoskeletal health and stress related disease. President of The Health Enhancement Company she oversees on-site wellness and development around ergonomics issues to national and international Fortune 500 companies.



Early symptom intervention

The use of athletic trainers and physical therapists to prevent recordable injuries

David Hoyle tells us how athletic trainers and physical therapists can be useful in reducing injuries through their knowledge of musculoskeletal therapies.

IT'S often said the best injury is the one that never happens. Many work-related musculoskeletal disorders (WRMSDs) begin as soreness. With a culture of early reporting and intervention, often the soreness can be managed without it turning into an injury. This can be done effectively through a few visits of care following OSHA guidelines for first aid, root cause analysis of the soreness, and appropriate behavioral and occasionally administrative or engineering ergonomic controls. The Select Medical WorkStrategies Program defines the assessment and triage of soreness along with interventions of root cause analysis, first aid, and behavioral, administrative, and engineering ergonomic controls as Early Symptom Intervention (ESI). The goal of ESI is to have a detailed plan to intervene early, keep soreness to a minimum and prevent the need for medical care beyond first aid. These steps prevent OSHA recordables, maximizing worker productivity and minimizing the effect of soreness on the worker's life.

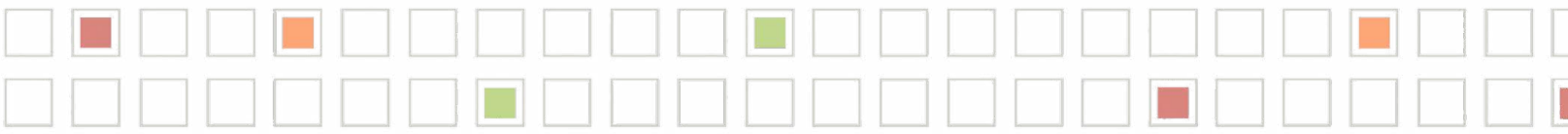
OSHA 29 CFR 1910.151 mandates that all employers have medical personnel available for advice and consultation on plant health. In the absence of an infirmary, clinic, or

hospital in near proximity to the workplace used for the treatment of all injured employees, the employer needs to have personnel adequately trained to render first aid available to its workforce.¹ In addition to having personnel trained to provide urgent on-site first aid who can support employees in emergency situations during the interval it would take for emergency medicine personnel to arrive in response to a 911 call, it also makes sense to have plans for less emergent situations where an employee may report soreness. OSHA provides an extensive definition of first aid.² Many OSHA-defined first aid interventions and periodic interpretations of the standards on first aid³ are effective at minimizing soreness and preventing injuries requiring medical intervention or lost work time when appropriately applied. Just as important as the use of first aid techniques to prevent injury is the need to identify when medical care beyond first aid is needed so actual injuries are treated expediently and not allowed to worsen or for the employee to lose faith in the employer's system and medical providers. Therefore assessment of soreness and triage to the most appropriate level of intervention should be conducted by individuals with

an expertise in musculoskeletal health. Although orthopedists have the highest level of knowledge about musculoskeletal injuries, they often are not readily available for triage and not well versed in regulations in the area of occupational health. Physical Therapists (PT) and Athletic Trainers (AT) also have a high degree of knowledge about musculoskeletal injuries⁴ and there is a growing trend towards PTs and ATs who are knowledgeable of employer needs and regulations governing occupational health. These professionals are also experts in the use of modalities available under the OSHA first aid guidelines including the use of stretching,⁵ exercise,⁶ thermal agents,⁷ taping (including kinesiology taping),⁸ massage, and non-prescription medications for inflammation and pain.²

In addition to their knowledge in the evaluation and management of acute musculoskeletal soreness, PTs and ATs have significant training in anatomy, physiology, physics, kinesiology, and body mechanics. This knowledge base provides an extensive background for root cause analysis and the development and implementation of solutions to control

"It's often said the best injury is the one that never happens"




hazards associated with WRMSDs consistent with the recommendations of the National Institute of Occupational Safety and Health (NIOSH).⁹ Root cause analysis should include consideration of the individual worker and possible impairments in range of motion, strength, and work habits as well as ergonomic risk factors of postures, forces, repetitions and environmental factors such as cold and vibration. In addition to getting an individual the appropriate level of first aid or medical care needed, institution of changes to the employee workstation and work habits should be instituted as part of a comprehensive ESI program. Follow up with the employee should occur for additional first aid, to assure appropriate integration of ergonomic solutions and behavioral modification.

A comprehensive ESI program using PTs or ATs is frequently provided on-site through dedication of one or more full time employees. However, many employers don't have the need or resources to provide this level of support. In such cases, employers are turning to part-time on-site contracts through a company who employs full-time ATs and PTs or arranging for triage and first aid to be conducted at a local physical therapy center equipped with the knowledge and ability to accommodate an employer's need.

PTs and ATs who have an interest and training in occupational health have a unique skill set and are readily available to assist employers in reducing OSHA recordable injuries through the use of Early Symptom Intervention including triage, first aid, root cause analysis, implementation of ergonomic controls and behavioral management techniques.

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David Hoyle has almost two decades of experience working with people with musculoskeletal dysfunction. Mr. Hoyle received his undergraduate degree in physical therapy in 1987, has been recognized as an Orthopaedic Clinical Specialist by the American Board of Physical Therapy Specialists since 1996, received his Certification in Manual Therapy from the University of St. Augustine in 1994, and has a master's degree in exercises sciences from the University of Connecticut. Mr. Hoyle has been published in JOSPT as well as other physical therapy journals.



Controlling costs in workers' compensation

Dr Ann of 24hr Virtual Clinic discusses the benefits of a technology solution in controlling the costs of workers' compensation.

ALMOST every business owner loathes workers' compensation insurance. Workers' compensation insurance costs are high and can go up significantly in the event of a claim or multiple claims. Also, workers' compensation can be a cost center which is heavily impacted by fraud and abuse. If employers can control the number and severity of claims and lower workers' compensation costs they can put the money to better use.

Time is not on Your Side

One of the challenges with a workers' compensation incident is that time is usually not on the business owner's side. If an employee has a non-emergency workplace injury and follows a normal progression of informing their supervisor and leaving work to seek medical attention, the costs rapidly escalate. Remember, time is not on the business owner's side and during this process, the employee may conclude his or her injury is worse than it is. And, this conclusion may be real (caused by a lag in treatment) or perceived. One of the keys to lowering the cost of workers' compensation incidents is to significantly shorten the time window from the event to the first conversation with a medical professional.

Technology can Reduce Time Lag

Through technology, a company can provide rapid response telemedicine that shortens the incidence of the medical response window, distributes all paperwork and lowers the cost of workers' compensation claims. Employees with non-emergency injuries talk with a healthcare

professional before leaving the workplace. Often, these injuries can be treated without a costly trip to the local emergency room or healthcare provider. Also, many injured employees can receive on-going consultation via a virtual clinic or provider. As a result, the cost of workers' compensation claims and time out of work are both significantly reduced. On average, a virtual triage program has proven to lower E-MOD scores and decrease workers' compensation claims and costs by 40%.

Technology can also help bring workers' compensation costs further down for the employer through involvement before an incident with prevention programs because the best way to reduce workplace injuries is to prevent them from happening in the first place! A structured ergonomics program with self-assessment and e-learning helps decrease the number one category of workers' compensation claims: **overexertion**.

Overexertion injuries like lifting, pushing, pulling, holding, carrying or throwing objects may be caused by musculoskeletal disorders (MSDs) which account for nearly 25% of work comp injuries and over \$15 billion in costs. This extensive ergonomic program is available to all employees and is specifically designed to increase employee engagement and awareness to prevent injury through targeted training, accurately measure risks and exposures, and provide ergonomic risk assessment and training personalized for each employee.

Partnering technology helps keep employees healthy, productive and on the job – just what all companies want.



Dr. Ann
founded WellCare
Dimensions Inc. in
1996. The mission



of the company was to provide a new dimension to the delivery of healthcare products and services through the 24hr Virtual Clinic™. The 24hr Virtual Clinic™ grew from a family telehealth benefit into a disruptive cost mitigation risk management program. Virtually, the clinic addresses occupational health, ergonomic health, behavioral health, non-critical healthcare and early symptom intervention. Dr. Ann received her Doctorate in Sports Management from the University of Northern Colorado, Greeley, CO; Masters in Sport Administration from Idaho State University, Pocatello, ID and Bachelors of Science in Health and Physical Education from Colorado State University, Ft. Collins, CO.

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 **CARDINUS**

Ergonomics support an aging workforce

Underwriter Laboratories look at the shifting demographics of our workforce and how ergonomics is changing to meet the challenge.

LOOK around you. There is a good chance that your co-workers and colleagues are getting older. For the first time in history, four generations are in the workplace at the same time.

According to the United Nations, by 2050, one in three people living in the developed world will be over 60. In Australia, one in four people is older than 55 and over the next decade this will increase to approximately one in three. This shift in demographics means that it will be necessary to prolong paid workforce participation in a bid to cut the dependence

of the non-working population on the working population. In the US, there were 28 million workers over the age of 55 back in 2008. Last year, that number had jumped to almost 40 million – an increase of 43%. By 2020 it is predicted that 25% of the U.S. labor force will be over 55 and almost 17% will be 65 and older. And when you have the majority of baby boomers saying they have no plans to put their feet up at retirement age, you can clearly see a trend emerging.

The changing make up of staff at companies everywhere presents both challenges and opportunities. Promoting health, safety,

and wellbeing is essential if companies are to truly engage older workers and make the most of their expertise, experience, and know-how across a range of different sectors. According to the National Technical Assistance and Research Center, the 25 million baby boomers likely to exit the workplace by the end of this decade possess some of the most important character traits to commercial success, including being results-driven, ambitious, idealistic, competitive, optimistic, and people-oriented. Finding ways to retain and attract older workers is about to become more important than ever.



So, accommodating these professionals and keeping them safe, fit, and productive is crucial. With age can come a loss of strength, flexibility, and reaction time. A decrease in oxygen intake can boost blood pressure. And psycho-social changes means workers favor different ways of working and learning on the job.

And that's where ergonomics can play a key role. Ergonomics is the science of designing the workplace to help and support workers given their current capabilities. By designing jobs, tasks and places that take away any form of incompatibility between work and worker, companies are better able to prevent sicknesses, injuries and mistakes, particularly among the older workforce.

Here are 6 rules for creating ergonomically positive workplaces.

1. Focus on neutral postures

Whether standing or sitting in the workplace, encouraging workers to adopt the neutral posture is best – the posture when the joints are not bent and the spine is aligned and not twisted, reducing stress and strain on the musculoskeletal system..

2. Remember the 'power zone'

Often referred to as the 'hand shake zone' too, remember to encourage lifting only when it is close to the body, between mid-thigh and mid-chest height. Similar to the 'strike zone' in baseball, this zone is where the arms and back can lift the most with the least amount of effort.

3. Educate and training

You're never too old to learn new things. A positive training or induction program can help to motivate staff to accept responsibility for their own workplace habits.

4. Offer good lighting

Probably the most common issue for older workers is poor lighting as visual acuity naturally deteriorates with age. Be sure to light work areas properly and appropriately.

5. Get a grip

Offering so-called 'power grips' rather than alternatives like pinch grips for a multitude of tasks, equipment and machinery is a basic ergonomic rule which will really help ageing workers.

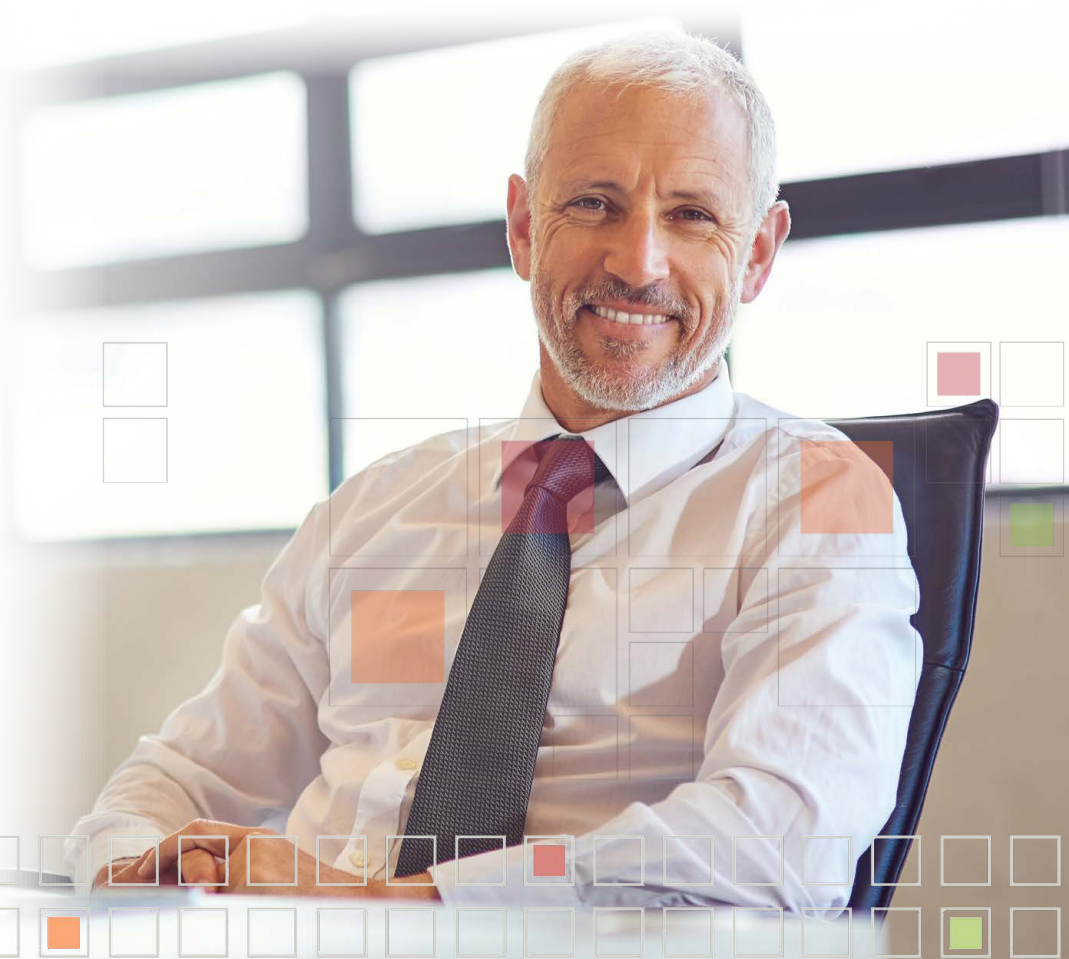
6. Avoid repetition

Some older workers may have less stamina and need extra recovery time when doing specific tasks. By allowing them to control the pace of work themselves, you will support their needs and boost productivity and morale.

These basics are a good starting point when considering the ergonomics of your workplace – and how fit you are to prepare for an aging workforce. As mentioned, older workers are valuable to any business and will increasingly represent a large portion of your organization's knowledge and skill.



■ **Underwriter Laboratories (UL) is a global independent safety science company with more than a century of expertise innovating safety solutions. Find out more at www.ulehssustainability.com/**



The effects of traumatic events take an exacting toll on our lives

How productivity is reduced by traumatic events and how a holistic view can help to improve it, from William Hood.

BEING a combat veteran and working in post-Katrina New Orleans all too often showed what the after effects of traumatic events can do. When Hurricane Harvey struck Houston life for many changed dramatically. Loss of home, a sense of security and being displaced became a new reality. For some there were no tangible physical loss but the disruptions to day to day life, friends or family were impacted. We have all seen the pictures of the aftermath of a storm, tornado or fire and while the rebuilding process may begin it's easy to discount the inner rebuilding and self-care needed to move forward especially in the work place.

While the Houston and surrounding areas responded with great generosity, hard work and care the effects of the storm two and half months later are being felt. For some in the Houston area whole office buildings were damaged and employees are now working from home or other various remote places if their home was impacted. The day to day impact for many is felt in the juggling act of trying to coordinate family, job, rebuild and new routines. The stress of trying to find a new normal invades all aspects of life and has impact on wellness and productivity in the workplace. As many studies suggest in trauma changes a person both psychologically and physiologically.

Many companies know and often use the old adage; form, storm, norm and perform when dealing with a crisis, trauma or change. However, sometimes this thinking diminishes the understanding of the whole person and the effects of trauma, displacement and change with individuals in the work place. It is all too common for the effects of trauma to be overlooked in the workplace.

None of us live in what I call the "work vacuum". We all bring with us into the office the things that make up our lives. The stress of families, illness, divorce, joys, pain, hopes and dreams. Our life circumstances affect our ability to be productive and a contributor to our teams.

When Hurricane Harvey struck the gulf coast our team got together to develop an outreach to help our clients address the impacts of trauma and stress on employees in the workplace. In our experience working with large corporate clients we have witnessed the impact of trauma-related stress on productivity. There is an increase of musculoskeletal disorder and repetitive stress injury and impact to overall wellness. Often employees' minds are distracted by loss, grief, a long list of to-dos and a sense of feeling powerless. Self-care and awareness are usually at the bottom of the list of priorities.



It is important for leadership to step back and seek to access the impacts of major traumatic events and develop thoughtful strategies for helping employees find ways to cope and even build resiliency skills.

The 8 steps of a post-trauma strategy

1. Work with company leadership to devise a process to determine employees at risk. This begins with company leadership broadcasting that such an initiative was underway and having an ergonomic specialist contact home-based employees. Data is collected from these contacts
2. Develop and implement a training package for home-based employees to implement healthy work habits in order to reduce risk and exposure to MSD.
3. Utilize behavioral software that will provide employees cognitive cues to implement good ergonomic behaviors.
4. Work with company leadership to strategize and develop best practices for moving back into repaired office space.
5. Assist with assuring proper ergonomic set up for employees as they move into repaired offices.
6. Assist in developing and managing an office ergonomic and corporate wellness processes.
7. Develop a post-program survey that can metric results and demonstrate impact of the program and its effects on employee wellness.
8. Work with leadership to develop a lessons learned, future training and outreach programs that will help employees meet future challenges.

The thoughtful and empathetic role of leadership can make the difference in not just surviving but overcoming and equipping employees with stronger resiliency skills to meet challenges in the future.



William Hood
is founder and
owner of Eunoia

Productivity Solutions, a Service-Disabled Veteran-Owned Small Business (SDVOSBC) focused on Corporate Wellness, Ergonomics and Executive/Leadership Coaching. William served as a Navy Chaplain for 29 years in various combat and extreme hazard duty billets. His experience in leadership development and coaching has helped lead individuals and organizations through trauma and conflict to find the best ways to succeed and move forward from a whole person perspective.

MSDs and steps to control

Richard Kruckeberg on the steps organizations can take towards better MSD control.

Early Recognition

Identifying minor issues before they become a major concern of when they occurred is core standard for OSHA/ NIOSH. This addresses concerns individuals have often before while they require significant medical involvement. Once they become “clinical” issues they can impair normal work or personal activities. A study by the National Council on Compensation Insurance Inc. released in 2015 showed that delayed injury reporting by two weeks can increase comp claim costs up to 51%.⁵ That is only the tip of the iceberg.

OSHA estimates 50% of MSD go unreported at workplaces.¹ Pransky et al reported “Although less than 5% of workers had officially reported a work-related injury or illness during the past year, over 85% experienced work-related symptoms, 50% had persistent work-related problems, and 30% reported either lost time from work or work restrictions because of their ailment” for reasons of fear of retribution, loss of work time, or other reasons.³ Presenteeism, being on the job but less efficient due health issues, cost 31% of daily wages benefits for every equivalent lost workday⁴ or 4.4 hours per employee⁷. A program should encourage early intervention to address issues before they become a recordable or absenteeism or before they become a presenteeism matter.

Conservative Management

“Good recovery is more likely if you can control the pain, stay at work (even if you have some pain), and keep active, perhaps with modified activities.”⁶ Identifying specific activities for specific body parts concerned and conditioning those parts and keeping the employee at work can mitigate escalation.

COSTS associated with management of work-related musculoskeletal disorders through worker’s compensation insurance significantly impact employers in the United States, as well as globally. Worker’s compensation direct costs are \$20 billion/year to the employer, yet, the direct costs of worker’s compensation often represent only 20 to 30 percent of the overall injury expenses.¹ Considering the present and potential improved economy and job expansion could lead to greater future worker’s compensation cost and risks.

Indirect costs, including overtime, temporary labor, increased training, supervisor time, production delays, unhappy customers, increased stress, and property or equipment damage represent several times the direct cost of the injury. A 2015 BMUS Executive Summary reports the total direct and indirect cost in the US for MSD injuries at \$874 billion.² Injury costs, both direct and indirect, will have a much greater impact on the employers’ overall costs than workers’ compensation insurance rate decreases.

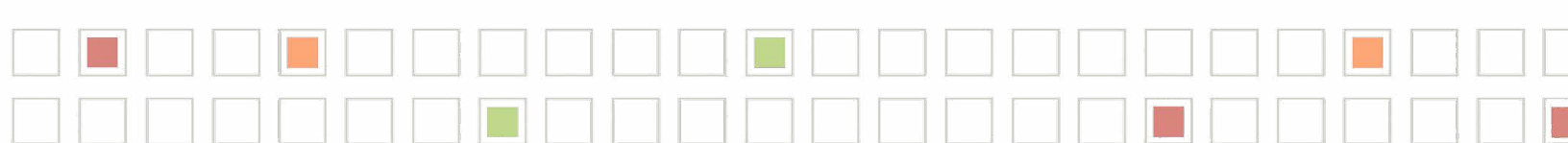
The current method for management of workers’ compensation insurance reportable incident (employees’ claims) cost by employers involves multiple industry, location specific systems such as bill review, medical case management and employee involvement

and activism, including employee choice of care provider, as examples, whose compliance, are dependent on local management participation. These methods are mainly evaluated by financial costs after the occurrence of the loss, based on the revenue for the plant or specific employer location.

There is no known process that allows a combination of the pre-emptive sourcing of workers’ compensation reportable incidents to be gathered by employers. A preemptive process would aide in managing and modifying processes to reduce the reportable incidents prior to their conversion to an actual occurrence cost, and allow employees to access educational methods for improving their individual wellness. This process would further identify propensity of compliance by the employee, so as to allow further evaluation by the employer of the statistical probability of a workers’ compensation source of reportable incident occurring.

OSHA developed guidelines to assist industry in preventing and/ or minimizing work injuries.¹ The ultimate goal is an increase in revenue, a reduction in cost or an avoidance of cost. The methods that meet OSHA guidelines for injury prevention and reducing workers’ compensation cost are as follows:

“OSHA estimates 50% of MSD go unreported at workplaces”



Systematic monitoring

Following up on employee musculoskeletal concerns keep employee/employer on the same page regarding the resolution process of the MSD issue. As noted above any condition not identified within two weeks can become more expensive to deal with.^{3,8} If the employer can touch pointing areas that have relative high rates of issues and specific body areas that may be at risk and take a proactive role in ergonomics, which can significantly reduce workers' compensation claims.

Education

Education about MSD has been a strong indicator of prevention as noted by Dokuztug et al.⁷ NIOSH advocates education about MSDs and ergonomics as a proven method of reducing MSDs. The **education** of the activity to deal with the area of concern empowers the employee so that issues do not become clinical.⁹ Prevention techniques could be available for workforce regarding MSD by body part.

Accessibility

Surveying employees regarding health concerns is advocated to direct human resources on areas of work that may need attention as to work methods or equipment needs. Methods of surveying employees in the past included telephonic and mail. In today's computer/internet savvy worker a product available via internet or smart phone app

would provide continuous access to gather information and correlate in regards to ranked need. In a study by Wantland, et al in Journal of Medical Internet Research, found significant improvement of knowledge with internet-based programs over non-internet-based programs.⁶

The above is information for the systematic and methodical way of identifying sources, and recommending options to address correction of the sources' effect that may lead to reduce employees' reportable incident claims against the employers' workers' compensation insurance. This would allow for lower costs, associated with workers' compensation, and provide information on areas of adjustment in the workplace for ergonomic assessment or improvement.

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- (<http://www.centralillinoispt.com>) **Inventor of the MSD Source Guide™, has 27 years of orthopaedic and industrial physical therapy business operations experience at his private practice clinic, while also a clinical instructor at the University of Illinois, Northwestern University, and former director of Physical Therapist Assistant Program at Lake Land College. He is also a board member of MM Analytics, a web base company dedicated to providing solutions predict/prevent/mitigate Workers' Compensation claims so employers can achieve higher productivity. Kruckeberg is board certified in Orthopaedic Physical Therapy and Hand Therapy.**

Sit-stand desks – clarifying the facts

Guy Osmond gives us his take on the allure of the sit-stand desk phenomena and provides tips for a healthier work life.

MUCH has been said and written about sit-stand desks. And much of it has been (and still is) nonsense!

Sit-stand desks have been available in various forms (primarily crank-adjustment, counter-balanced or electric and, more recently, desktop adaptors) for over twenty years. However, it is only within the last few years that they have received so much attention.

Before I continue I should state that I have been selling sit-stand desks for nearly twenty years and wholeheartedly recommend their use. I strongly support their implementation as part of a wider health and productivity regime with proper training and clearly defined purpose. What I question is the way in which many people in the workplace furniture industry have misappropriated the sit-stand desk as some sort of panacea to avoid a range of health conditions and avert early death! In the next few hundred words I hope to explode a few myths and clarify some misunderstandings.

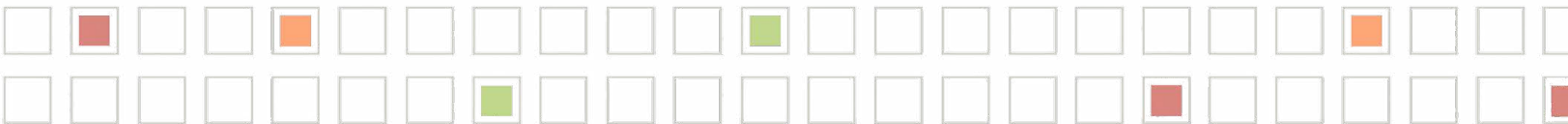
It appears that the recent fuss all started in 2014 when one or two aspiring desk salesmen latched onto the [2012 systematic review](#)

[and meta-analysis](#) concerning prolonged seating by Wilmot, Edwardson, Achana et al. This looked at 18 studies with, collectively, nearly 800,000 participants. Fifteen of these studies were deemed moderate to high quality. As a result of their analysis, the researchers concluded that “Sedentary time is associated with an increased risk of diabetes, cardiovascular disease and cardiovascular and all-cause mortality; the strength of the association is most consistent for diabetes”.

Soon after the research was published, someone recognized that the possible outcomes of prolonged sitting are comparable with those associated with smoking and the expression “Sitting is the new smoking” was born. In the age of social media, 24 hour news and tabloid newspapers, this was, of course, soundbite heaven. The expression soon began to appear frequently, often quoted by people who had no idea of the origin, context or the true meaning.

With scare stories appearing in the media, the time was ripe for the publication in 2015 of a Consensus Statement (not a research paper) entitled “The sedentary office: a growing case for change towards better health and

productivity”. This appeared under the banner of Public Health England and was published on the website of the British Journal of Sports Medicine. With such apparent credibility, this statement recommended (amongst other outcomes) “standing and light activity” for between two and four hours per day and that “seated-based work should be regularly broken up with standing-based work, the use of sit-stand desks, or the taking of short active standing breaks”.





At the time of publication, there was some controversy about an undeclared conflict of interest because one of the authors also owns a sit-stand desk company. However, nearly 80 news outlets picked up the story and the conflict of interest was lost in the media flurry that followed.

Spawned by these media reports, there have been countless articles, blogs and stories of varying quality and value. Many are sales

itches thinly disguised as advice and many fail to make the fundamental observation that the whole issue is about **sitting less, not about standing more.**

People like a simple message. It could be tempting to approach the issue as a binary choice between sitting and standing and then try to find a way to quantify that. At a recent conference in the United States, I witnessed several delegates (in various seminars) ask the question ‘how long should we stand for?’ and, of course, the right answer is the classic ergonomist’s response: ‘It depends.’ Individuals have very different comfort thresholds for standing. In addition, individual health, fitness, posture, footwear and numerous other factors need to be considered. More important still is the simple fact that sitting and standing do not make the whole equation. Movement is also an essential constituent.

During her many years at NASA, Dr Joan Vernikos concluded that a key element to health is to ensure we trigger our ‘gravity muscles’ frequently. We do this by standing up and doing everyday activities that counter gravity, such as putting things on shelves, using steps and stairs, dancing, carrying the shopping, even gardening. Her research demonstrated that the number of times you counter gravity is more important than how long you do it for. It is therefore important to ensure that you do not sit for too long and you make frequent changes of posture. Getting up every 20-30 minutes is optimal but do not simply swap sitting for standing. Move about and change posture frequently.

To put all this information into context, here are some ideas for individuals and employers to improve the health of individuals and minimize the health risks of sitting at work:

Ideas for individuals to sit less and be healthier

- Whether you are sitting or standing, ensure your posture is good
- Do not sit or stand for too long. Mix it up
- Drink lots of water. It is good for you and creates natural comfort breaks
- Have some meetings standing
- Try walking meetings
- Think about your tasks. Some are better suited to standing
- Raise your sit-stand desk up too high at the end of the day. It makes life easier for cleaners and forces you to reposition it in the morning
- Raise the desk when colleagues approach to talk to you and have your conversation standing up
- Stand for telephone conversations, especially if you need to be assertive. Or walk and talk
- Stand to sort papers and files
- Sending an internal email? Go and speak to the person instead
- Park as far away from the building as possible. Do the same when you go shopping
- Use the stairs, not the lift
- Wear a fitness tracker and track your steps. Compete with yourself to improve your average
- Do stretching exercises at your desk and/or on the move
- Enroll in health programs

Ideas for employers to optimize performance through sit-stand furniture and alternatives to sitting

- Train users to understand how to use their sit-stand desk, when to make posture changes and what good posture feels like (sitting and standing)
- Install “poseur tables” for short standing meetings and touch down use



- Consider replacing some meeting tables with standing versions
- Check if it is possible to slow down the lift(s) to encourage stair use
- In established Hot Desking areas, install a pair of sit-stand desks at the end of each set of standard desks. This will work very well provided good policies and procedures are in place (and the Hot Desking facilities are properly implemented and managed)
- Use schemes like [Global Corporate Challenge](#) which both encourage movement and foster team building
- Create walking routes around your premises
- Label routes and staircases with calories burned using schemes like [StepJockey](#)
- Incorporate posture and ergonomics into your health and wellbeing programs
- Gamify your workplace to encourage movement

In summary, therefore:

- Sit-stand desks are wonderful but not the sole solution
- Make sure people are trained how to adopt good sitting and standing postures. Experience tells us that this is not as obvious as it sounds!
- Make frequent changes of posture whilst sitting and get up at least every 20-30 minutes
- If you do not like standing, make sure you still stand up and sit down at least every 20 minutes
- Do not just swap sitting for standing
- Create opportunities to walk and move about during your working day
- Be critical of what you hear! Is it true or is it just a sales pitch?



■ **Guy has been in workplace ergonomics for over 20 years. His company, Osmond Ergonomics, is “the UK’s most knowledgeable supplier of innovative products and services to improve workplace wellbeing and productivity”.**

Guy’s team have a range of specialist skills not generally found amongst mainstream office furniture suppliers and he prides himself on sourcing outstanding products from all over the world. Guy’s specialities include ergonomics, reducing workplace absenteeism and presenteeism, improving productivity, addressing musculoskeletal problems and disabilities in the workplace. He blogs and speaks regularly on topics including flexible working and the changing office environment.



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Why do we get things wrong?

Companies employ stupid people. Daily we see that accidents are caused by negligent behavior. We always seem to focus on the poor sap who pressed the wrong button; who missed the warning sign; or who simply did the wrong thing. Do we conclude that there is an underclass of people who come to work to hurt themselves or others? Or are some people simply too careless to work? Or perhaps something else is going on? Nigel Heaton and Claire Philp investigate.

AS a society we appear to like simple solutions. Someone is to blame. Once we eliminated mechanical and technical failure, or deliberate sabotage, we blame the operator. It is 'human error'. We are comforted by the idea that if we could just get rid of the stupid people and only employ the clever ones, all accidents would be eliminated. Organizations can be seen to act. "We are eliminating human error by training everyone and sacking anyone who makes a mistake". If someone does something wrong it is clear where the blame lies. Yet after more than 120 years of post-industrial society we still see a plethora of errors that range from the benign – I pulled that door and I should have pushed – to the tragic – he fell asleep at the wheel. Can it be true that if we just get rid of the 5% of the work force who are too stupid or too lazy to follow instructions then errors and accidents would disappear?

The reality is that 'human error' is an excuse. It is mostly a symptom and rarely a cause. Much like an infection, if we don't accurately

identify the pathology, we cannot treat the disease. Worse, if we treat the symptom but not the underlying condition the problem will continue to reoccur and may even get worse. We might have experienced a near miss, a free lesson. The next time the incident occurs it might be a lot, lot worse.

We know that we commit errors every day. We drive our partner's car and activate the windscreen wipers instead of the indicators. The outcome is not a large-scale disaster, merely an inconvenience. In fact, we commit errors much more often than we realize, because the vast majority of errors don't have any measureable effect at all. We can even make very significant mistakes repeatedly and nothing bad ever happens. It is only on the 100th occasion that the disaster befalls and we realize that the warning signs had been there all along if only we had the vision to see them.

What is human error?

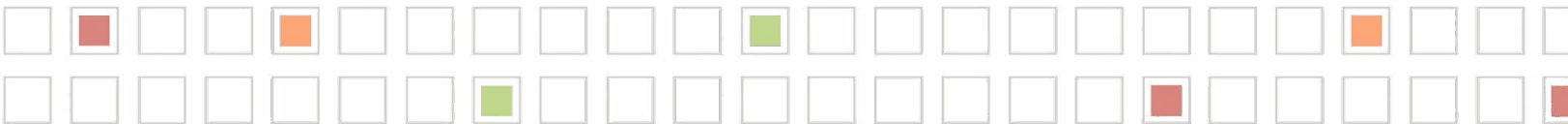
The immediate cause of most errors is the person on the front line not doing the right thing. This gives rise to a common trait in most people – hindsight bias. There is a very obvious problem, the operator did not perform as expected therefore the operator caused the problem. We judge the accident by the result (what happened) and blame the direct cause of the accident (the operator). What is clear is that this often misses a much more interesting story and does not help prevent reoccurrence. We see hindsight bias in events such as the tragedy that killed 7 motorists on the M5. One individual, who was in charge

of a bonfire, was charged with manslaughter because the smoke may or may not have been a contributory factor in the accidents.

After the charge had been dismissed, the Counsel for the defendant stated that

the police and local council were "motivated by desire to find someone to blame for this terrible accident, simply for the sake of it".

"The immediate cause of most errors is the person on the front line not doing the right thing"







We see a perverse reverse of hindsight bias in cases of 'extreme' heroism. For example, the behavior of Chesley 'Sully' Sullenberger demonstrates how a pilot, when faced with the most extreme conditions imaginable, is able to throw away the rulebook and perform the 'miracle on the Hudson'. Imagine the way in which the authorities would have reacted if the wing had clipped the river and everyone had died. The official investigations would almost certainly have jumped on pilot error, just as they initially did in the case of the Kegworth air crash and the Mull of Kintyre helicopter crash. We like a simple explanation and a single point of blame. The truth tends to be much more complex.

We can simplify our concerns into three main areas:

1. The behavior of the person
2. The design and environment in which the error occurred
3. The overarching management system.

For the purposes of this brief article we will concentrate on the behavior of the person.

Why did they behave as they did?

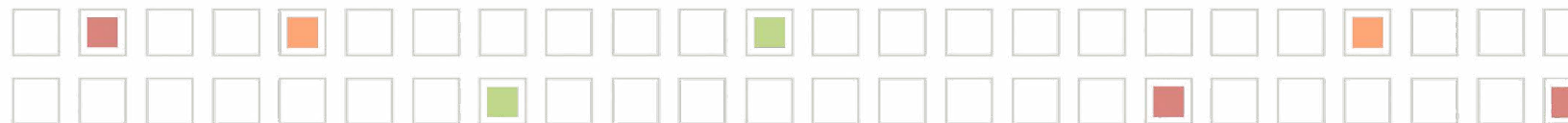
Our understanding of what drives behaviors starts from identifying two underlying conditions immediately before an error. The person knew what they should be doing or they did not. The simplest and probably the rarest of errors is that the person did something because they did not have the correct knowledge. Sometimes this is due to a lack of training other times it is thinking that they have been trained but it is the wrong training. These **knowledge-based errors** are the easiest to correct. We simply provide the knowledge. It is worth noting that the only time that additional training is appropriate as a control to correct errors is when the root cause of the error is a lack of knowledge. Training or re-training people will not, per se, eliminate error.

If the error provoking condition is not a lack of knowledge, then operators know what they need to do. We can split an error when operators know what is expected of them into two. The first and most concerning error is that which is caused by forgetfulness – a slip or lapse. The operator simply made a mistake –

they were too busy, too distracted, under too much pressure. A **slip** is a 'whoops' type of error. I turned on the wiper when I meant to indicate. A **lapse** is caused by forgetfulness. I left my high visibility jacket over my chair when I ran out into the yard to see what is going on. These types of errors can be very costly. They are incredibly hard to control and can cost lives. Atul Gawande has produced his '*checklist manifesto*' as one approach to ensuring that slips and lapses in routine safety critical procedures are followed. His excellent four-part Reith lecture explain the issue is still available on the BBC: <http://www.bbc.co.uk/programmes/b00729d9/episodes/downloads>

The final, and most common, cause of human error is the violation. Despite its rather unpleasant name, not all violations are equal. We find ourselves in a situation where the operators know the rules (so they do not need training), they do not forget (so a checklist will not help them); instead they choose to ignore the rule.

Violations cover a wide spectrum of error provoking conditions. Sully risked his life and the





lives of all his passengers because if he followed the rules they would all have died. More prosaically, Alan Chittock was suspended from his job when he ran onto the track to rescue a disabled woman who had fallen onto a live track in her wheelchair. Mr Chittock was temporarily suspended for breaking the railway rules. In both cases, the violation was prompted by a desire to save lives. If the violation is an heroic action, we judge it by the intention and not the outcome (avoiding hindsight bias).

This type of behavior is at one end of the spectrum of violations. The other end is occupied by behavior that is designed to deliberately sabotage or cause damage to the system, the operator or others. There are many points along the spectrum that determine how 'serious' the violation is. Operators may behave in the way that they believe managers wish them to behave. "I know that they say they want us to follow the safe system, but if we did it would take all day, and they value speed above all else". Operators may be tempted to take short cuts to get home early or to hit production targets. They may work in the same way as

everyone else, even if they know that this is in violation of the safe way of working.



Why do we care?

When faced with an accident, we want to find simple answers. We know someone is to blame. We blame those with the least power and least likely to complain - the injured party or the person who was the direct cause of the accident. We rarely look at the management system that provokes the error or the physical designs that make errors incredibly easy to make.

Human error is complex and is a statement of an external manifestation of an underlying condition. If we treat the wrong thing we risk the problem reoccurring. In the 18th Century, a common treatment for smallpox was to prescribe chocolate. It made the patient feel better, but unfortunately did little to prevent the development of the disease or make the disease less contagious. The doctor felt better as he was doing something and patients felt better (they were given loads of chocolate). It turns out chocolate was not a cure for smallpox.

In the same way, blaming operator error might make us feel better. Managers can be assured that it was just the stupid person at the coalface who made the mistake. And the next time? It was another stupid person. And again, and again.

We need to understand human error with a view to prevent history from repeating itself. We need to conduct robust investigations and challenge ourselves about the range of error provoking conditions. We need to build systems that are forgiving and ones that are robust enough to facilitate heroic behavior. We need to remember that to err is human and to forgive is divine, and after all, we're only human.

Nigel Heaton provides training, consultancy and audit services around a wide range of risk management issues. He has acted as an expert witness for claimants and defendants and works for a large number of large organizations, advising Boards and senior management on how to develop effective risk management strategies. He is a Fellow of the Institute of Ergonomics and Human Factors, a Chartered Member of the Institution of Occupational Safety, a Member of the International Institute of Safety Risk Management, and a Member of the Institute of Risk Management.




Claire is an organizational psychologist who focusses on health and safety. Drawing upon her previous training in psychology her particular focus is on projects with a behavioral aspect. She is able to offer a psychological perspective on safety compliance, behaviors and interventions. Claire also trains in organizational culture, behavioral safety and behavior change techniques.



Improving health and wellbeing in the built environment

Tim Hanwell of Officeworks reimagines the office through biophilic design to aid in reducing stress and maximizing productivity levels.

AT Officeworks we firmly believe that employers should be embracing a design approach that puts the wellbeing of office workers at its core. Biophilic design can reduce stress, improve cognitive function and creativity and improve our wellbeing. Given that businesses waste millions of pounds each year on lost productivity due to stress-related illnesses, design that reconnects us with nature – biophilic design – is essential for providing people opportunities to live and work in healthy places and spaces with less stress and greater overall health and wellbeing.

Here we look at the increasing influence Biophilia is having on interior design and architecture, explain the benefits of a biophilic design in the workplace and why a growing number of employers are bringing nature into the workplace.

What is Biophilia?

The word biophilia was first used by social psychologist Erich Fromm (The Heart of Man) in 1964. He described it as “the passionate love of life and all that is alive.” The concept was then popularized by biologist Edward O. Wilson in his book Biophilia in 1984, in which he describes the innate relationship between humans and nature.

With the emergence of the green building movement in the early 1990s, links were made between improved environmental quality and worker productivity (Browning and Romm, 1994). While the financial gains due to productivity improvements were considered significant, productivity was identified as a placeholder for health and wellbeing, which have an even broader impact.

The healing power of a connection with nature was established by Roger Ulrich’s landmark study comparing recovery rates of patients with and without a view to nature, which concluded that having a window looking out onto plants speeded up the healing process of patients in hospitals. Similarly, having plants in the same room as patients in hospitals also speeds up their healing process.

The last decade has seen a steady growth in work around the intersections of neuroscience and architecture, both in research and in practice; even green building standards have begun to incorporate biophilia, predominantly for its contribution to indoor environmental quality and connection to place.

Most recently, biophilic design has been recognized as a complementary strategy for addressing workplace stress, student performance, patient recovery, community cohesiveness and other familiar challenges to health and overall wellbeing.

With today’s focus on health and wellbeing both at home and in the office it has never been more important to design spaces that inspire, energize and support the people who use them.



How biophilic design is beneficial

Psychologist Dr. Chris Knight from Exeter University led a [study](#) which found that simply adding houseplants to sparse offices increased staff productivity by 15%.

A global study into the impact of office design by virtual campaign forum [Human Spaces](#) has revealed the full extent of the benefits offered to workers by offices that incorporate natural elements. The study of 7,600 workers in 16 countries found that those working in offices with natural light, good ventilation and plants reported a 15% higher level of wellbeing and a 6% productivity increase. They also found that staff were more likely to feel happy and inspired and less likely to feel bored or anxious when entering a biophilic workplace.

Importantly, the report found that office design was so important to workers that a third (33%) of respondents said that it would unequivocally affect their decision whether or not to work somewhere.

So how does this translate into tangible benefits?

Improved productivity: This can be attributed to a variety of factors including but not limited to better air quality, greater sense of wellbeing, improved concentration levels (see below) and/or a greater choice of work settings, including outdoor areas.

Increased concentration levels: Plant life in the workplace can vary from a selection of

potted plants dotted throughout to elaborate living walls, but the end result is the same – they increase oxygen levels in the workplace which in turn, decreases mental fatigue and increases concentration levels, and some would argue, overall productivity.

Creativity blossoms: A more stimulating workplace allows creativity to flourish, and can be nurtured through the inclusion of features like artwork, wall art and graphics, but also simple improvements like access to natural light (and views of the outdoors), incorporating color and including natural finishes can also have a positive impact.

Enhanced staff wellbeing:

All of the above factors play their part in enhancing staff wellbeing, which can have a real tangible impact on the bottom line as absenteeism falls and staff productivity and output increases.

Greater Staff Retention: As staff wellbeing levels increases, so too does staff retention which is a key concern for many, if not all companies. Recruitment costs coupled with lost output as new staff members get trained can be substantial. Biophilic office design can help to engage staff and to provide them with a workplace where they enjoy being, and hence don't want to leave.

What does a biophilic office look like?

Biophilic design is more than a 'nice to have'. The use of nature to harness employees' full potential is becoming an essential aspect of modern, progressive office space. Businesses

investing heavily in the approach include [Apple with Campus 2](#) and [Google's Dublin Campus](#).

As well as good natural light levels, an office design that incorporates elements of the natural world might also have views onto nature, natural textures, organic materials and naturalistic colors plus recuperation spaces to restore mental and physical energy.

How do you actually utilize biophilic design for your office? Here are the three main principles, with some examples for each.

Nature in the space

This is about bringing actual nature into the building. For example:

- Pot plants on desks
- Living green walls
- Water features
- Fresh air circulation
- Natural light
- Window views to trees, landscapes or water
- Sound of birdsong or water
- Fish in aquariums

Nature of the space

This is about the configuration of the workspace. For example

- Cozy, private workspaces like small rooms or sheltered nooks
- Open-plan collaboration spaces
- Balconies and atriums with views from a height

Natural elements

This is about using human-manufactured elements that mimic natural forms in some way. For example:

- Wood, stone or slate finishes
- Artwork depicting plants, animals, landscapes



- Shades of green, blue, yellow and brown
- Floral patterns
- Circular shapes and curved lines

If you have the opportunity to design your ideal office from scratch or undergo a major renovation, you'll be able to utilize all of these ideas. But we know most business people are working within a more limited environment.

Even if you're just renting a small office within a commercial unit you can't control, you can still employ some biophilic design. For example, you could add a potted plant on every desk, put up prints of nature photography on the walls and arrange the furniture in a way that creates partially enclosed private workstations in the corners and a collaborative 'break-out' area in the center.



■ *Since 1994 Tim has been a fully qualified and experienced osteopath and expert in musculoskeletal disorders, pain and injury associated with sitting, and repetitive strain injury (RSI). His clients have ranged from the London School of Economics, to Rolls Royce, the BBC and the NHS. As co-founder of Officeworks Tim's interests are in creating healthy office environments and reducing the risk of workplace injuries. Tim's medical knowledge helps companies improve the health and wellbeing of their sedentary staff, reduce absenteeism and increase productivity.*



People as a cyber security risk

Andy Taylor of APMG International tells us why people are the greatest risk to an organization's cyber security.

FOR many years, people have been referred to as the greatest asset of an organization. The expense of both recruiting and training them was always seen as a reason to try to retain them, particularly the good ones, at all cost. One of the main reasons for this was the experience and knowledge that was lost when a valued staff member left the organization. There was also the risk that they would leave and join a competitor, taking with them favored clients, technical knowledge and perhaps even IPR. This was managed through good human resource departments, incentives and trying to build loyalty in the staff.

Today staff are being portrayed in a different light. They are being referred to as a risk, (indeed in some places the greatest risk), to an organization. This change has been caused in no small part by cyber-crime and issues around the internet in general. Cyber-crime is now bigger in financial terms than the illicit drugs trade and so is a major risk to any organization, be they a household name operating worldwide or just your local corner shop. This article looks at this change and suggests some of the ways it might be addressed.

Historically

Long before the first industrial revolution in the late 1700s, workers, for example goldsmiths or other similar livery guild members, were seen to be of great value and in particular, a source of knowledge and experience. This was down to the years spent gathering knowledge and applying it in a variety of circumstances thereby learning from mistakes. As the knowledge developed it was passed on to the apprentice and shared with other professionals in the relevant walk of life.

As the first industrial revolution took hold, bringing the people in from the fields, into factories - with machinery and processes to learn, this sharing and passing on of knowledge became even more significant and so apprenticeships and similar practices



were enhanced. It therefore became even more important to retain the experienced staff. It was probably during this period that people became valued as the greatest asset and since then the importance has increased, until recently.

The second industrial revolution of the late 1800s continued to raise the importance of people as industrial processes, combined with the availability of electricity, increased the learnt knowledge that employees held. When the third revolution started in the early 1970s with the advent of automated production, electronics and computers, things began to change. Knowledge wasn't only invested in people but in automated systems and in the electronic storage facilities that were being developed. It therefore became even more important to retain the experienced staff. It was probably during this period that people became valued as the greatest asset and since then the importance has increased, until recently.

The internet

Although the beginnings of the internet were in the 1960s, it wasn't until the late 1980s that the internet really broke into our consciousness. That, combined with the development of artificial intelligence, big data and robotics, was the beginning of what is now referred to as the fourth industrial revolution. One of the key influences that the internet has brought about is that knowledge is no longer vested in a relatively few specialists, but widely available to anyone with the ability to access it. It has now become much more important to ensure employees have access, not only to the relevant knowledge and data, but also to the appropriate processes for managing the data into information and usefulness. Employees are no longer as valuable as they used to be, since their organizational knowledge is more widely available, more easily recorded and can be passed on to a new employee as required.

Cyber-crime

As with any new invention, process or activity the criminal fraternity follow closely on the heels of those developing it. The internet (and all that it enables) is no different. Cyber-crime has become a way of life for those committing it, and it needs to be considered seriously by anyone choosing to connect to the internet through any device.

More importantly, employees now hold the keys to the wealth of information in which the criminals are interested, due to its financial value (if nothing else). The ease and speed with which vast quantities of information can be moved about is a striking change from the days of old. Employees are now on the front line of defending an organization against any criminal attempts to misappropriate data in one way or another. They are unfortunately also the principal conduit for getting access to that information – **the greatest risk**. In the past twelve months, nearly half of all reported cyber-attacks have involved hacking and malware, mostly directly targeted at the personnel of the victim organization.

The ways in which staff have been implicated fall into three general groups.

1. Phishing Emails: By inadvertently providing details of the access to sensitive or valuable organizational information. This could be giving out (sharing) login details or by using insecure login details (perhaps using poor passwords). More often than not, this is achieved by sending a phishing email that is attractive enough for the employee recipient to click on a link to "find out more". This clicking will then do one of several things. It could download malicious software, take the user to a bogus website where more information is requested, or cause the recipient to take another action on the basis of the information it contains.

2. Virtual Imposter/Pretending to be another person or department: If an email looks as though it has come from (for example) the finance director and requests money to be paid into a specific account, then it is likely a junior member of staff in the accounts department would comply but not realize the request was bogus. This has happened a number of times with some significant amounts of money being transferred into the criminal's account. It could just as easily be a telephone call that triggers this action - but one from someone who has gained sufficient knowledge of the organization to be believable. A telephone call from a bogus IT department is a method of fooling the staff member into giving out their personal login details. Someone phoning to ask for the account details of a genuine customer to be altered is another example. Receipt of an invoice, again apparently from a genuine

customer, but doctored to pay into a criminal's account instead, has also been a very successful ploy. The method of initial contact could of course be any other device – smartphone text message or social media contact.

3. Physical Intrusion:

The third method is far older and is the physical intrusion into an office environment. The attacker though will have done extensive reconnaissance

beforehand so that they appear to be as genuine as possible. They may have requested an interview or made an appointment for some reason which sounds perfectly genuine.

“A telephone call from a bogus IT department is a method of fooling the staff member into giving out their personal login details”

Their attack is often initiated by arriving early for the appointment and gaining access into the building without the appropriate level of supervision. Once inside they will then harvest any useful information they can find, including

seeing what the staff passes look like (in order to be able to replicate one for later use). Details of logins, passwords, job titles, extension numbers and organizational hierarchy can all be useful intelligence for the

criminal. They may even leave a strategically placed, infected USB stick, in the hope it will be used in a machine where the infection will be downloaded instantaneously.

The solutions

Addressing the risks arising through the staff is essential and is a complex business. The long-term aim has to be to reduce the risk to an acceptable level, and technology can, in part, help with this. Designing systems such that human error is very likely to be successfully detected before it does any damage, perhaps by input-checking, should be the norm for all IT systems. Restricting the access to large databases, notably of sensitive or commercially valuable information, to those who really do need access to it, should be standard. Other measures might include:

- access controls that prevent large amounts of data being downloaded from corporate systems, other than by approved and individually identified staff members, being utilized whenever possible;



- ensuring that those with elevated privileges on a system only use that account for the task for which it is required and not for routine web browsing and email;
- insisting that business processes dealing with the payment of money have a minimum of two people involved.

Checking these controls are adequate, and gaining a certificate to prove it, can be done through APMG and Cyber Essentials details of which can be found here: <https://apmg-international.com/cyber-essentials>. The UK government is now expecting any organization with whom it does business to hold the Cyber Essentials certification.

This issue is exacerbated by the huge increase in what is often called the grey or shadow infrastructure, those items of technology owned by the staff but used to undertake legitimate activities on the corporate network. Smartphones in particular, are now as powerful as desktop computers were, not so long ago, and so can be used to undertake both legitimate and illicit activities. The management of these devices for the security of the company is critical but difficult to achieve.

In recent years there has been a trend to provide, for example, an awareness briefing to new staff on arrival and then, in the more effective organizations, a refresher course every year or so. However, a recent report from CLTRe in the USA shows, that the level of awareness of cyber security issues in the staff has a very weak correlation with the amount of cyber security awareness training provided. What has been shown to be far more important is the development of a security culture in the organization. This research, based on over 30 different organizations in various business

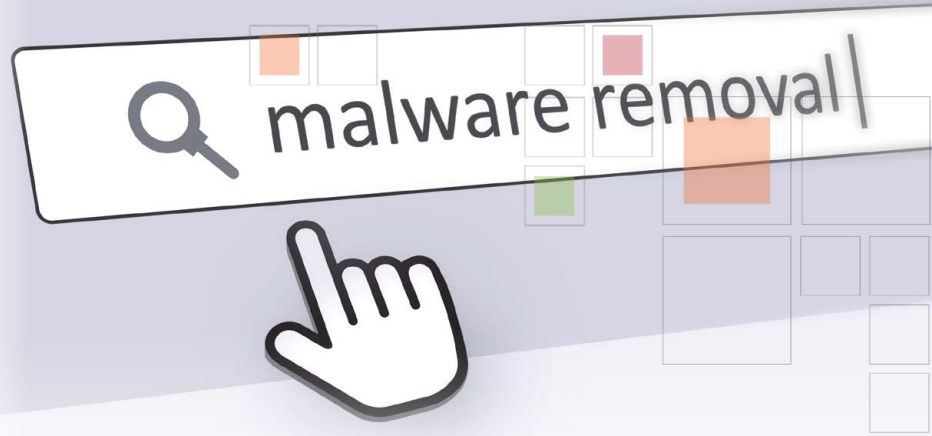
sectors in Norway and Sweden, shows that it is far more important to take a holistic, risk-based approach to developing the **culture** in an organization.

The security culture is the effective combination of a number of different aspects including the attitude of staff towards security together with the communications, responsibilities and knowledge related to security. Whilst training can provide some of the required knowledge, that alone is not likely to develop the other areas essential for the establishment of a security culture within an organization. The culture should establish that cyber-security is a critical part of every staff members' job description and responsibilities. It is about ensuring the right practices are not just learned but understood and, most importantly, implemented effectively by all members of staff from the top of the office to the most junior.

The analogy which perhaps best shows the difference between security culture and awareness is that of meteorology. Climatology

tells us what the weather could be like tomorrow, based on the evidence of the last couple of hundred years or so. This is what security culture needs to be. It describes what the norms are, what behaviors we expect of staff and the common (hopefully best) practices we expect them to use. The weather report tells what the weather *actually* is and it may bear absolutely no resemblance to what climatology tells us should be the case. This is the reality of security where daily incidents arise and have to be dealt with but, nevertheless, the general trend of the "climatology culture" should be the expected norm.

Training can clearly help to develop the culture but it needs to be the right sort of training. Another interesting finding from the CLTRe research was that the older members of staff tended to be better at cyber security despite having been subjected to the same security training and communications. This shows, in part, that the older age groups are more likely to accept and benefit from the more traditional ways of educating staff. Training events and briefings, in addition to reminders, posters



and the like have a greater impact on the older demographic than on the younger ones. Younger staff members need to be treated differently -perhaps utilizing a much more immersive style of learning. They are much better at learning from doing than being told and so events that allow them to *experience* cyber-attacks, to see the consequences of their actions, or other similar security-related activities, are much more likely to improve the security culture in this sector of the organization.

Cyber security training is an essential part of any organization's defenses and training that has been certified by GCHQ will provide the best level of knowledge. This scheme, run by APMG checks that the training and trainer is up to the standards set by GCHQ and details of training organizations and courses that have been approved can be found here: <https://apmg-international.com/product/gct>

The recent move towards the use of so called "escape room" style events, as an example, has shown them to be very effective. In these events participants are required to solve problems in order to "escape" from the room. The problem-solving clues provided can remind them of the key security messages the organization wants to impart to its staff. Well-designed events can help staff to see not only the consequences of their bad practice but also the way the organization would like them to behave. These do not have to be limited to the young however; mature staff can enjoy them too!

There is no one silver bullet to address all the issues cyber security raises. It is essential to take a risk-based approach and to ensure that the view taken to any solution is an holistic one. Doing it piecemeal simply will not work. Cyber security cannot be, and must not be seen as, an

inconvenience, an add-on or as something to be dealt with by the "security" department. It is everyone's responsibility and must be seen as business as usual for all members of staff. APMG can help to assess the maturity of the security controls and capabilities that are in place in an organization. The higher the level of maturity for the security capabilities, the more likely they are to be able to defend the organization effectively. An assessment tool, developed by Dstl for the MoD, was explicitly designed to do just this and is now commercially available through APMG at <https://apmg-international.com/cdcat>

Understanding where the most important information is held, its business value, how it is processed and stored, who has access to it and the means by which illicit access might be gained, is the approach that must be taken. From there, ensuring the various controls, physical, procedural and technical, are implemented, in a layered approach, together with understanding how well they are operating, will form the basis of an appropriately secure organization. The use of strong service management practices will assist this very well and should be the basis of all cyber security capabilities.

When the technical knowledge of the staff are insufficient to take a comprehensive look at the security of an organization, bringing in a specialist might be the answer. As in most professions, not everyone who advertises their skills is a good specialist. The National Cyber Security Centre's Certified Cyber Professional scheme (CCP) is designed to ensure you know who has been checked against GCHQ standards for appropriate levels of competence and knowledge. Those certified by APMG can be found here: <https://apmg-international.com/product/ccp>

Conclusion

Cyber security is now one of the greatest business risks to be addressed, and one that has the potential to do the most damage to an organization. Dealing with it in the same traditional, risk-based way as other business risks have been addressed is the only effective solution. Health and safety at work is now the norm and is rarely considered as anything other than standard. Cyber security has to reach the same level of acceptance, involvement and implementation by all members of staff.



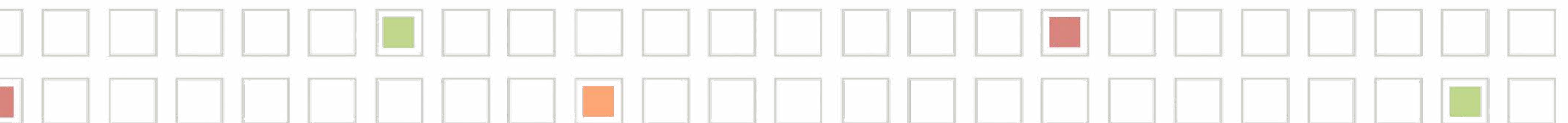
Andy Taylor is the lead assessor for APMG

International in

several cyber security disciplines.

These include the schemes set up by GCHQ to assess the competence of individuals, cyber security training and the organisations that provide the courses. He has worked in security since the mid 1980s and is a qualified lead auditor for ISO27001. APMG's Cyber Portfolio includes the Cyber Defence Capability Assessment Tool (CDCAT®), developed by the Defence Science and Technology Laboratory (Dstl) and industry supported certification scheme Cyber Essentials, developed by the UK government which provides criteria for organizations to measure their cyber-security systems against. CDCAT® is available through Kyngswoode Services Limited, a Channel Partner with APMG International.

¹Indepth insights into the human factor. The 2017 Security Culture Report. Published by CLTRe



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 **CARDINUS**

Vehicle attacks by terrorists: the challenge for individuals

Andy Neal discusses situational awareness and how to stay clear of danger during vehicle-based terrorist attacks.

BY its very nature — and indeed by its design —terrorism in which attackers operate alone or in small cells against largely unprotected targets using simple tactics and available weapons is difficult to counter.

While a good number of plots have been stopped, security agencies simply cannot catch them all — and inevitably some succeed. Such attackers are often armed with simple weapons such as knives, vehicles and crude bombs.

This strategy has not only given authorities headaches, but it also poses a danger to ordinary people who may become victims of these types attacks. Victims in most of these cases have not been specifically targeted — they just happen to be in a targeted location when an attack is launched. Traditionally, we advise people to exercise good situational awareness in the hope that they can detect terrorist behaviors and this remains excellent advice when the terrorists are planning an attack.

This is because their surveillance is conducted against the targeted area and not on the passers-by who might be present when the attack is executed.

A pedestrian who is going to walk across London Bridge tomorrow simply has no way of seeing the would-be attacker watching the bridge today, unless they have an awareness of behaviors. It's often the members of the public acting on intuition or gut instinct that can be the key to stopping preparations for an attack.



Situational Awareness

Here are some things you can look out for:

- Prior to any terrorist attack or major crime, the suspects will usually carry out what is known as 'hostile reconnaissance'. This is when members of the terrorist cell or criminal gang will check out and possibly test security measures or the structure of the building, etc. This is to help them to plan their attack/crime for maximum effect.
- Be vigilant for people taking photos or videos of the building and the surroundings.
- What does their behavior look like in the setting?
- Is there vision fixed on any one area or subject?
- Keep an eye out for any items such as bags that look unusually heavy, or any marks on the bags.
- What is their pace like when walking, fast or slow?

The Right Mind-Set

Developing and maintaining the proper mind-set or plan of action is a critical in an attack. Accepting that simple attacks with vehicles, knives and guns are possible, and being mentally prepared to respond will help counter the threat. With the proper mind-set, people can develop the discipline wherever they go to make mental notes of exits and potential places to seek shelter or items to use as cover if trouble breaks out.

One problem that can delay a person's reaction to an attack is the difficulty of seeing an active attacker through a crowd. If a crowd is thick enough, it could even be hard to spot a vehicle being used in an assault. Because of this, it is important to pay attention to crowd dynamics — especially since the crowd itself can amplify the effects of an attack. A crowd stampede can cause injuries and even fatalities. In fact, several of the injuries in the September 15th London bombing attempt were caused when people fleeing the scene trampled others. An incident in a crowd tends

to create an effect much like a pebble thrown into a pond, with the ripples flowing away from the initial cause and creating a cascading human stampede. Being aware of crowd dynamics applies pretty much any time you find yourself in an area crowded by people.

Sometimes the squeal of tires, or the sound of an explosion, screams or shots fired will give you a pretty clear indication that trouble is brewing. At other times, a clue could be something as subtle as a nudge, a jostle or even a push in a crowd. If you sense a sudden change in a crowd that potentially could develop into a stampede, it is important to keep moving toward the crowd's edge and the moment that you should move quickly to the exit, shelter or cover you have previously identified.

Even after one attack has begun, there is always the danger that another will follow or that the initial attack was a tactic used to guide groups of people into the kill zone of a secondary assault.

That's what happened in the 2016 Brussels airport bombing, the 2002 Bali nightclub bombing and in many other soft-target attacks. Because of this, it is important to not just blindly run with the crowd. You should always be moving toward safety and protection while carefully watching for secondary attackers.

Surviving is possible, even in the heart of an incident, by keeping your wits about you and having a plan to respond already in mind. These guidelines apply whether you are dealing with vehicular assaults, edged weapons attacks, active shooter situations or other types of attacks.

Actions on Vehicle-Based Attacks

Vehicular attacks can be deadly, but they are not an ideal method of attack, and with the right precautions, they can be stopped.

The following information has been developed to advise you on some of the tactics I would recommend you use if a situation develops:

Most public spaces have vehicle-based deterrents already installed in the entrances and exits; these will be in the form of large concrete posts and concrete flower tubs as well as street furniture.

However older streets and shopping areas do not have the infrastructure for modern security measures like vehicle mitigation defenses.

Access to older buildings is often only ever by the main entrances located in the same streets as pedestrians.

When entering a location with your family, or yourself, have a look at the vehicle mitigation measures. This could include being in areas with bollards or large plant pots; even statues are designed as vehicle-based stopping points. Ask yourself this question, could you drive a vehicle directly down the road? The answer will probably be "yes."

If the area you are in is open and has vehicle access consider adopting these tactics:

- Try and walk against the flow of traffic
- Keep close to the building line and not immediately next to the road
- Watch for the movement of people and sounds
- Run at a right angle away from the vehicle and try to put objects such as buildings, trees, lampposts, fire hydrants and garbage bins between yourself and the attacker.

If you hear shouts and screams, you **must immediately react** by looking for a place of cover, something that would stop a vehicle from moving through it. Look immediately for concrete structures and robust base furniture that offers you impact protection and cover from sight. A waste paper bin is not a safe area nor will a bench stop a car.



Do Not:

- Run in straight lines, run at angles – think to yourself how quickly can you clear the front of a vehicle if you run or dive?
- Do not run with a crowd, people in critical situations act like sheep and all follow each other; this increases your risk extensively. Make a decision and act on it, not what the crowd are doing
- Do not sit in a café or restaurant with your back to the road or area, always sit facing the road, so that you can have maximum vision – remember if you hear anything unusual, do not dismiss it, actively look and establish the risk
- Do not wear headphones in public places
- Also, consider your footwear, is it necessary to wear high heels while shopping, if you do wear high heels consider carrying some flat shoes for your journey
- Keep up with local and national media and keep an eye out for indicators from the security services about the likelihood of attacks
- Look for the presence of extra security such as heavily armed police. This is a reassurance measure, but should also indicate to you that you should plan a suitable seating area and look for roadside furniture that offers you protection
- Formulate a plan in your head – “If this happens I’m going in that direction to that location”



■ **Andy is the founder and director of Protaris - a unique specialist security training provider and strategic risk management adviser. Over a career spanning 22 years Andy has a great record in delivering outcomes across regional, national and international projects in partnership with government, military and non-government agencies. Highly regarded in his field, Andy has extensive experience, specialist training and a unique style of delivery that gets results.**



Traditional vs. innovative treatment:

Tackling corporate back syndrome and other MSDs

Dr. Daryl Laney of Neuromuscular Corporate Solutions talks MSD costs and the various approaches organizations take to tackle the issue.

MUSCULOSKELETAL disorders (MSDs) are quickly becoming a leading cause of pain and disability in the workplace, as well as one of the largest cost-drivers for employers.

The expense associated with MSDs now surpass other high-cost, chronic conditions such as diabetes, respiratory illness, and cardiovascular disease. While musculoskeletal disorders have numerous causes and have always been present in the workforce, advances in technology and changes in the way we work strongly influence the spike in MSD cases. To best address this growing concern, it is important to understand the nature of MSDs, what causes them, importance of prevention, and considering both traditional and innovative treatment approaches to make an impact.

What are MSDs and What Causes Them

Musculoskeletal disorders are injuries to the soft-tissue, which can affect muscles, nerves, tendons, joints, cartilage, and the connective tissue throughout the body called fascia. These injuries can cause pain and restriction in the structures that support the neck, back, and limbs. These conditions can be very painful, distracting, impact productivity, and generate costly medical claims for specialist visits, diagnostic imaging, physical therapy, pain management, and surgery.

Common MSDs include tendonitis, strains, sprains, carpal tunnel syndrome, as well as neck, back, hip, and knee pain. MSDs are often triggered by one, or a combination of factors, including:

- Sudden or sustained exposure to force
- Repetitive motion
- Awkward postures
- Vibration
- Exposure to individual risk factors
- Exposure to workplace risk factors



These injuries or conditions can happen as a result of everyday life, strenuous physical activity, repetitive use, poor ergonomics, diet, lack of exercise, stress, and even sleeping habits.

Corporate Back Syndrome

Perhaps one of the most common musculoskeletal conditions seen in the workplace is “Corporate Back Syndrome,” consisting of a group of MSDs that impact several regions of the body. This typically impacts desk workers that routinely use computers and other devices throughout the day.

The average human head weighs about 10-12 pounds. Stabilizing muscles in the neck and upper back work to keep the head vertical and in line with the shoulders and gravity. As the day wears on, many begin to slouch forward, thus increasing the mid-back curve, resulting in forward head posture. With every inch the head moves forward, it gains an additional 10 pounds in weight that the body must compensate for.

“Technology has transformed our world in many dynamic ways, including how we work”

This results in the muscles working harder to support the head, causing upper back and neck stiffness, pain in and or around the shoulder blades, headaches, and even numbness and tingling down the arms into the hands. It also can cause mid-back and low-back tightness and pin point pain areas in the low back and pelvis.

Technology has transformed our world in many dynamic ways, including how we work. A combination of poor posture, extended time in a fixed position, communal

workspaces with improper ergonomics, and remote work can contribute to pain in the workforce, while on the job.

Types of Care

While prevention and intervention through ergonomics and behavior change are the first step in limiting MSDs, effective and lasting treatment is essential. Throughout the past 30 years, we’ve seen many changes and philosophies relating to physical medicine and treatment protocols for musculoskeletal disorders. Treating MSDs requires dividing physical medicine into two categories: traditional and innovative.

The Path of Traditional Medicine

When following a traditional treatment trajectory, once an injury occurs, a patient will visit their primary care physician. During this visit, the PCP will likely recommend anti-inflammatories and instruct them to return if no improvement is seen. Because anti-inflammatories rarely heal an injury alone, the patient has another visit with their doctor, which may result in a referral for an x-ray or a recommendation to see an orthopedist. Once the patient visits the specialist, the orthopedist will likely order an MRI, only to hear that they need physical therapy.

With traditional physical medicine, most clinics or physical therapists have standardized treatment protocols for all types of musculoskeletal injuries. A patient with a grade II rotator cuff sprain/strain is typically given a set list of exercises, stretches, and home instruction that is dispensed uniformly. While

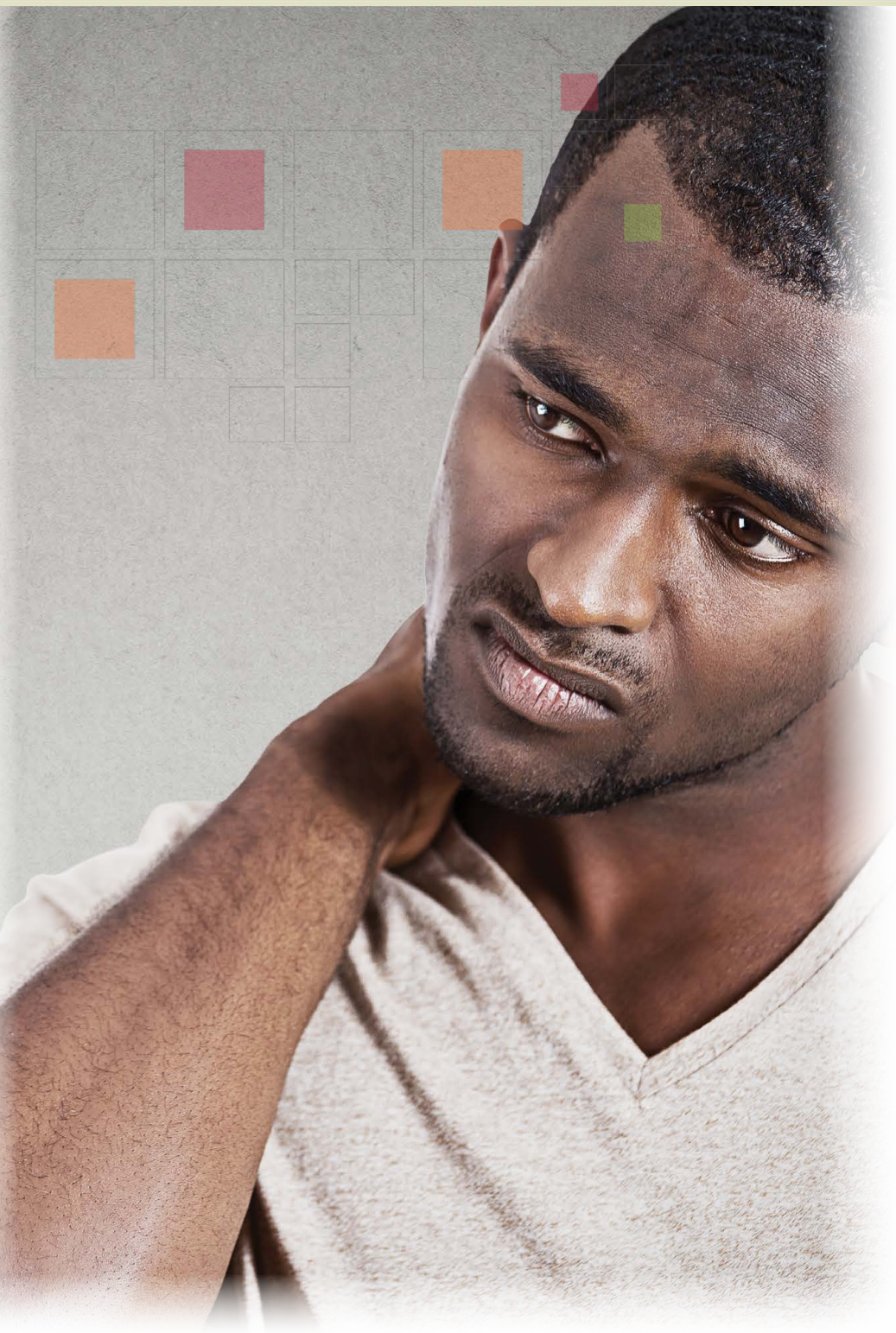
many of these protocols do help to resolve injuries, a one-size fits all approach often doesn't completely address the complexities and nuances of each individual injury.

Once the patient has gone to several up to a dozen or more physical therapy sessions, the patient may experience some injury resolution. If the patient does not see improvement, recommendations of more imaging may be made, as well as pain management, and perhaps unnecessary and costly surgery. While the traditional approach does have its place and is needed in some cases, for many it can prove to be costly, ineffective, time consuming, and lengthen the duration of the injury without resolution.

The Path of Innovative Care

In response to traditional MSD care, many innovative treatment options that focus on soft tissue are growing in popularity to individuals and organizations alike. There are several different provider groups, all of whom use different methodologies and techniques, but share a common treatment focus of manually manipulating the area of soft-tissue affected by the specific MSD. There is generally a clinical assessment, qualitative testing, followed by hands-on soft tissue and joint manipulation to help with the healing of the painful areas and their surrounding damaged tissues.

Depending on the provider group, treatment sessions are anywhere from 15 minutes to 1 hour long and most injuries can be resolved under 4 visits. With brick and mortar provider offices available offsite, as well as provider groups that partner with employers to come on-site, there are several options of how their employees can seek and receive treatment. When compared to a more traditional path,



soft-tissue treatment is gaining attention with greater effectiveness of treatment, convenience, low cost with lesser intervention, and positive patient outcomes.

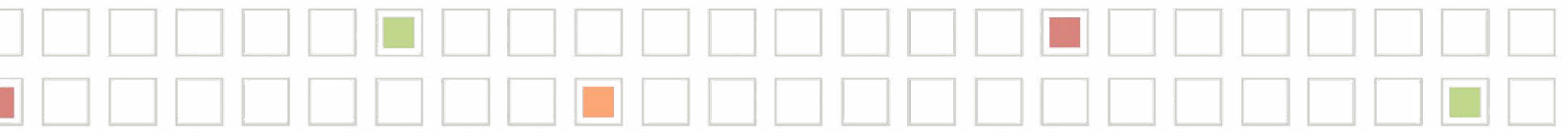
The Take Away

With U.S. healthcare costs continuing to rise faster than inflation, it is important to focus on taking swift action to minimize MSD costs and identify opportunities and develop low risk strategies for prevention, intervention, and out of the box treatment options. By doing this, employers can create solutions that drive positive change in their workforce health, as well as their bottom line.



Dr. Laney has over 27 years of experience as a chiropractor, with focus on resolving musculoskeletal disorders in both private practice and in the corporate setting. For the past 12 years, he has worked with companies to reduce MSD-related expenses by providing on-site care for employees.

Dr. Laney graduated with honors from Parker College of Chiropractic, continuing with extensive research and training in advanced soft tissue and peripheral nerve entrapment techniques. His experience working with companies gave Dr. Laney insight and understanding of the challenges that MSDs pose for employers; highlighting the importance of prevention and targeted injury resolution.



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