



Injury Prevention through Cause Analysis and Worker Readiness

By Dan Hannan, CSP

EXECUTIVE SUMMARY

The proclamation that injuries “just happen” is unacceptable. Even worse is to dismiss the contributing factors that set up a repeat of another injury by the same cause. Central to injury analysis is the psychology of risk-based decision making, such as: “Should I use this broken ladder or take an extra 20 minutes of time to obtain another one?” Accordingly, many safety programs are constructed with the hope that an individual’s decision-making process and habits can be shaped for the better. Regardless of their non-work habits, tendencies and frame of mind, we anticipate the employee being able to “turn on” a higher regard for safety once he or she enters the workspace. This is an unrealistic assumption, as we are all creatures of habit. When critical decisions need to be made, we often resort to what is comfortable or what has worked for us in the past, especially if we are under schedule demands or dealing with a stressful work or home environment.

Most injury prevention approaches require that a worker’s training and experience are in line with the required tasks. However, to achieve a complete work-ready state requires the mind and body to function seamlessly together in order to be physically and mentally prepared.

Arriving to work prepared and fit for duty is largely seen as an employee’s responsibility. But, in reality, many employees, especially those working in remote locations for oil, gas or mining industries, may be living in noisy, crowded, substandard conditions where even a good night’s sleep and proper nutrition is hard to come by. In these situations, the worker isn’t arriving on the job in the best position to keep him or her and co-workers safe. An employer who takes a holistic approach to employee safety and risk management will consider all factors that contribute to a high injury rate, even those encountered away from work.

A growing number of employers have turned to Target Hospitality and its innovative workforce housing solutions to ensure that their employees have a secure and quiet home environment, and are arriving on the job well fed and well prepared to perform their jobs. Ensuring that its employees are fit for duty makes sense for many reasons, including increases in worker productivity, job satisfaction and employee retention, but it is also a great step toward injury prevention.

Injury prevention is best accomplished by understanding each injury mechanism and its contributing factors. Once understood, these factors can be dealt with through effective controls and practices. This paper examines the following common elements associated with the cause of injuries and illnesses.



Process controls

Inadequate or poorly executed practices create unnecessary risks.



Complacency

Increased comfort levels can result in reduced safety awareness.



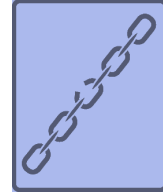
Hazard assessment, recognition and avoidance

The inability to identify unsafe conditions and behaviors, and take appropriate action.



Support and culture development

A lack of resources and improper messaging from leadership communicates to the workforce that productivity is more important than safety.



Fatigue management

When the mind and body are over-stressed, they fail to work together, resulting in poor decision making.

INTRODUCTION AND BACKGROUND

“Fatalities happen across all industries and are often the result of very preventable occurrences. Whether an injury or a fatality, one or more root-cause factors can be identified, which commonly include poor decision making, poorly developed procedures or a culture that promotes risk taking.”

Each year the U.S. labor force loses 4,500 workers due to work-related fatalities. Leading causes of these deaths include falls, electrocution and being struck by objects. Additionally, more than 3 million employees are injured annually while at work, including chronic illnesses such as musculoskeletal disorders, carpal tunnel, hearing loss and lung diseases like silicosis and mesothelioma.¹ Fatalities happen across all industries and are often the result of very preventable occurrences. Whether an injury or a fatality, one or more root-cause factors can be identified, which commonly include poor decision making, poorly developed procedures or a culture that promotes risk taking.

In most cases, there is usually some responsibility and accountability to be shared by both the employer and employee. For example, although an employee may identify an unsafe condition, he may fail to report it for fear of reprisal from co-workers or his supervisor. In this case, the employee has the necessary hazard recognition skills, but the employer has failed to ensure a work environment that supports a “see something – say something” policy, favoring safety over production. In the case of a worker falling to his death, the root cause could be a loss of focus while assembling a fall protection system. Pressures to rush a task, workplace distractions and even fatigue due to lack of sleep often underlie this lapse of focus.

A contributing factor that is generally out of the employees’ hands is whether or not a company has made adequate preparations for the well-being of its workforce. A growing number of employers have turned to Target Hospitality and its innovative workforce housing solutions to ensure that their employees have a secure and quiet home environment and are arriving on the job well fed and well prepared to perform their jobs.

Since the creation of the Occupational Health and Safety Administration (OSHA) in 1970, workplace fatalities have decreased nearly 65 percent, while the injury rate has decreased from 11 injuries per 100 workers to about three injuries per 100 workers.² These federal workplace regulations began with the declaration that workers are not expendable. Since 1970, employers have slowly begun to understand and appreciate the proposition that a safe workplace and a fit-for-duty workforce are vital to a profitable and sustainable business.

¹ U.S. Dept. of Labor, Bureau of Labor Statistics (BLS), Data and Statistics, www.bls.gov

² *Ibid.*

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Nobody wants to work where injuries are frequent and his or her employer has little regard for the well-being of workers. Nobody wants to lose a finger or an eye, or develop hearing loss or a lung disease. Companies that understand the complete value of safety realize that injuries and illnesses result in lost productivity, higher worker compensation insurance costs, monetary penalties and negative publicity. Injuries are bad for business, and without a healthy and ready workforce, it’s difficult to remain competitive in the marketplace.

The challenges of managing the well-being of a worker are considerably greater when a project is in an isolated or remote location. Consider a typical commercial construction project occurring in a city where the worker lives in the area. All of the worker’s mental and physical needs are met daily – returning home to his or her social network of family, friends, recreation and creature comforts.



Contrasting that with a remote work assignment such as the construction of an oil or gas pipeline spanning hundreds of miles and several years, the stressors associated with displacement are significant.

The development of a safety-centered culture, one where risk management is embraced at all levels of operation, is viewed as a “journey” and often takes years to attain the status of excellence. To shape the beliefs and values of management and the workforce doesn’t happen overnight, and it requires vision and commitment. The journey begins where employers see safety only as a “have to do” practice, favoring production above all else as they approach safety in a reactive way – waiting for injuries to occur. Unfortunately, realizing that change must happen often takes a qualifying event such as a fatality, OSHA inspection or worker compensation insurance costs that go through the roof.

The journey then continues from Reactive through a series of stages, the next being Compliance Driven – where only minimal effort is applied, and safety is seen as just a series of inspection events.

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Then on to Employee Focus where safety responsibility is placed solely on the safety manager, and the question “Why do these injuries still happen?” reoccurs with no answer; progressing to Management Accountability – where safety ownership by management becomes a visible commitment, and prevention is embraced; and finally to Safety Excellence and Leadership – where an interdependent work environment exists, and values are shared and lived by everyone.

The beauty of safety is that at its core a common purpose is shared – the preservation of life. In the short term, we all want to go to work and return home in one piece. In the long term, we want to retire without having sustained a debilitating disease. This can happen, but it requires both employers and employees to make sure their priorities are aligned and commitments are fulfilled.

PROCESS CONTROLS



Companies develop standard operating procedures (SOPs), practices, guidelines and protocols to reduce risk by applying controls in the form of directions for the worker to follow. However, avoiding an injury or illness is not guaranteed just because a process control is in place – it still requires proper development and execution. For example, a confined space entry procedure requires that a permit be completed prior to entry to ensure all of the hazards are accounted for and the necessary controls are in place. However, if the permit is completed hastily (“pencil-whipped”), critical elements such as available rescue resources may be unaccounted for, putting the entry worker at risk in an emergency situation.

The decision by the worker to deviate from a procedure is a behavior that must be monitored and corrected. The decision-making process to follow procedures, for instance, includes both internal and external motivating factors. This mental process is influenced by a worker’s risk-reward value system, work output expectations and environmental stressors such as lack of sleep, poor social interactions and a substandard living experience.

Unfortunately, it is most often after an injury has occurred or an illness is reported that a deficiency in a process control is realized. Incident investigations play a very important part of process improvement. It is during an investigation that the process controls are scrutinized in search of a root cause and corrective action.

Solutions

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- **Inspections and audits**

These are periodic and scheduled examinations of a process control to ensure they are being executed properly and are effective. Observation data is used to identify a negative trend, such as skipped procedural steps, that may require disciplinary action or a procedure to be modified. This quality control measure supports the process review life cycle of “plan-do-check-act.”

- **Near-miss and observation reporting**

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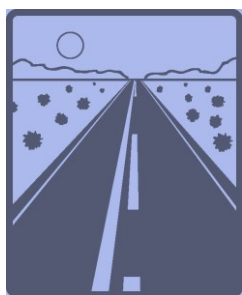
- **Exercises and drills**

Emergency procedures for addressing a fire, severe weather or responding to a medical condition require regular practice and evaluation to ensure they are adequate. These should involve all persons in the response chain to thoroughly evaluate a response procedure. Taking time to develop a “what-if” scenario and discuss it during a safety meeting helps keep workers mentally engaged. A “skill-sharpening” functional exercise, with likely scenarios such as rescuing a dummy from a confined space, should be completed several times per year.

- **Another set of eyes**

Contracting for an independent safety review/audit via an outside consulting resource provides an unbiased opinion and recommendations.

COMPLACENCY



Complacency is the condition where routine activities result in mental fatigue and a loss of focus. It is the product of a mundane task being performed so regularly that the same result or outcome is expected. Complacency is often found during periods of long driving times where the driver “zones out,” becoming lulled into the same uneventful experience mile after mile. The danger lies in the inability to respond in a timely and appropriate manner, otherwise known as “letting your guard down.”

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Consider an assembly line where a worker must handle the same part several hundred times per day. What is the likelihood that the worker will remain alert enough to respond quickly should something threaten him or his co-workers? Sadly, it is easier to stay on guard or focused if an injury were to occur with some regularity. However, this would be contrary to the goal of reducing workplace injuries.

Solutions

- **Engage the worker regularly**

The idea is to communicate the value of safety often enough so that it stays meaningful but not so often that the message becomes watered down. Messages that relate safety to personal experiences, such as avoiding a weekend injury at home, have the most impact and recall. Routinely reminding workers of both the human and business costs associated with safety gains and losses is completely acceptable. For example, a short discussion relating injury costs to increased insurance premiums and lower profits can be worked into the daily pre-shift safety huddle. Likewise, a lengthier message from the vice president to the workforce during a quarterly meeting may describe how the workforce is viewed as human capital, highly valued and must be safeguarded.

- **Change the task**

A change in the work environment or work task helps break up monotony. A change of scenery, personnel and activity keeps the mind engaged.

- **Take breaks**

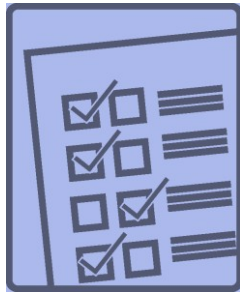
Regular breaks allow the mind to rest and the body to stretch. Effective stretching increases blood circulation, refocuses the brain and can help reduce the likelihood of repetitive motion or musculoskeletal disorders like carpal tunnel.

- **Decompress**

The ability to separate from work and retreat to accommodations of sufficient comfort allows the mind and body to refresh and refocus.

HAZARD ASSESSMENT, RECOGNITION AND AVOIDANCE

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You don’t know what you don’t know, and if safety were just common sense, workplace fatalities would not exist. OSHA requires employers to ensure that employees are properly task-trained before assigning them work. This directive means the worker must possess the skill to perform the work safely. At the core of working safely lies the ability to follow procedures, recognize when an unsafe condition or behavior is occurring and then take the necessary corrective action.

To account for the hazards associated with an activity and prevent an injury or illness, an assessment is completed. The hazard assessment process must start in advance of the work being performed and then applied throughout the work sequence as personnel, equipment and conditions change. Once the hazards of the activity are identified, controls can be applied and injury avoidance becomes more certain.

Hazard recognition skills generally improve in time as greater familiarity is gained, and unsafe conditions are experienced and logged into memory. To support recognition, skill development training is commonly provided to ensure employees have a baseline understanding of safety regulations, acceptable conditions and behaviors, and company-specific procedures. To effectively apply hazard recognition skills requires a prepared employee and one who is alert and focused on his/her surroundings and the task at hand. Achieving a focused state of mind depends on, among other things, a manageable rate of work, limited distractions and a healthy and rested body.

Solutions

- **Planning**

Planning begins with the evaluation of exposures based on the scope of work and tasks to be performed. A process known as job hazard analysis (JHA) is a straightforward assessment approach that involves breaking a task into steps, identifying the exposures present at each step and applying controls to prevent injury. Each physical, chemical, biological and mechanical hazard is accounted for in completing a JHA. For complex and extended work activities, a health and safety plan (HASP) document is prepared that summarizes all of the critical project safety aspects, including personnel roles and responsibilities, emergency actions, hazards, controls and means of communication.

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- **Procedures**

Procedures are developed to standardize safety practices. These include written protocols for such activities as lock-out/tag-out, hazard communication and confined space entry.

- **Inspections**

Inspections are performed regularly to identify unsafe conditions and behaviors, and well-executed practices. Because an inspection captures the condition at a single point in time, the quality and quantity of inspections must be balanced to obtain an acceptable return on the investment. Data from inspections are used to verify training, verify adherence to following procedures and identify negative trends that require intervention.

- **Communication**

Communication is essential to ensure that all of the collected hazard information is disseminated to the workers. This is commonly done through extended training: on a daily basis during a morning workforce briefing known as a “tailgate meeting,” or on a weekly basis with a mini education session known as a “toolbox talk.” The daily discussion, for instance, could include the forecast of approaching severe weather and facility shelter locations, or the cause of and corrective action for a recent injury.

SUPPORT AND CULTURE DEVELOPMENT



Even the best safety intentions will die on the vine without enough of the right type of work environment and resource support. Great safety cultures are defined by employers whose actions show a true sense of caring for employees and even beyond to their families. The byproduct of this caring attitude and support becomes trust, which yields a greater sense of obligation by the employee to do the right thing, such as heeding the safety requirements to keep themselves and their co-workers safe. In time, a safety culture develops where employees inherently look out for each other and realize interdependence.

Support comes in a variety of forms, and understanding that employees are valued human capital is central to the need to keep them safe. For example, an adequate amount of time and money must be allocated to ensure that workers are properly task-trained and are supported with the right “tools” to perform their work well. In the case of remotely located workers, employers demonstrate support by offering housing solutions that minimize negative stressors outside of the workplace. Additionally, providing readily accessible medical care in the form of a clinic and registered nurse demonstrates a commitment to the well-being of the workers.

“An employer can demonstrate support to its workforce by providing quality off-hours accommodations. The ability for an employee to receive a restful night’s sleep, obtain quality food, socialize, communicate with his or her family and recreate at a secure location speaks volumes about the employer’s commitment to the well-being of its workforce.”

By simply taking proper care of a cut and preventing it from turning into a serious infection, resulting in lost workdays, returns value to the productivity bottom line. Finally, leadership must demonstrate support by being visibly active through communications so the workforce understands that safety is prioritized above production.

Solutions

- **Recognize effort, not just achievement**

Although a safety goal may not be achieved, an unconditional support to celebrate and recognize the effort tells the workforce that the commitment is absolute.

- **Quality training**

There is no greater injustice than sending a worker to an eight-hour training session that is ineffective at developing a skill or knowledge. A quality training experience tells the workforce that the employer wants to do it right. Training that fully engages the worker in the learning process is essential. A theory-to-practice approach is often the most effective. This is achieved, for example, when an employee listens to how fall protection equipment works and then uses the equipment in a hands-on application to demonstrate competency.

- **Quality accommodations**

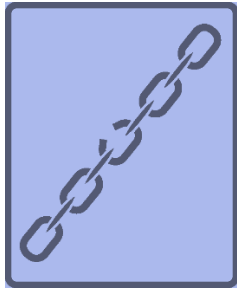
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- **Extend caring beyond the workplace**

Make opportunities available to the worker’s family such as sponsoring programs that promote safe and healthy lifestyle choices. Health fairs, bicycle safety programs, home security assessments and home fire prevention and preparedness programs are examples of extending safety practices beyond the workplace. A good example includes Target Hospitality’ “Economics of Comfort” proposition, which has shown that ensuring a secure home environment and healthy meals leads to happy and healthy employees, which in turn leads to increases in productivity and employee retention.

FATIGUE MANAGEMENT

“Sleep is critical to ensure cognitive brain function and repairing cellular damage to stay healthy. The benefits of sleep are only realized when they are obtained in both the necessary quantity and quality. Not enough or interrupted sleep can result in decreased productivity and puts workers at risk of performing their job duties unsafely.”



Although not commonly recognized by OSHA as a category of workplace injury, unlike falls or electric shock, fatigue is often seen as an underlying contributing cause of many injuries. When the mind and body are not optimally working together, injuries occur. Strain caused by physical fatigue, emotional distractions and harsh environmental conditions can cause an otherwise safety-minded individual to think and behave in an uncharacteristically unsafe way. Fatigue components include: sleep, nutrition, environmental conditions, physical fitness, work demands and stress.

Sleep

The National Highway Traffic Safety Administration conservatively estimates that 100,000 police-reported crashes are the direct result of driver fatigue each year. This results in an estimated 1,550 deaths, 71,000 injuries and \$12.5 billion in monetary losses. Additionally, researchers at Harvard Medical School in Boston surveyed more than 10,000 people in the United States in 2012 and found that insomnia is responsible for 274,000 workplace accidents and errors each year, adding up to \$31 billion in extra costs to their employers.

Sleep is critical to ensure cognitive brain function and repairing cellular damage to stay healthy. The benefits of sleep are only realized when they are obtained in both the necessary quantity and quality. Not enough or interrupted sleep can result in decreased productivity and puts workers at risk of performing their job duties unsafely. The loss of just two hours of sleep a night has been shown to have the same impairment effect on the body as a 0.05% blood alcohol content.³

Each individual is different in terms of the amount of sleep he or she requires to function properly, with averages ranging from six to nine hours. Shorting the body of needed sleep, even a little bit every night, can have an additive effect and can cause health problems over time. Combating sleep with the use of stimulants causes the body to fight its natural circadian rhythm. Workers should be cautioned about the use of stimulants and sleep aids, especially when combined in a routine cycle to stay awake and fall asleep.

³ National Sleep Foundation, website: <http://sleepfoundation.org/drowsy-driving-advocacy>

Solutions

To address the risk of sleep deprivation, consider the following:

“A workplace nutrition program encourages healthy eating among all employees, emphasizing fruits and vegetables and whole-grain products; low-fat dairy products, lean meats, poultry, fish and legumes; and small amounts of salt, sugar and saturated fat.”

- **Comfortable accommodations**
Provide for accommodations that are comfortable and afford isolation for restful sleep
- **Effect on work shifts**
Manage work shifts to allow for at least eight hours of sleep time
- **Plan for travel**
Where driving is a significant part of the work, develop a “travel plan” that requires rest breaks or the need for two drivers to take turns.

NUTRITION

The body is fueled by what we put into it. “You are what you eat” was the mantra we learned as children. Or to put it another way, in terms of modern-day computing, “junk in equals junk out.” The availability of nutritious food helps ensure that the body is receiving an adequate amount of protein, fat and amino acids, which are essential to cellular function and overall good health. If provided with wholesome and healthy food options, most people will consistently make good choices to eat right. A balanced diet produces a worker with a stable output of energy and mental capacity.

The long-term benefits of making good eating choices are numerous as well. Research has shown that good nutrition can help lower the risk of many chronic diseases, including heart disease, stroke, some cancers, diabetes and osteoporosis. A workplace nutrition program encourages healthy eating among all employees, emphasizing fruits and vegetables and whole-grain products; low-fat dairy products, lean meats, poultry, fish and legumes; and small amounts of salt, sugar and saturated fat.⁴

Solutions

To promote nutrition in the workplace, consider the following:

- **Diet information**
Provide resources to better understand the importance of diet, such as access to a nutritionist/dietitian, online consultation or pamphlet information.

⁴ Centers for Disease Control and Prevention (CDC), [Nutrition](http://www.cdc.gov/workplacehealthpromotion/implementation/topics/nutrition.html) webpage: <http://www.cdc.gov/workplacehealthpromotion/implementation/topics/nutrition.html>

“Temperature, humidity, direct sunlight, altitude and other environmental conditions affect a worker’s ability to physically and mentally perform.”

- **Quality food**

Provide access to properly prepared quality food.

ENVIRONMENTAL CONDITIONS

Temperature, humidity, direct sunlight, altitude and other environmental conditions affect a worker’s ability to physically and mentally perform. Each person responds differently to these conditions based on their physiology and physical condition. This becomes a challenge for the employer as, for instance, a heat/cold stress policy may exist, but it is usually left up to the employee to decide when he or she has had enough. How we treat our body, including what goes into it, also affects our ability to withstand the elements. Alcohol and caffeine, for instance, are both diuretics and cause the body to shed fluids faster than they should. Their consumption in large amounts should be discouraged when hydration is critical.

Of all the environmental conditions, the one that commonly poses the greatest threat of an injury is temperature. Both short and prolonged periods of exposure to heat and cold work environments place an enormous amount of physical and mental stress on the body. As warm-blooded creatures, we strive to maintain a core body temperature of 98.6 degrees F. With a swing in our core temperature of just four or five degrees in either direction, the body reacts by sweating profusely or shivering uncontrollably. Eventually organs shut down in an attempt to preserve the heart and brain. Unconsciousness and even death can occur from heat stroke or hypothermia.

Solutions

- **Supply water**

Make sure that plenty of water and electrolyte solutions are available for both hot and cold work tasks.

- **Cycle through work and rest**

Develop work/rest cycles and manage the consumption of fluids, even when an employee is not thirsty, as the onset of injuries can occur quickly. Also, sleep accommodations that provide for well-heated and well-cooled spaces are important to allow the body to recover daily.

- **Maintain a balanced diet**

Maintaining a well-balanced diet helps ensure the body has all of the necessary nutrients to run efficiently.

- **Train workers to identify symptoms**

Make sure that all workers are trained to identify physical signs and symptoms of overexposure.

PHYSICAL FITNESS AND WORK DEMANDS

“Wellness programs have become a popular employer initiative over the last several years. These programs promote physical fitness, diet, weight loss and smoking cessation in an effort to develop a healthier, happier and more productive workforce. Cost benefits include fewer workplace injuries, as well as non-work-related injuries that keep workers off the job and maintain the employer’s health care insurance premium.”

Age, size and sex have nothing to do with how physically fit and capable someone is to perform a task safely. A person who is physically small in stature may be able to successfully lift a large object if he or she uses the correct lifting technique and is in generally good physical condition. To avoid injury, the employer is well served to promote physical fitness and align physical ability with work demands. For the following solutions, it is recommended that you coordinate with the human resource department prior to implementation to ensure compliance with hiring practices.

Solutions

- **Provide pre-hire medical evaluations**
A pre-hire medical evaluation and physical fitness exam can determine if a candidate has a pre-existing injury or physical limitation that may prevent him/her from performing the job safely.
- **Offer fitness opportunities**
Provide for an exercise space/equipment or offer membership discounts at area fitness centers.
- **Initiate a wellness program**
Wellness programs have become a popular employer initiative over the last several years. These programs promote physical fitness, diet, weight loss and smoking cessation in an effort to develop a healthier, happier and more productive workforce. Cost benefits include fewer workplace injuries, as well as non-work-related injuries that keep workers off the job and maintain the employer’s health care insurance premium.
- **Call in an ergonomist**
Work demands can be assessed in part by a certified ergonomist who can assist with evaluating the push, pull, drag and lift activities of a job position. Once these have been identified, a pre-hire work-simulation assessment can be developed. Rolling a drum, shoveling sand, lifting boxes to an elevated work table and many other real-world tests can be performed under the watchful eye of an ergonomist to determine whether the candidate has the necessary physical capacity.

STRESS

Mental and physical stresses are caused by a variety of life situations and manifest themselves in many ways. Death of a loved one, marriage difficulties, being away from family for extended periods of time, job demands or losing a job are some of the leading stressors.

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Stress can physically appear in a number of overt and unseen ways, such as twitching muscles or a migraine headache. In some instances, the effects of stress are so severe that they prohibit a person from functioning altogether, such as clinical depression. The amount and type of stress needed to impair someone varies greatly. The key is for individuals to recognize their signs and symptoms, and apply means to reduce the stress or seek assistance.

Solutions

- **Exercise**
Moderate and regular exercise has proven to provide relief from stress. A brisk walk can do wonders for the constitution. In some cases, rigorous exercise can cause the release of endorphins that produce the feeling of joy or even ecstasy.
- **Meditation**
If done at the beginning or end of the day, meditation allows for the mind and body to relax, center and focus.
- **Physical therapy**
Massage, acupressure and acupuncture therapy have been shown to offer relief from stress.
- **Leisure activities**
Fishing, hunting, watching TV, playing games or any other leisure activity can redirect the brain to the moment where fun is occurring.

CONCLUSION

Employers are faced with many challenges and responsibilities to keep their workers safe and healthy. Gone are the days of hiring a worker and simply pointing to the job assignment with little regard for the outcome. Smart employers take stock of their workforce, and see them as human capital and an investment for success. Injury prevention becomes a value proposition.

Smart employers extend their safety and health commitment beyond the jobsite to include access to comfortable and secure housing and a supportive residential community, such as the workforce solutions and temporary housing offered by Target Hospitality. Such solutions help maintain a work-ready workforce – one that is fit, mentally and physically, to make good risk-based decisions and able to recognize workplace hazards. Accounting for employees’ well-being, both on and off the job, is smart business and one in which a symbiotic relationship forms: You take care of them, and they take care of you.

About the Author

Dan Hannan is a Certified Safety Professional and an Authorized OSHA Outreach instructor with 24 years of applied health and safety experience. Mr. Hannan is presently the Corporate Safety and Health Director for Merjent, Inc., an environmental and social consulting firm serving the world's leading energy and mining companies, where he is responsible for the safety outcome of all Merjent employees, and supports program and project health and safety needs. Mr. Hannan is an accomplished trainer, specializing in safety leadership development, and has led organizations through cultural assessments and process improvement activities. He is very involved in the greater safety community and is a Board Member of the American Society of Safety Professionals (ASSE), Northwest Chapter, a Board Member of Washington/Dakota Community Awareness & Emergency Response (Wakota CAER) and a member of the National Safety Council's Executive Committee for Off-the-Job Safety. He is also widely published, providing advice and strategy on a variety of safety topics for industry trade publications, and is author of "Preventing Home Accidents," a book promoting resources for safe living at home. Merjent consultants have decades of specialized experience supporting the oil and gas pipeline, electric transmission, alternative energy, biofuels and mining sectors through planning and feasibility, environmental permitting, construction compliance, operational compliance, third-party analyses, stakeholder engagement and technology solutions services. Mr. Hannan can be reached at dhannan@merjent.com.

About Target Hospitality

Target Hospitality, an Algeco Scotsman company, is one of the largest providers of turnkey housing solutions in North America. It operates globally in some of the most remote environments, supporting oil, gas and mining with workforce housing, mobile crew camps and extended-stay hotels; government departments and organizations with temporary lodging and refugee integration; and capital projects. Target Hospitality was named by Inc. magazine in 2012 and 2013 as one of "America's Fastest Growing Private Companies." Visit www.TargetLogistics.net or call (800) 832-4242.