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Achieving Optimum Productivity from an Aging Work Force—An Integrative Behavioral-Based Injury Prevention and Wellness Program for Safety Professionals

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Introduction

The effect of aging on work capacities is resulting is a global decline of work productivity due to combined absenteeism and "presenteeism" (i.e., being at work but not being productive). Altered physical capacities associated with age-related conditions such as arthritis, impaired balance and coordination, degenerative disc disease, diabetes, heart disease, and cancer are creating special demands and challenges for Safety Professionals today. Ergonomics alone will not effectively address this growing problem.

The impact of an aging workforce is being felt globally with the make-up of the labor force changing significantly in the past 50 years. By the year 2010, an unprecedented 25% of our work population will reach 65 years old or older! There are economic burdens as well. The ratio between the worker and the retired person is changing dramatically. In 1950, there were 7 workers per every retired elderly person. By the year 2030, there will only be 3 workers for every retired elderly person.

More alarmingly, the younger generation of workers that are beginning to replace baby boomers in the work force appears to be less fit than their predecessors with resulting obesity and obesity-related disorders such as type II diabetes, arthritis and degenerative disc disease becoming pandemic at a much earlier age. All of these trends will be translated into more on-the-job injuries, illness-related absenteeism, disability and reduction in productivity.

It is the opinion of the author that the Safety Professional must be prepared to be on the front line to combat these alarming trends. Modern medicine today in the United States still remains too reactive to be fully effective, too often treating symptoms rather than the causes. The real answers and solutions to the impending health crisis lie in integrated safety programs that incorporate ergonomic, behavioral-based safety, and wellness interventions that can effectively reduce the occurrences of MSDs and improve health of employees.

Preventing Musculoskeletal Disorders

Incidences of musculoskeletal disorders (MSDs) are on an increase as the working population ages and comprise one of the largest problems in industry today. Spinal disorders, particularly those of the lower back and neck, are very prevalent today and can lead to permanent disability and chronic pain in an aging work force. After low back and neck injuries, shoulder injuries rank third in prevalence. However, the good news is that almost all MSDs are preventable.

The cause of the vast majority of MSDs today is related to how we work (ergonomics) and how we live (lifestyle). The majority of MSDs can be directly related to poor ergonomic practices involving awkward, stressful postures, improper material handling, and highly repetitive motions. Poor lifestyle habits that lead to obesity and declining physical fitness with loss of flexibility and muscle support of the spine and extremities also contributes significantly to these problems. By understanding and applying good ergonomic practices, modifying poor work and lifestyle behaviors and improving physical fitness (lifestyle), the vast majority of MSDs can be prevented.

Risk Factors for MSDs:

A. Work-Related:
- Poor Posture
- Excessive Force
- Excessive Repetition and/or Sustained Static Forces
- Extremity and Whole Body vibration

B. Lifestyle:
- Obesity
- Declining physical fitness
- Weak abdominals and neck muscles
- Lack of flexibility
- Poor cardiorespiratory (aerobic) fitness

Preventing Low Back and Neck MSDs

Back and neck injuries respectively comprise the most costly and frequent types of MSDs experienced by employees today. One of the main objectives of preventing back and neck disorders is to protect the spinal discs so that the shock absorption function of these structures continues to exist with age. This is not as easy as it may seem when one understands that the average human spine bends and twists over 2000 times a day and is exposed to hundreds of pounds of spinal pressure when conducting common tasks such as lifting or pushing or pulling.

Many work and activities of daily living today deprive the spinal disc of nutrition and weaken the disc wall. As we age, the human disc starts to lose its natural blood supply at around 10 years of age and by age 20 or so, the spinal discs, except for the outermost layers in the wall, are essentially devoid of blood supply. Therefore, the adult spinal discs that lack blood supply must obtain nutrients by absorbing surrounding body fluids when disc pressure is low via a process called passive diffusion. When internal disc pressure is high, fluid moves out of the disc causing dehydration and narrowing of the disc. Therefore, a healthy exchange involving movement of fresh body fluids into discs and movement of waste products out of the discs requires pressure in

the disc to be alternatively increased and decreased over time. In other words, the spine should be exposed to activities that allow periodic "pressure on and pressure off" throughout the day.

Sustained high pressure in the disc will prevent the uptake of fluid and lead to dehydration and weakening of the cellular structure of the disc wall, tears in the disc wall, disc ruptures and disc degeneration. Research shows that by age 50 approximately 90% of Americans have significant lower lumbar and lower cervical disc degeneration that can be seen on MRI.

Work and lifestyle activities can be directly related to MSDs. Prolonged postures that involve bending forward at the waist (flexion) while standing or slumped sitting, significantly increases lumbar disc pressure and prevents proper disc nutrition if sustained. Therefore, humans are not designed to sit behind a desk for 8 -10 hours or be bent over at the waist while performing work like welding without periodically moving in a way that reduces disc pressure.

Injury to the lower back can be made worse when the flexed posture is combined with other risk factors. Holding a heavy tool or material or being exposed to vibration from a vibrating tool (extremity vibration) or from standing or sitting on a vibrating structure as when driving or operating heavy equipment (whole body vibration) will cause acceleration of fluid loss in the discs of the lower back.

The majority of lifting injuries, about 83%, occur when lifting with the lower back rounded out while bent over at the waist. When lifting in this dangerous posture, research reveals that back muscles become stretched out and inactive while the abdominal muscles become shortened and inactive. In essence, when a person is bent over to lift, there is poor spinal muscle support. This is particularly bad because the amount of increased lumbar disc pressure while lifting in this posture becomes markedly amplified by any additional weight being lifted with the hands.

The problem with increasing pressure in lumbar discs is that the absence of pain fibers in the inner wall of the discs does not provide a warning system when there is tissue damage. Therefore, the discs can gradually degenerate or herniate without warning. When the inner core jelly of the disc breaks through the wall of the disc, it starts to push out, or bulge, the disc. Bulging discs can place pressure on nerves or eventually lead to a full rupture. When the jelly of the disc completely tears through the disc wall, the condition is known as a complete or frank rupture.

Preventing Low Back Injuries – The Real Cure

Herniated and ruptured discs may require decompression surgery if intervention does not occur in time. The problem with surgery is that they too often fail to work. Recurrent disc bulging or scar tissue following back surgery can result in as much or more pain and disability than existed prior to surgery. This can result in a person suffering from chronic pain and disability for many years if not permanently. If a person understands how to prevent these problems by improving ergonomics and lifestyle habits, one can avoid a lot of misery from pain and complications secondary to neck and back surgeries.

Ergonomic Strategies to Prevent Low Back Injuries

Hierarchy Approach:

- Engineering Interventions: Modify work design by engineering changes to reduce risk factors (e.g., excessive force, awkward postures, and high repetition

- Administrative Interventions: Establish corporate rules and regulations that require employees to follow work procedures that help reduce risk factors (e.g., mandatory stretch breaks, job rotation, etc.)
- Behavioral Interventions: Train employees to practice behaviors that will reduce risk factors (e.g., proper lift techniques, postural relief techniques)

Key Concepts for Work Design and Work Behavior:

Key Concept # 1: Maintain Neutral Posture

- Neutral posture is the optimum position of the spine that promotes disc nutrition and reduces the most pressure on the disc. When is a neutral posture, the contents of the disc is centralized and not pushed against the back wall where disc herniations can result.

- Sitting neutral is facilitated by the proper use of lumbar support. Seated work is very stressful to the lower back. A lumbar cushion helps to keep the lower back properly aligned to promote nutrition of the disc.

- Sitting slumped will cause elevation of disc pressure and backward migration of the jelly in the disc. This can lead to disc herniations. Sitting slumped while exposed to whole body vibration is a particularly damaging combination. Exposure to whole body vibration exposure is common in our society. It happens every time a person drives a car, truck, or operated heavy equipment. It is interesting to note that studies show that driving an automobile or truck more than two (2) hours per day doubles a person's risk for disc herniations in the lower (lumbar) region of the back. This risk is significantly reduced by using a properly positioned lumbar cushion while seated.

- Safety Professionals should make sure that people who drive vehicles more than 2 hrs per day are aware of the following:

    1. They should use a lumbar cushion that fits in the lower curve (not behind the buttocks).
    2. They should move the car/truck seat close enough to the steering wheel to avoid sitting slumped against the lumbar support (upper body should be erect).
    3. They should move the lower back while driving every 30 minutes to promote fluid transport.
    4. They should avoid suddenly twisting the upper body when climbing in or out of a vehicle. Move slowly and try to minimize twisting of the trunk by turning the entire body together as a unit.

- Standing neutral means standing with the back fully erect. Bending forward over a worktable takes the back out of a neutral posture and increases strain on the lower back. Therefore, proper work height is essential for standing neutral. However, even if we stand perfectly erect, as we stand for prolonged periods of time the abdominal muscles relax and allow the pelvis to tilt too far forward. This causes excessive curvature of the lower back and joint pain. Prolonged standing in a neutral posture is assisted by having a step rail or stool to place one foot on. This helps to prevent the pelvis form tilting down and straining the lower back.

Key Concept # 2: Upper Body Support

- When bending over at the waist use one hand to support the upper body whenever possible. For example, when leaning over the sink to brush one's teeth with the right hand, support the upper body weight by using the left hand to support the upper body. This technique can often be used when leaning over to work on the engine of a car.

Key Concept # 3: Posture Relief

- Posture relief exercises should be a common practice. Since most work involves flexing the lower back as when seated or when bending at the waist while standing, back extension exercises are universally the most important posture relief exercises to perform. However, side bending and trunk rotations are examples of other commonly used posture relief exercises that can be incorporated to help prevent damage to the body from sustained awkward postures.

  Back extension exercises are easy to perform. Simply place the hands on the hips and slowly bend the upper body or trunk backwards. Tell employees not to over extend. Repeating this exercise throughout the day helps to prevent disc herniations. The motion of back extension lowers disc pressure and moves the disc jelly forward, away from the back wall of the disc where most disc herniations occur. It is the most effective back exercise to perform on a daily basis for most people that will help prevent disabling disc herniations and ruptures.

  Note: Properly performed back extensions should not cause significant pain. If so, an employee should consult with a doctor. Certain spinal conditions may be aggravated by back extensions. Two conditions need to be addressed:

  Spinal stenosis is a condition that may be congenital or acquired as we age. This condition involves narrowing of the openings in our spine where spinal nerves pass. Pinched nerves from this condition can be very painful and disabling. People should be aware that back extension exercises may aggravate these conditions and cause increased pain, especially if a person with this condition extends to full range.

  Another condition that is typically aggravated by back extension, known as *spondylolisthesis*, is a congenital condition affecting the lumbar spine in about 8 -10% of the population. This condition involves a defect in the structure connect two vertebrae, allowing one vertebra to slip forward on the other. This slippage of the vertebra reduces the opening for the spinal nerves exiting from thee spinal canal behind the discs. Back extensions will further narrow the opening for the nerves and thus, cause increased pain.

  Other conditions that may be aggravated by back extensions include excessive lower back curvature from being *swayed back*, being *pregnant (third trimester)* or from standing for prolonged periods of time.

  People who are swayed back, pregnant, or have *spinal stenosis* or *spondylolisthesis,* will typically report back pain with prolonged standing and tolerate seated postures much better (the opposite pain pattern of a disc herniation patient). Posture relief exercises that involve spinal flexion such as pulling the knees up to the chest or performing sit-ups will typically be

therapeutic for patient with these conditions. A proper medical evaluation should be conducted on anyone who reports significant back pain from standing or bending backwards or any posture prior to starting any exercise program.

Summary of Exceptions to the Rule: When Back Extension Posture Relief Exercises May Not Be Beneficial:

- Low back pain from prolonged standing
- Swayed back
- Pregnancy (especially during the 3rd trimester)
- Spinal stenosis (narrowing of spinal nerve openings secondary to degenerative disc disease)
- Spondylolisthesis (congenital defect causing one vertebra to slip forward on another)

Evaluation and Treatment of Spinal Problems—The McKenzie Method

The McKenzie evaluation method of the spine, developed by Robin McKenzie, a physical therapist from New Zealand, is highly effective for resolving back and neck problems without invasive procedures including surgeries. The technique is based on biomechanics and assessing spinal motions that aggravate pain and relieve pain. The patient is then instructed on specialized exercises to help remodel the damaged tissue, repair herniated discs, and relieve irritation or compression non nerve roots. The earlier a person incorporates the McKenzie approach in therapy, the higher the success rate.

In some cases spinal surgery may not be avoidable. However, over the past 20 years, the author has incorporated the McKenzie concepts in his industrial consulting and clinical practice for both injury prevention and treatment with over a 90% success rate among industry clients and patients. There is little doubt that since the vast majority of spinal problems are mechanical in nature, caused by certain postures, body motions, or spinal overloading that therapy and ergonomic interventions that correct stressful postures and motions of the body and relieves loading on the spine can be used to effectively repair and prevent spinal injuries. To locate a McKenzie certified physical therapist in any location throughout the world, employees can be referred to the following web site: www.McKenzieMdt.org.

Using McKenzie Concepts Proactively

In the clinic, the McKenzie technique is an evaluation method used to determine a diagnostic-specific postural correction and exercise program that will relieve and cure spinal problems. However, we all know that prevention is the best cure. Using the principles of the McKenzie method on the job and at home, a person can learn to work in neutral postures and perform postural correction exercises to maintain optimum health of the spine by understanding the mechanics of the spine as taught in this program.

Preventing Low Back Injuries from Lifting

Key Concepts

1. Engineer out material handling risk factors
   a. Store materials on shelves at heights that prevent awkward postures removing or placing materials on the shelves. Place frequently handled materials at waist level and infrequently handled materials at high or lower shelf levels.
   b. Use conveyor belts, carts (especially adjustable height carts such as scissor lift carts), fork lifts, pallet jacks, chain hoists and other lift devices to avoid manual handling of materials
2. Perform exercises at home and at work that keep the spine flexible, nourished, and strong.
3. When manually lifting, always keep the load close and use the B.L.A.S.T. technique:
   B—Bow the lower back in
   L—Use the **L**egs to lift, not the back
   A—Tighten the **A**bdominal muscles
   S—Lift **S**lowly and **S**moothly
   T—Never **T**wist

Preventing Neck Injuries

Like the lower back, posture plays a big role in neck (cervical spine) injuries. The most common posture that stresses the neck is the forward head posture and /or neck flexion posture (looking downward). Both postures increase pressure in spinal discs located in the lower region of the neck. In fact, excessive disc pressures are so common in the lower neck that the vast majority of neck surgeries involve this region (C5-6 and C6-7). Looking upward is also stressful to the neck, placing excessive force on the joints located behind the discs (i.e., cervical facet joints). This can lead to joint deterioration and bone spurs (degenerative arthritis). Combining forward head posture while looking upward, as people commonly do with bifocals, is probably the most destructive of all neck postures, combining stress on the facet joints with stress on the lower spinal discs of the neck.

Ergonomic Interventions

Vision is a big issue that affects neck posture as vision directs posture. For example, if a computer monitor is located too low, a person will flex the neck in order to see the monitor clearly. If the monitor is positioned too far way, the person will move the neck and head forward to achieve optimum focus. If work is located overhead, then the person will be forced to look upward. Therefore, positioning work so that the head can be maintained level and centered over the shoulders is the key to reducing stress on the neck.

Bifocal Posture

The “bifocal posture”, as defined by the author, is any posture in which the head is tilted backwards with the chin is elevated. A person does not have to be wearing bifocals to exhibit this posture. A common example of bifocal posture without wearing bifocals involves the posture of a person seated slumped at a computer with his/her head forward and the chin elevated in order to look up at the monitor. The problem with forward head posture combined with the chin being elevated relates to the mechanical stresses that this posture places on the cervical spine. The bifocal posture involves 3 significant mechanical stressors on the neck:

1. Increased disc pressure in the lower neck
2. Increased compression on the facet joints in the mid- and upper neck
3. Compression on the vertebral arteries at the base of the skull.

The results of the stressors are potentially:

1. Lower cervical disc herniations or ruptures
2. Upper and lower fact joint deterioration and bone spurs
3. Headaches from vertebral artery irritation along with long term arterial plaque build-up that can increase one's risk for a stroke.

It should be noted that combining neck rotation with the bifocal posture places even more compression on the vertebral arteries at the base of the skull. Therefore, jobs requiring constant rotation of the neck should be analyzed for ergonomic modification. This is common when a computer monitor is placed to the left or right of the keyboard- a very poor ergonomic set-up that can lead to serious neck problems.

Spinal degeneration in the neck can lead to a cervical nerve being compressed. This will cause pain typically to occur in the shoulder, arms and hands. A pinched nerve in the neck can cause carpal tunnel-like pain in the hand. Therefore, problems in the neck should always be cleared before a diagnosis of carpal tunnel syndrome is confirmed.

Bending the neck sideways can also cause facet joint and vertebral artery compression. Therefore, a person who uses a telephone should avoid cradling a receiver under the neck. Use of headphones is an excellent remedy to eliminate this harmful posture.

In field settings, ergonomic interventions that help eliminate looking upward for prolonged periods of time by eliminating overhead work are very beneficial. This can be accomplished by either lowering the work (e.g., repositioning , engineering redesign) or elevating the employee (e.g., platforms, ladders, steps, lifts, etc.).

Lifting above the shoulders increases disc pressure in the cervical spine and is a common cause of cervical and shoulder strain. Lifting objects, particularly objects weighing 35 lbs or more, should be avoided.

<u>Summary of Ergonomic Principles to Reduce Risk of Neck Injuries</u>

1. Ergonomics- eliminate work tasks that cause
    a. Forward head
    b. Looking down (Neck flexion)
    c. Neck rotation
    d. Looking upward (Neck extension)
    e. Lifting above the shoulder level

Preventing Shoulder Injuries

The most common types of shoulder injuries affecting the aging work population involve rotator cuff tears, impingements and bursitis. By far, the leading cause of shoulder injuries is working

with the arms at or above shoulder level or from generating excessive forces on the shoulders. As people age, the space below the boney roof of the shoulder formed by the acromial process of the scapula becomes narrower as posture changes. Working with the arms overhead or working with the arms extended while leaning forward and bent at the waist, can cause impingement of rotator cuff muscles and the bursa. A review of the medical literature verifies age-related vulnerability to shoulder injuries with the majority of such injuries occurring between ages 42- 46.

Safety Professionals should focus on eliminating jobs requiring repetitive or sustained overhead work. Obstacles should be removed that cause the worker to lean forward while simultaneously reaching out with the arms and hands. Leaning forward lowers the acromial process and narrows the gap between the bony process and the head of the humerus (upper arm bone). This causes premature impingement at the shoulder.

Ergonomic principles include engineering changes to eliminate overhead work and reaching while bent over at the waist. This can involve repositioning of the work by lowering the height of the work or by elevating the employee using scaffolds, platforms, man lifts, etc to position the employee so that he/she can work in the optimum (primary) vertical and horizontal safe work zones.

The primary safe vertical safe work zone lies within a vertical zone located between knuckles level and shoulder level. The primary horizontal safe work zone is the area that can be delineated with the forearms flexed at the elbows at 90 degrees and the upper arms held vertical on sides of the trunk. While in this position, the horizontal safe work zone is outlined by the tips of the fingers when making a movement with the arms and hands that resembles calling someone safe at a baseball game. The side to side movement of the arms should be conducted while keeping the elbows close to the trunk of the body. By using the hands in these primary “safe zones” employees minimize the risk of shoulder impingements.

Whenever an employee is unable to avoid working with the arms overhead or with the arms extended in front of the body while leaning forward, frequent postural breaks that allow the arms to be relaxed by the side of the body should be encouraged. Taking frequent breaks from overhead work reduces mechanical stress on the shoulder and restores blood flow into the rotator cuffs, arms, wrists and hands. This also helps to reduce the risk of developing an associated MSD of the wrist, carpal tunnel syndrome.

Lastly, lifting, pulling and pushing can cause significant strain on the rotator cuff muscles in the shoulders. The same golden rule that it applies to lifting to prevent lower back injuries applies to lifting to prevent shoulder injuries. That is, always keep the load close to the body. In addition, teach employees to use hand tools that do not force the arm to be elevated at the shoulder. For example, using a pistol grip tool allows a worker to position the upper arm vertical by the side of the trunk and maintain the forearm parallel to the floor when working on vertical surfaces at the right height (e.g., elbow or waist height). However, using the same pistol grip tool on a horizontal surface at waist level or higher will cause the employee to elevate the arm at the shoulder. This will increase the risk of shoulder impingement. In this latter case, working on a horizontal surface with a straight-handled tool will eliminate the need to elevate the arm at the shoulder. Tool selection therefore, is important.

Summary of Methods to Prevent MSDs

a. Conduct job-specific functional testing – Assess new hires to ensure that they have the strength, flexibility, and aerobic capacities necessary to perform the essential duties of the job
b. Behavioral-Based Training should address:
    - Proper body mechanics
    - Postural safety analysis – working in neutral postures
    - On-the-job stretching – warm up and posture relief stretching

c. Ergonomic Improvements that eliminate or reduce
    - Excessive force
    - Awkward posture
    - Excessive repetition or sustained static muscle contractions
    - Hand-arm and whole body vibration exposures
    - Exposures to extremes in hot, humid, and cold environments

d. Wellness Education
    - Nutrition / weight management
    - Stress management
    - Exercise

Diabetes

America's increasingly sedentary lifestyles and love affair with fast foods and sweets have resulted in the fattening of its citizens and the development of life threatening health problems. One of the most common health problems resulting from this social phenomenon is diabetes. Diabetes is a disease that involves the inability of the body to either produce insulin (Type I) or react to insulin (Type II. Insulin is a hormone produced by the pancreas, an organ located near the stomach that is essential for controlling plasma glucose levels (blood sugar levels) in the body.

The primary effect of ingesting too much sugar is the over-production of insulin. Insulin's normal role is to facilitate the process of using sugar (in the form of glucose) for fuel. In other words, insulin is required by cells of the body to properly utilize glucose for energy. Without insulin, the cells cannot utilize glucose properly and the sugar level in the blood begins to builds up. Too much sugar in the blood stream is very toxic to the body and leads to serious health problems, including coma and death. Therefore, the key to preventing the occurrence of certain types of diabetes is to live a lifestyle that avoids the development of insulin resistance in body tissues.

Therefore, people with uncontrolled diabetes experience a build up of excessive sugar in the blood that can cause serious medical problems such as:

- Vision loss
- Nerve damage
- Blood vessel and heart damage
- Kidney disease
- Conditions leading to amputations

- Premature death.

Obviously, too much sugar in the blood is bad for America's health. Yet, today the average American will digest more sugar directly from sweets or indirectly from processed high glycemic foods (foods that break down into sugar rapidly once digested) in one day than our great, great ancestors ate in their entire lives! As a result of this love affair with highly processed carbohydrates, diabetes has become a national epidemic.

Diabetes has become so prevalent today that the United States and the rest of the world are considered to be in the midst of a diabetic epidemic. This is easy to understand when recent trends of occurrences of diabetes are analyzed. In the past decade there has been a 40% increase of diabetes in the United States. Sixteen million Americans are known diabetics. This figure does not include an estimated 6 million more that are thought to have diabetes that has not yet been diagnosed. It is estimated that an additional 6 million people in the United States are prediabetic, having higher than normal sugar levels but lower than levels required for a diagnosis of diabetes. However, being prediabetic is a serious problem as well since it significantly increases the risk for cardiovascular disease, the number one killer of Americans today.

Due to life-threatening health complications of this disease, diabetes is now the 5th leading cause of death in the United States. At this time, there is no known medical cure for diabetes. Since the majority of diabetes can be related to lifestyle habits, prevention by changing lifestyle habits is considered the best cure. This concept is supported by numerous medical research studies. The National Diabetes Prevention Program found that modest weight loss from increasing physical activity, exercise, and improving nutrition significantly delayed or prevented the onset of type II diabetes [American Diabetes Association (ADA), 2002].

The Effect of Diabetes on Life and Work Productivity

Diabetes has an adverse effect on one's personal life as well as work productivity. People with diabetes generally experience a lower quality of life and live shorter lives than people who do not have diabetes. Among the work force, diabetics have higher than normal adsenteeism from work, losing 8.3 days at work on average as compared to those without diabetes who lose on average 1.7 days [National Diabetes Education Program (NDEP), 1999]. The economic impact of this disease in the United States is huge, costing the United States approximately$132 million in 2005 and consuming 10% of all healthcare dollars. Medical expenditures are 2-4 times higher for diabetics than non-diabetics as diabetics require continual health care and self-management education to control blood glucose levels and complications (ADA, 2004).

What Can Safety Professionals Do for Diabetic Employees?

Until we find a cure for diabetes, safety professionals must understand that this disease can have a significant impact on work performance and productivity, especially among people who are not properly monitoring and managing the disease. Diabetics fatigue faster and tolerate heat less than non-diabetics. Diabetics can "bottom-out" from severe hypoglycemia when performing manual labor and actually faint, go into diabetic shock, or even die. The basis for this reaction is simple. Unlike other tissues in the body, muscle does not require insulin to use glucose for energy. Consequently, a diabetic who is injecting insulin to regulate blood sugar levels while engaged in manual labor, may actually remove too much glucose from the blood due to the combined effects of injected insulin and muscle utilization of glucose.

Therefore, diabetes education and awareness is an important wellness program that should be offered to their work forces. Diabetic screenings of employees will help identify pre-diabetics and diabetics and obtain medical intervention and care before the disease causes more severe, disabling side effects. Many Americans do not even realize that they have diabetes or diabetic symptoms until years after its onset.

Employers can also address the types of foods offered in work-site cafeterias or by contracted food services, in vending machines and at employee meetings and seminars. It does not help the diabetes epidemic to serve donuts and other high glycemic foods at business meetings or to make such foods easily assessable at work locations.

Employees should be observed for signs of fatigue, irritability, and memory loss. Management needs to be well aware of medication needs and side effects of medications. Safety issues may exist for diabetics with impaired sensation, especially if they have to depend on tactile sensation to operate machinery or handle hot materials. Diabetics, due to metabolic disturbance in how the can process sugar for energy, have less endurance than non-diabetics and should avoid heavy manual labor. They should also avoid prolonged work in extreme heat or cold. Due to increase risk of nerve damage, diabetics should avoid exposure to hand-held vibration tools and avoid highly repetitive work. It is known that diabetics have a higher susceptibility to carpal tunnel syndrome.

The awareness of these limitations faced by diabetics provides a foundation for developing a sound ergonomics program at the work-site. Ergonomic solutions that are particularly important to diabetic employees include eliminating or reducing material handling demands, hand-arm and whole body vibration, and exposure to temperature extremes.

Considerations for the Diabetic

- Have annual medical physicals to monitor disease
- Take medications as prescribed for control of insulin and blood pressure
- Eat healthy diets designed for diabetics
- Exercise regularly and lose excess weight
- Consider nutritional supplements approved by a medical physician Notify employer of special needs related to medications, nutrition and work demands (environmental and physical demands)

Diabetes Summary

Diabetes is a condition that for many people can be prevented by eating healthier balanced meals and exercising more. Keeping weight down is critical for avoiding chemical changes in the body that significantly increases one's risk for obesity and diabetes.

Although at this time, there is no cure for diabetes, future medical research for new drugs to treat diabetes is quite promising. Careful monitoring of blood pressure and serum levels of glucose and lipids in conjunction with proper eating habits and exercise will go a long way in allowing a person with diabetes to live a relatively normal life. Remember, if an employee is diabetic, it is absolutely essential to encourage that person to monitor blood glucose levels and maintain regular medical check-ups to prevent harmful side effects of this disease. Self-monitoring of blood

glucose levels, medications, and diabetes self management education (DSME) provided by a Certified Diabetes Educator (CDE) can help manage medical costs and improve the quality of life and work productivity.

Preventing and Managing Heart Disease

Heart or cardiovascular disease compromises work capacities and becomes more prevalent with age. The Safety Professional must be aware of limitations caused by this disease which is the number one killer of Americans today and help promote heath awareness programs that will educate employees about prevention and management. On average, over 900,000 people die annually from heart disease. This translates into a death by heart disease every 25 seconds in this country!
Each year, more than a million Americans have heart attacks.

It's no secret, in the United States today, sedentary lifestyles and obesity are killing us! This trend is also being noted in the work force as the aging baby boomer generation begins to reach the age when both heart disease and cancer are more likely to occur.

Cardiovascular disease is beginning to have a significant impact on work capacities in different jobs across the nation. Employers are noting that more job applicants for jobs today are obese and exhibit poor aerobic fitness. Due to the increasing incidences of heart disease, job-specific functional testing is being conducted by more and more companies as many types of heart disease do not become symptomatic until a person is involved in an exertional activity. Job demands that require significant cardiorespiratory demands can expect to create extra stress on deconditioned employees with impaired cardiovascular problems.

One of the primary approaches to helping people reduce their risk of developing cardiovascular disease is to motivate them to prioritize becoming physically fit. Granted, this is easier said than done. Most people do not place health at the top of life's priorities, especially in the working years when people are trying to make a living and support a family.

Becoming physically active with exercise at home is more important today than ever before as more and more jobs are sedentary in nature. The average office worker, for example, will burn on average only 1200 - 1500 calories per day but commonly ingest more than 2000 calories from meals and snacks. Unless office workers exercise regularly, they will not burn the extra calories that enter the body via food and become overweight.

Testing for Heart Disease

One of the first prudent steps to take when making a conscious decision to reduce the risk of heart disease is to encourage employees to have a cardiovascular medical work up. Too often, heart or cardiovascular disease is a silent disease. Heart attacks can occur suddenly and without warning. Every person should get regular medical physical examinations and have blood work drawn to assess their blood chemistry.

Analysis of Cardiovascular Risk – The Lipoprotein Profile

The level of cholesterol and other lipids in the blood are considered to be indicators of the risk level for developing cardiovascular disease. The best way to check the blood level of cholesterol and other lipids is to have blood drawn at a laboratory to conduct a test that will provide a "lipoprotein profile". It is generally recommended that at least once every five years following the age of 20 that everyone should have a lipoprotein profile to assess cholesterol and serum lipid balance. In order for this test to be accurate, it has to be performed after a 9-12 hour fast.

Total Cholesterol

Total cholesterol level provides a measurement of the amount of all types of cholesterol in the blood measured as milligrams (mg) of cholesterol per deciliter (dL) of blood demarcated as "mg/dL". The following table provides standard ranges of cholesterol serum levels that are desirable, borderline high, and high:

Total Cholesterol Level	**Heart Disease Risk Category**
< 150 mg/dL*	Optimal (Excellent range)
150 - 200 mg/dL	Mild Risk (Generally accepted as normal)
200-239 mg/dL	Borderline High Risk
240 mg/dL and above	High risk

Table 1.

Low Density Lipoproteins (LDL)

Low density lipoproteins are necessary to carry cholesterol (usually from the liver) into the blood stream for utilization by the body to help manufacture cell wall membranes. However, too much cholesterol dumped into the blood vessels will result in harmful fatty plaque build-ups and hardening of the arteries or atherosclerosis – the basis for cardiovascular disease. Therefore, LDL has earned the name of "bad cholesterol". LDL, therefore, is a lipoprotein that carries cholesterol into the blood vessels of the body. High levels of LDL are the main contributor of cholesterol buildup and blockage in the arteries and represent a significant risk factor for developing cardiovascular disease.

As part of a sound wellness program, employees should be strongly encouraged to lower their triglycerides and LDL levels in blood. This is accomplished by proper diet (losing weight), increasing physical activity and aerobic exercise, smoking cessation, and in some cases by cholesterol reducing medications. A medical doctor can help decide which type of drug is best for each employee who may need these drugs.

The following table provides standard ranges of LDL serum levels that are optimal, near optimal, borderline high and high:

LDL Cholesterol Level	Category
Less than 100 mg/dL	Optimal
100-129 mg/dL	Near optimal/above optimal
130-159 mg/dL	Borderline high
160-189 mg/dL	High
190 mg/dL and above	Very high

Table 2.

Major Risk Factors That Affect LDL Levels

- Cigarette smoking
- High Blood Pressure (140/90 mmHg or higher or being on blood pressure medication)
- Low HDL cholesterol (less than 40 mg/dL)
- Family history of early heart disease (heart disease in father or brother before age 55; heart disease in mother or sister before age 65)
- Age (men 45 years or older; women 55 years or older
- Obesity
- Reduced physical activity (lack of exercise)

High Density Lipoproteins (HDL)

HDL is known as "good cholesterol" because a high HDL level seems to protect against heart attacks. Unlike LDL, HDL is the lipoprotein carrier that removes cholesterol from blood vessels and carries it into the liver where it is converted into harmless bile for digestion. High levels of HDL in the blood are thought to help prevent cholesterol from building up in the arterial walls. Some experts believe HDL removes excess cholesterol from plaques and thus slows their growth. A low HDL level (less than 40 mg/dL in men; less than 50 mg/dL in women) indicates a greater risk for heart disease. A low HDL cholesterol level may also raise a person's risk for strokes. HDL levels greater than 60 mg/dL, on the other hand, will actually lower a person's risk for heart disease.

HDL Cholesterol Level	Heart Disease Risk Category
> 60 mg/dL	Reduced Risk
40 - 60 mg/dL	Borderline Risk
< 40 mg/dL	Elevated Risk

Table 3.

HDL / LDL Ratio

HDL and LDL ratios are calculated from the lipoprotein profile. A profile that reveals a low HDL level and a high LDL level is associated with an increased risk of heart disease.

Triglycerides

Triglycerides can also raise heart disease risk. Levels that are borderline high (150-199 mg/dL) or high (200 mg/dL or more) may need treatment in some people.

Triglycerides	**Heart Disease Risk Category**
< 150 mg/dL	Low Risk
150 – 199 mg/dL	Borderline High Risk
≥ 200 mg/dL	High Risk

Table 4.

Preventing and Managing Cancer

Cancer, one of the leading causes of death in the United States, is a disease involving uncontrolled cellular division. Approximately 1,437, 180 new cancer cases are expected to be diagnosed in 2008 (American Cancer Society). The majority of cancers (estimated at 77%) in the United States occur at 55 and older when the immune system becomes more compromised. Consequently, it is expected that the incidences of cancer will double over the next 50 years to 2.6 million cases per year mainly due to population growth and increasing longevity. Therefore, as the work population ages and older employees continue to work longer, the Safety Professional will find that that he/she will be dealing more frequently with employees who have some form of cancer. Cancer, along with the side effects of treatment, may significantly reduce the strength and endurance of employees and therefore, cause increased safety concerns.

Known Risk Factors and Causes of Cancer

Scientific studies have shown that about 33% of cancers in the United States are related to poor nutrition, obesity and reduced physical activity. Smoking is related to an additional 33 – 35% of cancers. Stress in related to cancer as well. About 4% of cancers are related to occupational exposure to carcinogens and 2 % related to environmental pollution. As in many diseases, genetics can play a significant role in cancer. Some cancers are known to be passed through heredity. However, poor genetics should be viewed as the gun with poor lifestyle habits serving as the trigger. The fact of the matter is that lifestyles obviously play a more significant role in cancer than genetics. Lifestyle behaviors such as excessive consumption of alcohol, smoking, and lack of exercise have all been identified as triggers for cancers. The American Cancer Society reported that since approximately 90% of cancers have no hereditary link that most cancers are preventable!

Primary Causes of Cancers

Smoking

Smoking is the leading cause of lung cancer and also contributes to cardiovascular disease. Cigarette smoke is very high in free radical oxidants and depletes antioxidants in body. Smoking also lowers HDL cholesterol levels and increases the tendency for blood to clot. A smoker must ingest 2-3X as much Vitamin C as a non-smoker to maintain an equal blood level.

Poor Diet
The modern American diet is a huge contributor to cancer. Food that is high in fats and sugars and low in vitamins and minerals will cause chronic inflammatory changes in the body and compromise the immune system. Modern cooking methods will also increase exposure to carcinogens (cancer causing substances)

Chronic Inflammation
Diseases such a reflux esophagitis, hepatitis B and C, viruses, and chronic gastritis can lead to mutation in cellular structure that evolves into various forms of cancers. Therefore, it is essential that employees address any chronic disease by receiving proper medical treatment.

Stress
Stress common in our fast-paced society and can cause a reduction of nutrients that serve as antioxidants and compromises the immune system. Stress has a significant physiological effect on the nervous system and production of hormones such as cortisol. Cortisol increases blood sugar levels and fat in the blood. Stress also affects DNA in the cells and therefore, can increase the risk to cancer. It is essential that Safety Professionals take definitive steps to help employee reduce and deal with stress.

Occupational Chemical Exposure / Pollutants
As mentioned earlier, only about 4% of cancers are related to occupational exposure to carcinogens. Various chemicals and pollutants have been identified as carcinogens (cancer causing substances). Carcinogens are thought to cause cancer by altering cellular metabolism or damaging DNA. Identification of chemical carcinogens in the United Sates is based on criteria established by the International Agency for Research on Cancer (IARC). The identification of proven chemical carcinogens is based on formal epidemiological studies among workers who develop cancer after exposure to a chemical for long periods, over many years. Probable human carcinogens are substances that have shown suggestive epidemiological evidence but the data are not sufficient to satisfy the criteria for establishment of causality. However, there is proven evidence from animal studies carried out under conditions which are relevant to human exposure. Arsenic, asbestos , benzene, beryllium sulfate, calcium chromate, chloromethyl methyl ether, and lead chromate are a few examples of substances that are proven carcinogens. Secondary smoke from cigarettes represents a form of air pollution that is a known carcinogen for lung cancer.

Exercise and Cancer
Exercise is one of the three best ways (the others being good nutrition and stress management) to reduce the risk of cancer. In fact, there are over 200 scientific studies that have shown that exercise helps prevent cancers of the breast, colon, rectum, uterus and prostate! The anti-cancer effect of exercise is thought to be related to exercise's positive influence on neurochemicals, the immune system, hormone metabolism, and DNA.

Dietary and Nutritional Recommendations for Preventing Cancer
Dietary antioxidants help prevent cancer. The main sources of dietary antioxidants are fruits and vegetables. It is recommended that humans should eat at least 5 portions of fruits and vegetables per day but only about 9% of the US Population do! Many of the same dietary recommendations given to reduce the risk of cardiovascular disease and lose weight apply to reducing the risk of cancer. Cancer occurrence is higher in people who are overweight or obese. Therefore, reducing caloric intake, avoiding high glycemic foods and lowering fat content of food are important.

Saturated fats and trans fat are considered to increase the risk of cancer. Food preparation techniques are important. Avoid creating exposure to carcinogens by grilling, deep frying and barbequing. Employees should be educated about the benefits of cooking with healthier oils such as canola or olive oil and avoiding reusing the same oils for cooking. Cooking with the same oil repeatedly increases the formation of harmful trans fat.

Employees should be encouraged to increase fiber content and eat more organically grown vegetables and fruits. Fruits and vegetables contain anti-cancer chemicals known as *phytochemicals*. Phytochemicals are natural plant micronutrients that serve as antioxidants that help prevent cancer. Therefore, it is very important to eat a variety of organic fruits and vegetables daily. Nutritionists also recommend teas and moderate amounts of red wine.

Nutritional Supplements That Help Fight Cancer and Heart Disease

The use of nutritional supplements can be controversial. Employees should be instructed to always check with their medical doctors prior to taking any nutritional supplements. A good multiple vitamin may be beneficial when a person's diet is poor. Vitamins, if used, should only be ingested during a meal. Taking certain supplements may be contraindicated when taking certain types of medications. Smokers should not take beta carotene as some studies indicate that this supplement may increase the risk of lung cancer in smokers. Supplements should never be used in place of medications for treating cancer. The best sources of antioxidants are fresh, raw fruits and vegetables

Exercise and Diet

One of the primary approaches to preventing heart disease is to prevent or reduce the build-up of arterial fatty plaques by elevating good cholesterol, HDL. The primary methods to accomplish this feat are to regularly perform aerobic exercises and eat nutritious low fat, low glycemic meals. Aerobic exercise increases HDL (good cholesterol) and lowers LDL (bad cholesterol). Aerobic exercise also offers helps to prevent cancer and has numerous other benefits to health. For example, aerobic exercise produces healthy neurochemicals and hormones such as endorphins that offset the harmful effects of stress.

The good news about exercise is that medical studies show that we do not have to sweat out long demanding exercise routines. The studies indicate that all we have to do is moderately exercise on a regular basis. In fact studies show that moderate exercise, as little as 30 minutes per day, leads to large benefits! The American Heart Association reported that 30 minutes of walking each day cuts risk of heart disease in half!

- **Weight Management:** For overweight or obese people, losing weight may help lower LDL. This is particularly important for people who have a number of risk factors that includes high levels of serum triglycerides, low levels of HDL, and a waist measurement that exceeds 40 inches for men and 35 inches for women.
- **Physical Activity**: Regular physical activity or exercise for at least 30 minutes per day is highly recommended for everyone. Moderate aerobic exercise such as brisk walking can help raise HDL and lower LDL. Exercise is especially important for people with high triglycerides levels, low HDL levels and who are overweight with a large waist measurements.

Making Time for Exercise

Recently, the amount of exercise to help reduce the obesity trend in this country was revised to a recommended 60 – 90 minutes of moderate daily exercise daily. But most people think they do not have time for any exercise, much less and hour to 1 ½ hours per day! People are always complaining about too little time and how busy life has become. This is particularly true for people who fall in the age range of 30 – 45. People in this age range are more likely to be parents who are working 40 hrs or more hours per week

In reality though, people have plenty of time to exercise daily. Actually, the primary reason for not exercising has little to do with time. The problem is simply a matter of motivation. Most people do not truly understand how crucial and essential daily exercise is to maintaining health. It is interesting to note that when a person suffers a mild heart attack or stroke that suddenly proper nutrition and exercise becomes the most important issues in the world! In fact, nothing else really matters to these people because the fear and realization that death or severe disability could be just around the corner provides very effective motivation to exercise. When people truly realize that losing their health means losing everything, exercise becomes a very important part of the daily routine. It is very unfortunate that it takes a life threatening event such as a mild heart attack to make a person become suddenly motivated to exercise. Unfortunately, too many people wait until it is too late. Dead heart or brain tissue cannot be replaced.

So, how does one find 30 – 90 minutes each day for exercise? Consider that the average American has about 40 hours of free time each week that is available for exercise. People spend anywhere for 15 – 20 hours of that time per week just watching television. In addition, people commonly spend additional hours playing games, chatting in chat rooms, and/or surfing the web on computers.

It seems then, that for most people today, time is not being spent correctly. Encourage employees to plan a structured, formal exercise program of at least 30 minutes per day and then challenge them to make up the remaining 30 - 60 minutes each day of increased physical activity. The following recommendations should be considered for adding 30 – 60 extra minutes of exercise daily to a 30-minute structured exercise program.

Recommended Steps to Achieving Optimum Health

Step #1: Encourage Employees to Prioritize Health!

Making a conscious, determined decision to prioritize health over all other issues in life is the key to obtaining optimum health. This means thinking about health from the moment one gets out of bed in the morning until one goes to sleep at night. This means thinking about what is eaten at each meal and between each meal. This means making certain that exercises are performed daily that will help maintain cardiorespiratory fitness and help prevent cancer. This means avoiding finding excuses to not exercise (the most common being lack of time and fatigue).This means avoiding bad lifestyle habits such as smoking and excessive consumption of alcohol.

Step #2: Develop an Action Plan

Now comes perhaps the hardest part – becoming disciplined to exercise! The key part of exercise discipline involves consciously scheduling exercise into one's life on a daily basis and sticking

with the schedule. Employees may ask what part of the day is the best time to exercise. The answer is simple. The best time of the day to exercise is the time of the day that a person finds to be most convenient to exercise. Some people like to exercise in the morning, others at noon, and many prefer the afternoons or early evenings right after work. It really does not matter as long as the person stays committed to exercising on a regular basis.

Step #3: Take Actions to Overcome the Fatigue Barrier to Exercise

The biggest reason for failure to exercise deals with feeling too fatigued to exercise. Well, feeling fatigued is not the same as being fatigued. True fatigue involves a physiological exhaustion of body processes that can occur from chronic lack of sleep or as a result of an illness. Most people however, who say that they are fatigued, are feeling fatigued due to the effects of hormonal changes in the body caused by eating the wrong foods and/or eating too much, mental stress, and lack of exercise. Since food can cause an increase in hormones that induces drowsiness, food is often used as a drug to control stress. Most people are very familiar with the mid-afternoon drowsiness that occurs after eating a big lunch.

One big step to preventing the profound feeling of fatigue is to change unhealthy diet patterns and watch what is eaten during the day. Eating a food with high levels of processed carbs (high glycemic) and/or fat will not only increase the risk of cardiovascular disease, but it will also cause increased levels of hormones in the body such as insulin. Insulin is produced after a high glycemic meal to lower excess sugar levels in the blood. When insulin is produced rapidly and in large quantities, blood sugar is lowered rapidly and hypoglycemia occurs. Hypoglycemic induces drowsiness and increases cravings for sweets.

Lack of movement throughout the day due to static, prolonged standing or sitting postures will cause blood to pool in the lower extremities and reduce blood to the brain. Reduced oxygen to the brain, even minute deficits, will cause a feeling of drowsiness or fatigue. In addition, as we stop exercising we become deconditioned and our metabolism rate decreases. This is usually accompanied by weight gain.

Poor eating habits and lack of exercise contributes to a vicious cycle of declining health. The more health declines, the harder it becomes to get back into exercise. The only way to beat the rapid decline of health from modern lifestyle and work habits is to take actions to overcome the hurdle that has been created by this lifestyle. It may not be very easy at first to start exercising but if the effort is made to make changes as recommended, exercise not only becomes easier, it becomes pleasurable and even addictive.

The first step to overcome the fatigue barrier is to change a fatigue-inducing diet to an energy-inducing diet. This begins by eating a well-balanced breakfast every morning. Medical studies have shown that people who skip breakfast on a regular basis increase their risk by two times the national average to become overweight and develop type II diabetes. A healthy breakfast does not include high fat processed meats like bacon or food products made by processed flour such as pancakes, waffles and biscuits or whole fat milk. A healthy breakfast includes egg white omelets with vegetables, lean meats like ham, and food products containing whole wheat with high fiber content such as whole wheat bread. High fiber cereals with 1% or skim milk and fresh fruit are healthy choices as well. A good breakfast will improve energy levels in the morning.

Following breakfast, caution must be taken to eat smartly during the remainder of the day and in a manner that reduces hunger cravings. This is accomplished by eating small portions of healthy snacks that are low glycemic and low in saturated fats (e.g., raw nuts). Also drinking lots of water, rather than sugary drinks, between major meals helps to increase energy and reduce hunger. A person will be much less likely to make healthier food selections and eat less at lunch if hunger cravings have been prevented by having eaten a good, healthy breakfast, and a mid-morning healthy snack. In other words, eating healthy foods (low glycemic and low fat) more frequently during the day maintains a level of satiety that reduces the likelihood of any sudden hunger cravings. Eating a healthy low glycemic and low fat snack mid-afternoon and drinking more water will again help reduce hunger urges for dinner in the evening, usually the most abused meal of the day. An eating pattern that reflects this whole concept is called the 6-meal plan. The 6-meal plan simply means eating healthy low fat, low glycemic foods that follow the following pattern:

1. Breakfast
2. Mid-morning snack
3. Light lunch
4. Mid-afternoon snack
5. Light dinner
6. Mid-evening snack

This pattern of eating will keep insulin production low and level throughout the day. This will reduce the periodic bouts of hypoglycemia that drives hunger cravings and creates a feeling of fatigue. Consequently, a person eating this way will have more energy and feel less fatigued at the end of the day. This reduces the fatigue barrier to exercise.

Feeling fatigued at the end of the workday can still occur even with the recommended 6-meal diet plan. The most likely reason for this feeling will be reduced oxygenation to the brain from lack of physical activity throughout the day and from mental stress. Static work postures, especially involving prolonged seated work, leads to pooling of blood in the lower extremities and reduced blood flow and oxygenation to the brain. At the same time mental stress increases metabolic activity of the nervous systems which increases oxygen demands by the brain. Combined, mental fatigue can occur.

The best approach to reduce onset of mental fatigue is to become more physically active at work. This may mean getting up more to walk around, taking the stairs rather than the elevator and even taking exercise breaks at work. Exercise can include stretching, aerobics and/or strengthening using free weights or pulley systems. Employees should always take advantage of any on-site exercise rooms or fitness club memberships if offered by their employers.

Lastly, if the feeling of fatigue exists despite all methods to prevent it, simply encourage employees to program their brains to change the “fatigue response paradigm”. That is, when feeling fatigued, encourage employees to change their paradigms (the way one thinks) from thinking “I’m tired, I need to lay down or sit”, to paradigms of thinking “I feel tired, I need to exercise”! When this paradigm change is actually made, the average person will notice that exercising gets rid of the feeling of fatigue within about 3-4 minutes. The reason for this response is that exercise pumps blood and oxygen to the brain. Oxygenation of the brain from increased blood flow activates the area of the brain that increases alertness. In addition, exercise will pump

out the lactic acid that has built up in the muscles that have been held statically all day. This process takes about 3 minutes on average depending on the fitness level of the person, age and intensity of exercise. Some people even refer to the increased feeling of energy after exercising for a while as "getting my second wind"!

Exercise, to be effective, must be appreciated. Encourage employees to use a visualization technique during exercise to develop a mental picture of HDL running through the blood vessels and carrying cholesterol out of the blood to the liver where it is turned into harmless bile. Employees should be educated to know that each time they plan a day that encompasses exercise, that they increase their chances of living a longer and better quality life.

The F.A.S.T. Approach to Exercising

Obviously, aerobic exercise is very beneficial for preventing heart disease. However, aerobic exercise is not sufficient in and of itself to create balanced health. Exercise should also improve flexibility and increase strength of bone joints, ligaments and muscles. An approach to fitness advocated in this program is referred to as the F.A.S.T. approach. This acronym stands for:

F—Flexibility (Stretching)
A—Aerobics (Walking, running, bicycling, etc)
S—Strengthening (weight lifting, push-ups, sit-ups, etc.)
T—Time: Schedule exercise every day!

Summary Goals for the Safety Professional

1. Perform good ergonomics assessments to reduce exposures to excessive force, awkward postures, repetitive or sustained static work, exposure to hand and whole body vibration, contact stress, and exposure to extremes of heat, humidity, and cold.

2. Consider job-specific functional testing of employees to ensure there is a proper match between the functional capacities of the person and the physical demands of a job.

3. Assist management in assigning job demands carefully to employees with diabetes, heart disease, and cancer.

4. Develop corporate-wide fitness / wellness program (in conjunction with health care providers)
   - Consider on-site fitness centers or corporate support for health club memberships
   - Conduct health fairs / screenings
   - Encourage involvement in walkathons
   - Offer wellness programs

5. Promote healthy nutrition at work

6. Consider employee fitness screens and fit-for-duty evaluations

7. Reduce stress on employees
    - Empower with more control and input
    - Avoid work overload
    - Encourage dialog and open communications
    - Provide constructive feedback and avoid demeaning criticisms

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