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The Aging Workplace – It's Not Just Ergonomics
or
Will You Still Need Me, Will You Still Love Me, When I'm 64?

Russell E. Dronne, CSP, MS, ARM, CPCU, ALCM
Property Casualty Risk Engineer
Chubb Group of Insurance Companies
New York, New York

Tina Minter, CSP, ALCM, ARM
Workers Compensation Specialist
Chubb Group of Insurance Companies
Waukesha, Wisconsin

Introduction

For many years, the goal of the American employee was to retire early and spend a few years in carefree retirement enjoying the fruits of a long career, more often than not with a single company. The "Baby Boomers" who will start turning 62 this year no longer have their "father's pension plan." This is just one of the reasons that employees are staying on the job longer or may entirely switch careers as they approach what many used to believe was the "expected retirement age" of 65. This lengthening of the working career presents both challenges and opportunities to the business community.

A look at the changing demographics of the workplace and public policy decisions are impacting forever the nature of older workers in our places of business. In the past, many employees looked forward to a pension plan that was designed, funded and administered by their employer. They knew that at the end of working career, they were guaranteed a monthly check, which in many cases, increased to meet the rate of inflation. This income, in addition to the monthly checks received from the federal Social Security System, was usually enough to allow the retiree to live comfortably for the 10 to 15 years that they expected to live from retirement at age 65.

The American Association of Retired People noted that between 2000 and 2020, the number of individuals between the ages of 55 to 64 will increase by nearly 40 percent and those above the age of 65 will also increase by more that 40 percent (AARP).

How things have changed! Many of us are required to fund our own "retirement accounts" through 401Ks, make our own investment decisions and even social security is now fully realized only if the employee retires after age 66 or 67, depending on current age. Anyone who has recently looked at their 401K statement may have decided to work longer than they planned even 1 year ago. Because the average person is living longer, it's very probable that they will live past 85. The additional medical cost that older Americans need to plan for is another reason that some workers are delaying retirement from their employers or starting a "second career" either as a part-time or full-time employee after they have "retired." The rest of this paper is devoted to the adaptations that American business needs to make to maintain a safe work environment for the "silver-collared" workers that are becoming a fixture at our places of business.

Challenges in the Workplace

We will discuss various conditions and areas of concerns impacting both employees and employers. In each of these sections, a list of suggested improvements or actions will be identified to assist the employer in adapting the physical workplace or workplace policies to take into account the increasing number of aging employees.

Injury Rates

A review of injury and illness data across various workplaces shows some interesting results. As noted previously in this article, the percent of older workers in the labor force has been steadily increasing. Workers over age 55 accounted for 12 percent of the injury and illness cases involving days away from work, slightly less than the 13 percent share of the hours that this group worked. Although the older workers suffered fewer injuries than their younger counterparts, the time away from work or severity was higher. The median days away from work for all workers was 8 days, for those 55 to 64 it was 12 days and for those aged 65 and older it was 18 days (Rogers and Wiatrowski, 2005).

There are a number of factors that may explain the decrease in injury rate and increase in severity. Older workers, in many cases, have moved into jobs that are supervisory in nature and limit some of the physical challenges of job tasks faced by their younger colleagues. Their years of experience and training have shown them the proper ways to complete tasks without putting their bodies at risk for injuries.

On the flip side, certain chronic conditions such as high blood pressure, diabetes and low back pain tend to become more prevalent in older populations. These conditions slow down the natural healing process and may turn what for younger workers would be a minor injury into a more complex case. A review of a company's workers compensation loss runs may reveal cases of employees with diabetes who suffer a cut or burn that takes an extremely long time to heal or result in a debilitating infection.

Chronic Disorders and Diseases

As we age, the onset of various aliments seems to increase rapidly with each passing birthday. Older workers, even if they have not been injured, utilize the health care system to a greater degree than their younger counterparts. This in conjunction with their higher wages and benefits can put a strain on the financial resources of a business. High pressure, arthritis, diabetes, cataracts and balance issues are treatable aliments, however the treatments require regular visits to health care professionals that may increase the level of absenteeism in older workers. The prevalence of serious medical conditions increased over the past decade among adults in their late 50's. For example, more adults had diabetes in 2002 than in 1992. A greater number of older adults reported being troubled often by pain and suffering from arthritis in 2002 than in 1992. Fewer than half of the reported arthritis cases were serious enough to limit everyday activities (Johnson, 2004.) Even when they are at work, they may require additional rest breaks to take medications, rest their eyes or warm up and stretch before physical work activities. The medications taken by the older worker may have side effects, that affect visual perception or balance, which could increase the probability of accidents. In addition, failing eyesight may require the aging worker to limit commuting to daylight hours.

The strong work ethic of the older worker may cause them to under report minor injuries and simply "work through the pain." In many cases their actions are an indication that they fear becoming more dependent and do not wish to invoke negative feelings from management toward them.

Businesses can implement policies and procedures to assist the aging worker. These could include:

- Flexible work hours that allow those with poor night vision to adjust their start and finish time to coincide with the hours of daylight.
- Scheduling "lunch and learns" with health care professionals that discuss some of the symptoms and implications of chronic diseases.
- Permitting breaks during the workday that allow employees to take medications, snack to maintain blood sugar levels, rest their eyes or stretch and rest muscles and joints.
- Encourage older employees to utilize the health care system for preventative "well visits" and take immediate action if early symptoms of chronic disease begin to show up.
- Encourage the use of "pre-retirement" short work weeks so that older workers can gradually ease into retirement or continue to work part time after the "usual retirement" age of 65.

Hearing

As we age, one of the first senses to go is our hearing. Some of this loss in hearing is a result of the natural aging process known as presbycusis, which starts around age 35. This is a condition where the cilia in the inner ear no longer function as well as they did when the employee was just starting their career. In addition to a decrease in the sound level that the older employee hears, there is also a tone sensitivity loss. Very high frequency or low frequency sounds may be muted or not recognized. Workplace noise may also play a role in the hearing loss, especially in the factory or shop environment. The older employee's decades long hobbies such as hunting,

woodworking or auto repair could very well exasperate a workplace inducted hearing loss. Because Baby Boomers are now entering the age 60 plus workforce, there is some concern that that attendance at rock concerts and listening to loud music over the past 50 years may play a greater role in decreased hearing that was not seen in prior generations.

As noted above, the current aging workforce is utilizing the health care system to a greater degree in managing age onset aliments and many physicians prescribe drugs that, while addressing the chronic disease problem, may have side effects such as drug induced tinnitus. Damage to the ears, including the inner ear may cause additional problems relating to the employee's balance.

Safety engineers need to take these potential issues related to hearing loss into account when designing the workplace or developing training programs:

- Don't rely on sound as the sole means of emergency communication. Older employees with hearing loss may not hear announcements or understand what the message is.
- Use strobe lights or flashing signals to indicate warnings or emergency conditions. At employee orientation, and on a regular basis, employees should be instructed on procedures to follow when emergency lights are activated.
- Control panels should use lights as well as sound to indicate warnings.
- Encourage employees to have their hearing checked on a regular basis.
- When designing or teaching training programs, include audio aids such as wireless microphones and speakers that project to all areas of the training area. Include handouts or on screen lists of the important points being covered so those employees with hearing problems can follow along using visual clues.

Vision

Static visual acuity is greatest in our early 20's and decreases steadily throughout our adult life. Night time legibility at distance for a 60 year old is only 77% of that of a 25 year old (Haight and Belwal, 2006.) Dynamic acuity, the ability to see moving targets, deteriorates faster than static acuity. Dynamic visual acuity is more closely associated with accident involvement that static acuity. Other abnormalities found in older people that have been correlated with increase vehicular accidents include perception of angular movement; movement in depth and visual field; eye-tracking movement; glare sensitivity; color vision; contrast sensitivity; and the ability to see in dim light (Haight, 2003). Older workers are more susceptible to scene clutter.

Over the age of 40, an individual's vision may change faster than in prior years so that they now need to hold a book or newspaper further away from their eyes to get the correct focal point. This carries into the workplace to the extent that images on computer monitors are no longer clear and crisp. Medical aliments such as cataracts, glaucoma and age related macular degeneration become more prominent as the employee approaches the age of 50. There is also an increase in "dry eyes" as individuals age, especially in those workers who are using computers throughout most of their workday (Anshel, 2006).

In the manufacturing environment, aging workers have difficulties working in the low illumination environment of some factory settings. Those individuals whose job tasks require close tolerance work may have difficulty in seeing contrasting objects or sections of objects.

Several workplace adaptations that employers can make to assist the aging worker would be to:

- Encourage annual eye exams, including screening for potential medical problems such as cataracts, glaucoma and macular degeneration. The aging worker may need to use different glasses for working on computers and reading.
- Train the employees or staff on the basic principles of office ergonomics so that they can make the adjustments to the monitor distances, height and angles from the employees office chairs.
- Encourage employees working at computer to take "micro breaks" every 30 minutes, where they look away from the screen toward an object at least 30 feet away for 30 seconds.
- Use task lighting to increase the illumination for employees doing detailed work.
- The task lighting should be placed to the side or in front of employees to decrease shadows.
- General illumination throughout the workplace should be increased by 50 percent over that which would be deemed "adequate" by younger employees.
- Increase the contrast of stair edges and curbs through the use of paints or striping.
- High illuminance fluorescent fixtures can be used to increase color discrimination.
- Signage should be highly visible and use strong contrasting colors.

Physical Limitations

As individuals age, their physical capabilities decrease over time. Research showed that individuals over the age of 50 tend to exhibit a more conservative reach. They kept their elbows closer to the torso and did not elevate the shoulder as much as a younger worker. This would decrease the reach that the employee would have to pull an object from a bin or adjust a control (Chaffin, et al, 2000).

The decrease in muscle mass and elasticity is greater as we age. This is in addition to the loss of bone mass as well as the reduction in central and peripheral nerve fibers. These changes affect a person's ability to control movement rapidly and accurately. Research found that there is an age related slowing in all facets of movement initiation – including response preparation, selection, programming and complexity. Movement execution was also found to slow with age (Haight, 2003).

This loss of control of postural stability tends to begin after age 50 and is thought to be related to the increase in falls that are more common in older individuals. The decreased muscle elasticity is possibly a cause for the change in gait of older workers where they tend to shuffle instead of lifting their legs as they move. Any slight change in walking surfaces such as a crack or difference of greater than ½ inch in adjacent surfaces presents a potential for a trip to occur and result in serious injury. Falls account for 20% of the fatalities of individuals over the age of 55.

Older worker's decreased muscle elasticity and increased balance problems, which affects an individual's ability to recover balance or lost footing, presents a challenge when working on elevations or ladders.

Physical strength also decreases with age. Industrial performance is commonly limited by the ability to lift heavy objects repeatedly. NIOSH has specified an action limit that is reached when fewer that 75% of women and 99% of men can meet the job requirements safely. However, by the age of 65, the average strength of an individual decreases by 25%. Not only does this decrease in strength relate to lifting ability but also in turning valves hand wheels, dials and knobs. In a 1988 study elderly females were found to have difficulty generating enough torque in water faucet handles of various shapes. It was shown that lever controls are preferred over knobs because twice the amount of torque can be exerted using levers. Taking in account the limitations of older workers is critical when designing control mechanisms. If one cannot operate controls adequately, errors can be expected (Bordett, et al, 1988).

As part of the design process the employer should incorporate the following in the design of the workplace:

- Reduce the amount of reach that is required for employees to use controls, pick parts or other tasks that above waist height.
- Install chain actuators for valve hand wheels, damper levers or other similar control devices. This brings the control manipulation down to ground level.
- Eliminate heavy lifts, elevated work from ladders and long reaches.
- Design work floors and platforms with smooth and solid decking while allowing for some cushioning.
- Install slip resistant material for flooring and especially for stair treads.
- Install shallow angle stairways in place of ladders when space permits and where any elevated access is needed

Cognitive limitations

A large amount of research has been done on the cognitive functioning of older workers. The literature suggests that older workers take longer to make a decision but the quality of the final decision seems to be unaffected by age. The process to come to a decision is increased by the number of variables that are put into the process. For example, when taking a trip, older adults take longer to make decisions about route selections, especially when speed increases. Slower decision making is exacerbated when there is perceived time pressure (Haight, 2003.) Older adults also have difficulty managing or coordinating multiple tasks. The older workers allocate attention differently than younger workers. Some studies have shown that the age related decline in performance is most attributable to the declining ability to manage or coordinate multiple tasks. This is more pronounced when tasks complexity is higher, the tasks are unfamiliar or time demands are short.

Because older adults keep their attention engaged, they exhibit better performance when the situation requires flexibility in response to changing stimuli in the workplace. With experience,

practice and training, it is possible that age related error differences can be reduced (Gilbert, et al., 1996).

Some suggestions for workplace design to eliminate errors in the accommodation of older workers would include:

- Remove clutter from control panels and computer screens.
- Lengthen the time requirements between steps in a task.
- Reduce the need for simultaneous performance of two or more steps in a task.
- Increase the time allowed to make decisions.
- Consider necessary reaction time when assigning older workers to tasks.
- Provide opportunities for practice and time to develop task familiarity.

Conclusion

The silver collared worker brings a lot to the table: judgment, flexibility, experience and creativity. American business should capitalize on these traits and work with improving policies and workplace design to allow the aging worker to continue contributing to businesses in a safe and healthy environment. Include these older workers in the design process. Seek outside professionals for assistance in adapting the work place, training and human resource policies to fit the aging workforce especially those individuals that may want to continue to work on a part-time basis. The basic ergonomic principle of adapting the task to the person is even more critical when we do so with the aging workforce in mind.

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