Ergonomics: An ounce of prevention

By Teri R. Switzer

A step-by-step program you can use in your library

Over the past ten years offices have successfully made the transition from typewriters, filing cabinets, and single phone lines to fax machines and personal computers complete with multiple programs that perform many functions. While technology has made the workplace more efficient, many offices are noticing an increase in workers' compensation claims and employee absenteeism due to physical therapy, surgery and recuperation, and doctor's appointments. In short, what should be a streamlined workflow has become one plagued by the diseases of the '90s, cumulative trauma disorders such as repetitive stress injuries.

The Occupational Safety and Health Association (OSHA) has been working on establishing general ergonomic standards since 1991.[1] As Secretary of Labor Elizabeth Dole testified in 1990, "Repetitive motion illnesses can be minimized through proper workplace engineering and job design and by effective employee training and education."[2] In concert with Secretary Dole's comments, Robert C. Gombar, chief legal counsel for the OSHA Review Commission, advises organizations to be proactive and develop an ergonomics program.[3] This is exactly the stance that Colorado State University (CSU) Libraries has taken. Realizing that prevention is the best technique for treatment of repetitive stress injuries, the University Libraries committed itself to an intense five-year ergonomics program. During that time, both the administration and the staff became integral pieces of the success of the program. Following their lead, any academic library can develop a cost-effective ergonomics program by using the following six steps as a model.

Develop a statement of responsibility

A statement of ergonomic responsibility should list the responsibilities of the library administration, the library's personnel office, the department/unit heads, the systems office, and the employees. Using an ergonomic statement of responsibility issued by Michigan State University Libraries as a guide, the CSU Libraries wrote its own which addresses ergonomic issues that are pertinent to the libraries. While wording will vary from institution to institution, the premise will remain the same, that of detailing each person's responsibility to his/her own ergonomic safety.

Compile a packet of information

The words "each" and "worker" are key terms. Who are your workers? Most libraries not only have permanent staff, they may also have hourly employees and volunteers. No one should be overlooked. While some may be at greater risk than others, all workers are at risk to some degree. If prevention is aimed at the whole, treatment will be aimed at only a fraction.

What should be included in the information packet? Cornell University Libraries has put together a folder consisting of articles on repetitive motion injuries and stretching exercises to do either at the terminal or in the workplace. The University of Missouri-Columbia Libraries distributes booklets on topics such as preventing repetitive strain—commercially published by Krames Communications—to each of its staff. The packet distributed by the CSU Libraries is a combination of these two examples and includes the statement of ergonomic responsibility. Regardless of the contents of your hand-

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book, stress the importance of reading the material. Schedule small group meetings to review the materials and ensure that staff know the basics of ergonomics and the various cumulative trauma disorders. This also gives the staff an opportunity to ask questions about the materials they have been given and the program plan. Encourage staff to become willing participants in the program. Not only is it for the benefit of the library to have injury-free and productive staff but it's also for the benefit of each individual staff member.

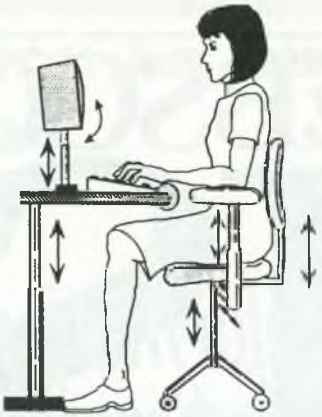

Figure 1. An adjustable workstation is essential in reducing stress injuries.[4]

Ergonomically evaluate each employee

The initial part of the CSU Libraries' five-year ergonomics program was to provide an ergonomics evaluation of each permanent employee and his/her workstation and work area. Each year approximately one-fifth of the staff were reviewed by one of the university's physical therapists who specializes in ergonomics. In addition to the individual reviews, some problem work areas such as the discharge station and the circulation desk were videotaped and analyzed by the ergonomics specialist. While work flow had to be redesigned and some special equipment purchased, these modifications were easily and inexpensively accommodated.

Use ergonomically correct equipment

As part of an ergonomics evaluation of both individuals and workflow/work areas, recommendations regarding the type of ergonomically correct office equipment that is needed are usually made. If this is not done by the specialist, a good resource to check is the *American National Standard for Human Factors Engineering of Visual Display Terminal Workstations,* published by the Human Factors Society. Many office consultant companies are also versed in this area and can give information about several models of ergonomically correct chairs, desks, and computers.

In choosing ergonomically correct furniture it is necessary to consider each employee's duties and body size.[5] Because employees are mobile, it is more cost-effective if all equipment is adjustable, including desks and/or computer workstations (see Figure 1). The placement of equipment is as important as the equipment itself. The general rule of thumb for placement of a computer workstation is to place the monitor screen between 18 and 30 inches from the eyes and the keyboard approximately 23–30 inches from the floor. It may be necessary to lower the monitor for those who wear bifocal lenses. Incorrect positioning of the monitor affects the posture of the operator; if a monitor screen is too low, the operator will slouch. This can produce aching shoulders, back, and neck.

Lighting is an area that is often overlooked when equipping an office. Workstation lighting should provide a 10:3 ratio, meaning screen characters should be 10 times brighter than the monitor background and the room lighting should be three times brighter than the monitor background.[6] Traditional office lighting consisting of fluorescent lights and desk lamps is not the best for offices with computers. Instead, fixtures which illuminate with a downward distribution of light not exceeding 45 to the vertical and either built in louvers or baffles or curved mirrors are more suitable. It also is recommended that most workstations should have an adjustable shaded lamp and any overhead lighting should be equipped with baffles.[7] Glare (also referred to as reflection) can be a product of light from a window or from artificial lighting. A monitor facing a window will receive reflected glare and a window facing the computer operator will produce a direct glare. Glare on monitor screens is annoying and, over a period of time, can cause eye strain and fatigue. To lessen both glare and reflection, position the computer at a right angle to the window. If glare is still present, inexpensive "blinders" can be purchased to fit on the monitor. Shades, blinds, or curtains can also reduce glare from a window.

Radiation and electromagnetic fields have been a concern to ergonomists for the past few years. While most studies take the position that x-ray emissions from late-model personal com-

puters are within accepted safety standard limits, there are still factions that believe the opposite.[8] Nonetheless, in group office areas it is becoming more common to see computer monitors separated by room dividers or screens.

Provide continuous training

Ergonomic training should not be done once and then forgotten. The most expensive and best ergonomic equipment cannot take the place of training. Staff need instructions on how to adjust their chairs and other equipment, how to pick up books, how to lift and carry objects, and what to do if an injury occurs. Even though handouts and ergonomic tips published in the in-house newsletter are effective, they don't take the place of a semiannual "refresher" workshop. While it would be nice if this could be conducted by an ergonomic specialist, many budgets don't allow this type of expense. Instead, the library's personnel office or a committee of library staff could be formed to take on some of the ergonomics and wellness issues. Such a committee was formed at CSU Libraries in 1992; the Libraries Ergonomics and Wellness Committee has the fundamental charge of addressing wellness issues through noontime brown-bag programs and promoting other campus wellness initiatives. It is planned to provide the committee with training in basic ergonomic issues such as recommended placement of computer terminals and exercises to do while at the terminal or work area.

Forming a committee to address ergonomic issues serves a twofold purpose. It not only allows the library to provide "refresher" workshops on ergonomics, but also gives a sense of "ownership" or buying into the ergonomic program by the staff. Even though the administration must be in favor of an ergonomics program, the success depends on staff acceptance.

Reevaluate the program regularly

Just as the most expensive ergonomic chair won't keep cumulative trauma disorders from occurring, neither will having an ergonomics program. As issues change, staff change, job duties change, and workflow changes, so must the program itself. When new issues arise, administrators must respond. As a follow-up to the ergonomics program instituted at CSU Libraries, a survey was sent to the employees who had been evaluated. The survey asked questions such as what equipment was furnished and has the individual experienced a cumulative trauma disorder since the program had been in effect. More than 75% of the surveys were returned. Of these, 99% of the respondents regularly adjust their workstation/desk chairs and other office equipment to fit their personal needs. While this reflects a positive outcome, the most encouraging statistic is that only .03% of the respondents have had a cumulative trauma disorder since being ergonomically evaluated. Prior to the initiation of the program, one staff member found it necessary to receive disability retirement due to a repetitive stress injury. The survey also made it apparent that all staff now using a pointing device such as a mouse are beginning to be concerned about potential problems with their arms and shoulders as a result of constant reaching for their mouse. That has prompted us to hold a special workshop on proper placement of pointing devices (a mouse, wand, or joystick).

Conclusion

As job duties change and staff spend more hours at computer terminals, the emphasis on ergonomics must be made. To be effective, an ergonomics program needs to be simple to understand and follow and must be accepted by the staff. Creating a sense of "ownership" and helping staff realize that their well-being is important are key elements to a successful program. With soaring costs of health care and workers' compensation insurance, prevention becomes an important management tool.

Notes

1. "Ergonomics: Guidelines Out, Regulations Coming," *Occupational Hazards* 52 (November 1990): 13.

2. Ibid.

3. "An Ergonomics Standard," *Occupational Hazards* 52 (June 1990): 11.

4. Diagram first printed in *A National Strategy for Occupational Musculoskeletal Injuries: Implementation Issues and Research Needs* (U.S. Dept. of Health and Human Services, 1992).

5. Kathleen A Rickert, "Ergonomics in the Office," *Risk Management* 39 (August 1992): 19.

6. *VDT's and Vision: A User's Guide to Relieving Eyestrain, Headache and Visual Stress* (Optometric Extension Program Foundation pamphlet, 1983).

7. Etienne Grandjean, *Ergonomics in Computerized Offices* (Philadelphia: Taylor and Francis, 1987), p. 53.

8. Ibid., p. 195. ■