Section 27: ERGONOMICS AND BODY MECHANICS

INTRODUCTION

Ergonomics is the scientific study of human work. A goal of ergonomics is to reduce work-related musculoskeletal disorders by adapting the work to fit the person, instead of forcing the person to adapt to the work. This can involve desks, chairs, and computer terminals in offices; vehicles; tools and equipment; and other aspects of work.

Body mechanics involves positioning, posture, and movement. Body mechanics is important in strenuous activities such as lifting, hammering, shoveling, and climbing, as well as in less-active office work.

Musculoskeletal disorders are illnesses or injuries that affect one or more parts of the musculoskeletal system. They are also known as cumulative trauma disorders, repetitive trauma disorders, repetitive strain injuries, or repetitive motion disorders. Prevention of these injuries is possible through use of good ergonomics and body mechanics.

APPLICABILITY

This program applies to all King County employees, regardless of their job duties. The Safety and Claims Management office provides no-cost ergonomics training, body mechanics training, and individual ergonomics consultations. Jobs involving awkward postures; high hand force; highly repetitive motion; repeated impact; heavy, frequent, or awkward lifting; or vibration should be evaluated for feasible modifications.

Individual workstation or job evaluations may be requested for employees by Claims Officers, managers, or the employees themselves. If work-related musculoskeletal disorders (repetitive motion injuries) have occurred in a work area, it is especially important to have the area evaluated to determine if changes can be made to prevent future injuries. Training and workstation or job evaluations are available by submitting a request online at: https://kc1.sharepoint.com/sites/HRD/Pages/Ergonomic-Evaluation-Request.aspx

When offices are moved or remodeled, it is important to incorporate ergonomics into the design. Safety and Claims provides free ergonomic design consultation services for remodel and new building projects, on request. Safety and Health Professionals work in conjunction with Project Managers in the Facilities Management Division to design ergonomic workstations that can be adjusted to different users.

RESPONSIBILITIES

Managers and supervisors are responsible for:

- Recognizing potential ergonomic issues and requesting assistance
- Referring employees with musculoskeletal injuries to the Safety and Claims Management Office
- Enlisting the assistance of the Safety and Claims Management Office when re-locating or remodeling offices

Employees are responsible for:

- Recognizing the symptoms of possible musculoskeletal disorders and seeking medical assistance and advice from the Safety and Claims Management Office.
- Following body mechanics and ergonomics advice to reduce musculoskeletal symptoms

Safety and Health Professionals are responsible for:

- Responding to requests for assistance by providing job and workstation ergonomic evaluations
- Providing written recommendations for body mechanics and ergonomic improvements

FIELD ERGONOMICS

There is much potential for ergonomic and body mechanics hazards in field jobs. In particular, work that involves awkward postures; high hand force; highly repetitive motion; repeated impact; heavy, frequent, or awkward lifting; or vibration should be evaluated to determine if changes can be made to improve ergonomics or body mechanics. If one or more employee in the work group experiences musculoskeletal injuries from the work an ergonomic evaluation should be requested by the supervisor, the employee, or the Claims Officer.

Factors to consider in field ergonomics are workspace layout; work surfaces; walking and standing surfaces; materials handling/movement; static or awkward postures; tool size, weight, and balance; handle size and position; power control; and controls and displays. These factors need to be evaluated on a case-by-case basis to determine proper modifications and alternatives.

LIFTING AND MOVING MATERIALS

Work may require lifting and moving materials from one location to another. Improper lifting techniques and overexertion can cause sprains, strains and other injuries to the body. Sprains and strains of the back are the most common injury. Employees who are required to lift, carry, push, or pull items weighing over 20 pounds should receive training on proper lifting techniques to help reduce the risk of injury. Staying in good physical condition will help employees

reduce the chance of soreness, stiffness, and injury, and will help speed recovery if they do have an injury. The Safety and Claims Management office provides lifting and back care training to help employees lift and move using proper body mechanics. Call 206-477-3371 or 206-477-3370 for more information on this training class.

In general, remember to:

- Never attempt to move any item by yourself if the size and/or weight is beyond your capabilities. Instead, you should use mechanical assistance or get help from a co-worker.

- Think and plan before you attempt to move any item, even if it looks like a routine task.

- Use the proper method to make the lift and move, bending from your hips and keeping your back in alignment, keeping knees bent, and lifting with your leg muscles.

- Move your feet to turn, rather than twisting your torso. Haste and improper lifting methods can result in a life-altering injury.

OFFICE ERGONOMICS

An ergonomic office workstation may include various components, depending on the employee's needs. Major factors include computer keyboard height, mouse position, monitor height, and chair height and positioning. In some cases adjustments to the existing workstation can be made without buying new equipment, or by buying relatively inexpensive wrist rests and document holders. Sometimes a new chair or a computer table is required. Properly fitted workstations should be considered required equipment, especially for people who work at their computers or desks all day long.

Keyboard and Mouse

The computer keyboard should be positioned directly in front of the user, at approximately waist level or slightly lower. Elbows should be kept close to the body, and shoulders and arms should be relaxed. Wrists should be neutral, or flat, and should not be bent to either side. Split keyboards, also known as “ergonomic” keyboards, may help some people keep their hands in a neutral position, especially those with wide shoulders or a wide arm stance. Keyboards with a built-in pointing device are helpful in keeping the arms close to the body. Mouse alternatives such as trackballs or touchpads may help relieve hand and wrist discomfort. The mouse should be placed close to the keyboard at a height that allows for a neutral wrist. Raising the mouse with a book under the mouse pad can improve the wrist angle during mouse use. The elbow should be

supported with the chair armrest when using the mouse or trackball. Varying the fingers used to click the mouse, and using the mouse on the left side of the keyboard can help reduce repetitive motions.

Keyboard Holders

Desktops are often too high for users to position their arms properly. Adjustable keyboard holders may be installed by removing the center desk drawer, or under an open desk or table area. A keyboard holder should be both height adjustable and angle adjustable. The keyboard holder should be at least 11 inches deep by 26 inches wide, and include space or an attachment for a mouse or trackball. The keyboard holder should include a built-in padded wrist rest.

Wrist Rests

Most computer users should use a padded wrist rest to keep their wrists in a neutral position. Wrist rests are available for keyboards, mice, notebook computers, and adding machines. The wrist rest provides support between keystrokes, preventing overextension of the wrists. The wrist rest should be soft and well-padded, and should be the same height as the keyboard space bar. The wrists should not be planted on the wrist rest while typing - they should "float" just above the wrist rest and rest only occasionally.

Monitor

Monitors are typically height-adjustable, so monitor risers are not required. The top of the monitor should be at or slightly below the user's eye level. The user should check while working to ensure the head is positioned looking just slightly downward. The ideal position for the monitor is directly in front of the keyboard. Dual monitors can be centered in front of the keyboard. Tipping the bottom of the monitor up slightly will make it easier to see the bottom of the screen, and will help keep the head in proper position. A document holder positioned either between the keyboard and monitor(s) or next to a monitor should be used to hold paperwork.

Chairs

The chair should have a five-star base and pneumatic lift for height adjustment. It is important for users to sit with feet firmly on the floor. This will provide support and reduce back discomfort.

The seat should have a contoured surface, with a downward curve to the front edge. The seat pan should end about one to two inches behind the user's knees. A seat pan that adjusts horizontally can provide variable seat pan depth for multiple users. The seat pan should have adjustable tilt. A slight forward tilt to the seat pan reduces pressure on the thighs, helps maintain a good lumbar

curve, and helps keep the feet firmly on the floor.

The chair back should have an outward curve near the base to provide lumbar (low back) support. The lumbar support should be positioned so that it is waist height for the user. The chair back should adjust up and down so that the lumbar support can be individually fit to the user. The chair back angle should be adjustable to provide support in several positions. High chair backs can be beneficial for individuals with upper back or neck pain.

Adjustable armrests are recommended, especially for individuals who have shoulder or upper back pain. Armrests should adjust for both height and width to provide the proper support. Some armrests rotate as well. Shorter armrests will be less restrictive to the user, while still providing the necessary support. Individuals should not lean too heavily on their arms, as this can gradually result in injury. Armrests should be padded, and may be used while typing if the arms can be kept close to the body while on the armrest, or if a split keyboard is used. The mousing arm should rest on the armrest while using the mouse.

Generally, the individual who will be using the chair should choose it. If this is not possible, then fully-adjustable chairs will be more likely to fit more users. Fully-adjustable chairs should be provided for all multiple-user workstations. This means seats, backs and armrests must be adjustable as described above. Chairs should be sturdy and able to accommodate larger individuals without breaking down.

Computer Desks

If separate workstations for computers are purchased, the keyboard and mouse area should be height adjustable. If the workstation is shared by two or more users, monitor height and keyboard/mouse height should be easily adjustable for each user. A workstation at least 36 inches wide is recommended to accommodate the monitor, paperwork, keyboard, and mouse. The keyboard area should be at least 11 inches deep by 26 inches wide to hold various keyboard and mouse combinations. Rounded desk edges are preferable to reduce nerve compression in the wrists and arms.

Sit/stand workstations are becoming more common, as many employees prefer to stand for at least part of the day. There are various ways to modify a desk to a sit/stand workstation, including pneumatic lifts, electric lifts, and desktop monitor and keyboard holder devices. Safety and Health Professionals can provide assistance in determining sit/stand options.

Modular Workstations

Modular workstations (wall-hung or panel-hung) are recommended for their adaptability and height-adjustability. An L-shaped or U-shaped workstation is

good for computer and paperwork tasks. Drawer pedestals should be located at the ends of the workstation so they do not impede leg movement. The basic pedestal should be 26 inches high or less, and should be mobile or hanging to allow for maximum height adjustability of the desktop. A pencil/box/file pedestal configuration works well for all workstation heights. Edges of the desktop should be rounded.

Telephones

If the telephone is used while writing or working on the computer, a telephone headset may be appropriate, especially if neck pain is a problem. Cordless telephone headsets are available for users who need to move away from the desk frequently. Another alternative is to use a speaker phone (if in a private office). Neck rests that attach to the back of the handset are less desirable, since they do not eliminate the neck-to-shoulder position, but they can help if the telephone is not used frequently.

Lifting/Reaching/Filing

Notebooks, reference materials, and other often-used information should be kept close at hand, and books should be pulled close to the body before lifting. Lifting with an outstretched arm can cause stress on the elbow, shoulder, and back. Standing up to lift items is another way to get close to the item. The whole body should be used when pulling files, to place less stress on the arms. The arms should be positioned close to the body, and the body is used to pull the file. This is especially important with tight files.

Task Breaks

Task breaks should be taken at least every half hour. This may include getting up to walk to the printer, making copies, or doing other work. Positions should be changed frequently, and short stretch breaks should be taken often.

Other Equipment

Equipment such as keyboards with integrated pointing devices, document holders, height-adjustable monitor arms, and slant boards may also be desirable. Additional equipment information, specific examples of and sources for appropriate equipment, and individual workstation evaluations are available by calling the Safety and Claims Management office at 206-477-3350.