



California State University
Dominguez Hills

ERGONOMICS PROGRAM

*A Practical Description of the
Practices and Guidelines
Used by CSUDH to Administer the
Campus Ergonomic Issues of
Both Industrial and Office Classifications*

MAY 2010

This Written Plan Is Dedicated to the
Prevention of Ergonomic
Occupational Injuries and Illnesses
at California State University,
Dominguez Hills

and Is Established to Meet
Regulatory Compliance With
California Code of Regulations,
Title 8, §5110

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1.0 PURPOSE

Ergonomics is the study of the relationship between people (workers), their work tasks and their physical work environment.

The purpose of the CSUDH Ergonomics Program is to improve employee well-being through the reduction of workplace discomfort and the identification and control of ergonomic hazards that may result in personal occupational injuries or illnesses. This program is focused to be in compliance with CCR Title 8 §5110 and CSUDH policy and procedures. The program consists of the following elements:

- · Worksite analysis/assessment
- · Hazard prevention and control
- · Training and education
- · Medical management

This program is managed through a combination of ergonomic control strategies to include, but not limited to the following:

- Assessment for and the reduction of cumulative trauma risk factors
 - Involvement of administrators, supervisors and personnel in ergonomic planning
 - Claims management as it is related to workplace cumulative trauma injuries
 - Full evaluation of ergonomic interventions
 - Resource identification to maintain knowledge of trends and effective work practices pertaining to ergonomics
 - Actively support the dynamic nature of the program, recognizing new hazards, newly developed products and research findings to assist in guiding further planning and interventions for the Ergonomics Program
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2.0 DEFINITIONS

2.1 Controls

Any action used to minimize and/or eliminate risk. Controls can be classified into the following types:

- Engineering Controls – actual physical changes made to the workstation, equipment, materials or facilities that usually results in the elimination of a hazard(s) as a result of the change implemented.
- Administrative Controls– interventions aimed at reducing exposure to hazards without actual physical changes being made to the workstation and/or equipment. Types of administrative controls can be:
 - Job rotation
 - Rest breaks
 - Job enlargement
 - Limits on work hours
 - Cross-training
 - Staffing level changes
- Personal Protective Equipment–generally thought to be the least effective of the three types of controls; involves the proper use of protective devices (gloves, supports, pads) to assist in attempting to decrease the risk of exposure to the hazard.

2.2 Cumulative Trauma Disorders (CTDs)

The term for health disorders arising from repeated biomechanical stress on the body due to ergonomic hazards. CTDs are disorders of the muscles, tendons, and/or nerves that develop from or are aggravated by exertions or movement of the body of a repetitious nature. CTDs are also referred to as repetitive motion injuries,

repetitive strain injuries, repetitive trauma disorders, and overuse injuries.

2.3 Ergonomics

The field which is involved in conducting research regarding human characteristics and applying that information to the design or operation of products or systems for optimizing human performance, health, and safety (also known as human factors engineering). It is essentially fitting the job elements and equipment to the person to enhance human performance.

2.4 Ergonomic Hazards

Workplace conditions that pose a biomechanical stress to the worker. Such hazardous workplace conditions include, but are not limited to, faulty workstation layout, improper work methods, improper tools, and job design problems that include aspects of workflow, speed, posture, force requirements, and work/rest cycles. They are also referred to as "stressors".

2.5 Personal Protective Equipment (PPE)

Clothes, padding, gloves devices equipment, or other items worn on or attached to the body and used for the purpose of controlling CTD risk. This form of hazard control is the least effective method to control risk.

Note: Splints or wrist braces not considered to be PPE.

2.6 Repetitive Motion

Means to perform the same motion continuously that can be classified as a hazard to the worker(s).

2.7 Worksite Analysis

The breaking down of the complete working environment into components including personnel, workstation, workplace layout, equipment, supplies, and procedures for the purpose of identifying possible hazards and developing solutions for eliminating or controlling these hazards.

3.0 RESPONSIBILITIES

3.1 Managers

- Actively participate and support the ergonomic program.
- Provide adequate funding and time for ergonomic activities such as training, workstation assessments, participation in ergonomic training, and implementation of control measures, workplace modifications, and ergonomic equipment.
- Authorize assessment of the workstation if hazards are suspected
- Organize a communications system that effectively promotes the use of good ergonomic procedures and performance measurements.
- Coordinate with RM/EHOS to implement corrective actions, when necessary.

3.2 Employees

- Participate in ergonomic training.
- Notify department supervisors and/or managers of their reasonable needs to improve their workstation.
- Use equipment correctly.
- Promote a “safety culture” by using proper working techniques.
- Cooperate with the department managers, supervisors, or RM/EHOS to identify symptoms of Cumulative Trauma Disorder (CTD) and other ergonomically related concerns and reporting of recommendations for corrective actions.
- Report early signs and symptoms of work-related CTDs to your supervisor.

3.3 Risk Management / Environmental Health & Occupational Safety (RM/EHOS)

- Coordinate the ergonomics program to reduce cumulative trauma injuries at CSUDH.

- Provide guidance on modifying the workplace to minimize the potential for injuries and illnesses.
- Provide ergonomics training for employees, supervisors, and managers.
- Analyze and report trends in injury or incidence rates, and injury severity.
- Evaluate individual and departmental workstations.
- Provide assistance and advice on the selection of ergonomically sound furniture and equipment.
- Coordinate pre-employment physical for individuals in Hazard Classification groups.

3.4 Physical Plant

- Integrate ergonomic considerations into work space planning, workstation design, and building modifications in conjunction with RM/EHOS. Design for optimal environmental factors such as temperature, noise, vibration, and lighting during facility planning.

4.0 HAZARD CLASSIFICATION

4.1 **Group A**

Group A hazard classification consists of job functions which normally utilize computer terminals, telephone use, business machines, use of power tools and/or vibrating machinery in excess of six hours per day.

4.2 **Group B**

Group B hazard classification consists of job functions which result in job functions, as described in Group A, usage three to five hours per day.

4.3 **Group C**

Group C hazard classification consists of job functions which result in non-routine job functions (out of their normal job tasks) for a limited time. These non-routine job tasks may present a very definite hazard to the worker due to inherent nature of the task being performed and/or the type of equipment being used.

5.0 EXPOSURES

5.1 Awkward Postures –

Reaching, twisting, bending, working overhead, pinch grips, holding of fixed positions, squatting, kneeling

5.2 Repetitive Motions –

Same types of motions performed over and over again using the same muscles, tendons, and joints (typing data entry, transposing, exercise, hobbies, etc.)

5.3 Forceful Exertions –

Amount of muscular effort expended to perform work, load shape, grip type, effort required, length of time of the continuous force, number of times load is handled per hour, body posture.

5.4 Pressure Points –

Sides of fingers, palms, wrists, forearms, elbows, knees (i.e. resting forearms or wrists against sharp edges on a desk or work table)

5.5 Vibration –

Motion, from minimal to excessive, caused usually as a result of an operating motor, tool such as sanders, grinders, chippers, routers, drills, saws, etc.

6.0 PREVENTION

Prevention is the key to reduce or eliminate the risk of developing a cumulative trauma disorder. Prevention includes the use of good body mechanics, good ergonomic design (engineering controls), and the use of administrative controls. Early intervention makes a difference for employees who experience symptoms such as pain, numbness, tingling, or tenderness in the fingers, hands, arms, or muscle pain in the back, shoulders, or other parts of the body from lifting or other body motions. It is important for employees to report early signs and symptoms of work-related CTDs to their manager and/or supervisor and to follow up with RM/EHOS for evaluation.

6.1 Good Body Posture

Using good body posture is important for minimizing the risk of developing a CTD. Equipment, tools, and furniture are an important part of the work environment. Since frequent use of these items does have a significant impact on job performance and overall health, good body posture is essential when equipment, tools, and furniture are used.

Note: This topic is covered in more detail in the Office Ergonomics and Industrial Ergonomics sections later in this program.

6.2 Engineering Controls

Engineering control measures should be addressed as the first line of defense to eliminate or reduce ergonomic hazards that employees are exposed to. It is important to design out the problem when this approach is feasible.

6.3 Administrative Controls

- Job enlargement: Have employees perform more parts of a job rather than one specific task repeatedly.
- Job rotation: Cross-train employees to perform other jobs. Rotate employees in jobs that use different muscle groups, if possible.
- Work breaks: Have employees take frequent short breaks from repetitive tasks throughout the day.
- Training: Training provides information for mitigating ergonomic hazards, strategies to improve a workstation layout, and stress-reduction exercises.

7.0 OFFICE ERGONOMICS

7.1 Funding of Ergonomic Equipment Purchases

The ergonomic equipment recommended as a result of an ergonomic assessment conducted by the RM / EHOS department staff can only be purchased with the approval of the department where the equipment will be used and with the approval of the RM / EHOS department. This equipment purchase will be shared between both departments on a 50% per department basis. The equipment that falls into this category will be as described in items 7.4 – 7.11.

7.2 Purchase Justification

Ergonomic equipment, both industrial and clerical, inherently due to technical advancements and engineering costs, is more often than not, expensive. It is for this reason that this type of equipment will not be purchased without complete management evaluation and full ergonomic assessment justification. Ergonomic equipment will not be replaced / purchased for any of the following rationales:

- Decorative reasons such as style or color
- Functional equipment will not be replaced due to age of the equipment
- Other department work stations have replaced equipment

7.3 Workstation Assessment

The purpose of the workstation assessment is to ensure computer users are using proper ergonomic practices at their workstation or when a computer user is experiencing some type of biomechanical stress. The assessment can help management and RM/EHOS determine which workstations and individuals should be targeted for further evaluation or additional ergonomic needs. Workstation assessments can be requested at any time, but the assessment must

be authorized by a staff person at the director level or higher. The assessment will take place only after ergonomic training has been completed (online or classroom).

The following guidelines are intended to help computer users understand and reduce health risks associated with computer workstations. Since no two bodies are identical, different styles, models and sizes of furniture and accessories may be needed. A "VDT/PC Workstation Assessment Survey" has been created to assess each individual VDT workstation (See Attachment 1). The workstation assessment will be conducted with the computer user at his or her workstation in conjunction with the ergonomic guidelines listed below.

During the workstation assessment, equipment adjustments (monitor height, keyboard, chair, etc.) with the computer user will be made at that time. RM/EHOS will provide guides and review proper workstation set up during the assessment. Any recommendations following the assessment will be forwarded to the department director and/or manager for further corrective actions. General guidelines for setting up a VDT workstation are listed below.

7.4 Placement Zones

The placement zone is the area in which an employee performs most routine tasks, whether repetitive movements (e.g., typing at a keyboard) or less frequent movements (e.g., lifting). Work should be arranged to be within easy reach and usual work located within 30.5 cm (12 inches) of the operator. Frequently used materials should be located within arm's distance from the operator (45.75 cm or 18 inches at the maximum). Such an arrangement reduces potential stress to the back, shoulders, and arms by avoiding awkward postures and

positions. Attachment 2 depicts the “ideal” or ergonomically correct work posture.

7.5 Wrist Rests/Pads

- When resting use a wrist rest for support to help maintain a neutral wrist.
- Use a wrist rest for cushioning to protect the wrist from resting on a hard or sharp work surface.

7.6 Chairs

Some of the key items to consider in an ergonomic chair are:

- Use a chair that is stable, mobile, swivels, and allows for operator movement.
- Use a chair that provides proper lower back support. The back support should be easy to adjust backward, forward, up, and down. A properly adjusted chair is important to help reduce or prevent stress on the back.
- Use a chair that has an adjustable seat height. Raise or lower the chair to a comfortable height such that the thighs are parallel to the floor and the knees are at a 90 – 110 degree angle. Rest the feet flat on the floor or use a footrest.
- Use the armrests if they allow maintaining elbows at a 90 – 100 degree angle. If the armrests obstruct sitting posture, then adjust the armrests, or get a chair that allows proper posture, or use a chair without armrests.

7.7 Work Surfaces

- Adjust the work surface so that the keyboard is at the correct height to maintain proper posture (i.e., elbows at keyboard height with the forearms parallel to the floor). If possible, use a split-level design table

that has an adjustable top height: the lower level for keyboard and mouse or trackball, and the upper level for the VDT monitor. The height of each level should adjust separately.

- Use a table large enough to hold the keyboard, monitor, wrist rest, mouse or trackball, and a document holder for all necessary documents.
- Keep adequate clearance under the table for leg length, knee height, and thighs.

7.8 VDT Monitors

- Position the VDT monitor directly in front of you.
- Position the VDT at a comfortable viewing distance from the eyes, typically arm's distance (18-24 inches, but may vary due to monitor size and corrective lenses); the proper viewing height should reflect the top of the display screen at 2" to 3" above the users eye level height; and the viewing angle should be approximately 15-30 degrees below the horizontal line of sight.
- Use a VDT monitor that tilts and rotates.
- Use a VDT monitor that has adjustable contrast and brightness. Adjust the contrast to a high level and the brightness to a low level to minimize or prevent eyestrain.
- Keep the display screen or glare shield clean because dust reduces character clarity and reflects light.
- Adjust the tilt of the monitor to minimize glare and reflections from overhead lights, windows, etc. or use anti-glare screens.

7.9 Keyboards

- Use a keyboard that is detached from the VDT monitor.
- Position the keyboard directly in front of you.
- Position the keyboard approximately at elbow height.

- Adjust the keyboard angle to a comfortable position; a slight negative angle should exist for the keyboard placement to allow for maximum comfort and neutral positioning of the user's hands on the keyboard. The control to adjust the angle is located at the rear of the keyboard.
- Hands should glide over the keys. Use a light touch for typing, keeping the hands and fingers relaxed.

7.10 Other Input Devices

- When using a mouse, trackball, or special keypads, place the wrist in a neutral position.
- When using a mouse, trackball, or special keypads, rest the arm and hand close to the body and at a natural elevation - not reaching forward or raising the shoulder.
- Locate the input device adjacent to the keyboard so it can be accessed without stretching or leaning over to one side.
- Use the whole arm to move the input device instead of just the wrist.
- If the arm is resting on the table edge (hard work surface) when using the mouse or trackball, then use a mouse pad rest to provide cushion.

7.11 Document Holders

- Use a document holder that has an adjustable height.
- Use a document holder large enough to support the documents the operator uses.
- Position the document holder beside and parallel to the display screen.
- Position the document holder at the same height and distance as the display screen. Such positioning minimizes the amount the operator has to turn his/her head to look from the document to the display screen and reduces eye muscle fatigue by maintaining the same focal distance.

- Document holders that rest under the monitor and have an angled platform in line with the screen and operator are also acceptable.

7.12 Footrests

A footrest may be necessary if the operator cannot rest his/her feet comfortably on the floor.

- Use a footrest that has an adjustable height and heel stop.
- Use a footrest that is large enough to allow for operator movement.

7.13 Eyewear

The VDT operator should have eye check-ups on a regular basis. Some VDT operators who wear corrective lenses/contacts should wear lenses designed specifically for VDT use.

7.14 Printers

- Use a low noise printer. Otherwise, enclose the printer in a noise-proof box.
- Locate the paper supply where the operator can easily reach it.

7.15 Exercises

- For the eyes, look away from the work to a distant point at least every hour.
- For the body, stretch the neck, shoulders, back, legs, arms, and fingers at least twice a day. Stand up and walk around often to increase blood flow circulation

8.0 INDUSTRIAL ERGONOMICS

When ergonomics is applied at an industrial work area (e.g., work shops, labs, and equipment repair areas) it is referred to as "Industrial Ergonomics." It can encompass all other workstations except VDT workstations. The CTD risk factors are still relevant, only the setting is different. As mentioned previously, good body posture should always be employed to minimize muscle tension and body strain.

8.1 Manual Material Handling

Manual material handling involves sitting, lifting, lowering, and carrying objects; it may also involve getting up and down from a standing position. All of these movements involve using the back. To avoid the risk of developing back problems, ergonomic principles should be applied while using the back. If ergonomics is ignored, daily stresses on the muscles, joints, and disks in the back can eventually cause a CTD in the back. For objects that are too heavy or bulky for safe manual handling by employees, mechanical lifting devices must be used for lifting and moving.

*Note: Although There Is No Legal Maximum
Weight Limits For Objects Lifted By Employees.
The National Institute For Occupational Safety (Niosh)
Recommends A 25 Lbs. Maximum Weight Limit
For Lifting Compact Objects.*

To minimize the risk of developing a CTD in the back, employees should follow these guidelines:

- Keep the back/torso erect with the natural curve of the spine intact.
- Keep the load close to the body.
- Lift and carry a heavy load with two hands instead of one.
- Lift loads at about waist height.
- Bend at the knees to lift objects, not the back.
- Store loads above knee heights, but below shoulder height.

- Stay in good physical condition.
- Use a chair that supports the weight of the upper body when sitting for long periods. Adequate low back support should also be provided to retain the natural curve of the spine.
- Avoid bending forward or backward or twisting while lifting or carrying the load.
- Do not lean forward, backward, or to either side without support.
- Avoid lifting, pushing, or pulling a load that is too heavy. Always get assistance when needed. The maximum weight of the load that can be handled will vary for each employee.

To prevent back injuries:

- Avoid lifting, bending, or reaching whenever you can. Use a cart, dolly, cranes, hoists, lift tables, and other lift-assisting devices.
- Place objects off the floor, ideally between you knees and chest (i.e. waist high).
- Test the weight of an object before lifting by picking up a corner.
- Get help if it's too heavy for you to lift it alone.
- When lifting an object:
 1. Take a balanced stance, feet shoulder width apart.



2. Squat down to lift, get as close as you can to the object
3. Get secure footing and a good grip, and then hug the load.



4. Lift gradually using your legs, keeping the load close to you and keeping the back and neck straight.



5. Once standing, change directions by pointing your feet and turn you whole body. Avoid twisting at the waist.



6. To put a load down, use these guidelines in reverse.

8.2 Hand Tools

Improper hand tool selection or improper use of tools can cause CTDs. Hand tools should fit the employee's hand; employees with small hands or who are left-handed may need tools designed specifically for these situations. Hand and wrist posture are important because they affect how much force the muscles must produce to hold objects. When selecting and purchasing hand tools, these guidelines should be followed:

- Select tools that allow the wrist to be held straight and that minimize twisting of the arm and wrist. Good working posture can be maintained when properly designed tools are used.
- Select tools that allow the operator to use a power grip, not a pinch grip. Minimal muscle force is required to hold objects in a power grip posture. The pinch grip requires excessive fingertip pressure, and can lead to a CTD.
- Avoid tools that put excessive pressure on any one spot of the hand (i.e., sides of fingers, palm of the hand).
- For power or pneumatic tools, select tools with vibration dampening built in whenever possible. Provide personal protective equipment such as gel-padded-padded gloves to reduce exposure to vibration.

9.0 TRAINING

9.1 Office Ergonomics

The Office Ergonomics training session is intended to cover all aspects of user computer interfacing. Subjects such as work station arrangement, correct body posture, and exercises to minimize the frequency of cumulative traumas. Attendees include Group A classification.

9.2 Manual Material Handling

This course is designed for all employees engaged in regular lifting of items >20 lbs (Group C employees). It provides information about proper lifting techniques and how to avoid injuries associated with manual material handling.

9.3 New Employees

All new employees shall attend a safety orientation program that includes ergonomics. The orientation program is designed to inform new employees about the CSUDH Ergonomics Program.

Employees must attend an ergonomic training session before an ergonomic assessment is provided in order to ensure employees receive an explanation of: CSUDH Ergonomic Program; exposures associated with repetitive motion injuries; symptoms and consequences of injuries caused by repetitive motion injuries; the importance of reporting symptoms and injuries to a Manager/Supervisor; and methods used by CSUDH to minimize repetitive motion injuries.

10.0 MEDICAL MANAGEMENT

All related Cumulative Trauma Disorder injuries or symptoms are managed through RM/EHOS. RM/EHOS will supervise employees who are under doctor care for CTD's while at work, to ensure employees do not aggravate the medical condition. Managers will also ensure corrective actions at the workstation have been implemented to prevent such injuries or symptoms from reoccurring.

11.0 ATTACHMENTS

11.1 Office Ergonomics Workstation Assessment

See Office Assessment Form at:

http://ww.csudh.edu/admfin/health_sand_safety.shtml

12 Keys to Office Workstation Set-up

See Office Workstation Set-up at:

http://ww.csudh.edu/admfin/health_sand_safety.shtml

11.2 Industrial Ergonomics Assessment

See Industrial Ergonomics Assessment Form at:

http://ww.csudh.edu/admfin/health_sand_safety.shtml
